KPMG Future Analytics

Environmental Impact Assessment Report (EIAR)

Volume 2: Main Report

In respect of a Part 10 (s. 175) Planning Application for a Proposed Mixed-use Residential-Led Development located on lands at Cherry Orchard, Dublin 10.

On behalf of The Land Development Agency

December 2023

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Non-Technical Summary

A Non-Technical Summary of the EIAR has been prepared and submitted along with this Report. The EIA Directives includes the requirement for a non-technical summary, as one of the fundamental objectives of the EIA process is to ensure that the public is made fully aware of the environmental implications of any decisions about whether to allow new projects to take place. EPA Guidelines note that the non-technical summary of the EIAR should cover the issues that arose in sufficient detail so that the key issues and their implications can be clearly understood. The Guidelines also notes that, in the case of larger projects it can be useful to present the non-technical summary as a separate document, which can be widely distributed to the public who are likely to be affected by the project.

In that regard a document containing the Non-Technical Summary of all the chapters and subsequent details on the key issues and their implication has been submitted along with this EIAR and planning application. The structure of the Non-Technical Summary follows a similar structure to this EIAR, i.e., describing the project, existing environment, effects, and mitigation measures, etc.

All likely significant effect, where relevant has been detailed and included.

1 Introduction

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of The Land Development Agency (LDA), in respect of a Proposed Development at sites located on lands at Cherry Orchard, Dublin 10 (known as Development Site 4 and 5 in the Park West Cherry Orchard Local Area Plan 2019).

The subject site of circa 11.5 hectares is located on lands at Park West Avenue, Cherry Orchard, Dublin 10, and forms Development Sites 4 and 5 as identified in the Park West Cherry Orchard Local Area Plan 2019. The site is bound by Cloverhill Road to the north, Cedar Brook Avenue and Park West Avenue to the east, Park West Cherry Orchard Rail Station to the southeast, the rail line to the south, and the M50 motorway to the west.

1.2 Proposed Scheme

The planning application which has been submitted alongside this EIAR relates only to Phase 1 of the overall Development of Cherry Orchard Point. However, for the purposes of the Environmental Impact Assessment Report, it is determined that the most prudent approach would be to consider the development lands (Site 4 and 5) holistically, given the nature of cumulative impacts, and to submit a combined EIAR for the collective planning applications.

The overall proposal, subject to assessment as part of this EIAR, is for the development of what is recognised as Cherry Orchard Point and is identified as Development Sites 4 and 5 under the Park West Cherry Orchard Local Area Plan (Figure 1.1). The overall development will provide approximately 1,115 homes, 4,790 sqm of retail uses on Park West Avenue, creche facility, and up to 16,310 sqm of commercial / enterprise uses adjacent to the M50 corridor.

Figure 1.1 Development Sites in the context of surrounding area

An overview of the proposed scheme, which is the subject of this Planning Application, has been set out below, including details in relation to overall development, which will be assessed throughout this EIAR.

Application Site

The Application Site (also known as 'Subject Site' hereon) is part of Site 4 at Cherry Orchard, Dublin 10 (known as Development Site 4 in the Cherry Orchard Local Area Plan 2019), see Figure 1.3.

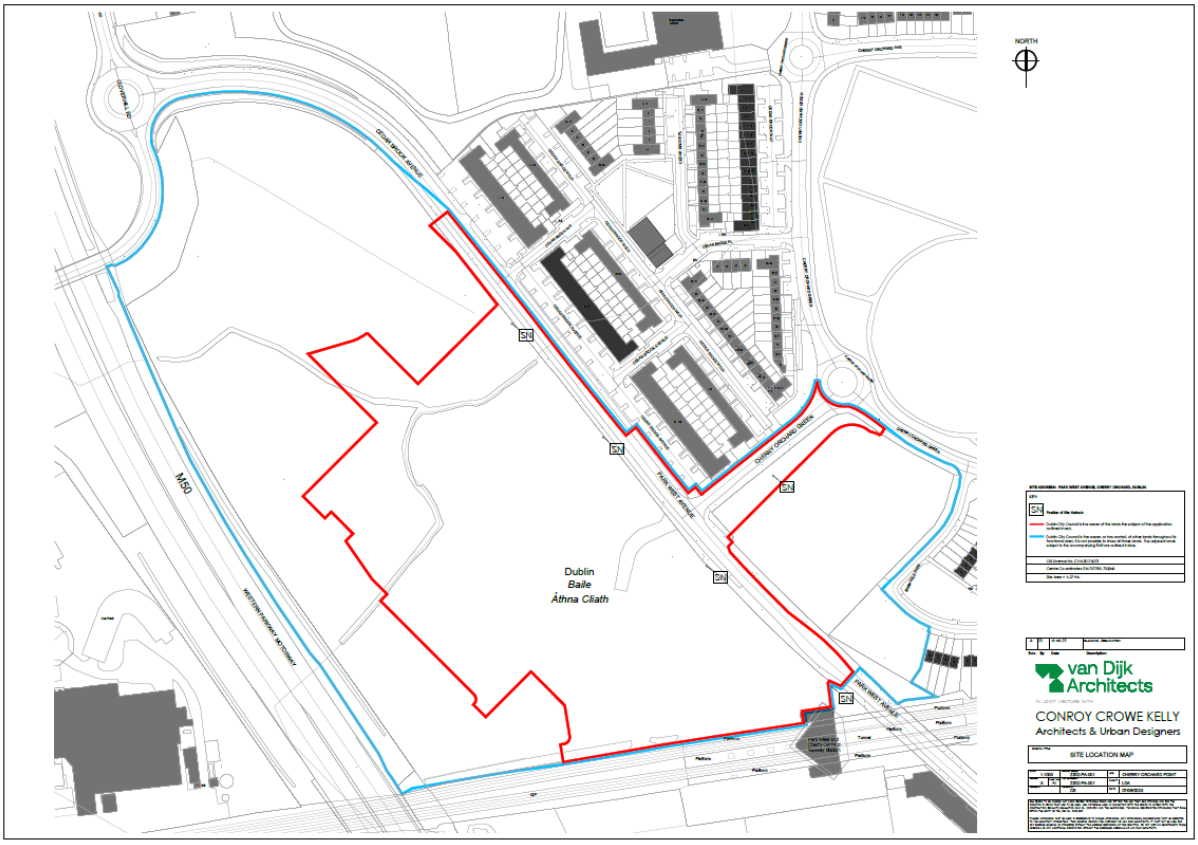


Figure 1.2 Site Location Map (Blue line: Ownership Boundary and Red line: Application Boundary)

The proposed scheme represents Phase 1 of the overall planned development and has been proposed on part of Site 4, covering an area of c. 6.27 hectares (red line boundary in Figure 1.3) The application site consists of a mix of residential, retail, commercial and community uses (the details of which has been set out in Planning Report submitted along with this application).

Figure 1.3 Site Layout Plan (Source: van Dijk Architects and Conroy Crowe Kelly Architects and Urban Designers)

The proposed development subject to the planning application for Phase 1 consists of a residential led mixed use scheme containing 708no. residential apartments comprising 547no. cost rental and 161no. social / affordable units, a convenience retail supermarket, independent retail / commercial units, dedicated internal and external community and arts / cultural spaces, a childcare facility with associated outdoor play area, landscaped public open space including community plaza, multipurpose amenity lawn, play space, outdoor fitness trail, multi-use games area (MUGA), playground and all associated site and development works. The proposed development represents Phase 1 of the overall planned development for Development Sites 4 and 5 of the LAP lands.

The proposed development (GFA of c. 66,398.8sqm) involves the construction of 16 blocks contained within 9 buildings ranging in height from 4 to 15 storeys comprising 28no. studio units, 263no. one-bed units, 368no. two-bed units (52no. two-bed three-person and 316no. two-bed four-person) and 49no. three-bed units (59,022.8sq.m total residential GFA), together with a convenience retail supermarket (2,523sq.m GFA), 7no. retail / commercial units (totalling 373sq,m GFA), community, arts and cultural spaces delivered across 13no. community and arts / cultural units (totalling 1,222sq.m GFA), and associated external events space and community gardens (1,157sq.m), a childcare facility (672sq.m GFA) with associated external playing space (200sq.m) and all ancillary and sundry accommodation including sub stations, plant, refuse stores, cycle stores, and metre / comms rooms (2,586sq.m total GFA).

Further specific details of the subject site and proposed scheme are set out in Chapter 2 (Background to the Proposed Scheme).

1.3 EIAR Study Boundary

Development Sites

The subject lands comprise 2 no. sites known as Key Development Site 4 and Site 5 as identified in the Park West Cherry Orchard Local Area Plan 2019. The lands together are approximately 11.5 hectares in size, with plans for a mixed-use residential development. The lands are under the ownership of Dublin City Council and are being developed in partnership with the Land Development Agency. Figure 1.4 below demarcates the Development Sites in context of the surrounding area.

The sites are bound by Cloverhill Road to the north, Cedar Brook Avenue and Park West Avenue to the east, Park West Cherry Orchard Rail Station to the southeast, the rail line to the south, and the M50 motorway to the west. Two large industrial estates can be found to the south and southwest of the site as well as many green spaces and parks softening the area.

Figure 1.4 Development Sites in the context of surrounding area

The Development on Sites 4 and 5 of the Local Area Plan 2019 will be delivered across four Phases (see Figure 1.5).

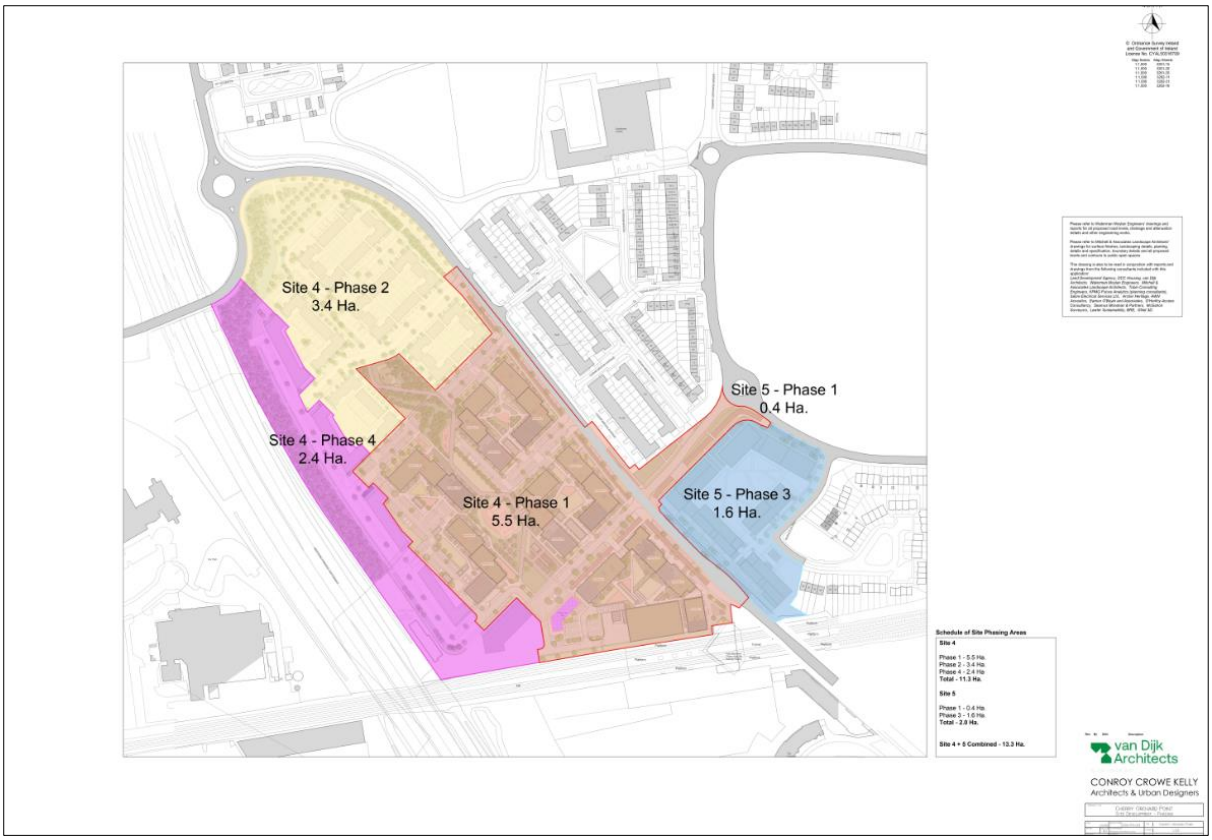


Figure 1.5 Phasing Plan for the delivery of the Proposed Development on Key Sites 4 and 5 under the Park West Cherry Orchard Local Area Plan 2019 (Source: Van Dijk Architects and Conroy Crowe Kelly Architects).

A breakdown of the total residential units under - cost rental, social and affordable units proposed for Phases 1-3 is provided in the below Table 1.1. Figure 1.6 illustrates the various character areas identified and proposed to be delivered.

Table 1.1 Break down of typology of residential units proposed in Phases 1 to 3 of the Development

Phase	Cost Rental	Social and Affordable	Total Units
1	547	161	708
2	153		153
3	203	51	254
Total			**1,115**

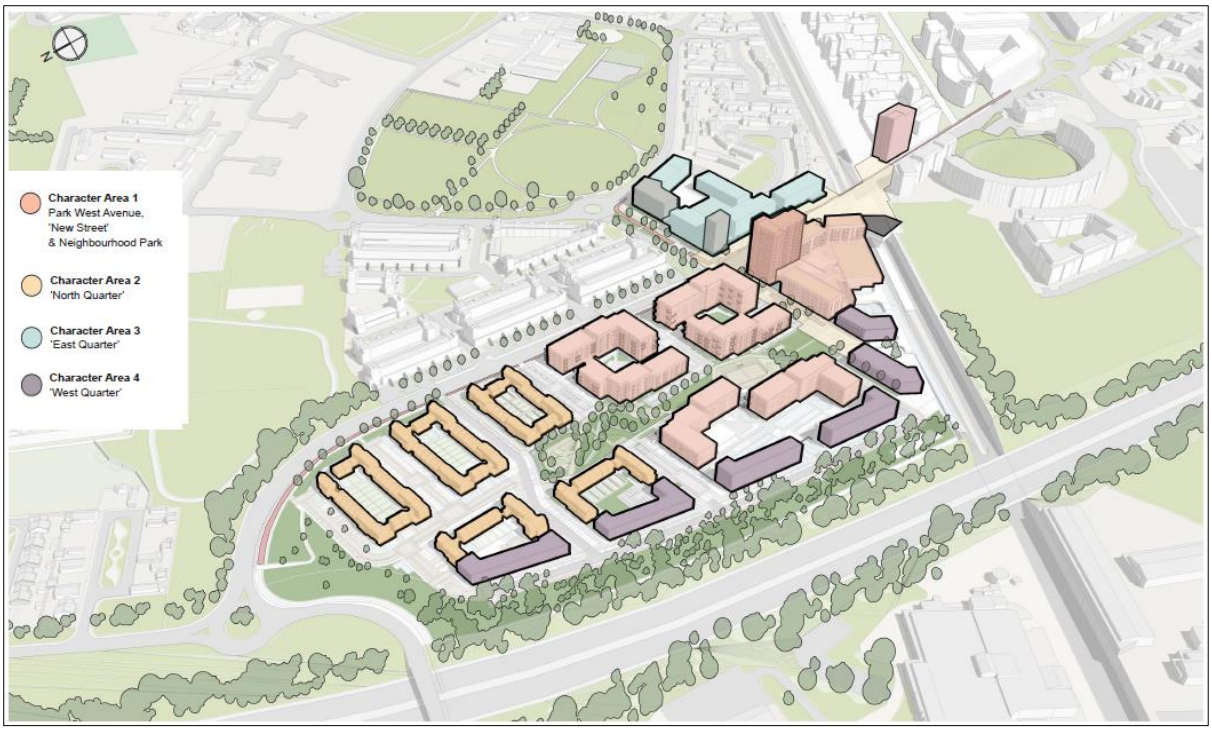


Figure 1.6 Proposed Development with the Character Areas illustrated (Source: Architectural Design Statement)

In total, the Development will provide approximately 1,115 homes, 4,790 sqm of retail uses on Park West Avenue, a creche, up to 16,310 sqm of commercial / enterprise uses adjacent to the M50 corridor and around 1,200 sqm of non-residential uses on Site 5.

The study area for the purposes of this EIAR has been defined in consideration of the entire development / ownership boundaries of Sites 4 and 5 (boundaries demarcated in Figure 1.7). This consideration has been made on the basis that the development falls under a single ownership and hence, will be a single scheme, delivered in phases to align with the availability of essential infrastructure, services and amenities. Hence, the overall impacts of the entire development on the surrounding area, the associated risks and any subsequent mitigation measures will have to be set out and addressed at the outset.

Figure 1.7 illustrates the ownership boundary (in green), which also forms the basis for defining the EIAR Study Boundary / Catchment, which would extend from the outlined ownership boundaries.

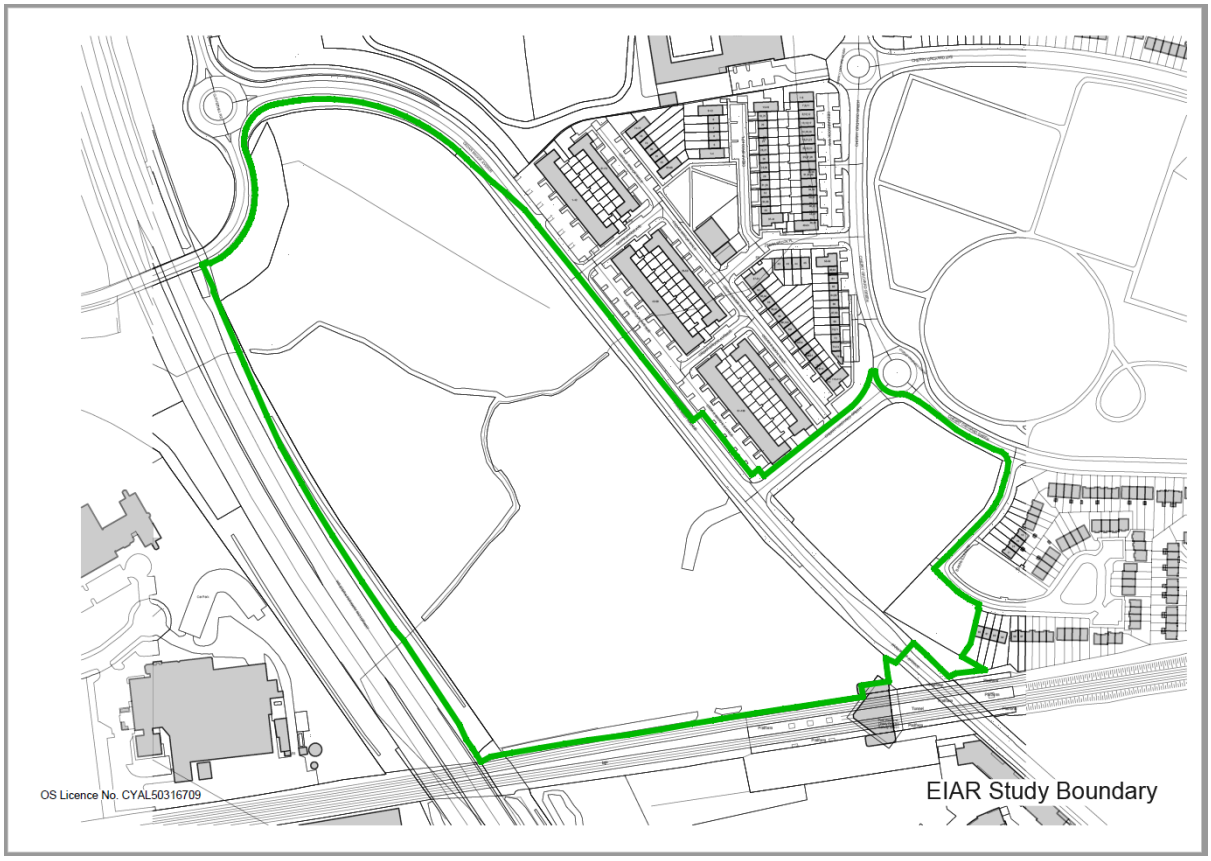


Figure 1.7 EIAR Boundary

Further details on the approach to, and consideration of, the receiving environment and subsequent sensitive receptors have been provided in each of the Chapters through this EIAR.

1.4 Definition of EIA

The 2014 EIA Directive (2014/52/EU) defines 'Environmental Impact Assessment' as a process consisting of the preparation of an environmental impact assessment report by the developer, for the examination of the competent authority to reach a reasoned conclusion on the significant effects of the project on the environment. EIA Directives have been transposed into the Irish law by way of the *Planning and Development Acts 2000 (As amended) and Planning and Development Regulations* 2001-2023.

As defined by Directive 2014/52/EU and restated within the *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* by the Department of Housing, Planning and Local Government, it is a process consisting of:

(a) the preparation of an Environmental Impact Assessment Report (EIAR) by the developer

(b) the carrying out of consultations

(c) the examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through consultations with the public, prescribed bodies and any affected Member States

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

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

The *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022) by the Environmental Protection Agency (EPA) defines an EIAR as *'a report or statement of the effects, if any, that the proposed project, if carried out, would have on the environment.'* The Guidelines further note that:

> *"The EIAR is prepared by the developer and is submitted to a CA as part of a consent process. The CA uses the information provided to assess the environmental effects of the project and, in the context of other considerations, to help determine if consent should be granted. The information in the EIAR is also used by other parties to evaluate the acceptability of the project and its effects and to inform their submissions to the CA."*

This report prepared by or behalf of the developer on the environmental impact assessment is referred to as an Environmental Impact Assessment Report since the amended directive 2014/52/EU. It was previously referred to as Environmental Impact Statement (EIS).

1.5 Need for an EIAR

1.5.1 EIA Legislation Context

This EIAR document has been prepared in accordance with the European Union EIA Directive 85/337/EC as amended by 97/11/EC, 2003/4/EC, 2011/92/EU and Directive 2014/52/EU. The EIAR has also been prepared in accordance with the *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environment Impact Assessments* (2018) and the *Guidelines on the information to be contained in Environmental Impact Assessment Reports* published by the EPA (2022). The following key guidelines and guidance produced by EU and other government agencies were consulted in the preparation of this EIAR:

- EU Guidance on EIA Screening (European Commission 2001).
- EU Guidance on EIA Scoping (European Commission 2001).
- EIA Review Checklist (European Commission 2001).
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002)
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Development Management Guidelines (DoEHLG, 2007).
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports
- (EPA 2017)
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems - Key Issues Consultation Paper (Department of Environment, Community and Local Government, 2017).
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (Department of Housing, Planning and Local Government, 2017).
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Screening (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Scoping (European Commission 2017)

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018)]
- Environmental Impact Assessment Screening Practice Note 02 (Office of Planning Regulator 2021)

Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022)

1.5.2 EIA Screening

The 2017 *Environmental Impact Assessment of Projects: Guidance on Screening* published by the European Commission defines the screening as the stage that *'ascertains whether a projects effects on the environment are expected to be significant'*. Projects are required to undertake screening to determine whether an EIA is necessary. The Screening is carried out as per a case-by-case examination or by the thresholds set by the relevant Member State's Competent Authority. Mandatory legislative threshold requirements take into account the type and scale of the proposed development, and the sensitivity of the receiving environment.

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the "**EIA Directive**") which are designed to ensure that projects likely to have significant effects on the environment are subject to a comprehensive assessment of environmental effects prior to development consent being given.

Article 2 of the EIA Directive provides that Member States shall bring into force the laws, regulations, and administrative provisions necessary to comply with the Directive by 16 May 2017.

The EIA Directive has been transposed into Irish law by way of, inter alia, amendments to the Planning and Development Act 2000, and the Planning and Development Regulations 2001.

Annex I of the EIA Directive requires as mandatory the preparation of an EIA for all development projects listed therein. Schedule 5 (Part 1) of the *Planning & Development Regulations*

2001 (as amended) transposes Annex 1 of the EIA Directive directly into Irish land use planning legislation. The Directive prescribes mandatory thresholds in respect to Annex 1 projects. Annex II of the EIA Directive provides EU Member States discretion in determining the need for an EIA on a case by- case basis for certain classes of project having regard to the overriding consideration that projects likely to have significant effects on the environment should be subject to EIA. Schedule 5 (Part 2) of the *Planning & Development Regulations* 2001 (as amended) set mandatory thresholds for each project class.

Class 10(b) (i) and (iv) addresses 'Infrastructure Projects' and requires that the following class of project be subject to EIA:
(b) (i) Construction of more than 500 dwelling units.

Furthermore, Category 10(b)(iv) refers to:
'*Urban development which would involve an area greater than 2 hectares in the case of business district, 10hectares in the case of other parts of a built-up area and 20 hectares elsewhere.'*

1.5.3 Scoping of EIAR

The proposed development has been subject to several pre-planning meetings and discussions with Dublin City Council and An Bord Pleanála.

This Planning Application is made under Part 10 Section 175 of the Planning and Development Act, 2000 (as amended) (The Act). Planning applications where the Planning Authority, either in its own capacity or in partnership with another entity, proposes to carry out development within its functional area in which an Environmental Impact Assessment Report (EIAR) has been prepared, are made under Section 175 of The Act. Such applications are made directly to An Bord Pleanála (ABP) for assessment and decision.

The Subject Lands are under the ownership of Dublin City Council (DCC). The consenting process for planning permission was determined on the basis of the role of Dublin City Council in the project – as landowners – noting their development agreement with The Land Development Agency in respect of the subject lands.

A written scoping opinion on what information should be provided as part of the EIAR was provided by An Bord Pleanála on 20th March 2023. A summary of An Bord's opinion is set out below:

1. The Proposed Development- to include information on the site, design, size and other relevant features of the proposed development. Consultation
2. The Existing Environment - The existing/baseline environment should be clearly outlined including details of existing/historical defences employed within the area.
3. The Receiving Environment - the EIAR shall include all areas that would be impacted upon, directly or indirectly, by the proposed development.
4. The Likely Significant Effects of the Proposed Development - Impacts should address direct, indirect, secondary, cumulative, short, medium and long-term, permanent, temporary, positive and negative effects as well as impact interactions.
5. The Measures to Mitigate Adverse Impacts - The EIAR shall give a description of the features of the proposed development and measures envisaged to avoid, prevent, reduce and, if possible, offset likely significant adverse effects on the environment.
6. The Consideration of Alternatives. The consideration of alternatives should also be addressed in the EIAR and should comprise a description of the reasonable alternatives relevant to the proposed development which were studied and the reason for the option chosen having regard to the effects on the environment.
7. A Non-Technical Summary - The EIAR must contain a non-technical summary of the detailed information contained within the EIAR.

In terms of specific environmental topics the development is likely the impact upon, it was An Bord's opinion that the EIAR should in particular address the following matters:

- Population and Human Health,
- Biodiversity (for example fauna and flora),
- Land (for example land take) and Soil (excavation, contamination, importation),
- Water (for example hydro morphological changes, coastal processes, and quality),
- Air and Climate (incl. greenhouse gas emissions, impacts relevant to adaptation),
- Material Assets (transportation, waste and utilities),
- Cultural Heritage (including archaeology),
- Landscape,
- Interactions between the above factors.

1.5.4 Risk of Major Accidents and Disasters

In accordance with Article 3(2) and Annex IV of the Directive, the vulnerability of the project to risks of major accidents and/or disasters, as well as likely significant effects on the environment if it did occur, are considered.

Article 3(2) of the Directive states that an EIAR should consider the following: -

> *'The effects referred to in paragraph 1 on the factors set out therein 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'.*

In addition, an EIAR should also contain the following information prescribed in 5(d) of Annex IV of the EIA Directive:

> *"A description of the likely significant effects of the project on the environment resulting from, inter alia:(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);"*

The 2018 Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment sets out two key considerations to address this:

- "The potential of the project to cause accidents and/or disasters, including implications for human health, cultural heritage, and the environment.
- The vulnerability of the project to potential disasters/accidents, including the risk to the project of both natural disasters (e.g., flooding) and man-made disasters (e.g., technological disasters)."

During the construction phase, the risk of accidents and/ or disasters caused by the project, arising from the potential for construction accidents, are addressed under Health and Safety Regulations and other codes. When directly relevant to the planning and EIA process, certain mitigation measures are identified in order to prevent and/ or mitigate any significant effects.

During the operational phase, the risk of fire related accidents is addressed through the Building Regulations (Fire Safety) and is also addressed through mitigation measures, where applicable. Specifically, residual risks of fire and road traffic accidents will be managed by emergency services.

1.6 Structure and Content of EIAR

The content of this EIAR has been prepared as per the requirements provided in Article 5(1) and Annex IV of the EIA Directive Environmental Protection Agency's *Guidelines on the information to be contained in Environmental Impact Assessment Reports* describes what an EIAR is to contain in accordance with Article 5(1), as follows:

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

The EPA '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' describe inclusion of the following as good practice in the preparation of an EIAR:

- Key alternatives considered;
- Proposed project;
- Receiving environment;
- Likely significant effects; and
- Mitigation and monitoring measures and residual effects.

A non-technical summary is also required to be provided. This is provided as a separate volume to this report. This section will provide core information of the assessments in a simpler language and condensed format to ensure that the public and local community are aware of the likely environmental impacts of the proposed development.

As per article 3(1) of the EIA Directive *the environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of individual case, the direct and indirect significant effects of a project on the following factors:*

(a) population and human health;
(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
(c) land, soil, water, air and climate;
(d) material assets, cultural heritage and the landscape;
(e) the interaction between the factors referred to in points (a) to (d)

This EIAR includes all necessary technical studies to address the likely environmental impacts of the construction and operation of the proposed development. The disciplines identified for inclusion in this EIAR, along with the technical content, were determined based on a various site walkover surveys, completion of an environmental scoping exercise (to inform the content and extent of matters covered in the environmental information) and consultation with statutory bodies.

Within the main body of the EIAR, Chapter 1 sets out the Introduction and Methodology, Chapter 2 sets out the relevant Planning Policy and Context and Chapter 4 sets out the Population and Human Health characteristics of the receiving environment.

The environmental topics where there is potential for significant impacts to arise are addressed in Chapters 5 to 16 as follows:

Chapter 5	Air Quality
Chapter 6	Climatic Factors
Chapter 7	Noise and Vibration
Chapter 8	Biodiversity
Chapter 9	Archaeological, Architectural and Cultural Heritage
Chapter 10	Landscape and Visual
Chapter 11	Land, Soil and Geology
Chapter 12	Water
Chapter 13	Population and Human Health
Chapter 14	Material Assets -Traffic & Transportation
Chapter 15	Material Assets – Waste Management
Chapter 16	Material Assets – Utilities

Chapter 17 provides an overview of various interactions across environmental topics. Chapter 18 provides a Summary of Mitigation Measures and Residual Impacts.

Where appropriate, each of the main sections of this report are structured in the same general format, as follows:

- An introduction describing the purpose of the section and setting out the qualifications and experience of the author;
- A description of the methodology used in the section;
- A description of the aspects of the existing environment relevant to the environmental topic under consideration;
- Characteristics of the proposed development under consideration;
- An assessment of the impact of the proposed development on the environmental topic;
- Recommendations for mitigation measures to reduce or eliminate any significant negative impacts identified; and,
- An assessment of the residual impact that will remain, assuming that recommended mitigation measures are fully and successfully implemented.
- Summary of interactions, where identified;
- Monitoring measures, where relevant;
- References.

Further details of the methodology and discipline specific best practice and guidance are presented in the relevant Chapters included within this report.

Details of the project will be available online through the EIA Portal and on the website of the Competent Authority. A copy of the application, including this EIAR, will also be available on the following website www.cherryorchardpointphase1partx.ie

1.7 General EIAR Methodology

1.7.1 Introduction

The methodology adopted for the preparation of this EIAR comprised a systematic analysis of the impact of the Proposed Project in relation to the existing environment. The overall methodology for preparation of the EIAR is discussed under the following headings;

- Basis for assessment;
- Impact assessment and mitigation; and
- Significance of environmental issues.

1.7.2 Basis for Assessment

The impact assessment examines the existing environmental conditions within the study area for each element of assessment and then determines the potential impacts associated with the Proposed Project during its construction and operational phases.

The study area considered within this EIAR differed for each environmental aspect and extended to incorporate all areas where there was potential for significant impact (i.e. any sensitive areas which could be affected by this development were included in the study area). Further information on the extent of the study area considered for each topic is addressed in the relevant corresponding EIAR chapter. As noted previously, the subject site for the purposes of this EIAR is the wider Cherry Orchard Point (Development Sites 4 and 5).

1.7.3 Impact Assessment and Mitigation

The preparation of the EIAR was an iterative process, linking into the design development process. The approach adopted in the impact assessment and preparation of the EIAR was based on the recommendations in the *Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA, 2022)*.

The proposed design was developed and the potential impacts of the proposal on the receiving environment was identified. Mitigation measures, once identified and assessed, have been incorporated into the design, where possible.

1.7.4 Residual Impacts

Residual impacts relate to environmental change(s) which will occur after the proposed mitigation measures have been put in place and taken effect. Although there may be some residual impacts which arise from any development, these impacts are usually considered to be minimal in nature.

1.7.5 Significance of Environmental Issues

The glossaries contained in the EPA Guidelines on the information to be contained in EIAR describe an impact as '*change resulting from the implementation of project*.'

The following factors were considered when determining the significance of the impact (both positive and negative) of the Proposed Project on the receiving environment:

- The quality and sensitivity of the existing/baseline receiving environment;
- The relative importance of the environment in terms of national, regional, county, or local importance;
- The degree to which the quality of the environment is enhanced or impaired;
- The scale of change in terms of land area, number of people impacted, number and population of species affected, including the scale of change resulting from cumulative impacts;
- The consequence of that impact/change occurring;
- The certainty/risk of the impact/change occurring;
- Whether the impact is temporary or permanent; and
- The degree of mitigation that can be achieved.

The criteria outlined in the EPA Guidelines have also been followed when quantifying the duration and magnitude of impacts. The quality of the impact is described as 'negative', 'neutral' or 'positive'. Particular consideration is also given to whether significant impacts are 'Direct' or 'Indirect'. Further information on the specific methodologies utilised for the assessment of each environmental aspect are included in the relevant EIAR chapters.

Where no impact or a positive impact was predicted to occur, the design of the Proposed Project remained unchanged. Where significant adverse impacts are predicted, mitigation measures are proposed to avoid or minimise impacts. Where feasible, these measures were then incorporated into the design of the Proposed Project.

In terms of the assessment of the significance of potential environmental effects, The EPA Guidelines sets out that the assessment of significance should be based on clear and unambiguous criteria, and that significance should be defined in a way that reflects what is valued in the environment by public and private stakeholders. A common approach to this would be the application of multi-criteria analysis.

Common criteria used to evaluate significance include the magnitude of the predicted effect and the sensitivity of the receiving environment:

- *'Magnitude' considers the characteristics of the change (**timing**, **scale**, **size**, and **duration of the impact**) which would probably affect the target receptor as a result of the proposed Project;*
- *'Sensitivity' is understood as the sensitivity of the environmental receptor to change, including its capacity to accommodate the changes the Projects may bring about.*

The EC guidelines also notes that significance is always context-specific and hence, a tailored criteria should be developed for each Project and its settings.

The EC Guidelines on Scoping states that all assessment methods should define clear thresholds or criteria for determining whether an impact is significant, based on the characteristics of an impact, in a clear and unambiguous manner.

The assessment method, hence, follows the commonly used approach of the 'multi-criteria analysis' to evaluate significance – which includes consideration of the magnitude of the predicted effects and the sensitivity of the receiving environment.

In order to scale and weigh the two criteria (on sensitivity and magnitude), a matrix similar to that set out in the EPA Guidelines (2022), has been considered to evaluate the significance of effects:

Table 1.2 Matrix of Significance

Impact Magnitude	**Environmental Sensitivity**			
	High	**Medium**	**Low**	**Negligible**
High	Profound	Very Significant or Significant	Significant or Slight	Slight
Medium	Very Significant or Significant	Significant	Slight	Slight or Non-Significant
Low	Significant or Slight	Slight	Slight or Non-Significant	Slight or Non-Significant
Negligible	Slight	Slight or Non-Significant	Slight or Non-Significant	Imperceptible

Generalised definitions of the above scale of effects, as provided within the EPA Guidelines (2022), is represented below in Table 1.3.

Table 1.3 Description of Significance of Effects (as per the EPA Guidelines 2022)

Terminology Describing Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences
Non-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 Effects	An effect which, by its character, magnitude, duration, or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

In line with the above, the Section on Impact Assessment through each Chapter, has set out in detail the impacts resulting from the Development as a whole and the extent of their significance on the receiving environment.

The construction of the development will be undertaken in accordance with the conditions of any forthcoming planning approval received for the scheme. Any further modification to the Proposed Project to improve/reduce environmental impacts will only occur where such modifications are

minor/points of detail. The final Proposed Project design and construction will comply with all relevant statutory approvals.

Following on from a grant of planning permission, the proposed project will progress to construction stage. All mitigation measures set out within this EIAR, and which are applicable to construction of the project and operation of the development, will be adhered to. This includes any mitigation measures contained in such planning permission, as may be granted.

1.8 Contributors/Subject Matter Experts: EIAR Team

This EIAR has been prepared by KPMG Future Analytics (Chartered Town Planning and Development Consultants) along with various competent specialist sub-consultants on behalf of the Land Development Agency (LDA). The list below presents the subject matter experts who contributed to the preparation of the report and their qualifications:

Table 1.4 Summary of EIAR Authors and Qualification

Environmental Aspect	Company Name	Person Responsible	Qualification
EIAR Manager	KPMG Future Analytics	Alan Crawford	BA (Hons) MRUP MIPI
EIAR Reviewer	KPMG Future Analytics	Stephen Purcell	BSc. (Hons) MRUP MSc. MIPI FSCSI FRICS
Air Quality	AWN Consulting	Dr Avril Challoner	PhD, BEng, CSci, CEnv
Climate Factors	AWN Consulting	Dr Avril Challoner	PhD, BEng, CSci, CEnv
Noise and Vibration	AWN Consulting	Alistair Maclaurin	BSc PgDip MIOA
Biodiversity	-	Gerry Tobin	BSc. (Zoo), M.A.
Archaeological, Architectural and Cultural Heritage	Archer Heritage Planning	Maeve McCormick	BA MSc Archaeology
Landscape and Visual Impact	Mitchell and Associates	Feargus McGarvey	BA (Hons) DipLA MILI HMGLDA
Lands, Soils, and Geology	Waterman Moylan	Robert Walpole	HCEng, BEng, BEng, MIEI
Water	Waterman Moylan	Robert Walpole	HCEng, BEng, BEng, MIEI
Population and Human Health	KPMG Future Analytics	Alan Crawford	BA (Hons) MRUP MIPI
Material Assets – Traffic and Transport	Waterman Moylan	Brian McCann	BE, MSc (Eng), DIC, CEng, FIEI, MIStructE, MConsEI
Material Assets – Waste Management	AWN Consulting	Niamh Kelly Chonaill Bradley, Principal Environmental Consultant	B.A. Earth Sciences, MSc International Disaster Management, Affiliate Member of CIWM BSc Environmental Science, Associate Member of CIWM
Material Assets - Utilities	Waterman Moylan	Robert Walpole	HCEng, BEng, BEng, MIEI

Further detail on the background and experience of subject matter experts is set out in the introductory sections to relevant chapters.

1.9 Difficulties Encountered During the Study

Difficulties encountered in the preparation of the EIAR are outlined in each chapter as they relate to the various environmental topics.

1.10 References

- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- European Union (2018) The European Union (Planning and Development) (Environmental Impact Assessment) Regulations
- European Union (1999) European Communities (Environmental Impact Assessment) (Amendment) Regulations (S.I. No. 93 of 1999)
- Irish Statute (2000) The Planning and Development Act (No. 30 of 2000), as amended
- Irish Statute (2001) Planning and Development Regulations (S.I. No. 600 of 2001) as amended European Commission, (2001) Guidance on EIA – Scoping
- EPA (2017) Draft Guidelines on preparation of Environmental Impact Assessment Reports
- Department of the Environment, Community and Local Government (DoECLG), (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment
- EPA (2002) Guidelines on the Information to be contained in Environmental Impact Statements
- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements
- EPA (2015) Draft Revised Guidelines on the Information to be contained in Environmental Impact Statements
- EPA (2015) Draft Revised Advice Notes on Current Practice in the Preparation of Environmental Impact Statements
- EPA (2015) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Department of Housing Planning and Local Government (2018) EIA Portal. Available from: https://www.housing.gov.ie/planning/environmental-assessment/environmental-impactassessment-eia/eia-portal.

2 Background to the Proposed Scheme

2.1 Introduction

This section of the EIAR provides background to the Proposed Development and site location in accordance with the requirements set out within the EIA legislation and guidance on preparation and content of EIAR. This chapter has been prepared by Alan Crawford, MRUP MIPI, Associate Director (Planning) at KPMG Future Analytics. Alan has 11 years' experience in the planning of residential schemes including the preparation and project management of EIARs.

2.2 Subject Lands

The subject landholding consists of 2 no. sites known as Key Development Site 4 and Site 5 under the Park West Cherry Orchard Local Area Plan 2019. The lands are located in Cherry Orchard, Dublin 10 and together have a combined area of 11.5 hectares. The subject lands are under the ownership of Dublin City Council and are being developed for a mixed-use residential scheme by the Council in partnership with The Land Development Agency (LDA).

The subject lands are bound by the M50 motorway along the west, the Dublin southwestern railway line along the south side, the Palmerstown Way fly over to the north and the exiting residential development of Cedar Brook and Barnville and the New Cherry Orchard Park to the east.

The lands are comprised of two plots separated by Part West Avenue and have no buildings or features of note. The Development Site 5 appears to have a significant quantity of fill and a large ESB pylon on the corner of this site. The subject lands are currently vacant and overgrown in sections, particularly along the M50 boundary. The traces of three historic townland boundaries cover the centre of the larger site (Site 4). Site 4 is generally flat in nature, rising sharply to the M50 along the west boundary. Towards the railway station (south), the site falls and the change in level to Park West Avenue (east) is retained by a concrete wall. The Development will have long distance views of the Dublin mountains toward southeast from the centre of Site 4.

Figure 2.1 Subject Lands (Site 4 and Site 5). The ownership boundary is demarcated by a blue line and the application boundary by red line. (Source: Architectural Design Statement)

The subject sites are well located with access to a range of existing bus and train services, including the BusConnects network operated by Dublin Bus.

The development of Sites 4 and 5 of the Park West Cherry Orchard Local Area Plan (LAP) 2019 will be delivered across four Phases with a mix of uses in line with the requirements of the LAP, with predominantly residential uses (including cost rental, social and affordable units across Phases 1 to 3).

The overall Development will provide approximately 1,115 homes, 4,790 sqm of retail uses on Park West Avenue, creche facility, and up to 16,310 sqm of commercial / enterprise uses adjacent to the M50 corridor.

2.3 Application Site

The Application Site (also known as 'Subject Site' herein) is part of Site 4 at Cherry Orchard, Dublin 10. The Subject Site is currently vacant and contains a large expanse of grassed lawn, mature trees and overgrown vegetation which form the western and northern boundary of the site. The lands are largely flat in nature rising sharply to the M50 along the western boundary falling towards the rail station. The lands are strategically positioned bounded by the M50 to the west and the Park West-Cherry Orchard

rail station to the south which provides excellent accessibility and connectivity opportunities. The site also benefits from direct access via Cedar Brook Avenue which connects with Park West Avenue and is served by the No.60 and G1 bus routes providing direct linkages to Dublin City Centre and the Docklands. The surrounding area is mixed use in nature with two large industrial estates each to the southwest and southeast of the site, residential developments located further east, Cloverhill Prison to the north and a number of recreational and green spaces including Cherry Orchard Park.

The Subject Site is part of the wider area identified under the Dublin City Development Plan 2022-2028 for regeneration which is reflected in the lands' designation as a Strategic Development Regeneration Area (SDRA 4). The Park West Cherry Orchard Local Area Plan for the area was adopted in 2019 and identified 8 no. Key Development Sites within the wider LAP lands that offer the potential to deliver approximately 2,000 residential units in tandem with employment and commercial development. The subject site represents part of Development Site 4 and will form the first of four phases of development aimed at delivering upon the aspirations of the LAP for the redevelopment of these lands.

The proposed scheme represents Phase 1 of the overall planned development and has been proposed on part of Site 4, covering an area of c. 6.27 hectares (red line boundary in Figure 2.2). The Subject Site consists of a mix of residential, retail, commercial and community uses (the details of which has been set out in Planning Report submitted along with this application).

Figure 2.2: Site Layout Design Strategy (Source: Architectural Design Statement)

The proposed scheme involves construction of 16 blocks contained within 9 buildings ranging in height from 4 to 15 storeys comprising of 28no. studio units, 263no. on-bed units, 368no. two-bed units (52no. two-bed three-person and 316no. two-bed four-person) and 49no. three-bed units (59,022.8sq.m total GFA) together with a convenience retail supermarket (2,523sq.m GFA), 7no. retail / commercial units (totalling 373sq,m GFA), community, arts and cultural spaces delivered across 13no. community and arts / cultural units (totalling 1,222sq.m GFA), and associated external events space and community gardens (1,157sq.m), a childcare facility (672sq.m GFA) with associated external playing space (200sq.m) and all ancillary and sundry accommodation including sub stations, plant, refuse stores, cycle stores, and metre / comms rooms (2,586sq.m total GFA).

A summary of the proposed blocks and their subsequent uses has been provided in Table 2.1 below.

Table 2.1 Proposed Mix of Uses and Units within each Block.

Apartment Block	Storeys	Units	Density Area	GFA (m2)	Non-Residential (m2)	Non-Residential Use
Apt Building 1	6	24	High	4,594	2,523	Retail
Apt Building 2A	6	27	High	3,084.8	222	Retail
Apt Building 2B	15	110	High	10,096	307	Retail (151 sqm)/Community (156sqm)
Apt Building 3	5	35	High	3,611	424	Community
Apt Building 5A	6	54	Medium	5,032	672	Creche
Apt Building 5B	5	29	Medium	2,628	0	NA
Apt Building 6A	6	58	Medium	5,019	0	NA
Apt Building 6B	5	24	Medium	2,584	289	Community
Apt Building 7A	7	81	Medium	6,363	0	NA
Apt Building 7B	6	30	Medium	3,208.8	353	Community
Apt Building 8A	6	63	Medium	5,424	0	NA
Apt Building 8B	5	33	Medium	2,640	0	NA
Apt Building 9A	5	47	Medium	3,791	0	NA
Apt Building 9B	4	22	Medium	2,075.2	0	NA
Apt Building 10A	4	42	Medium	3,664	0	NA
Apt Building 10B	5	29	Medium	2,584	0	NA
		708		**66,398.8**	**4,790**	

The rationale for the proposed mix of uses is in line with the vision for the scheme as set out with the statutory Local Area Plan 2019 for the Park West Cherry Orchard local area as well as the requirements of the Dublin City Development Plan 2022-2028.

2.4 Accessibility of the subject site

The Subject Site is located approximately 7km from the city centre within equal distance from the M50/N4 junction and the M50/N7 junction. Located only 2km away, the N4 connects Dublin to the Northwest of Ireland while the N7 provides a direct connection to Limerick. The trainline runs regularly connecting the Subject Site to the city centre while also providing services to the midlands. The nearest stop to the Luas (Red) Line, the Red Cow, is approximately four kilometres to the south of the Subject Site.

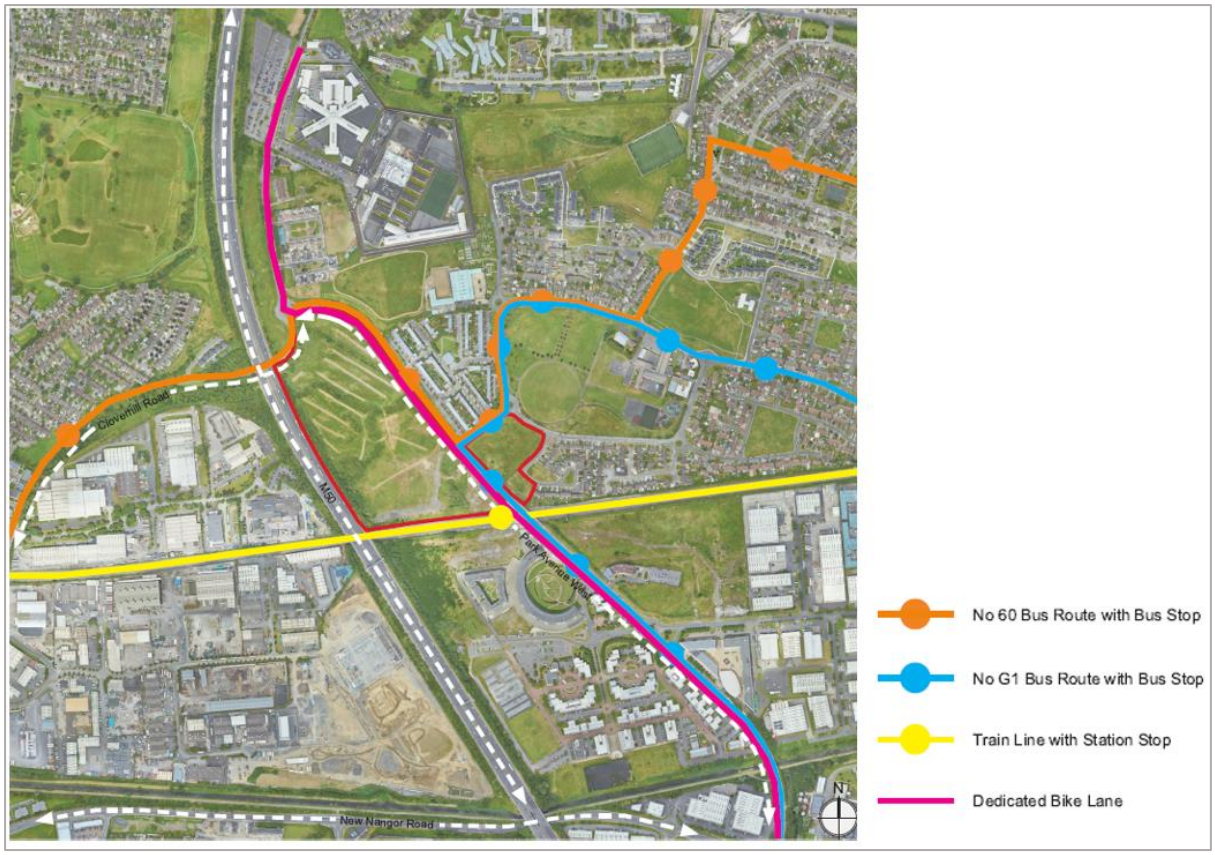


Figure 2.3 Subject site and public transport

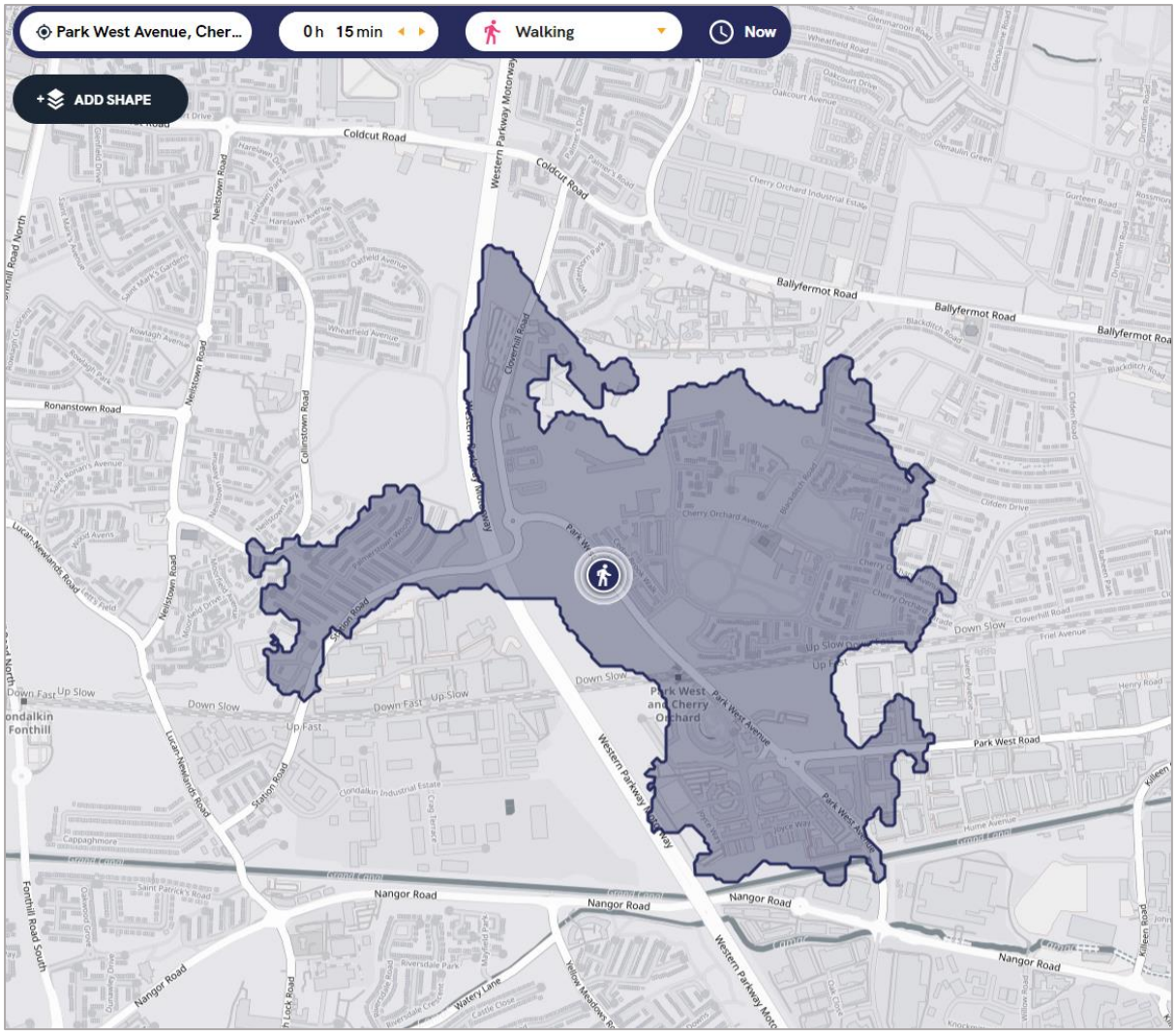


Figure 2.4:15-minute walking distance from the subject site (source: app.traveltime.com)

As shown above, the proposed access point to the subject site via Park West Avenue, will facilitate direct pedestrian linkages to Cherry Orchard Park, the existing community centre, a primary school and other facilities within 15 minutes walking distance from the site. Furthermore, the non-residential elements of the scheme that are available to general public will be directly accessible to wider Cherry Orchard community enabling the development to become a socially inclusive neighbourhood based on the principle of the 15-minute city. This approach, coupled with the provision of a continuum of housing options including cost rental housing will promote social inclusion and integration and contribute to the creation of compact growth and the consolidation of an established urban settlement supported by excellent existing and planned public transport infrastructure.

Commuter Rail Corridor

The Park West Train Station is located to the south of the Subject Lands and commenced in 2008 and falls along the South Western Commuter Rail Line (See Figure 2.5, marked yellow). This train station is an intermediate station on the Kildare Commuter Line with regular commuter and inter-city services from Portlaoise and Newbridge to Heuston Station and from Hazelhatch and Celbridge to Grand Canal Dock. Commuter services, as per the information on Irish Rail, serve suburbs in the north, west and south of the city and are usually frequent at rush hour and less so, during peak hours. The southwest commuter rail along the subject lands provides services with a frequency of 30 minutes at peak times.

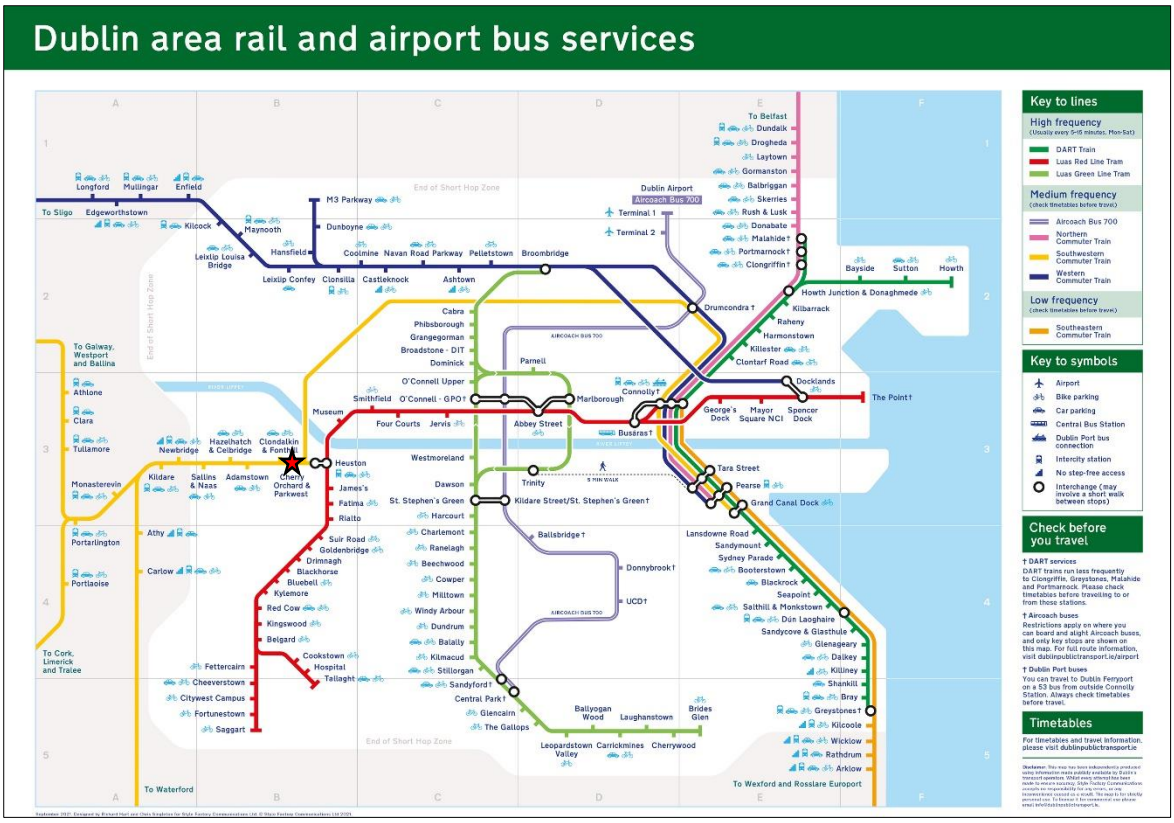


Figure 2.5: Train and Tram Corridors for Dublin City – South West Rail Line is annotated by yellow line with the Park West & Cherry Orchard Stop marked with a red star. (Source: Irish Rail)

The DART+ Programme was introduced to promote multi modal transit, active transport, boost regional connectivity and make public transport the preferred option for most people. This programme envisages the existing DART network to grow from its current length 50km to over 150km.

The DART + South West Project is the second of the infrastructural projects of the DART+ Programme expected to be delivered. This DART+ South West corridor is expected to extend along the south west commuter rail line adjacent to the Subject Lands and the Park West & Cherry Orchard Train station would be one of the stops. This, once delivered, will further expand the connectivity for both the future residents of the proposed development as well as the locals to other parts of the city and beyond.

Section 2.8 'Related Developments' provides further detail on this proposed DART+ South West extension, its delivery in tandem with the proposed scheme and any related impacts the project may have on the proposed development.

Greater Dublin Area Cycle Network

Under the Greater Dublin Area Cycle Network, a secondary (8C) cycle network passes along the west from across the M50 to intersect to the north of Site 4 and move further north (8C1) connecting into a primary route (7A). The secondary route (8C) also continues along the east of the Subject Site toward the south, to meet the primary route (7B/N10) and the Grand Canal Greenway (N10). Figure 2.6 below further illustrates the cycle network planned under the Greater Dublin Area Cycle Network Plan, for the area surrounding the Subject Site.

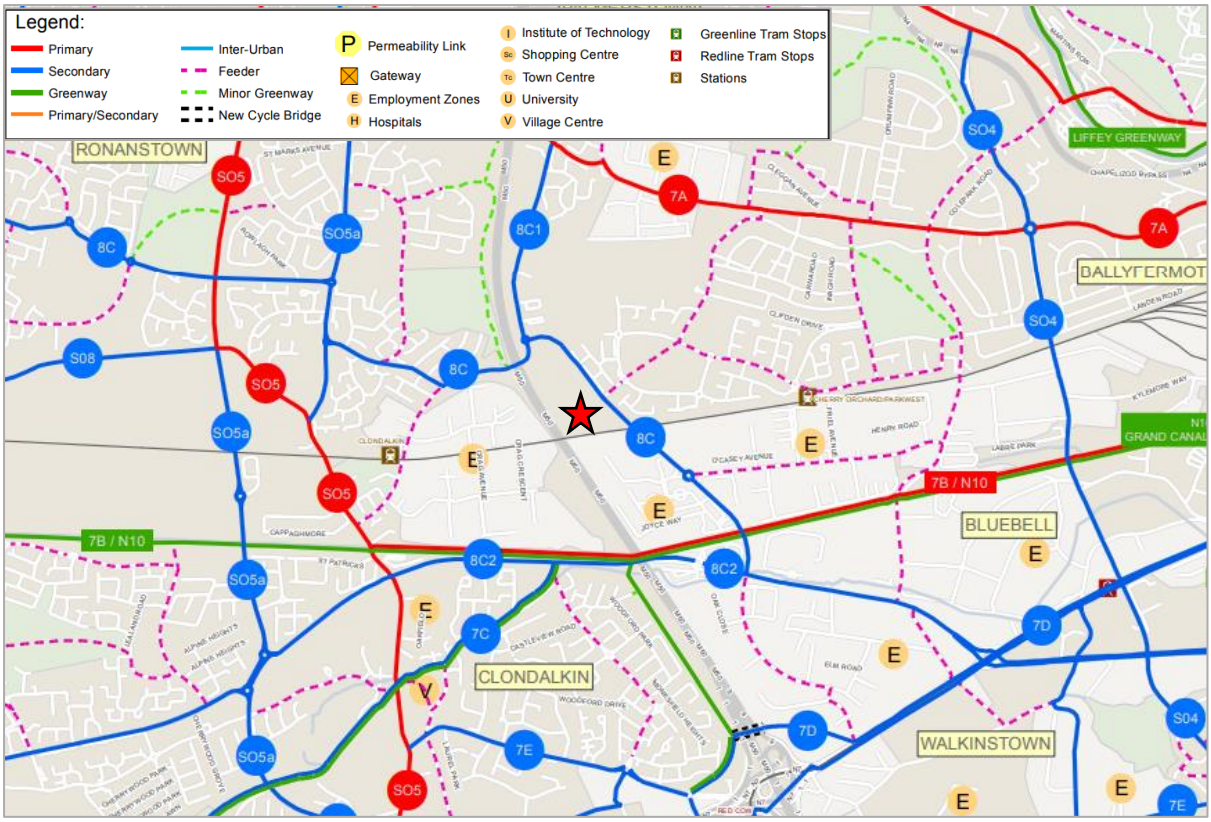


Figure 2.6:The Greater Dublin Area Cycle Network Plan 2013 (updated in 2021/22) and the subject site is marked by a red star. (Source: National Transport Authority – Proposed Cycle Network Dublin Area)

BusConnects Corridor

The Subject Site is served by the Spine / Branch Route (G1) which provides further connections to the D1 / D3 spine and other local, orbital, and peak time routes including the Red Line Luas at Red Cow – these routes link the Subject Site to the west of Dublin city. The G1 spine and route 60 also provide links to G2 spine and other orbital and city bound routes – connecting the Subject Site to the east of the city, including the Docklands via the city centre.

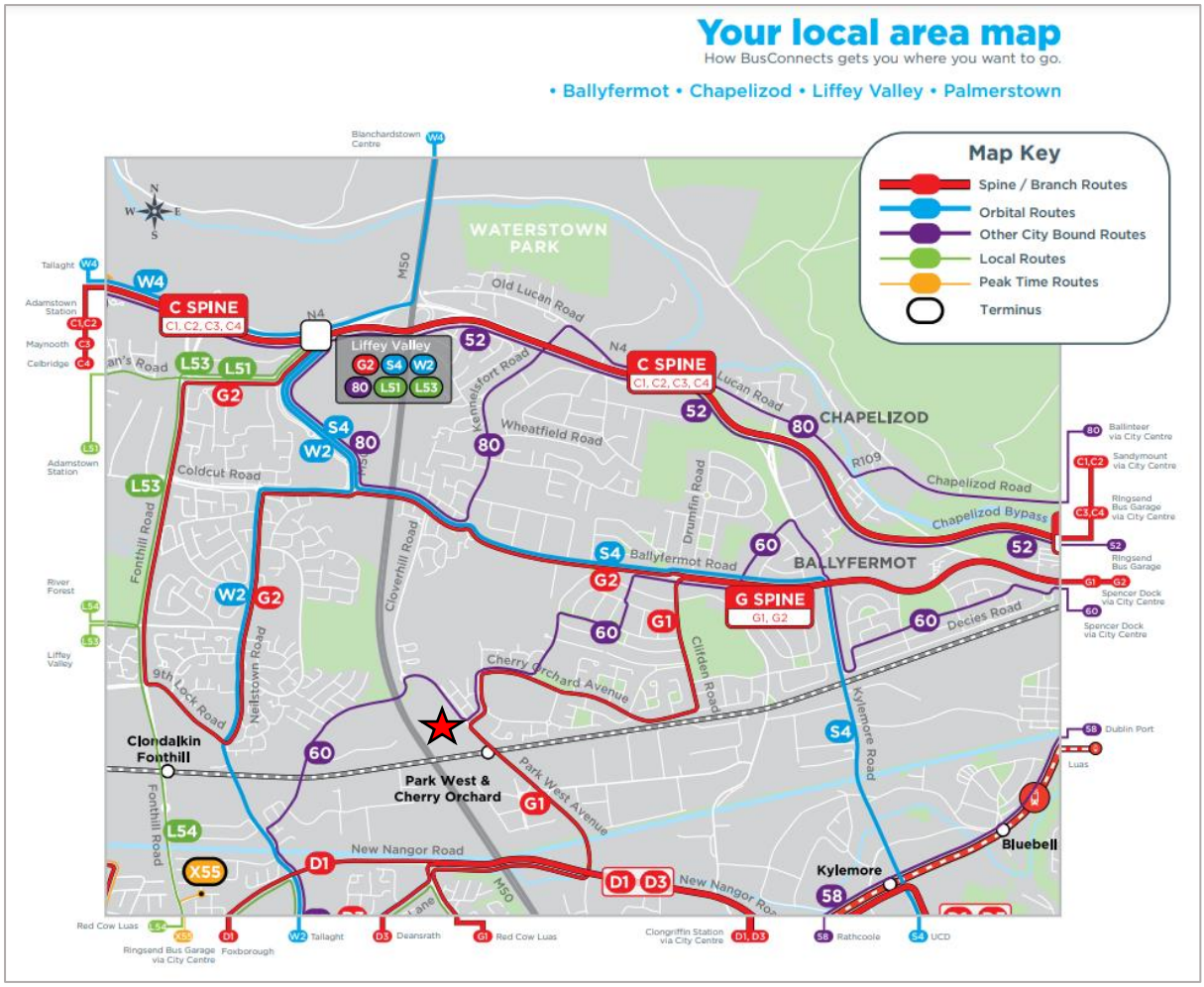


Figure 2.7: Bus Corridors under BusConnects, serving the Subject Site which has been marked by a red star (Source: busconnects.ie)

Having regard to the above, it is clear that the application site benefits from excellent public transport infrastructure that provide direct linkages to the city centre. Connectivity and the ability to integrate the proposed development with the wider Cherry Orchard community is a key principle of the urban design strategy for the scheme. The future expansion of the bus network under the BusConnects programme and the increased frequency and capacity of the rail services proposed under the Dart+ South West Project will encourage a modal shift towards more sustainable modes of transport for future residents and promote a reduction in the reliance of the private car as the principal method of transport. The design of the scheme includes the provision of additional pedestrian and cycle linkages to further encourage active travel and deliver a safe and secure environment that prioritises pedestrian and cycle mobility.

2.5 Land Use Zoning for subject lands

The land use zoning strategy set out in the Dublin City Development Plan 2022-2028 ensures the integration of land-use planning with infrastructure delivery, which is essential to achieving sustainable development.

The overall zoning strategy is based on the following principles as set out in the Development Plan:

- *To ensure that land-use zoning across the city spatially facilitates the aims of the core strategy and the objective to develop a compact, connected, low carbon, and climatically resilient city.*
- *To ensure that land is appropriately zoned in order to accommodate the expected growth needs of Dublin City within the timeframe of the plan and to ensure the protection of community and social*

infrastructure, and critical ecosystems services, through the application of appropriate land-use zoning designations in order to provide adequate facilities and amenities to meet the growing needs of the city.

- *To provide for balanced and sustainable development by promoting, in particular, a mixed-use pattern of development with a move away from more traditional forms of single mono-use zoning.*
- *To ensure that the most efficient use is being made of the city's land in line with the principles of the 15-minute city, and that the redevelopment of under-utilised and brownfield land is promoted in order to consolidate and add vitality to existing centres.*
- *To promote the intensification of development adjacent and close to public transport nodes and corridors in order to minimise trip generation and distribution and to promote sustainable compact urban form.*
- *To ensure that the city's zoned enterprise and employment lands are integrated with key supporting infrastructure to provide for more intensive forms of employment.*

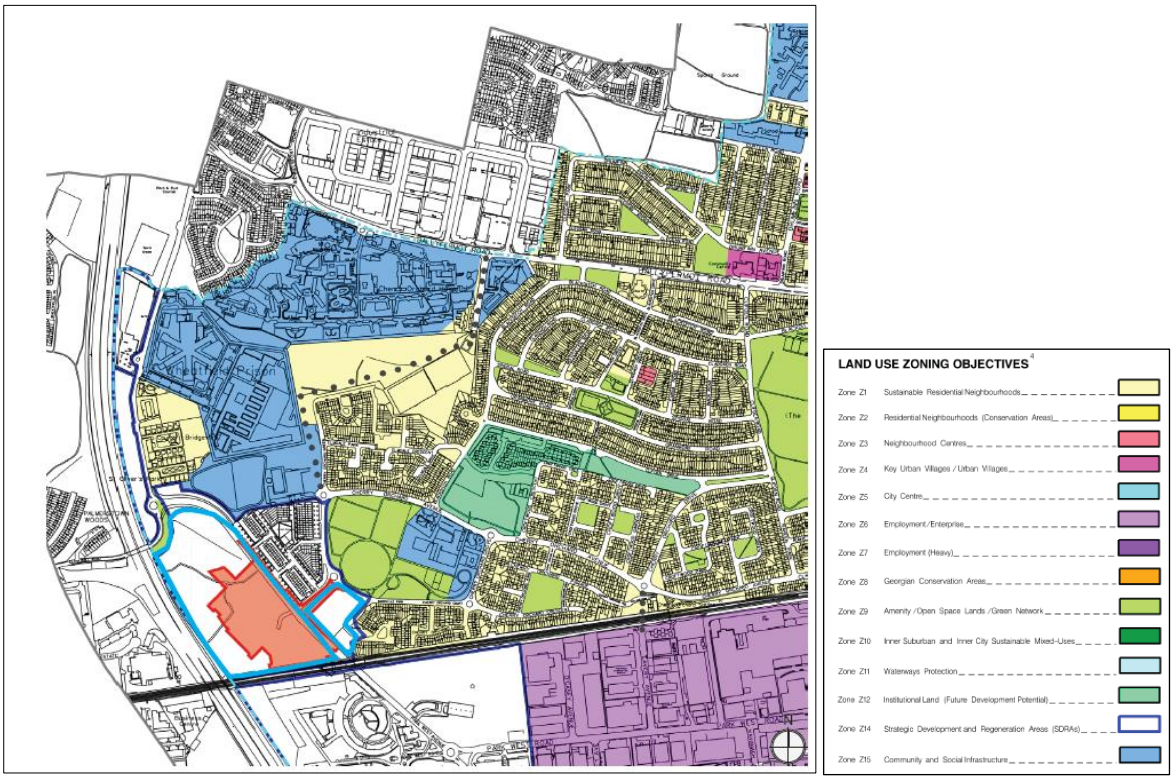


Figure 2.8: Land Use Zoning Map, Dublin City Development Plan 2022 – 2028

The subject site is zoned Z14 Strategic Development and Regeneration Area, specifically SDRA 4 – Park West / Cherry Orchard under the Dublin City Development Plan 2022 - 2028. The land use zoning objective of such lands aims "*To seek the social, economic and physical development and/or regeneration of an area with mixed-use, of which residential would be the predominant use*."

The proposed development involves residential, community, cultural / arts, and employment-based uses, all of which are permissible under the Z14 zoning objective ascribed to the subject site.

2.6 The Proposed Scheme

The proposed development which relates to Phase 1 of the overall Site 4 and 5 lands and the subject of this planning application principally involves the construction of a residential led mixed use scheme comprising 708no. residential apartments comprising 547no. cost rental and 161no. social / affordable units together with a convenience retail supermarket, 7no. retail / commercial units, community, arts

and cultural spaces including external events space and community gardens, and a childcare facility with associated external playing space. The proposed development will also deliver high-quality landscaped public open space and will include a public plaza, play space, outdoor fitness trail, communal amenity space, internal pedestrian and cycle routes and all associated site and development works to facilitate the proposed development. Please refer to the statutory notices for full and complete description of the proposed development.

The built elements of the scheme involve the construction of 9 buildings housing 16 blocks ranging in height from 4 to 15 storeys. The development layout strategy of the scheme follows established and best practice principles of good quality urban design centred on creating a sustainable and well-connected community within the Cherry Orchard area. The design and layout of the scheme coupled with the incorporation of a variety in height, form and materials will create a distinctive character and sense of place and identity for future residents. The transition of increased height and density to the south-eastern corner of the site, adjacent the train station, illustrates how the scheme is respectful of the prevailing and established character of the area but also delivers upon the vision of the Park West Cherry Orchard LAP and Dublin City Development Plan that seek higher densities and a landmark building in close proximity to the station. This approach to the design and layout of the development will result in the creation of a vibrant new urban area that is fully integrated and connected with the existing community.

Figure 2.9: Proposed Site Layout Plan (Source: VDA / CCK Architectural Design Statement)

Figure 2.9 above provides a visual representation of the scheme illustrating how the proposal represents a coherent and logical response to an underutilised site positioned in a strategic and accessible location. An overview of key development statistics is set out in the table below.

Table 2.2 Key Development Statistics

KEY DEVELOPMENT STATISTICS	
Site Area	6.27 ha
Gross Floor Area (Residential)	58,906 sqm
Density	145 (net)
Plot Ratio	1.4
Site Coverage	33.2%
Height	4 -15 Storeys
Total No. of units	708
OPEN SPACE	
Public Open Space	6,123 sqm
Communal Amenity Open Space	5,596sqm
External Events Space and Community Gardens	1,157sqm
NON-RESIDENTIAL	
Convenience Retail Supermarket	2,523 sqm
Retail and Commercial Units	373 sqm
Community and Arts / Cultural Spaces	1,222 sqm
Childcare facility	672 sqm
RESIDENTIAL	
Apartments	708
Cost Rental Apartments	547
Social / Affordable apartments	161
Part V	23%
PARKING	
Car Parking Provision	444
Bicycle Parking	1618
Motorbikes	22

The proposed development represents Phase 1 of the wider vision for the plan led redevelopment of Sites 4 and 5 of the LAP lands. The proposed development will contribute to delivering upon the LAP's vision for Cherry Orchard in creating an attractive and identifiable place with a vibrant and active community. The scheme has the potential to act as a catalyst to kick-start the regeneration of the wider area and revitalise underutilised lands through the implementation of a fully integrated and sustainable development.

2.6.1 Description of Development in the Statutory Notices

Planning permission is being sought for the following proposal:

In accordance with Section 175(4) of the Planning and Development Act, 2000 (as amended) The Land Development Agency, on behalf of Dublin City Council, gives notice of its intention to make an application for approval to An Bord Pleanála under Section 175(3) of the Planning and Development Act, 2000 (as amended) for a 10 year approval to carry out the following proposed development on a site of c. 6.27 hectares, located on lands at Cherry Orchard, Dublin 10 (known as Development Site 4 in the Park West Cherry Orchard Local Area Plan 2019). The site is bound by Cloverhill Road to the north, Cedar Brook Avenue and Park West Avenue to the east, Park West and Cherry Orchard rail station to the south east, the rail line to the south, and the M50 motorway to the west. The development will consist of the construction of a residential led mixed use scheme containing 708no. residential apartments comprising 547no. cost rental and 161no. social / affordable units, a convenience retail supermarket, independent retail / commercial units, dedicated internal and external community and arts / cultural spaces, a childcare facility with associated outdoor play area, landscaped public open space including community plaza, multipurpose amenity lawn, play space, outdoor fitness trail, multi-use games area (MUGA), playground and all associated site and development works. The proposed development represents Phase 1 of the overall planned development for Development Sites 4 and 5 of the LAP lands.

The proposed development (GFA of c. 66,398.8sqm) involves the construction of 16 blocks contained within 9 buildings ranging in height from 4 to 15 storeys comprising 28no. studio units, 263no. one-bed units, 368no. two-bed units (52no. two-bed three-person and 316no. two-bed four-person) and 49no. three-bed units (59,022.8sq.m total residential GFA), together with a convenience retail supermarket (2,523sq.m GFA), 7no. retail / commercial units (totalling 373sq,m GFA), community, arts and cultural spaces delivered across 13no. community and arts / cultural units (totalling 1,222sq.m GFA), and associated external events space and community gardens (1,157sq.m), a childcare facility (672sq.m GFA) with associated external playing space (200sq.m) and all ancillary and sundry accommodation including sub stations, plant, refuse stores, cycle stores, and metre / comms rooms (2,586sq.m total GFA). The proposed development is described on a block-by-block basis as follows:

- *Building 1 (4,594sq.m GFA) contains 24no. apartments comprising 13no. one-bed units and 11no. two-bed units, a convenience retail supermarket and associated ancillary accommodation in a block of 5 storeys above an additional car parking storey to the rear (6 floors total). Shared communal open space (2,226sq.m) between Buildings 1, 2A, 2B and 3 is provided in the form of a landscaped podium courtyard with outdoor gym, lawn area, playground, community vegetable patch, associated outdoor seating area*
- *Building 2A (3,084.8sq.m GFA) contains 27no. apartments comprising 8no. one-bed units, 14no. two-bed units and 5no. three-bed units, 4no. retail / commercial units and associated ancillary accommodation in a block of 6 storeys*
- *Building 2B (10,096sq.m GFA) contains 110no. apartments comprising 1no. studio unit, 43no. one-bed units and 66no. two-bed units, 3no. retail units, community and arts / cultural space and associated ancillary accommodation in a block of 15 storeys*
- *Building 3 (3,611sq.m GFA) contains 35no. apartments comprising 12no. one-bed units and 23no. two-bed units, community and arts / cultural space including provision for a Dublin City Council Community and Estate Management Office and associated ancillary accommodation in a block of 5 storeys*
- *Building 5A (5,032sq.m GFA) contains 54no. apartments comprising 10no. studio units, 16no. one-bed units and 28no. two-bed units, a childcare facility with associated external play area and associated ancillary accommodation in a block of 6 storeys. Shared communal open space (550sq.m) between buildings 5A and 5B is provided in the form of a landscaped lawn area with external seating*
- *Building 5B (2,628sq.m GFA) contains 29no. apartments comprising 10no. one-bed units, 14no. two-bed units and 5no. three-bed units and associated ancillary accommodation in a block of 5 storeys*
- *Building 6A (5,019sq.m GFA) contains 58no. apartments comprising 20no. one-bed units, 32no. two-bed units and 6no. three-bed units and associated ancillary accommodation in a block of 6 storeys. Shared communal open space (1,200sq.m) between buildings 6A, 6B, 7A and 7B is provided in the form of a landscaped courtyard with lawn area, playground and external seating*
- *Building 6B (2,584sq.m GFA) contains 24no. apartments comprising 8no. one-bed units, 12no. two-bed units and 4no. three-bed units, community and arts / cultural space and associated ancillary accommodation in a block of 5 storeys*
- *Building 7A (6,363sq.m GFA) contains 81no. apartments comprising 6no. studio units, 35no. one-bed units and 40no. two-bed units and associated ancillary accommodation in a block of 7storeys*
- *Building 7B (3,208.8sq.m GFA) contains 30no. apartments comprising 5no. one-bed units and 25no. two-bed units, community and arts / cultural space and associated ancillary accommodation in a block of 6 storeys*
- *Building 8A (5,424sq.m GFA) contains 63no. apartments comprising 6no. studio units, 17no. one-bed units, 34no. two-bed units and 6no. three bed units and associated ancillary accommodation in a block of 6 storeys. Shared communal open space (1,020sq.m) between buildings 8A, 8B, 9A and*

9B is provided in the form of a landscaped courtyard and associated external spaces with lawn areas, playground and associated external seating

- *Building 8B (2,640sq.m GFA) contains 33no. apartments comprising 5no. studio units, 13no. one-bed units, 10no. two-bed units and 5no. three-bed units and associated ancillary accommodation in a block of 5 storeys*
- *Building 9A (3,791sq.m GFA) contains 47no. apartments comprising 29no. one-bed units, 13no. two-bed units and 5no. three-bed units and associated ancillary accommodation in a block of 5 storeys*
- *Building 9B (2,075.2sq.m GFA) contains 22no. apartments comprising 8no. one-bed units, 10no. two-bed units and 4no. three-bed units and associated ancillary accommodation in a block of 4 storeys*
- *Building 10A (3,664sq.m GFA) contains 42no. apartments comprising 16no. one-bed units, 22no. two-bed units and 4no. three-bed units and associated ancillary accommodation in a block of 4 storeys. Shared communal open space (600sq.m) between buildings 10A and 10B is provided in the form of a landscaped lawn area with external seating*
- *Building 10B (2,584sq.m GFA) contains 29no. apartments comprising 10no. one-bed units, 14no. two-bed units and 5no. three-bed units and associated ancillary accommodation in a block of 5 storeys*

The proposed development also includes the provision of landscaped public open space of 6,123sqm including a public plaza, multi-use playing spaces, outdoor fitness trail, communal amenity space of 5,596sqm. Private open space for the apartments units is achieved through the provision of balconies or terraces for all individual apartments. Boundary treatment in the form of 3m high timber hoarding is proposed as a temporary interim solution to the future Phase 2 and Phase 3 development to the north-west (Phase 2) and north-east (Phase 3) of the site and to the proposed Irish Rail compound along the western boundary of the site pending the implementation of future development phases. Permanent boundary treatment comprising 1.8m high powder coated vertical railing is proposed to the top of the embankment adjacent the rail line to the south. A permanent 1.8 m high railing is proposed to the secured communal courtyards and creche garden. Railings and gates to secure the communal courtyards are also proposed as part of the development.

The proposed development will also involve the provision of 444no. car parking at undercroft and surface level throughout the development, of which 328no. spaces will be for residential use. 99no. non-residential car parking spaces are also proposed to serve the commercial element of the scheme, 92 of which will serve the proposed supermarket with 7 spaces reserved for the individual retail units. 6no. car parking spaces are proposed to serve the childcare facility. The proposed development also includes the provision of 11no. car sharing spaces. 21 of the proposed car parking spaces will be accessible and 222no. EV fitted representing 50% of the total parking spaces. 22no. motorcycle spaces are also proposed to serve the development.

A total of 1,618no. bicycle parking spaces, accommodated through a mixture of secure designated cycle stores and stacked bicycle racks / Sheffield stands are also proposed as part of the development. 1,552no. of these spaces are designated for residential use including the provision of 245no. short stay / visitor spaces. The remaining 66no. spaces are provided for the non-residential element of the development which includes 52no. short stay / visitor spaces.

Vehicular, pedestrian and cyclist access routes to serve the proposed development are provided from new entrances to the east of the site along Cedar Brook Avenue and Park West Avenue, upgrades to Cherry Orchard Green including landscaping and provision of a dedicated cycle path. The proposed development also includes the provision of off-street cycle lanes along Park West Avenue and Cherry Orchard Green that will provide direct connectivity to the Rail Station to the southeast and Cherry Orchard Park to the east.

The development will also provide for all associated ancillary site development infrastructure including site clearance, boundary treatment, associated public lighting, internal roads and pathways, ESB substations, switch room, water tank rooms, storage room, meter room, sprinkler tank room, comms room, bin storage, bicycle stores, hard and soft landscaping, play equipment, boundary walls, attenuation area, green and blue infrastructure including green roofs, PV panels and all associated works and infrastructure to facilitate the development including connection to foul and surface water drainage and water supply.

An Environmental Impact Assessment Report (EIAR) has been prepared in respect of the proposed development.

This planning application including the enclosed drawings, public notices, and application form, have been prepared in accordance with the requirements of the Planning and Development Regulations 2001, as amended ('the Regulations').

2.7 Need for the Scheme

The strategically positioned site, located adjacent to the M50 motorway and Park West Cherry Orchard Train Station, benefits from its proximity to high frequency public transport including BusConnects, the Dart line and the proposed Dart+ South West extension and a number of natural and outdoor amenities to enjoy. Coupled with the sustained population growth and ongoing demand for housing within the Greater Dublin Area (GDA), the proposed development and its location have the necessary requisite assets and features to accommodate a mixed-use residential scheme of the scale proposed.

The population growth noted between the intercensal period 2016 and 2022, and the population projections for the overall Dublin City area provide further justification and validation for the development proposal for new housing. Population and housing are intrinsically linked. An increase in population influences housing by creating demand. The availability of housing influences house and rental prices and can have a significant influence on who can potentially migrate into an area, affecting total population.

The Study Area catchment has been defined by c. 51 no. Census Small Area (SA) Boundaries (2022), intersected by a 1km buffer from the subject land boundaries (blue line in Figure 2.10 below). This consideration has been made on the basis that the development falls under a single ownership and hence, will be a single scheme, delivered in phases to align with the availability of essential infrastructure, services and amenities. This would further remain consistent with the Study Area defined in other reports for this scheme, specifically the EIAR, which would consider the entirety of the development in determining associated risks and any subsequent mitigation measures to be considered.

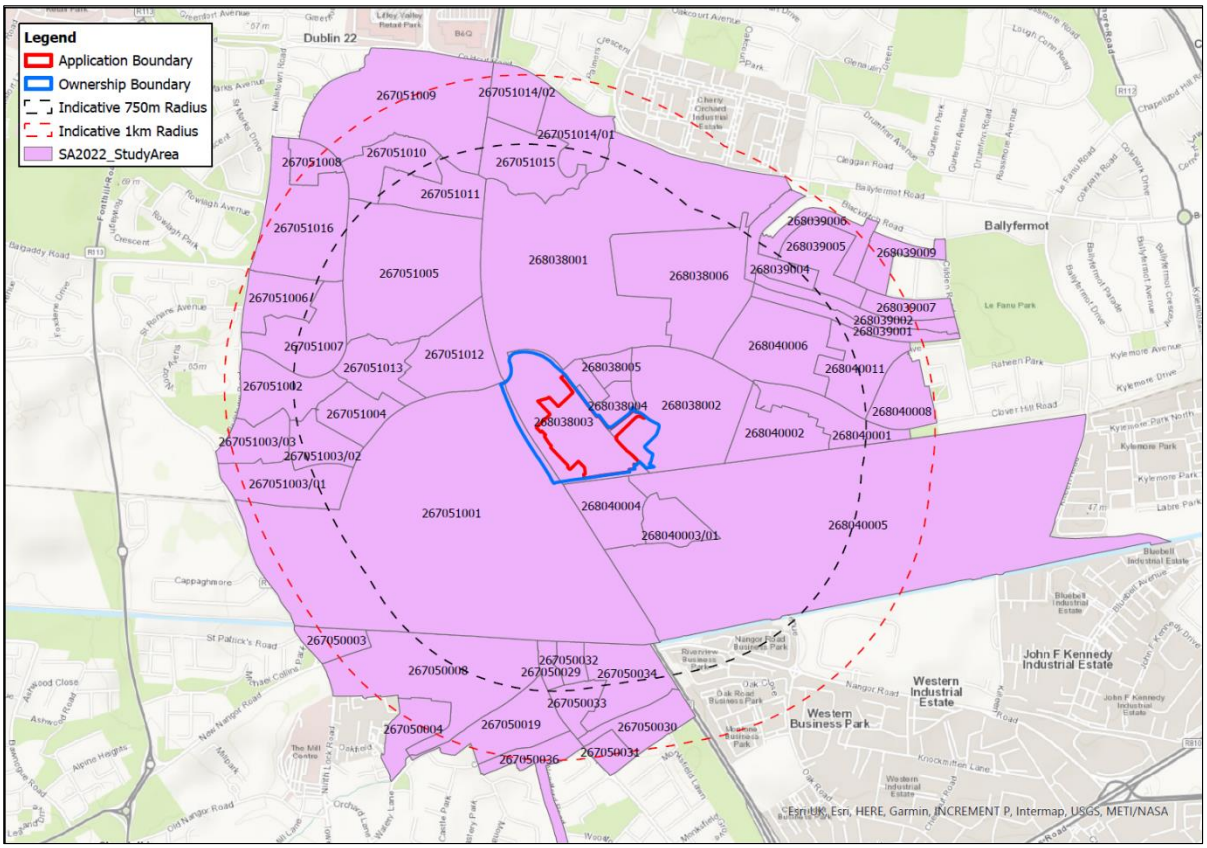


Figure 2.10 Study Area Catchment defined by Small Area Boundaries for Census 2022.

The study area catchment also aligns with the principle of the 15-minute walking city concept introduced within the new DCC CDP – which seeks to ensure that people's daily requirements can be reached within 15-minute by foot, bike, or public transport. As such it is considered that this study area provides a good representation of the socio-economic and demographic characteristics of the immediate populated area potentially impacted by the proposed development.

The Table 2.3 below, records the percentage change in population during this period to highlight overall residential patterns. As illustrated, the small areas defining the study area experienced only a slight increase of c. 0.2% between 2011 and 2016, which is contrary to the growth recorded for the Dublin Region, at 5.8% during the same period. Between 2016 and 2022, the Study Area population has experienced an exponential increase from the previous Census period, of c. 7.7%, which is similar to the population increase observed in the Dublin Region (c. 8.2%) during the 6 years following Census 2016. There is around 15% increase in the overall population for the Dublin Region during the 10-year period between 2011 and 2022 and an increase of 8% in the study area population during this period. It is noted that the increase in study area population over the 10-year period is largely owing to the population growth between 2016 and 2022.

Table 2.3: Population Change during the Census Period 2011, 2016 and 2022

Area	2011	2016	2022	2011-2016 Change#	2016-2022 Change #	2011-2022 Change#	2011-2016 Change %	2016-2022 Change %	2011-2022 Change %
Study Area	17,055	17,089	18,398	+34	+1,309	+1,343	0.2%	7.7%	7.9%
Dublin Region	1,273,069	1,347,359	1,458,154	+74,290	+110,795	+185,085	5.8%	8.2%	14.5%

The Census 2022 results on housing stock records that a total stock of habitable permanent housing in the State was over 5% higher than Census 2016. The number of occupied households increased by

8% while there was an overall drop in the number of vacant dwellings, which fell by c. 11%. The Census results for 2022 also recorded that the housing stock increased in all counties with the largest increases in the east of Ireland, *primarily around Dublin*. The fastest growth in the housing stock was recorded in Meath and Kildare (+11%), and Dublin city experienced a growth of around 4.2% between 2016 and 2022.

The housing data, on the other hand, at the Study Area Level demonstrated that as of Census 2022, the 'Average Year of Stock' for 'Permanent Private Households by Year of Built' was c. 1987. This implies that the Study Area experienced the highest growth in housing roughly between 1970s and 1990 (c. 42% growth). The Study Area further experienced a significant c. 57% drop in housing stock post 1990, between 1991-2000 from c. 23% new builds to c. 9% respectively. Although there were around 23% houses built between 2000-2010 (+138% since the previous decade), there has only been c. 10% new builds since 2011, in the local area surrounding the subject site. The overall housing stock for the study area has remained unchanged between the intercensal period 2011 and 2022.

The majority of the housing stock within the study area composes of houses with a smaller proportion of apartments. Around 97% of these are occupied, with a 3% vacancy rate as of Census 2022 – this remains unchanged since 2016. Of the total housing stock within the area, a total of c. 45% are 'Owner Occupied', c. 31% are Social Housing and around 19% are 'Rented (Privately)'.

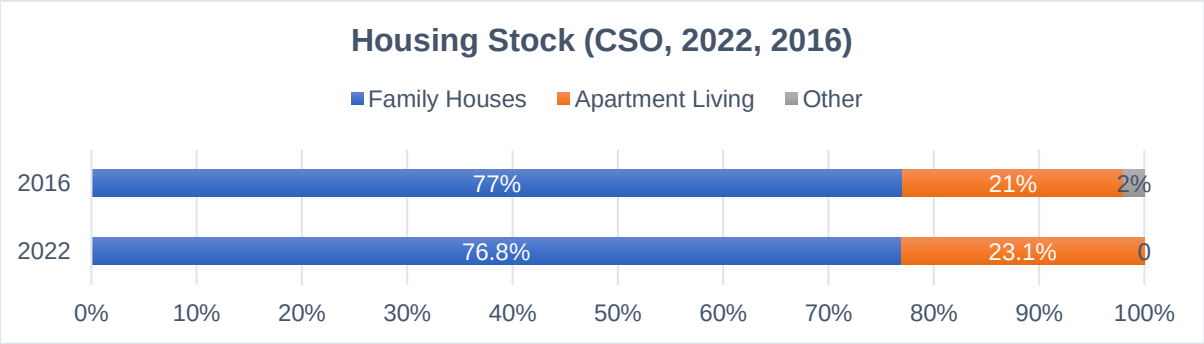


Figure 2.11 Housing Stock for the Study Area as of Census 2016 and 2022

The changing age profile for the study area between 2016 and 2022, would suggest there is a growing aging community in place, with an increase of c. 29% in the population age group 65 years and over (see Table 2.4) – this is likely a reflection of a lack of substantial new housing development coming on stream within the study area. The increase in this age group for the Dublin Region, albeit higher at c. 19%, is still lower than the study area.

The study area population, however, consisted largely of working age population in the 15-64 years age group (c. 70%), with the highest number of people (c. 18%) in the 30–39-year age group. The average age within the study area was recorded at 35 years – this is an increase since 2016, which recorded an average age of 33.5 years. Hence, the Study Area has a predominantly younger / working age group as of Census 2022, albeit with a gradually growing elderly population. The Dublin Region also consisted of a predominantly working age cohort during the Census 2016, with 68% of its population in the age group 15-64 years (68%).

Finally, it is noted, that the overall age composition was largely maintained within the study area and Dublin region between 2016 and 2022.

Table 2.4 Population Age Group within the Study Area as per Census 2022

Age Group	Study Area		Dublin Region		State 2022 %
	2022%	Change	2022%	Change	
0-14	20.3%	3.3%	18.4%	3.5%	19.7%
15-64	69.7%	6.4%	68.1%	7.7%	65.3%

65 years and over	10%	29.9%	13.4%	18.6%	15.1%
Total	100%	7.7%	100%	8.2%	100%

The Housing Needs Demand Assessment (HNDA) carried out under the Dublin City Development Plan 2022-2028 identifies that for the years 2023 to 2028, about *38% of new households will need social housing (this includes an existing unmet need of c. 2,343 households), 18% will be able to rent, and around 29% will need affordable housing (such as cost rental or affordable purchase)*. The population of Dublin City is expected to grow to 638,000 in 2031, and demand for over 52,000 new households has been estimated in Dublin City between 2020 and 2031.

The proposed scheme consists of a mix of social / affordable and cost rental units, which will provide the much needed and enhanced access to good quality housing within the area. The addition of 708 no. apartment units developed to modern building control, construction and design standards will improve the overall viability of the scheme and result in a continuum of housing options to meet varying needs of future occupiers.

The proposed scheme will further encourage an influx of new population including younger and working age groups into the area. This is owing to its provision of a mix of uses catering to the diverse needs of the different age groups that will reside in it, including extending some of these services to the wider area. Moreover, the subject lands are strategically located along quality public transport corridors with plans for further enhancements, and hence, can accommodate a high-quality high-density scheme of the scale proposed.

The study area has experienced a 7.7% increase in its population between 2016 and 2022, which is substantial given that it observed a very minor increase (of c. 0.2%) during the intercensal period 2011-2016. Housing demand within the study area will subsequently increase and continue to do so as the overall demand for housing within Dublin City also increases as a result of its growing population (in line with the HNDA targets). Housing development will hence be required to meet this growing demand. The proposed development has been designed to supply a mix of housing types to support a substantial mix of tenants and meet the housing demand for the area.

To achieve the ambitious compact development targets set out in the NPF for at least 50% of all new homes within or contiguous to the existing built-up area in Dublin and 30% in other settlements. Furthermore, the RSES, through its Dublin Metropolitan Area Strategic Plan (MASP) identifies strategic residential, employment and regeneration development opportunities on strategic development corridors, which are aligned with key public transport projects. Sites within or close to these corridors are best placed to accommodate the 113,000 residential units identified by the MASP to be fully built out in 2040.

The growth strategy contained in the RSES supports the continued sustainable growth of Dublin and its transition to a low carbon, climate resilient and environmentally sensitive region in accordance with the Dublin Metropolitan Area Strategic Plan (MASP). The RSES sets out specific population projections for Dublin City Council up to 2031, which predicts an increase of between 58,500 (low) and 70,500 (high) people by 2026 with further increase of between 84,000 (low) and 100,500 (high) people by the year 2031. The RSES projections have been used to extrapolate figures aligning with the development plan period. The adjusted population, hence, for Dublin City for the year 2028 is stated as 625,750 (low) to 640,000 (high) persons as per Section 2.2.2 under the Core Strategy in the Dublin City Development Plan 2022-2028.

The location of the subject lands, which is well served by road, bus connects, and rail infrastructure, places it in prime position to accommodate the sequential development of residential sites, to cater for the population growth envisaged. The future plans for DART+ and BusConnects will also make a significant impact on public transport and car dependency, and the layout has been designed to provide

for their integration into the development by means of safe, well-overlooked routes to the station and the bus stops.

The proposal has been developed in line with the Park West Cherry Orchard Local Area Plan 2019 which seeks to promote the development of new housing which delivers integrated, balanced communities and a sustainable social mix. The Local Area Plan 2019 identifies the need to balance the conflicting demands for addressing the significant social imbalance within Cherry Orchard with the demand for additional social housing in the area. In order to achieve a balanced residential population, the Local Area Plan 2019 promotes the provision of a broad mix of residential units delivering a wide range of housing typologies, sizes, and forms of tenure catering for families of all sizes and people of all ages.

In that regard, the vision for the proposed development is supported by a series of principles which have guided the planning and design process to date. These are:

- Connectivity within the new development and to existing residential neighbourhoods and parks.
- Variety in building height, form and materials.
- Variety in building tenure, being a mix of social, cost-rental and affordable dwellings.
- Efficiency in building density and in land use, as befitting a site with good rail and bus connections.
- A distinctive character which creates a new sense of place and local identity and supporting a new civic Main Street at the station.
- Landmark buildings in key locations, such as the railway station and Park West Avenue.
- People-friendly public streets and spaces, with overlooked parks and plenty of ground level activity.
- Well defined boundaries between private terraces, semi-private courtyards and the public realm.
- A natural, landscaped buffer along the M50 motorway.
- Biodiversity in soft landscaping with an emphasis on sustainable native planting and pollinator-friendly species.

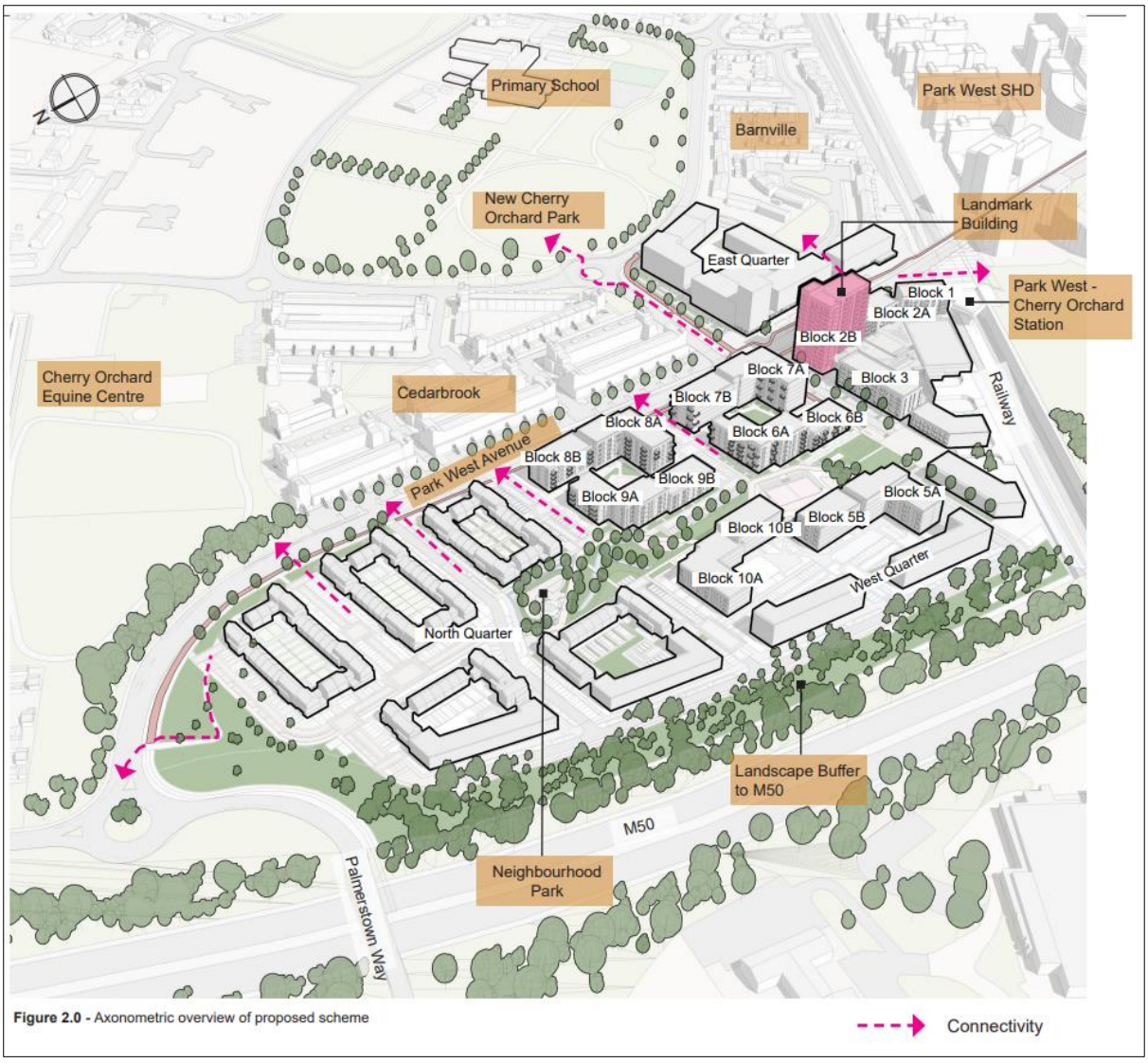


Figure 2.12 Proposed Development Layout Strategy (Source: Architectural Design Statement)

The proposed development will provide a vibrant and sustainable urban neighbourhood with a distinct character. It will be of sufficient density to sustain quality public transport, such as the planned DART+ upgrade to the rail line and Bus Connects project, and to sustain a mix of retail and commercial uses on Park West Avenue.

2.8 Related Developments

DART + South West Project (Proposed)

The DART + South West Project is the second of the infrastructural projects of the DART+ Programme expected to be delivered. The Rail Order Application for the project was submitted for statutory approval by Córas Iompair Éireann (CIÉ) on the 22nd March 2023. If approved, this rail improvement project will provide a sustainable, electrified service with increased capacity and frequency for services between Park West Cherry Orchard and Dublin City Centre.

Figure 2.13 Proposed Route Map of the Dart + South West with site identified with a red star. (Source: dartplus.ie)

It is expected that once this project is delivered, it will increase the train capacity to double the current (12) trains per hour per direction and increase passenger capacity from the current peak capacity of approximately 5,000 passengers per hour to around 20,000 passengers per hour per direction. The Figure 2.13 below provides the route map proposed for the DART + South West extension which also illustrates the new route passing adjacent to the Subject Site through the Park West and Cherry Orchard train station.

Figure 2.14 Estimated Frequencies and Capacity once the DART+ SW line is delivered.

(Source: https://www.dartplus.ie/en-ie/projects/dart-south-west)

Part of the rail upgrade works will involve the provision of a substation, temporary access and compound on lands within Development Site 4 as shown below. The design and layout of the application has had full regard to the proposed rail works and has incorporated suitable boundary treatment as an interim solution pending the full redevelopment of the wider lands. The submitted EIAR has also considered potential cumulative impacts that may arise from the application scheme in combination with the proposed rail upgrade works and has set out, where necessary, appropriate mitigation measures to minimise impacts on the environment. The electrification of the rail line coupled with increased capacity and frequency of the service will be of substantial benefit to residents enhancing connectivity to the city centre and providing a cleaner more sustainable mode of public transport.

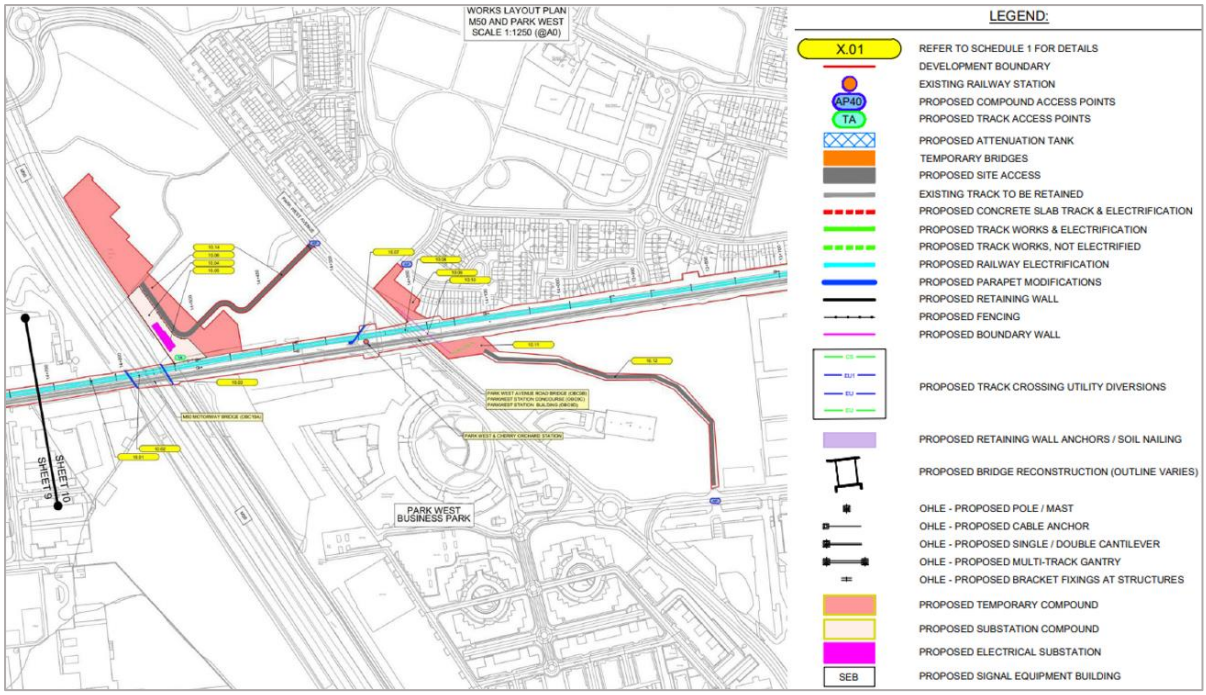


Figure 2.15 Proposed Works Layout Plan for the DART+ SW (Source: Layout Plan from DART+ SW Rail Order Application)

2.9 References

- Guidelines on the Information to be contained in Environmental Impact Assessment Report (Environmental Protection Agency, May 2022);
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, Draft August 2017);
- Advice Notes for Preparing Environmental Impact Statements, Draft September 2017;
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002); and
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2002)
- Dublin City Development Plan 2022-2028, available at: Development Plan 2022 - 2028 | Dublin City Council
- The Central Statistics Office (CSO), available at: Home - CSO - Central Statistics Office
- DART+ Programme, available at: DART+ DART+ South West (dartplus.ie)
- BusConnects, Dublin Initiative, available at: Dublin Archives | Busconnects
- Greater Dublin Area Cycle Network Plan, available at: Greater Dublin Area Cycle Network Plan - National Transport

3 Planning Policy Context

3.1 Introduction

The proposed development has been prepared in the context of relevant local, regional, and national policies and objectives. The accompanying planning report included as part of this planning application provides a detailed review of these policies and objectives. However, for the purposes of the EIAR, a summary of the relevant policies and objectives is provided within this section.

3.2 Policy Context

Given that the subject sites are located in the Cherry Orchard area of Dublin (Dublin 12), the Park West Cherry Orchard Local Area Plan (2019) is the current statutory plan for the area. The Dublin City Development Plan (2022) also pertains to the sites.

This chapter is a summary of the relevant policies and objectives pertaining to both development sites.

3.3 National Planning Framework (NPF): Project Ireland 2040

The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of the country out to the year 2040. It is a national document that will guide at a high-level, the strategic planning and development of the country over the next 20+ years, so that as the population expands, growth is sustainable (in economic, social and environmental terms). The NPF is structured around ten core principles referred to as 'National Strategic Outcomes'. In relation to future development proposals in Park West – Cherry Orchard, the following key outcomes are considered relevant: -

- **Compact Growth** – The focus on the promotion of compact growth throughout the NPF seeks a more "streamlined and coordinated approach" to the development of lands within and around the country's urban settlements.
- **Enhanced Regional Accessibility** – The NPF also aims to enhance accessibility between key urban centres.
- **Sustainability Mobility** – The NPF places an emphasis on utilising less carbon-intensive modes where possible, but also promoting the use of active modes such as cycling and walking.

Specifically, the NPF strives to prioritise areas within the build-up footprint of the main urban settlements as the primary locations in which to accommodate the State's future population. National Policy Objective (NPO) 3a defines this approach (below):

> *"Deliver at least 40% of all new homes nationally, within the built-up footprint of existing settlements."*

Such areas allow for the creation of critical mass that allows services and infrastructure to be more effectively, efficiently and easily provided. Targeting development in built up areas also reduces negative impacts on the natural environment and the loss of valuable, finite land resources and the emission of greenhouse gases.

However, in order to achieve Compact Growth, there must be a pragmatic and progressive approach to planning and development in terms of residential densities achieved through increased heights. The general approach of building up, not out, must be followed.

The NPF will focus increasing levels of forthcoming population growth and residential development into build up areas as the most sustainable and resilient locations in which to secure Ireland's future. This proposal aligns with the NPOs, NSOs and the broader principles of the Plan, developing a site that is immediately adjacent to existing built-up areas to secure additional sustainable housing supply as a high-quality scheme.

Figure 3.1: National Strategic Outcomes. Source: (NPF, 2018)

3.4 A Road Map for the First Revision of the National Planning Framework

The Government announced in June 2023 that it has commenced a first revision of the National Planning Framework, and published a Road Map to set out the process and intention for the revision.

The Road Map document sets out that the changes context, influenced by high-level drivers such as climate transition, population and demographics and digitalisation which is influencing the revision the NPF. It also sets out the context for the proposed revision, indicates the organisational and governance structures that will be established to oversee and inform the revision, outlines the intended timeframe for delivery and stages of delivery, and to communicate the consultation process.

Preliminary results from Census 2022 show that national population growth is broadly in line with the overall NPF population projection to April 2022, but with regional discrepancies. In addition, significant net in-migration to Ireland as a consequence of persons displaced by the Russian invasion of Ukraine and separately, and an increase in those seeking International Protection, have led to an accelerated increase in population and pressure for accommodation in 2022/2023.

Since the publication of the NPF in 2018 there have been a number of significant and critical developments in relation to planning policy, guidance and legislation, as well as governance and institutional change. Also, within this time, unprecedented, unforeseen events have occurred with ongoing consequences, such as the impacts of Covid-19 particularly in relation to trends in commuting patterns and the emergence of established blended working.

The Road Map sets out the following indicative schedule for the revision:

1 Pre-Draft Stage (March 2023 – July 2023)
2 Development Stage (July 2023 – October 2023)

3 Draft Stage (November 2023 – January 2024)
4 Amendment Stage (February 2024)
5 Final Stage (March 2024)

3.5 Project Ireland 2040: National Development Plan 2021-2030

The National Development Plan 2021-2030 (or "NDP") was published in 2021 as an updated version of the previous National Development Plan 2018-2027. As part of Project Ireland 2040, the NDP sets out the Government's over-arching investment strategy and budget for the period 2021-2030.

It is an ambitious plan which places a major focus on improving the delivery of infrastructure projects to ensure both speed of delivery and value for money across all projects. The Document sets out funding to underpin key Government priorities, including allocations which will support the realization of critical goals laid out in *Housing for All* – a New Housing Plan for Ireland (September 2021). The NDP underpins the overarching message of the National Planning Framework ("NPF").

Given the location of the subject site and its close proximity to existing services such as public transport and amenities, it is considered that the proposals align with the principles outlined in the National Development Plan. Moreover, the development also aligns with the principles and objectives of the Housing for All – a New Housing Plan for Ireland (see below).

3.6 Housing for All, A New Housing Plan for Ireland (2021)

A new National Plan addressing housing supply has been launched for the period 2021-2030. The Government's overall objective is that every citizen in the State should have access to good quality homes to purchase or rent at an affordable price built up to a high standard and in the right place offering a high quality of life. According to '*Housing for All – A New Housing Plan for Ireland' (2021),* Ireland needs an average of 33,000 homes constructed per annum until 2030 to meet targets set out for additional households as outlined in the National Planning Framework up from approximately 20,000 homes a year. The Plan identifies that new homes need to satisfy demand across four tenures – affordable, social, private rental and private ownership and be constructed within the context of specific development targets for the five cities and major towns.

Housing for All sets out a series of actions across four pathways aimed at addressing the housing crisis by delivering 33,000 homes every year underpinned by the following objectives:

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

Each pathway contains a number of measures to help achieve these objectives through enabling a framework of a more sustainable housing system that will meet current and future housing needs. Pathways 1 and 3 are of particular reference to the proposed development as detailed below.

Pathway 1: Supporting Home Ownership and Increasing Affordability

Housing for All has identified a target of 54,000 homes to be delivered up to 2030 as a means of increasing housing affordability through improved supply. Issues with housing affordability are well commentated on as house prices continue northward with more and more people being pushed out of the market. Whilst the Plan outlines a suite of policy and financial measures aimed at increasing affordability, it is imperative that supply of high-quality residential schemes that seek to deliver affordably housing. The proposed development, through the provision of 161no. social/affordable units, is supported by the wider aims and objectives of Housing for All which seek to support home ownership and increase housing affordability through increased supply.

Pathway 3: Increasing New Housing Supply

The proposed development seeks to deliver 708no. apartment units, comprising of 547no. cost rental and 161no. social / affordable units, integrated within a residential led mixed use scheme across 16 blocks contained within 9 buildings ranging in height from 4 to 15 storeys. The Plan notes the important role that increasing housing supply will play on reducing pressures on an already constrained market. The Plan further recognises the need to encourage the activation of planning permissions to assist in achieving the objective of increasing new housing supply.

The Plan also highlights how viability and costing issues have impacted upon the implementation of extant planning permissions that could otherwise provide a significant contribution to the Country's housing stock. The proposed development is an integral component to the redevelopment of the wider Cherry Orchard/Park West lands. The addition of 708 no. apartment units developed to modern building control, construction and design standards will improve the overall viability of the scheme and result in a continuum of housing options to meet varying needs of future occupiers.

3.6.1 Housing for All Q1 2023 Progress Report

This is the seventh progress report for Housing for All, which details the progress and measure achieved during Quarter 1 of 2023. In 2022, 29,851 new homes were completed, exceeding the Housing for All target of 24,600 for the year. This builds on the 20,553 new homes built in 2021. Government has stated it's committed to achieving the 2023 target of 29,000 new homes, which would deliver a total of 79,404 new homes over the period 2021 to 2023.

A total of 7,349 homes were recorded as having commenced in the first quarter of 2023, a 5% increase on Q1 2022.

It should be noted that the housing targets in Housing for All envision a significant increase in annual targets in the years up to 2030, rising from 29,000 in 2023 to 40,500 in by 2030.

3.7 S.28 Guidelines

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

The Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas and the accompanying Urban Design Manual: A Best Practice Guide (2009) set out the criteria on planning for sustainable neighbourhoods under four main themes, namely, provision of community facilities, efficient use of resources, amenity or quality of life issues and conservation of the built and natural environment.

The Guidelines advocate that an urban design and quality-led approach to creating urban densities will be promoted, where the focus will be on creating sustainable urban villages and neighbourhoods. A varied typology of residential units is promoted within neighbourhoods in order to encourage a diverse choice of housing options in terms of tenure, unit size, building design and to ensure demographic balance in residential communities.

3.7.2 Sustainable Urban Housing Design Standards for New Apartments Guidelines for Planning Authorities (2023)

The Department of Housing, Local Government and Heritage published the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities in 2022. The new guidelines are the result of an updating of previous Departmental guidelines published in 2015, 2018, and 2020, and have been prepared, taking account of up-to-date evidence of projected future housing demand and circumstances prevailing in the housing market.

The 2022 guidelines are issued as a further technical update in relation to 'Build-To-Rent' accommodation and to update some other references, where necessary. It removes the planning requirement to identify BTR schemes as a distinctive development type. The amendments essentially require that the same standards should apply to BTR development as those for all other apartment development. 7 no. Specific Planning Policy Requirement are detailed in the guidelines providing design parameters and standards for new apartment developments.

Apartment design parameters addressed in the guidelines include:

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

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

Urban Development and Building Heights Guidelines for Planning Authorities published by Department of Housing, Local Government and Heritage in 2018 are intended to set out national planning policy guidelines on building heights in relation to urban areas, building from the strategic policy framework set out in Project Ireland 2040 and the National Planning Framework.

Traditional building heights in most urban areas in Ireland vary somewhat within a limited and generally low-rise range. To meet the needs of a growing population and to limit the expansion of urban areas outwards, the guidelines specifically set out4 no. Specific Planning Policy Requirement, including:

- SPPR 1: In accordance with Government policy to support increased building height and density in locations with good public transport accessibility, particularly town/ city cores, planning authorities shall explicitly identify, through their statutory plans, areas where increased building height will be actively pursued for both redevelopment, regeneration and infill development to secure the objectives of the National Planning Framework and Regional Spatial and Economic Strategies and shall not provide for blanket numerical limitations on building height.
- SPPR 2: In driving general increases in building heights, planning authorities shall also ensure appropriate mixtures of uses, such as housing and commercial or employment development, are provided for in statutory plan policy. Mechanisms such as block delivery sequencing in statutory plans could be utilised to link the provision of new office, commercial, appropriate retail provision and residential accommodation, thereby enabling urban redevelopment to

proceed in a way that comprehensively meets contemporary economic and social needs, such as for housing, offices, social and community infrastructure, including leisure facilities.

3.7.4 The Planning System and Flood Risk Management, Guidelines for Planning Authorities (2009)

The Planning System and Flood Risk Management Guidelines were issued by the Minister of the Environment, Heritage and Local Government under Section 28 of the Planning and Development Act 2000. These Guidelines introduce comprehensive mechanisms for the incorporation of flood risk identification, assessment, and management into the planning process. Implementation of the Guidelines will be achieved through actions at the national, regional, local authority and site-specific levels. The role that floods risk should play at different levels of the planning system is summarised below:

Policy Documents / Instruments	Flood Risk Assessment Technique	Decision-making Tools	Key Chapters
National Spatial Strategy, National Planning Guidelines	Flood Risk Management Guidelines	n/a	1 2
Regional planning guidelines	Regional Flood Risk Appraisal, Catchment Flood Risk Management Plans	Sequential approach, Strategic Environmental Assessment	3 4
City / county development plan	Strategic Flood Risk Assessment, Catchment Flood Risk Management Plans	Sequential approach, dev. plan Justification Test, SEA	3 4
Local area plan	Strategic Flood Risk Assessment	Sequential approach, dev. plan Justification Test, SEA	3 4
Master plan, non-statutory plan, site brief	Site-specific Flood Risk Assessment	Sequential approach, dev. plan Justification Test, SEA / Env. Impact Assessment	3 5
Planning application	Site-specific Flood Risk Assessment	Sequential approach, dev. management Justification Test, EIA	3 5

Figure 3.2: Mechanisms for the incorporation of flood risk identification, assessment, and management

The key principles of a risk-based sequential approach to managing flood risk in the planning system are set out in this chapter. They are:

- Avoid development in areas at risk of flooding; If this is not possible, consider substituting a land use that is less vulnerable to flooding. Only when both avoidance and substitution cannot take place should consideration be given to mitigation and management of risks.
- Inappropriate types of development that would create unacceptable risks from flooding should not be planned for or permitted.
- Exceptions to the restriction of development due to potential flood risks are provided for through the use of a Justification Test, where the planning need and the sustainable management of flood risk to an acceptable level must be demonstrated.

3.7.5 Design Manual for Urban Roads and Streets (DMURS) (2019)

Design Manual for Urban Roads and Streets (DMURS) was published by the Department of Transport, Tourism and Sport and the Department of Environment, Community and Local Government in 2013 and last updated in 2019. DMURS provides guidance relating to the design of urban roads and streets with the aim to put well designed streets at the heart of sustainable communities. DMURS will focus on shifting the emphasis of designers, as appropriate, from more conventional approaches that are concerned with the movement of traffic to more sustainable approaches concerned with multi-modal movement and streets as places.

Whilst the movement of traffic is still a key issue, DMURS notes that there are several others, including the 'sense of place', which are of core significance to the creation of safe and more integrated street designs. The guidance document notes that four interlinked characteristics influence the sense of place within a street, including:

- Connectivity: The creation of vibrant and active places requires pedestrian activity. This in turn requires walkable street networks that can be easily navigated and are well connected.
- Enclosure: A sense of enclosure spatially defines streets and creates a more intimate and supervised environment. A sense of enclosure is achieved by orientating buildings toward the street and placing them along its edge. The use of street trees can also enhance the feeling of enclosure.
- Active Edge: An active frontage enlivens the edge of the street creating a more interesting and engaging environment. An active frontage is achieved with frequent entrances and openings that ensure the street is overlooked and generate pedestrian activity as people come and go from buildings.
- Pedestrian Activity/Facilities: The sense of intimacy, interest and overlooking that is created by a street that is enclosed and lined with active frontages enhances a pedestrian's feeling of security and well-being. Good pedestrian facilities (such as wide footpaths and well designed crossings) also make walking a more convenient and pleasurable experience that will further encourage pedestrian activity.

3.8 Climate Action Plan 2023

The Climate Action Plan 2023 (CAP23) is the second annual update to Ireland's Climate Action 2019. This plan is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings.

The supplementary Annex of Actions, approved by the Irish Government and published on 7 March 2023, provides the specific actions required to implement the targets set out in the Plan, and includes information regarding outputs, Lead Departments, timelines and stakeholders. The plan implements the carbon budgets and sectoral emissions ceilings and sets out a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050, as committed to in the Programme for Government. Climate Action Plan 2023 sets out how Ireland can accelerate the actions that are required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

Climate Action Plan 2023 envisaged six vital high impact sectors with reduction targets set out up until 2030. It is stated that in order to hit our targets we will need to achieve 45% commercial/public and 40% residential reduction in emissions by 2030, by increasing the energy efficiency of existing buildings, put in place policies to deliver zero-emissions new builds and continue to ramp up our retrofitting programme.

Figure 3.3: High Impacts Sectors (Climate Action Plan, 2023)

3.9 Regional Spatial and Economic Strategy for the Eastern and Midlands Region (RSES) 2019-2031

The Regional Spatial and Economic Strategy for the Eastern and Midland Region (RSES) is a high level strategic plan and investment framework that seeks to shape the development of the Eastern and Midland region up to 2031 and beyond, supporting the implementation of the NPF by providing a long term strategic planning and economic framework for the development of the region.

The RSES translates the NPOs of the NPF to key Regional Policy Objectives (RPOs) to inform and guide the relevant local authorities with respect to the preparation of the City and County Development Plans, Local Area Plan and other plans and in their assessment of planning applications. The vision for the RSES is “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”.

Key RPOs are detailed below, and it is firmly considered that the proposed development is consistent with them and their principles:

- **RPO 3.2:** 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.
- **RPO 4.3:** Support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built-up area of Dublin city and suburbs and ensure that the development of future development areas is co-ordinated with the delivery of key water infrastructure and public transport projects.
- **RPO 4.8:** Support the regeneration of underused town centre and brownfield / infill lands along with the delivery of existing zoned and serviced lands to facilitate significant population growth and achieve sustainable compact growth targets of 30% of all new homes to be built within the existing built-up urban area.
- **RPO 5.3:** Future development in the Dublin Metropolitan area shall be planned and designed in a manner that facilitates sustainable travel patterns, with a particular focus on increasing the share of active modes (walking and cycling) and public transport use and creating a safe attractive street environment for pedestrians and cyclists.
- **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’[1], ‘Sustainable Urban Housing; Design

Standards for New Apartments' Guidelines[2], and 'Urban Development and Building Heights Guidelines for Planning Authorities'.

- **RPO 5.5:** Future residential development supporting the right housing and tenure mix within the Dublin Metropolitan Area shall follow a clear sequential approach, with a primary focus on the consolidation of Dublin and suburbs, and the development of Key Metropolitan Towns, as set out in the Metropolitan Area Strategic Plan (MASP) and in line with the overall Settlement Strategy for the RSES. Identification of suitable residential development sites shall be supported by a quality site selection process that addresses environmental concerns.
- **RPO 9.3:** Support local authorities, approved housing bodies and other sectoral agencies in the provision of a greater diversity of housing type and tenure, including social and affordable housing and exploring new models of low-cost rental and affordable homeownership.
- **RPO 9.4:** Design standards for new apartment developments should encourage a wider demographic profile which actively includes families and an ageing population.
- **RPO 9.10:** In planning for the creation of healthy and attractive places, there is a need to provide alternatives to the car and to prioritise and promote cycling and walking in the design of streets and public spaces. Local authorities shall have regard to the Guiding Principles for 'Healthy Placemaking' and 'Integration of Land Use and Transport' as set out in the RSES and to national policy as set out in 'Sustainable Residential Development in Urban Areas' and the 'Design Manual for Urban Roads and Streets (DMURS)

In addition, the MASP identifies a number of guiding principles for the sustainable development of the Dublin Metropolitan Area which includes *inter alia:*

- *'Compact Sustainable Growth – Promote consolidation of Dublin City and suburbs, refocus on the development of brownfield and infill lands to achieve a target of at least 50% of all new homes within or contiguous to the existing built-up area in Dublin and at least 30% in other settlements.*
- *Integrated transport and land use – Target growth along high quality public transport corridors and nodes linked to the delivery of key public transport projects including BusConnects, DART expansion and LUAS extension programmes and the Metro Link, along with better integration between networks.'*

3.10 Dublin City Development Plan (CDP) 2022-2028

The Dublin City Development Plan 2022-2028 was adopted at a Special Council meeting on the 2nd of November 2022. The plan came into effect on the 14th of December 2022.

3.10.1 Core Strategy

Park West and Cherry Orchard is identified as one of a number of Strategic Development and Regeneration (SDRA), which are considered a critical component to the core strategy. All SDRAs have been examined to determine capacity for future housing growth, taking into account sustainable densities and relevant SDZs and LAPs where relevant. The SDRA areas targeted for housing growth in the development plan are aligned to existing and planned public transport corridors and guided by national policy set out in the NPF and RSES. They provide for planned, integrated and sustainable growth over a number of development plan periods for Dublin City Council. Most of the land targeted for new housing in the city is located in SDRAs, which are for the most part, brownfield and regeneration sites. The Plan notes that SDRAs will take longer periods of time to be fully delivered, with many running across two development plan cycles to reach completion.

The Park West and Cherry Orchard SDRA has been identified in the Core Strategy as having a "residential and open space" character, with the capacity for between 2,500 to 3,100 homes and a resident population of 6,200 people.

The proposed scheme, by providing 708 new homes and over 6,000 sqm of public open space, will be essential in delivering upon the objectives for the Park West and Cherry Orchard SDRA and its role as part of the Core Strategy. This will be further supported by the subsequent phases of the Cherry Orchard Point site which is subject to assessment under this EIAR, which will provide for circa 1,100 homes.

3.10.2 Housing

The development plan, particularly through Chapter 5 (Quality Housing and Sustainable Neighbourhoods), seeks to ensure the delivery of quality homes and sustainable communities as part of an overall strategy for compact growth.

Specific polices are set out in in the Development Plan relating to the type, quality and design of new housing. Policies of particular relevance to the proposed development include:

- **SC8:** To support the development of the inner suburbs and outer city in accordance with the strategic development areas and corridors set out under the Dublin Metropolitan Area Strategic Plan and fully maximise opportunities for intensification of infill, brownfield and underutilised land where it aligns with existing and pipeline public transport services and enhanced walking and cycling infrastructure.
- **SC12:** To promote a variety of housing and apartment types and sizes, as well as tenure diversity and mix, which will create both a distinctive sense of place in particular areas and neighbourhoods, including coherent streets and open spaces and provide for communities to thrive.
- **QHSN10:** To promote residential development at sustainable densities throughout the city in accordance with the Core Strategy, particularly on vacant and/or underutilised sites, having regard to the need for high standards of urban design and architecture and to successfully integrate with the character of the surrounding area.
- **QHSN11:** To promote the realisation of the 15-minute city which provides for liveable, sustainable urban neighbourhoods and villages throughout the city that deliver healthy placemaking, high quality housing and well designed, intergenerational and accessible, safe and inclusive public spaces served by local services, amenities, sports facilities and sustainable modes of public and accessible transport where feasible

The proposed scheme will result in the development of high quality new housing, at suitable densities, on underutilised lands adjacent to high quality rail services. It will support the principles for compact growth and the realisation of a 15 minute city.

3.10.3 Climate Action

As acknowledged in the Dublin City Council Climate Action Plan (CCAP) (2019-2024), the effects of climate change are already impacting Dublin City at a significant rate and are very likely to increase in their frequency and intensity. The Council has been active in progressing policies and projects such as the Climate Action Plan for Dublin City Council which sets a target of 40% reduction in the Council's greenhouse gas emissions by 2030. As a signatory to the Covenant of Mayors Dublin City has a more ambitious target of 55% by 2030 and carbon neutrality by 2050, in line with the EU Green Deal ambitions. The Development Plan set out policies under Chapter 3 that necessarily cross-references other sections of this plan which ensures the approach to climate action adopted in this development plan means that every chapter of the plan contributes to the overall effort to adapt to and mitigate the impacts of climate change.

Regarding built environment, the Development Plan encourages the of energy efficiency in the built environment relates not only to the building code and individual buildings, but also to the design and layout of schemes by maximising benefits from natural ventilation and lighting and also by encouraging

walking/cycling for residents/occupants and reduced reliance on fossil fuels. The following policies relating to climate action are considered to be of particular relevance to the proposed development:

- **CA8:** Climate Mitigation Actions in the Built Environment - To require low carbon development in the city which will seek to reduce carbon dioxide emissions and which will meet the highest feasible environmental standards during construction and occupation, see Section 15.7.1 when dealing with development proposals. New development should generally demonstrate/ provide for: a. building layout and design which maximises daylight, natural ventilation, active transport and public transport use; b. sustainable building/services/site design to maximise energy efficiency; c. sensitive energy efficiency improvements to existing buildings; d. energy efficiency, energy conservation, and the increased use of renewable energy in existing and new developments; e. on-site renewable energy infrastructure and renewable energy; f. minimising the generation of site and construction waste and maximising reuse or recycling; g. the use of construction materials that have low to zero embodied energy and CO2 emissions; and h. connection to (existing and planned) decentralised energy networks including the Dublin District Heating System where feasible.
- **CA9:** Climate Adaptation Actions in the Built Environment - Development proposals must demonstrate sustainable, climate adaptation, circular design principles for new buildings / services / site. The council will promote and support development which is resilient to climate change. This would include: a. measures such as green roofs and green walls to reduce internal overheating and the urban heat island effect; b. ensuring the efficient use of natural resources (including water) and making the most of natural systems both within and around buildings; c. minimising pollution by reducing surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems (SuDS); d. reducing flood risk, damage to property from extreme events– residential, public and commercial; e. reducing risks from temperature extremes and extreme weather events to critical infrastructure such as roads, communication networks, the water/drainage network, and energy supply; f. promoting, developing and protecting biodiversity, novel urban ecosystems and green infrastructure.

Climate mitigations and adaption have been core considerations in the design the proposed scheme. The development incorporates SuDs, green roofs, and sustainable façade design, and provides services and facilities that contribute to the energy efficiency, biodiversity, and green infrastructure services. The proposed scheme will comply with the requirements set out in the Development Plan and contribute to the climate actions in Dublin City.

3.10.4 The City Centre, Urban Villages and Retail

Dublin's urban centres comprise the city centre, which is the prime retail destination for the country, surrounded by a network of inner and outer suburban centres of different scales. Changes in economic conditions, technological advances, retail trends, changing consumer behaviours and the impacts and changes brought about by the Covid-19 pandemic have and continue to result in new patterns of work and lifestyles. The Development Plan has taken strategic approach to support and promote the city centre and the city's urban villages and retail. This includes promoting and consolidating the role of urban villages and neighbourhood centres and recognising the importance of placemaking and an attractive public realm.

In line with the Retail Planning Guidelines, 2012, the DCC Retail Strategy seeks to promote town centre vitality through the sequential approach to development. New retail development should relate to this retail hierarchy and it should located in the designated centre and be of a scale compatible with the function and capacity of the centre.

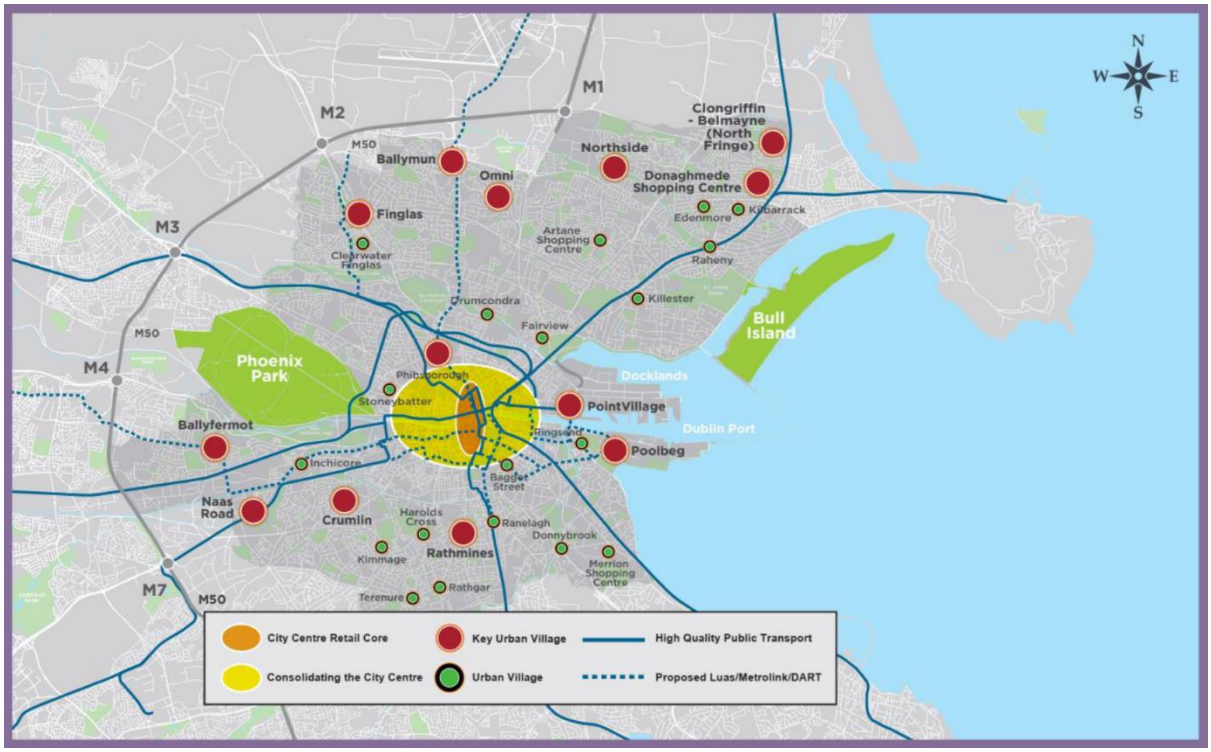


Figure 3.4: Retail Hierarchy for Dublin (Dublin Retail Hierarchy, 2022)

Specific policies are set out in the Development Plan to ensure the vibrancy and sustainability of the urban and village centres. Such as:

- CCUV3: Sequential Approach - To promote city centre and urban village vitality through the sequential approach to retail development, enable good quality development in appropriate locations, facilitate modal shift and to deliver quality design outcomes.
- CCUV6: Large Scale Retail / Mixed Use Developments - To ensure that large scale retail / mixed use development proposals match the capacity of existing and planned public transport; provide good quality street environments to provide safer and more attractive settings for people to shop / do business; and incorporate cycle and pedestrian friendly designs in line with the Retail Design Manual 2012.

The proposed scheme is a residential led mixed-use development which includes the provision of a convenience retail supermarket and small commercial units. The proposal has been examined against relevant requirements and policy which will ensure the integrity and sustainability of the urban centres in Dublin City. The proposed supermarket will support the daily needs of residents of the proposed development, whilst providing a much-needed amenity for the wider community. Design for the street front has been arranged to provide active frontage and passive surveillance, contribute further to the neighbourhood.

3.10.5 Sustainable Movement and Transport

Dublin City Council is committed to optimising the interconnection between land use and transport planning, aligning with the principles of the 15-minute city and proactively engaging with the relevant transport providers, agencies and external stakeholders to advance the delivery of key public transport infrastructure projects, providing improved walking and cycling infrastructure, and influencing travel behaviour, which together will assist modal shift and deliver an integrated and sustainable transport network.

Dublin City Council acknowledges the importance of transitioning to low carbon mobility solutions to mitigate against climate change and will continue to address this through an integrated set of policies and objectives.

- SMT1: Modal Shift and Compact Growth To continue to promote modal shift from private car use towards increased use of more sustainable forms of transport such as active mobility and public transport, and to work with the National Transport Authority (NTA), Transport Infrastructure Ireland (TII) and other transport agencies in progressing an integrated set of transport objectives to achieve compact growth.
- SMT2: Decarbonising Transport To support the decarbonising of motorised transport and facilitate the rollout of alternative low emission fuel infrastructure, prioritising electric vehicle (EV) infrastructure.

Dublin City Council also supports the development of mobility hubs, the aim of which is to encourage varied and sustainable types of transport in areas that are close to existing public transport links with high concentrations of employment, housing, shopping, amenities and recreation.

- SMT4: Integration of Public Transport Services and Development To support and encourage intensification and mixed-use development along public transport corridors and to ensure the integration of high-quality permeability links and public realm in tandem with the delivery of public transport services, to create attractive, liveable and high quality urban places.

The Development Plan emphasised on active travel and active public realm that encourages the sustainable mode of transport. Policies are stated to promote walking, cycling and other active travel mode with focus on infrastructure, design, and initiatives.

- SMT16: Walking, Cycling and Active Travel To prioritise the development of safe and connected walking and cycling facilities and prioritise a shift to active travel for people of all ages and abilities, in line with the city's mode share targets.

The proposed scheme benefits from the public transport with regular train services directly adjacent to the site and DART+ planned in the near future which will provide higher frequency public transport to the area. The design of the proposed scheme has incorporated active travel mode with pedestrian and cyclist friendly layout and infrastructure promoting sustainable transport mode. Abundant bicycle parking spaces are provided throughout the proposal with designated EV charging spaces and car sharing spaces for car uses. It is considered the proposal will be in compliance with the policies and standards listed in the Development Plan and provide a high-quality mixed-use development with appropriate density in a public transport hub location.

3.10.6 Strategic Development Regeneration Areas

A key element in the delivery of compact growth will be the sustainable development of the Strategic Development Regeneration Areas (SDRAs). It is considered that the SDRAs are capable of delivering significant quantities of homes and employment for the city.

The designated SDRAs align with the overarching goals of the NPF and RSES. They will be drivers of economic growth and investment in the city in line with National Policy Objective (NPO) 5 "*Develop cities and towns of sufficient scale and quality to compete internationally and to be drivers of national and regional growth, investment and prosperity*". Their development is also important in the context of NPO 6, "*Regenerate and rejuvenate cities, towns and villages of all types and scale as environmental assets, that can accommodate changing roles and functions, increased residential population and employment activity and enhanced levels of amenity and design quality, in order to sustainably influence and support their surrounding area".* The vision of the plan is that the SDRAs will be developed over the plan period for significant residential and employment uses developed in tandem with high quality social and community infrastructure and amenities, served by excellent public transport.

The subject site located within SDRA 4 (Park West / Cherry Orchard) and covers a total area of 49ha with an estimated capacity of 2,500-3,100. Development of SDRA 4 could accommodate circa 8% of the identified housing need for Dublin within the period of the current development plan.

Section 13.6 of the CDP sets out a series of guiding principles for SDRA 4 which establish the key objectives for the area. These guidelines principles are based upon the objectives for the area as set out in the adopted Park West Cherry Orchard Local Area Plan (2019), which is set out in greater details in Section 3.11 of this chapter of the EIAR.

The key guiding principles set out below reflect the guiding principles of the LAP and are as follows:

Urban Structure

- *Develop the remaining sites in the area in a sustainable manner to create a vibrant sustainable new (neighbourhood) urban area that is fully integrated and connected with the existing community.*
- *Enhance accessibility and connectivity both within the Park West – Cherry Orchard area and to the surrounding areas to service the remaining development sites.*
- *Promote sustainable modes of transport by making them convenient and attractive (including walking and cycling) through the implementation of a well-connected, permeable, coherent street network with high levels of accessibility to an integrated public transport network with improved infrastructure to maximise its potential use. Ensure timely provision and investment in infrastructure including water and drainage provision, public transport, telecommunications network etc. to support new development opportunities.*
- *To develop Park West Cherry Orchard in an integrated, sustainable way that will ensure the local community benefits from investment, greater infrastructure and services.*

Land Use & Activity

- *Ensure the Local Area Plan delivers private, council and affordable housing, schools, sports and recreational facilities, retail facilities and employment opportunities in consultation with local community and youth services.*
- *Deliver new residential units in a mix of unit types and tenures to cater for people across all spectrums of their lifecycle, with higher densities sought in proximity to the railway station.*
- *Create a local neighbourhood focal point within Cherry Orchard neighbourhood enhancing existing services and amenities and providing new local retail provision.*
- *Create a new commercial destination in the vicinity of the train station, with mixed use and supermarket provision, together with landmark buildings and civic spaces.*
- *Enhance existing open space areas and develop a connected network of green spaces and green infrastructure to maximise their potential use by the existing and future generations.*
- *Support opportunities and initiatives which promote education and aim to address unemployment supporting economic activity through the provision of existing and future services and businesses in the area.*
- *Support and facilitate the provision of additional school places to serve the existing and emerging communities.*
- *Support and facilitate the development of a Community and Social Enterprise Hub.*
- *Support the provision of mixed employment uses in proximity to the M50 boundary.*
- *Consolidate and improve the existing sports and recreation facilities and promote the provision of new recreational facilities.*

Height

- *Provide building heights in keeping with the height guidance set out for each individual site of the Park West – Cherry Orchard Local Area Plan 2019.*
- *Allow for limited locally higher buildings in the vicinity of the Train Station, in keeping with the LAP objectives and site briefs.*

Design

- *Implement the urban form and design strategy set out in Section 4.6 of the Park West – Cherry Orchard Local Area Plan 2019.*
- *Improve the appearance and image of the area and create a content, caring and vibrant sustainable community which integrates the new community with the existing established community.*
- *Underground overhead ESB pylons wherever possible to enhance the urban form of this part of the city.*

Green Infrastructure

- *To protect and promote the natural and built heritage of the area and provide a network of well-maintained parks and civic spaces connected by tree lined streets taking the opportunity to incorporate best practice SuDS infrastructure as appropriate.*
- *Support the aims and objectives of the Water Framework Directive for the Camac River Catchment, particularly in relation to hydro morphology and improvements in water quality and the streams that drain the LAP lands.*
- *To provide for water attenuation capabilities within the redesign of Cherry Orchard Park.*

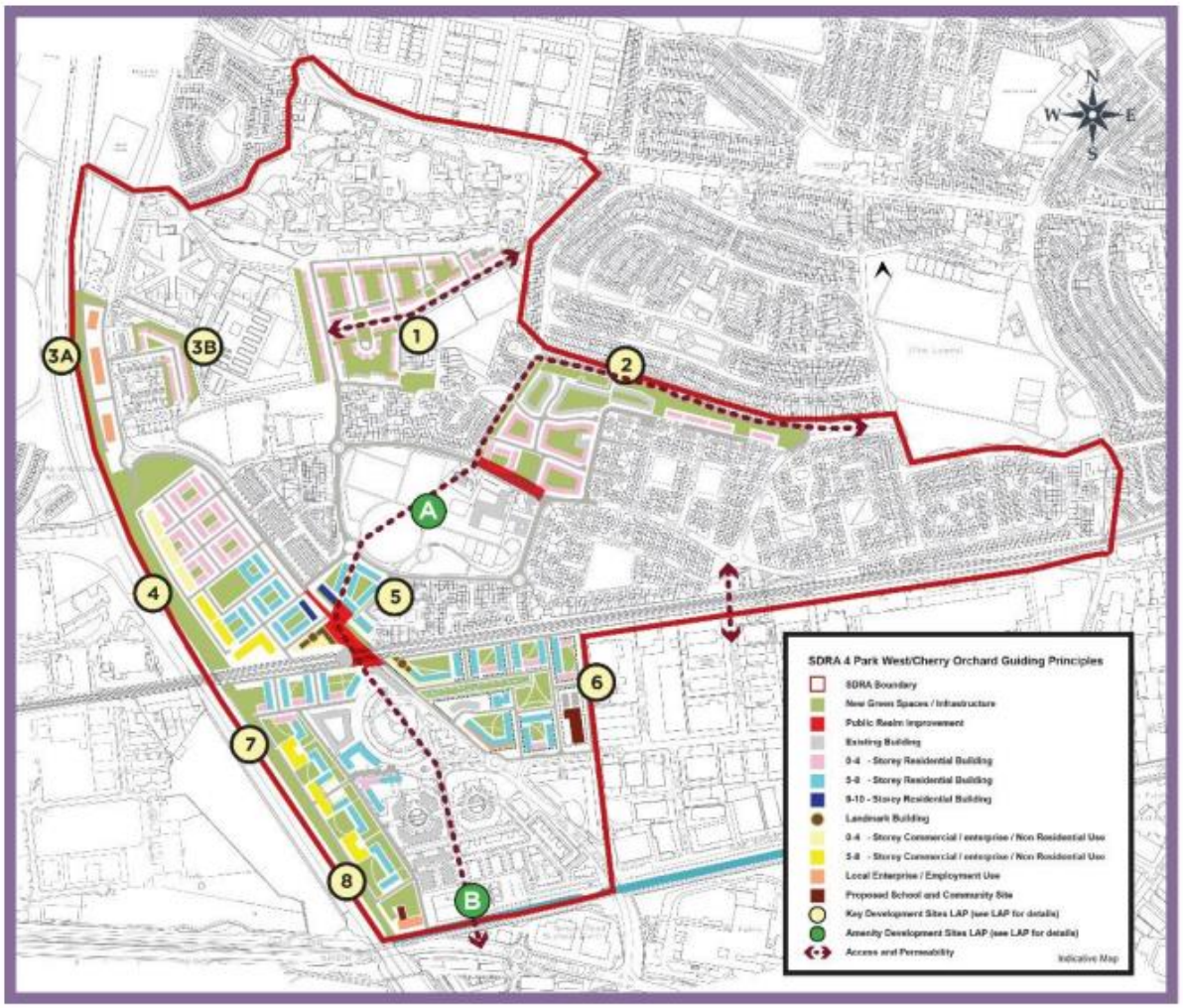


Figure 3.5: SDRA 4 Park West/Cherry Orchard (Dublin City Development Plan, 2022)

The proposed scheme will deliver a high quality, residential led mixed use scheme at a core part of SDRA adjacent to the train station. It will be a key role in delivering upon the vision for the

compact growth and sustainable development of this new neighbourhood, providing for a range community, commercial, cultural and employment-based uses.

Further detail on how the scheme supports the principles identified in relation to SDRA 4 under Section 13.6 of the DCDP, has been set out in Section 3.11 of this Chapter. This section also provides an overview of the scheme's alignment with the Park West Cherry Orchard Local Area Plan 2019.

3.10.7 Land-Use Zoning

The land use zoning strategy set out in the DCDP ensures the integration of land-use planning with infrastructure delivery, which is essential to achieving sustainable development.

The overall zoning strategy is based on the following principles:

- *To ensure that land-use zoning across the city spatially facilitates the aims of the core strategy and the objective to develop a compact, connected, low carbon, and climatically resilient city.*
- *To ensure that land is appropriately zoned in order to accommodate the expected growth needs of Dublin City within the timeframe of the plan and to ensure the protection of community and social infrastructure, and critical ecosystems services, through the application of appropriate land-use zoning designations in order to provide adequate facilities and amenities to meet the growing needs of the city.*
- *To provide for balanced and sustainable development by promoting, in particular, a mixed-use pattern of development with a move away from more traditional forms of single mono-use zoning.*
- *To ensure that the most efficient use is being made of the city's land in line with the principles of the 15-minute city, and that the redevelopment of under-utilised and brownfield land is promoted in order to consolidate and add vitality to existing centres.*
- *To promote the intensification of development adjacent and close to public transport nodes and corridors in order to minimise trip generation and distribution and to promote sustainable compact urban form.*
- *To ensure that the city's zoned enterprise and employment lands are integrated with key supporting infrastructure to provide for more intensive forms of employment.*

The subject site is zoned Z14 Strategic Development and Regeneration Area, specifically SDRA 4 – Park West / Cherry Orchard under the Dublin City Development Plan 2022 - 2028. The land use zoning objective of such lands aims "*To seek the social, economic and physical development and/or regeneration of an area with mixed-use, of which residential would be the predominant use*."

The proposed development involves residential, community, cultural / arts and employment-based uses, all of which are permissible under the Z14 zoning objective ascribed to the subject site.

3.10.8 Development Management Standards

Development Standards set out the criteria to be considered in the development management process so that development proposals can be assessed both in terms of how they contribute to the achievement of the core strategy and related policies and objectives.

Of the Development Standards as part of the Dublin City Development Plan 2022-2028, the following are considered to be most relevant to the proposed scheme and have illustrated compliance.

Neighbourhood Development

The importance of sustainable neighbourhood development and healthy placemaking is set out in Policy QHSN12

QHSN12: To encourage neighbourhood development which protects and enhances the quality of our built environment and supports public health and community wellbeing. Promote developments which:

- *build on local character as expressed in historic activities, buildings, materials, housing types or local landscape in order to harmonise with and further develop the unique character of these places;*
- *integrate active recreation and physical activity facilities including community centres and halls as part of the 15-minute city;*
- *encourage sustainable and low carbon transport modes through the promotion of alternative modes and 'walkable communities' whereby a range of facilities and services will be accessible within short walking or cycling distance;*
- *promote and implement low traffic neighbourhoods to ensure a high quality built environment and encourage active travel in delivering the 15 minute city model.*
- *promote sustainable design through energy efficiency, use of renewable energy and sustainable building materials and improved energy performance;*
- *promote the development of healthy, liveable and attractive places through public realm and environmental improvement projects;*
- *cater for all age groups and all levels of ability / mobility and ensuring that universal design is incorporated to maximise social inclusion;*
- *provide the necessary inclusive community facilities and design features to promote independence for older people and to maximise quality of life;*
- *have regard to the Guiding Principles for 'Healthy Placemaking' and 'Integration of Land Use and Transport' as set out in the Regional Spatial and Economic Strategy and national policy as set out in 'Sustainable Residential Development in Urban Areas' and the 'Design Manual for Urban Roads and Streets (DMURS)';*
- *are designed to promote safety and security and avoid anti-social behaviour.*

The proposed scheme represents a residential mixed-use development, built to highest quality delivering community uses, convenience store, smaller commercial uses and a range of open space amenities. It is considered that the proposed scheme will play a key role in delivering the objectives of Policy QHSN12 for the wider Park West and Cherry Orchard area.

Heights and Density

Policy QHSN10 of the Developmetn Plan sets out the requirements in relation to urban density: *"To promote residential development at sustainable densities throughout the city in accordance with the Core Strategy, particularly on vacant and/or underutilised sites, having regard to the need for high standards of urban design and architecture and to successfully integrate with the character of the surrounding area."*

Appendix 3 (Achieving Sustainable Compact Growth Policy for Density and Building Height in the City) of the DCDP sets out guidance for appropriate areas for increased density and height.

With regards to building heights, the guidance states that *"Building heights significantly define the character of cities and neighbourhoods. They are generally expressed in terms of either their overall height or their number of storeys. Height to width ratio can also be used to help define the slenderness of a taller building. Consideration of what constitutes a tall building can be subjective and also depends on context. For example, a 6-storey building in the city centre may not be considered as high, whereas such a proposal in a low density suburb, may be construed differently.*

The main determining factor in considering appropriate heights is the need to create exemplar urban development with attractive streets, spaces and public areas that integrate successfully with the surrounding area. The key factors that will determine height will be the impact on adjacent residential amenities, the proportions of the building in relation to the street, the creation of appropriate enclosure and surveillance, the provision of active ground floor uses and a legible, permeable and sustainable layout."

With regards to density it is stated that "*Higher density development allows land to be used more efficiently, assists in regeneration and minimises urban expansion. Higher densities maintain the vitality and viability of local services and provide for the critical mass for successful functionality of public transport facilities."*

It is noted that the strategic approach is that the highest densities should be located at the most accessible and sustainable locations. Sustainable densities in accordance with the standards set out in the Guidelines on Sustainable Residential Development in Urban Areas 2009 will be supported. An urban design and quality led approach to creating sustainable development will be promoted.

It is also noted that there should be a focus not just on maximising density to maximise yield, but on a range of qualitative criteria and the consideration of a wide range of other factors including architecture, urban design, community facilities and infrastructure, green infrastructure and quality placemaking..

The proposed site forms part of the Park West-Cherry Orchard Strategic Development Regeneration Area (SDRA) and subject to the provision for the Park West Cherry Orchard Local Area Plan (2019). Specific guidance on densities for the site are set out in the LAP and are reflected in the development capacities for the area identified in the DCDP. Appropriate heights for the site have also been set out in the LAP, which provides a framework for a cohesive urban structure. The proposed development aligns with the objectives of the LAP, whilst the design approach responds appropriately to the height and form of development in create a high-quality streetscape.

Greater detail on the how the scheme satisfies the objectives the LAP is set out in Section 3.11.

Residential Unit Type and Mix

The Development Plan largely defers to the Apartment Guidelines when setting policy objectives pertaining to unit type and mix. SPPR 1 of the Guidelines states that housing developments may include up to 50% one-bedroom or studio type units (with no more than 20-25% of the total proposed development as studios) and there shall be no minimum requirement for apartments with three or more bedrooms.

The proposed development comprises 42% 1 bed units, 7% 2 bed (3 person units), 42% 2 bed (4 person units) and 9% 3 bed units. Accordingly, the proposed development accords fully with SPPR 1.

Green Infrastructure

All new developments in the city are encouraged to incorporate an ecosystem services approach as a key instrument in achieving sustainable climate change action in accordance with Policy GI5 and GI6.

GI5: "To integrate urban greening features including nature-based solutions into the existing public realm where feasible and into the design of public realm projects for civic spaces and streets. The installation of living green walls will be encouraged to the fullest possible extent throughout the city of Dublin and tree pits with mixed planting will be preferred for the greening of streets in recognition of the co-benefits they offer for SuDs, biodiversity, amenity value and traffic calming".

GI6: "To integrate Green Infrastructure and an ecosystem services approach into new developments / new growth areas in the city that contributes to the city's green infrastructure network by its extension and enhancement and that provides for the environmental resilience of new development".

Green infrastructure and nature based solutions are a core element of the proposed scheme, and has is embedded within the movement strategy within and beyond the subject site.

The large neighbourhood park running the length of the development lands is the focus for passive and active amenity space for the new residents. The park is permeable to pedestrians and bicycles and is well over-looked by active edges.

The scheme site layout and the landscape plan follow the All-Ireland Pollinator planting code through the inclusion of native wildflower meadow planting, pollinator friendly street trees and tree planting, shrub and ground cover planting, swale planting and green roofs. The planting specification includes specimens that will flower throughout the year from spring to autumn, prioritises native planting and chooses pollinator friendly species of horticultural and ornamental planting.

Green/Blue roofs

Dublin City Council will require all new development projects over 100 sq. metres to provide green roofs to assist in climate action and urban drainage in accordance with Policy SI23.

SI23: "To require all new developments with roof areas in excess of 100 sq. metres to provide for a green blue roof designed in accordance with the requirements of Dublin City Council's Green & Blue Roof Guide (2021) which is summarised in Appendix 11."

Green roofs are proposed across each block of the proposed scheme in line with Policy SI23, with additional green roofs to ancillary structures including bin storage units.

Surface Water Management and SuDs

The DCDP requires that all new developments will also be required to utilise SuDS measures in accordance with Policy SI22 of the development plan. The SuDS measures shall be set out clearly in an assessment of the drainage details prepared by a qualified Engineer.

SI22: "To require the use of Sustainable Drainage Systems (SuDS) in all new developments, where appropriate, as set out in the Greater Dublin Strategic Drainage Study (Vol 2: New Development)/ Greater Dublin Regional Code of Practice for Drainage Works and having regard to the guidance set out in Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas, Water Sensitive Urban Design Best Practice Interim Guidance Document (DHLGH, 2021). Sustainable Drainage Systems (SuDS) should incorporate nature-based solutions and be designed in accordance with the Dublin City Council Sustainable Drainage Design & Evaluation Guide (2021) which is summarised in Appendix 12. SuDS should protect and enhance water quality through treatment at source while enhancing biodiversity and amenity".

The proposed development incorporates a Storm Water Management Plan which aligns with the requirements of SI11. Further detail is set out in Chapter 12 of this EIAR.

Public Open Space and Recreation

Section 15.8.6 of the Development Plan sets out the policy requirements relating to the provision of public open space as part of new development proposals. *Public open space should be of high quality landscaped design to provide for an amenity value. Public open space should utilise a combination of hard and soft landscaping to cater for a wide range of needs such as children's play, passive recreation and sporting facilities. Where adjacent to canals or rivers, proposals must take into account the functions of a riparian corridor and possible flood plain.*

Dublin City Council will seek the following in the delivery of public open space:

- *The design and layout of the open space should complement the layout of the surrounding built environment and complement the site layout.*
- *Open space should be overlooked and designed to ensure passive surveillance is achieved.*

- *The space should be visible from and accessible to the maximum number of users.*
- *Inaccessible or narrow unusable spaces will not be accepted.*
- *The level of daylight and sunlight received within the space shall be in accordance with the BRE Guidelines or any other supplementary guidance document.*
- *Any new public open space on the site should be contiguous to existing open space or natural feature (i.e. river corridors and canal bank) to encourage visual continuity and optimise value of ecological networks.*
- *Protect and incorporate existing trees that are worthy of retention into the design of new open spaces.*
- *Retain and incorporate other existing natural features into the design to reinforce local identity, landscape character, and amenity.*
- *Landscaping works should be integrated with overall surface water management and SuDS strategy such that landscaping plans may include associated biodiversity areas or wetlands which can reduce / better manage surface water run-off.*
- *Landscaping schemes should provide a hierarchy of different types of planting throughout the development in order to give visual variety. Permeable surfaces will be encouraged*
- *Materials must be appropriate, durable and of a good quality. The texture and colour of materials must be sympathetic to the locality and be an integral part of the design.*
- *Street furniture should be sited such that it does not provide an obstacle for people with disabilities and should be designed so that it is fully accessible where feasible.*
- *Age friendly measures should be incorporated into the design.*
- *Permeability and accessibility for all users, particularly disabled persons should be provided.*
- *Cycle and pedestrian friendly routes should be accommodated.*

The proposed development also includes the provision of high-quality landscaped public open space of 6,123sqm representing 12.5% of the net residential area of the application lands. The public open space includes a public plaza, multi-use playing spaces, outdoor fitness trail, amenity lawns, and Multi-Use Games Area. The design approach to the form and layout of the open space, which is an integral and central component of the scheme, has ultimately informed the movement and connectivity strategy for the development. The design and layout of the central Neighbourhood Park has enabled the development to integrate with the existing community by promoting permeability through the scheme and enhancing connectivity to the wider Cherry Orchard area. The public open space has been arranged in terms of a clear hierarchy with each area having its own distinct character and purpose and has been designed in compliance with the above-mentioned criteria.

Community and Social Audit

Section 15.8.2 of the Development Plan sets out the policy requirements pertaining to the provision of community facilities within development proposals. *Community facilities, such as local parks and playgrounds, community centres, local hubs, schools, childcare are an integral component of a successful neighbourhood. Applications for large residential developments or mixed use developments should include provision for community type uses. All residential applications comprising of 50 or more units shall include a community and social audit to assess the provision of community facilities and infrastructure within the vicinity of the site and identify whether there is a need to provide additional facilities to cater for the proposed development. Each of the subsections below shall be assessed as part of the community and social audit. A community and social audit should address the following:*

- *Identify the existing community and social provision in the surrounding area covering a 750m radius.*
- *Assess the overall need in terms of necessity, deficiency, and opportunities to share/ enhance existing facilities based on current and proposed population projections.*

- *Justify the inclusion or exclusion of a community facility as part of the proposed development having regard to the findings of the audit.*

A separate Social Infrastructure Audit has been prepared and submitted as part of the associated planning application addressing the requirements of the DCDP. The proposed scheme will address current and future needs through provision of community, arts and cultural spaces delivered across 13no. community and arts / cultural units (totalling 1,222sq.m GFA), and associated external events space and community gardens (1,157sq.m), and a childcare facility (672sq.m GFA). The need for additional uses in the wider Cherry Orchard Point development will be assessed and provided for in planning applications for subsequent phases.

Dual Aspect

Section 15.9.3 of the DCDP states that :*The Specific Planning Policy Requirement 4 requires a minimum of 33% dual aspect units in central and / or accessible urban locations and 50% of units in suburban and / or intermediate locations.*

In prime city centre locations, adjoining or adjacent to high quality, high frequency public transport, 33% dual aspect may be accepted in locations where there are specific site constraints such as tight urban infill sites up to 0.25ha or where there is a need to maintain a strong street frontage.

The proposed development is located in accessible location, directly adjacent to Park West and Cherry Orchard train station. The proposed scheme complies with the requirements of the DCDP and SPPR4 of the Apartment Guidelines with 40% of units being dual aspect. The geometry and orientation of the urban blocks was designed in such a manner that there are no single aspect north facing apartments within the development.

Daylight and Sunlight

Section 15.9.16.1 of the Development Plan states that *"good daylight and sunlight contribute to making a building energy-efficient; it reduces the need for electric lighting, while winter solar gain can reduce heating requirements. Daylight animates an interior and makes it attractive and interesting, as well as providing light to work or read by.*

A daylight and sunlight assessment should be provided to assess the impact of the proposed development on the surrounding properties and amenity areas outside the site boundary and assess the daylight and sunlight received within each individual unit and communal areas of a proposed scheme."

The site layout, urban blocks, receiving environment and individual apartments have been designed with regard to the principles and guidance of the recently published BR 209 2022 Site Layout Planning for Daylight and Sunlight: a Guide to Good Practice (3rd edition 2022). Specialist consultants collaborated with the architects and urban designers throughout the design process, and the proposed final scheme achieves a very high level of compliance with the Guidelines that is commensurate to the nature of this new, high-density, urban development. A full and comprehensive Daylight and Sunlight Assessment and Report accompanies this planning application.

Separation Distances

Section 15.9.17 of the DCDP states that "*Traditionally a minimum distance of 22m is required between opposing first floor windows. In taller blocks, a greater separation distance may be prescribed having regard to the layout, size, and design. In certain instances, depending on orientation and location in built-up areas, reduced separation distances may be acceptable.*

Separation distances between buildings will be assessed on a case by case basis. In all instances where the minimum separation distances are not met, each development will be assessed on a case

by case basis having regard to the specific site constraints and the ability to comply with other standards set out within this chapter in terms of residential quality and amenity."

A minimum of 22m between directly opposing upper floor 'primary' windows of habitable rooms is achieved throughout the scheme with some minor deviations made in response to a need for maximise passive surveillance.

This is a traditional metric for separation distances and originally aimed at traditional housing and privacy to the rear bedroom windows. Many urban streets would struggle to achieve a separation distance of 22m without damaging the height to width ratio, and there is no expectation or requirement for such privacy between opposing front first floor bedroom windows.

Where increased passive surveillance of communal open space, or the public realm is required, additional or 'secondary' windows are proposed.

The reduced separation distance between the corners of the high-density buildings is considered to be appropriate and have no material impact on the quality and amenity of the corner apartment.

Sustainable Movement and Transport

Section 15.16 of the DCDP states that *"Sustainable and efficient movement of people and goods is crucial for the success and vitality of the city. The Plan seeks to promote ease of movement within and around the city as well as playing a key role in safeguarding the environment and adapting to the impacts of climate change. This policy approach promotes the integration of land use and transportation, improved public transport and active travel infrastructure, an increased shift towards sustainable modes of travel and an increased focus on public realm and healthy place-making. This Plan also looks to the future of mobility in the city including the increasing role of shared mobility schemes, micro mobility options, electric vehicles and the application of technology in the mobility sector."*

Further detail on development standards are set out in Appendix 5 (Transport and Mobility: Technical Requirements) of the DCDP in relation to:

- *Access and Design Standards*
- *Traffic and Transport Assessments*
- *Mobility Management and Travel Planning*
- *Service Delivery and Access Strategy*
- *Design and Construction Standards and Processes for Roads and Footpaths*
- *Cycle and Car Parking Standards and Management*

The proposed development has been designed in a manner which prioritises sustainable modes of travel. Chapter 14 of this EIAR, and relevant associated planning application documents, set out further detail on how the proposed scheme is consistent with all relevant polices and objectives with regards to transport and access.

3.11 Park West Cherry Orchard Local Area Plan 2019

Dublin City Council adopted the Park West - Cherry Orchard Local Area Plan (LAP) in October 2019 in accordance with Section 20 of the Planning and Development Act 2000 (as amended). The vision of the Plan is to make Park West - Cherry Orchard an attractive and identifiable place with a vibrant and active community. To provide a good mix of residential typologies that will cater for all people and residents will benefit from the provision amenities including local shops, schools, parks and community and recreational facilities. The LAP establishes statutory planning framework to allow future development to be managed in a co-ordinated and sustainable manner, providing for the needs of existing and future communities.

'The past ten to twenty years has seen significant, albeit sporadic changes, to the physical character of Park West and Cherry Orchard. Previous plans for development fell foul to economic recessions leaving some new developments isolated and un-connected to neighbouring amenities. With new plans in place for significant investment in public transport infrastructure, including in particular, the provision of an electrified DART line to serve the Park West – Cherry Orchard train station, it is timely to put in place a plan that can maximise the benefit from public investment and help provide much needed housing for the City, located within sustainable and attractive emerging neighbourhoods.'

As set out in Section 3.10.6, the objectives for the lands as set out in the LAP have been incorporated into the City Development Plan (2022), specifically through the areas identification as a Strategic Development Regeneration Area (SDRA) 4.

The LAP sets out individual site briefs for each of the 8 key development sites, which set out the vision, aspirations and development objectives for each. The site being considered as part of this planning application forms the southern portion of Development Site 4 (M50-Cedarbrook Avenue). The wider Cherry Orchard Point development site identified for the purposes of this EIAR constitutes the entirety of Development Sits 4 and adjoining Development Site 5 of the LAP.

Figure 3.6 and Figure 3.7 below set out the key development sites and amenity sites and proposed land use strategy, notably Site 4 and Site 5 to which the proposed development is pertaining to.

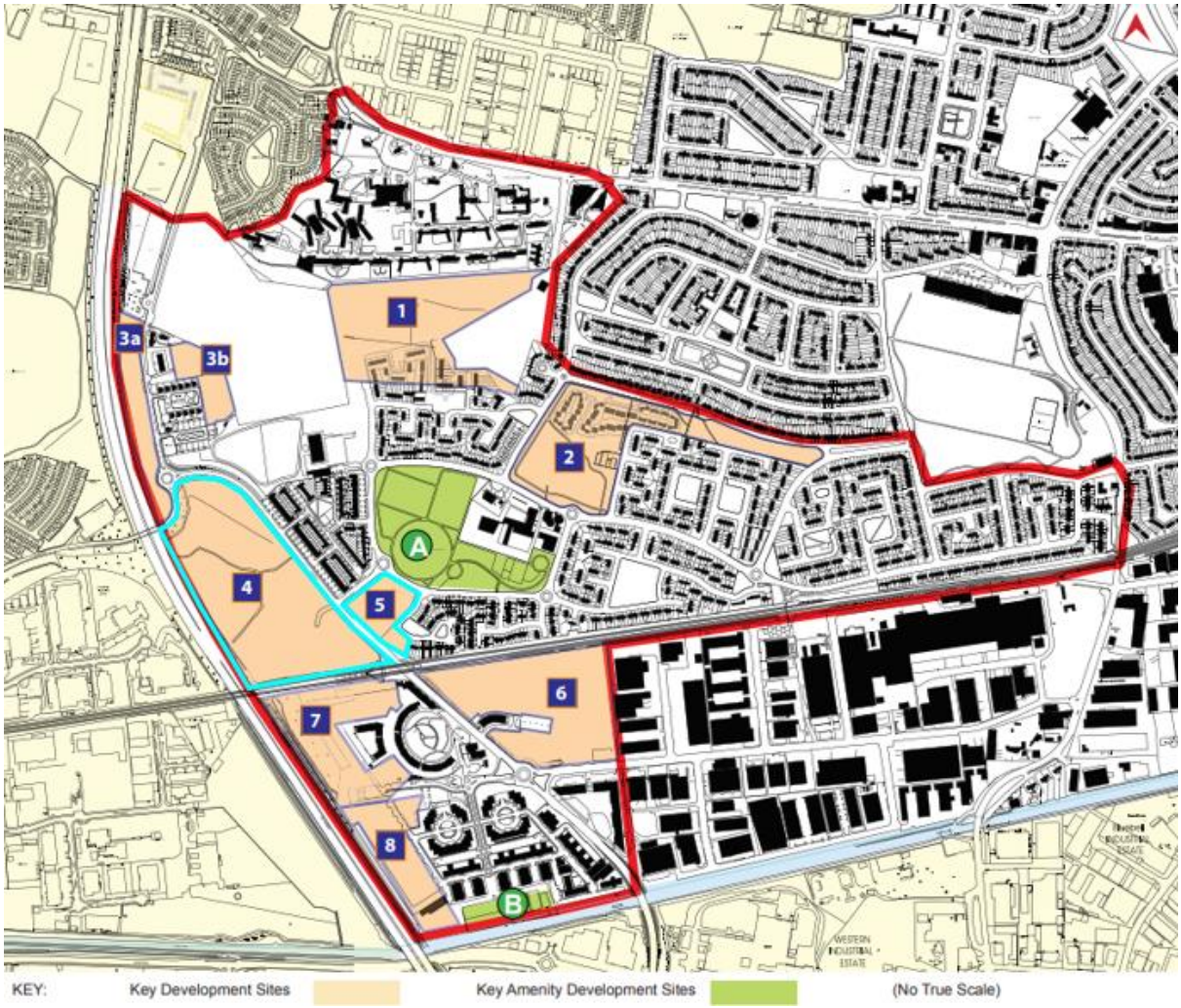


Figure 3.6 Key Development Sites and Amenity Sites with proposed development sites 4 & 5 in blue

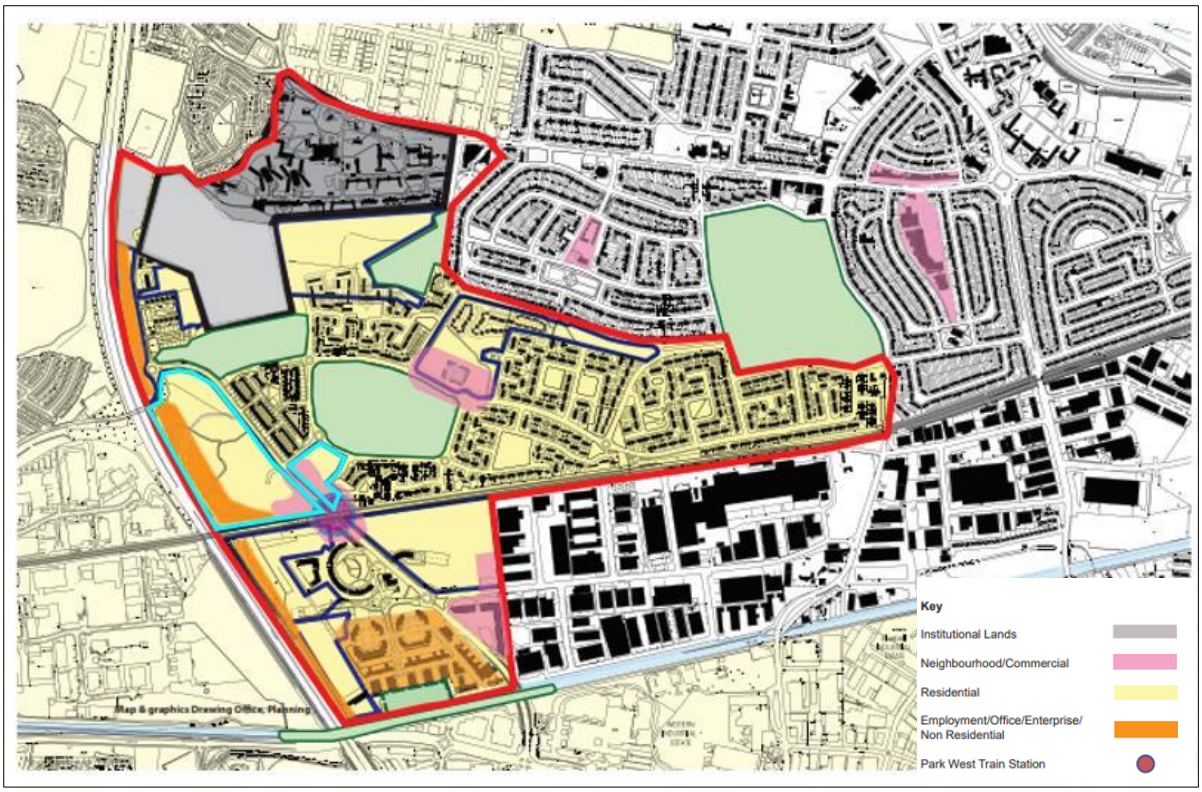


Figure 3.7 Proposed Land Use Strategy with proposed development sites 4 & 5 in blue

The LAP includes individual Site Briefs for the 8 Key Developments Sites which make up the area.

Objectives for Key Development Site 4 (M50-Cedarbrook Avenue Site)

The Site Brief for Site 4 sets out the following overarching development objectives:

- *Proposed Use: Predominantly Residential, with enterprise and commercial along the M50 and next to the Train Station. (c. 80/20 split).*
  - **The land mix for the proposed Phase 1 scheme delivers a residential led mixed development, with a splits of 89% residential / 11% non-residential. Delivery of subsequent phases, including enterprise and commercial uses along the M50, will results in the targeted 80/20 split.**
- *Density: 75 DPH average (Ranging from 50 – 125 DPH).*
  - **The density of the proposed Phase 1 scheme is 145.5 DPH. This increase in density has been arrived at through an optimised approach through detailed design, whilst remaining consistent guidance building heights, and in delivering the range of uses and amenities sought. The southern portion of Site 4 in which Phase 1 is located is where the LAP states that the highest densities should be focused.**
- Heights: Ranging from 2-4 storeys up to 7-8 storeys (24m) in close proximity to Train Station, with opportunity for place marker landmark building of up to 60m.
  - **The range of heights set out in the proposed scheme are consistent with those set out in the LAP, including the delivery of a taller landmark building to the south of the site.**
- Estimated Capacity: 600 – 700 units, subject to detailed design:
  - **Detailed design has resulted in an optimised capacity for the site. The planning application will deliver 701 units on the part of the Site 4 to which it relates to, with additional housing to be delivered on the remainder of the site in subsequent phases. This in resulting in a higher quantum of housing than that projected in the LAP.**

- *Supporting Infrastructure Requirements: Convenience retail to be provided. Local Park and Ride facility to be provided including provision for cycle parking facilities, as one of the supporting requirements when development site 4.*
    - **A new 2,523sq.m sqm retail convenience retail store is bring provided, in addition to smaller complimentary commercial units, which will help to establish a new core to the wider development. Through further detailed design, it has been determined that provision of a park and facility would be neither feasible or appropriate within Site 4 without compromising the provision of high quality housing and the other retail services and amenities sought in the LAP.**

The site brief sets out the following specific development objectives which are of relevance:

- *A new mixed-use development is sought for this site.*
    - **The proposed scheme will deliver a residential led mixed use in line, and mix of uses targeted within the LAP.**
- *Having regard to air, noise and amenity concerns associated with residential development next to the M50, the western strip of the site shall accommodate commercial/enterprise/employment uses such as may include own door office units, enterprise units or a community enterprise centre. Consideration also to be given to community uses that require large floorplates. It is required that these buildings shall be multi-storey where feasible to mitigate against noise from M50 traffic.*
    - **Provision has been allowed for in the design of the Phase 1 scheme layout for delivery of commercial/employment development in subsequent phases.**
- *Mixed use development in the vicinity of the train station will be sought, having regard to the noise levels associated with the station. Commercial ground floor development that animates the streetscape will be particularly sought. The site shall make provision for a large convenience store to the immediate north of the train station, to serve the entire LAP area.*
    - **An 2,523sq.m convenience store is being delivered to the south of the site, along with 7 smaller commercial units totalling 373 sqm.**
- *High density residential development is sought in proximity to the train station, scaling down in height and density towards the northern half of the site. Lower-density residential development will be considered to the northern half to "kick-start" development. Building heights along Park West Avenue, opposite Cedarbrook shall range up to four stories to the northern end and up to six stories to the southern end.*
    - **The height strategy of the proposed Phase 1 scheme is delivering highest densities closest to the train station, with a gradual reduction to the north, consistent with those set out in the LAP.**
- *Consideration will be given to a landmark building (up to 60m) in close proximity to the train station along the southern half of the site.*
    - **A tall building of 51.7 m is proposed adjacent to the train station, which will function as a local landmark.**
- *The residential quarter shall include provision of a new neighbourhood park linking into the overall Green Strategy for the LAP. Where feasible, retention of planting to old field boundaries will be encouraged.*
    - **The proposed Phase 1 scheme supports the overall green strategy but providing landscaped public open space of 6,123sqm including a public plaza, multi-use playing spaces, outdoor fitness trail, communal amenity space of 5,596sqm.**
- *Adequate separation distances shall be required between residential and enterprise/employment uses. This may incorporate a central green space to function as a transition zone.*

- **The layout of proposed residential blocks has been designed to enable an appropriate transition to enterprise and employment uses along the western portion of the site in subsequent phases.**

- *The development of this site will require a number of new access points onto Park West Avenue, and any future development (both residential and/or commercial/enterprise/employment) will be required to front onto and provide a strong active street frontage to Park West Avenue with limited setbacks where possible in order to create a strong urban street edge and contribute positively to the enhancement of Park West Avenue as a strategic north south link.*
  - **Vehicular, pedestrian and cyclist access routes to serve the proposed development are provided from new entrances to the east of the site along Cedar Brook Avenue and Park West Avenue, in line the movement strategy of the LAP. The design approach ensures the development blocks provide strong active street frontage to Park West Avenue.**
- *Examine possibility of providing local park and ride facilities at this location in close proximity to the rail station.*
  - **As noted above, the provision of a local park and ride facility has been examined and considered to be unfeasible to deliver without compromising other key objectives for the site.**
- *Development of the site will include for the provision of a glass bottle recycling bank ideally within close proximity to other community/retail uses identified for the site.*

- **The provision of a glass bottle recycling bank can be incorporated into the scheme at detailed design stage subject to agreement with the Planning Authority as a compliance submission. It is envisaged that such a facility would be located within close proximity to the retail supermarket. Notwithstanding, the Operation Waste Management Strategy for the development requires that all commercial tenants appropriately segregate their waste and make dedicated provision for the recycling of glass.**

Objectives for Key Development Site 5 (Barnville Site)

The Site Brief for Site 5 sets out the following overarching development objectives:

- *Proposed Use: Mixed use, predominantly residential with options for local retail and commercial uses (c. 80/20 split)*
- *Density: 75 DPH on average, ranging from 50 to 124 DPH*
- *Heights: Ranging from 4-6 storeys up to 7-8 storeys*
- *Estimated Capacity: 150 – 200 units, subject to detailed design*
- *Supporting Infrastructure Requirements: Site to provide pedestrian access through site towards Train Station. Opportunity for civic space / civic plaza (subject to detailed design).*

As noted, the detailed planning application to which this EIAR relates does not include Site 5, however is does form part of the wider Cherry Orchard Point development which is being assessed as part of this EIAR. The quantum and density of housing assumed in the EIAR, as well the land use mix, proposed transport and access and open space strategy for the overall study site is consistent with the vision and development objectives set out in the site brief.

Specifically, the application for Phase 1 will deliver improvements to Cedar Brook Way to deliver upon development objectives to *"facilitate local pedestrian desire lines to and from the rail station and to and from Cherry Orchard Park and the surrounding residential areas".*

Figure 3.8: Proposed height strategy for Sites 4 and 5.

3.12 Conclusion

The proposed new development will provide a vibrant and sustainable urban neighbourhood with a distinct character. It will be of sufficient density to sustain quality public transport, such as the planned DART upgrade to the rail line and Bus Connects project, and to sustain a mix of retail and commercial uses on Park West Avenue.

The new neighbourhood will have a permeable and legible street network with an emphasis on pedestrian and cycle friendly paths and will enable safe and well overlooked links to existing residential estates and public parks.

Central to the scheme is its green infrastructure, and it is proposed to construct a continuous neighbourhood park through the centre of the scheme, one that links all buildings and homes to the wider pedestrian and cycle network, and to the bus/rail public transport hub on Park West Avenue. This neighbourhood park will provide different passive, playful and active uses, to suit all ages and needs.
A new supermarket, shops and civic space on Park West Avenue will create activity and a 'buzz' around the station and will encourage more active travel (car free) short trips.

The overall development, on completion of all phases, is expected to comprise approximately 1100 dwellings and c.23,400 sqm of retail, community and cultural floor space, and commercial/ enterprise units.

Planning Application Phase 1 of Cherry Orchard Point will comprise:
708 dwellings, of which there will be:

- **28 no. studio apartments**
- **263 no. 1 bedroom apartments**
- **368 no. 2 bedroom apartments**
- **49 no. 3 bedroom apartments**
- **672 sqm creche with capacity for c.92 children, with capacity to**

- **increase that number.**
- **2523 sqm anchor supermarket**
- **373 sqm of complementary retail space**
- **2378 sqm of internal and external community and cultural space**
- **New civic plaza**
- **Biodiverse, natural open spaces**
- **Community garden**
- **'Active' open space and ball courts for kick about and games**

It is considered the scheme/proposed development will be in compliance with the requirements set out in the Dublin City Development Plan 2022-2028 as highlighted in the attached plans and statements provided by the design team.

3.13 References

- The National Planning Framework (2018): Project Ireland 2040
- A Road Map for the First Revision of the National Planning Framework
- Project Ireland 2040: National Development Plan 2021-2030
- Housing for all, A New Housing Plan for Ireland (2021)
- Housing for all Q1 2023 Progress Report
- Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009)
- Sustainable Urban Housing: Design Standards for New Apartments (2022)
- Urban Development and Building Heights Guidelines for Planning Authorities (2018)
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (2009)
- Climate Action Plan 2023
- Regional Spatial and Economic Strategy for the Eastern and Midlands Region (2019)
- Dublin City Development Plan 2022-2028
- Park West Cherry Orchard Local Area Plan 2019

4 Alternatives Considered

4.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by Van Djik Architects with Conroy Crowe Kelly Architects and contains a description of the reasonable alternatives considered during the evolution of the scheme design.

The aim of the project is to provide a new large-scale residential development that meets the criteria for high-quality sustainable urban development and complies with the objectives of the Dublin City Development Plan 2022-2028 and the Park West-Cherry Orchard Local Area Plan 2019. The working title for this project is 'Cherry Orchard Point'.

The scheme design for Cherry Orchard Point builds on the theme of sustainable urban development and encompasses both local, strategic and national policies with regard to the promotion of active travel, a reduction in private car ownership and trips, enhanced accessibility to public transport and the integration of a natural, bio-diverse scheme that places pedestrians and cyclists first.

The site constraints, objectives and client brief were established at the beginning of the project which meant that the main alternatives explored through the pre-planning design process generally comprised variations on massing, building height and plot size.

The preferred and final scheme proposes a total of 708 dwellings and 4790 sqm of commercial floor space, comprising a creche, supermarket, retail units and cultural and community spaces, as well as ancillary and associated works.

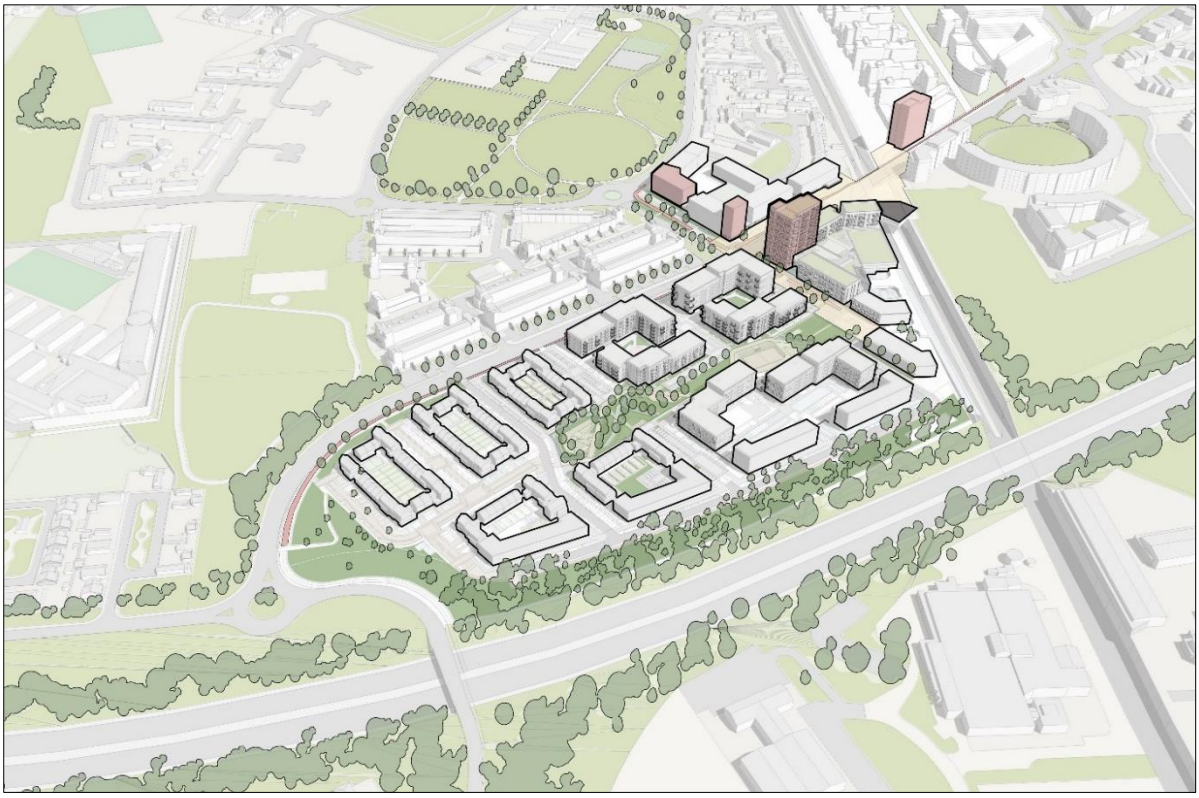


Figure 4.1 Proposed Development Site Layout (3D model view)

Summary Description of the Proposed Development

Cherry Orchard Point is a new, large mixed-use residential development to be located on a greenfield site beside Park West Avenue and the Park West/Cherry Orchard railway station.

The overall site has a combined area of c.13.1 hectares or 32.3 acres. It is zoned for development under the new Dublin City Council Development Plan 2022-2028 and is governed by the objectives of the Park West-Cherry Orchard Local Area Plan 2019. The proposed new development will provide a vibrant and sustainable urban neighbourhood with a distinct character. It will be of sufficient density to sustain quality public transport, such as the planned DART upgrade to the rail line and Bus Connects project, and to sustain a mix of retail and commercial uses on Park West Avenue. The new neighbourhood will have a permeable and legible street network with an emphasis of pedestrian and cycle-friendly paths and will enable safe and well-overlooked links to existing residential estates and public parks.

Phase 1 of the Cherry Orchard development will comprise 708 dwellings in a mix of medium and high-density apartment buildings, generally in heights of 4 to 6 storeys, and up to 15 storeys on a landmark corner. These will be a mix of social and cost-rental dwellings, ranging in size from 1 to 3-bedroom apartments. Universal Design standards for accessible homes to accommodate people with disabilities and older people will be applied in 10% of the homes, making this scheme suitable for a broad demographic group.

Central to the scheme is its green infrastructure, and it is proposed to construct a continuous car-free open park through the centre of the scheme, one that links all buildings and homes to the wider pedestrian and cycle network, and to the bus/rail public transport hub on Park West Avenue. This central park will provide different passive, playful and active uses, to suit all ages and needs.

The overall scheme seeks to locally restructure Park West Avenue as a 'Place', with a Main Street in the traditional sense that is shared by and accessible to the surrounding neighbourhoods as well as the future residents. A series of measures are proposed to be taken to enable the transformation of what is currently a hostile and unwelcoming environment; continuous street frontage close to the carriageway, multiple front doors and active edges (balconies, terraces, residential windows), mixed-uses at street level which will increase footfall, wide pavements, street trees and planters, off-street cycle paths, pedestrian and cycle priority crossing to Site 5 and New Cherry Orchard Park, bicycle parking and well-overlooked bus and rail stops.

A new supermarket, shops and civic space on Park West Avenue will create activity and a 'buzz' around the station and encourage more active travel (car-free) for short trips for local errands for existing and future residents. Parking for the supermarket and shops will be located in an off-street car park, under a landscaped podium, and on-street bays shall be provided for bus stops, taxi-bays, drop-off, loading bays and short-stay visitor parking. A slender 15-storey landmark building on the corner of Park West Avenue and the 'New Street' leading into the development will reinforce the identity of this new quarter.

The scheme has been designed by a multi-disciplinary team and consideration has been given to delivering a sustainable, efficient, and attractive neighbourhood to the highest standards. Daylight and sunlight studies have been made at every step of the way to ensure the proposed development does not impact on the existing surrounding development, and that its own new public spaces are bright and welcoming.

The overall development, on completion of all phases, is expected to comprise approximately 1115 dwellings and c.5990 sqm of retail and community floor space, subject to detailed design and planning permission, plus the future development of commercial/enterprise units along the M50 boundary.

The summary schedule of accommodation proposed for Phase 1 of Cherry Orchard Point is as follows:

- 28 no. studio apartments
- 263 no. 1 bedroom apartments
- 368 no. 2 bedroom apartments
- 49 no. 3 bedroom apartments
- 672 sqm creche with capacity for 92 children

- 2523 sqm anchor supermarket
- 373 sqm of retail space
- 1222 sqm of community and cultural space

The proposed development will also provide a new civic plaza and improvements to Park West Avenue adjacent to the station, a large neighbourhood park with active and passive uses including playground, callisthenics, kick-about space, a ball court, community garden and an event space. Soft landscaping will be native where possible and chosen to be pollinator-friendly to encourage a bio-diverse and natural environment.

Figure 4.2 Proposed Development Site Layout

4.2 Alternative Locations

The subject site is owned by Dublin City Council and is one of several undeveloped sites in the Park West-Cherry Orchard locale. There are 8 large development sites within the Park West-Cherry Orchard Local Area Plan that have been zoned for residential and/or mixed-use development. Five of these sites are owned (all, or the majority part thereof) by Dublin City Council and all 5 sites are available for development, which could be considered as suitable alternative locations for the proposed development.

The proposed development is for a large-scale residential development with mixed-uses at Site 4 of the Local Area Plan, the 'M50-Cedarbrook Avenue Site'. The development is appropriate to the site in

question and while consideration *could* be given to locating such a development elsewhere within the Local Area Plan lands or indeed elsewhere within the jurisdictional boundary of Dublin City Council, there is no material need to do so, as housing supply is desperately required across the city.

The mixed-use centre is location specific at the confluence of four neighbourhoods divided by the railway line and Park West Avenue(Cedarbrook/Cherry Orchard Park, the Crescent/Park West Plaza, the recently granted Park West SHD scheme and Cherry Orchard Point). There are no alternative locations that could meet the need for a mixed-use centre which so readily accessible to all four neighbourhoods.

Due to the nature of the proposed development, and demand for similar large-scale residential development within the LAP lands, and across the city and county environs, there is no material requirement to consider an alternative location.

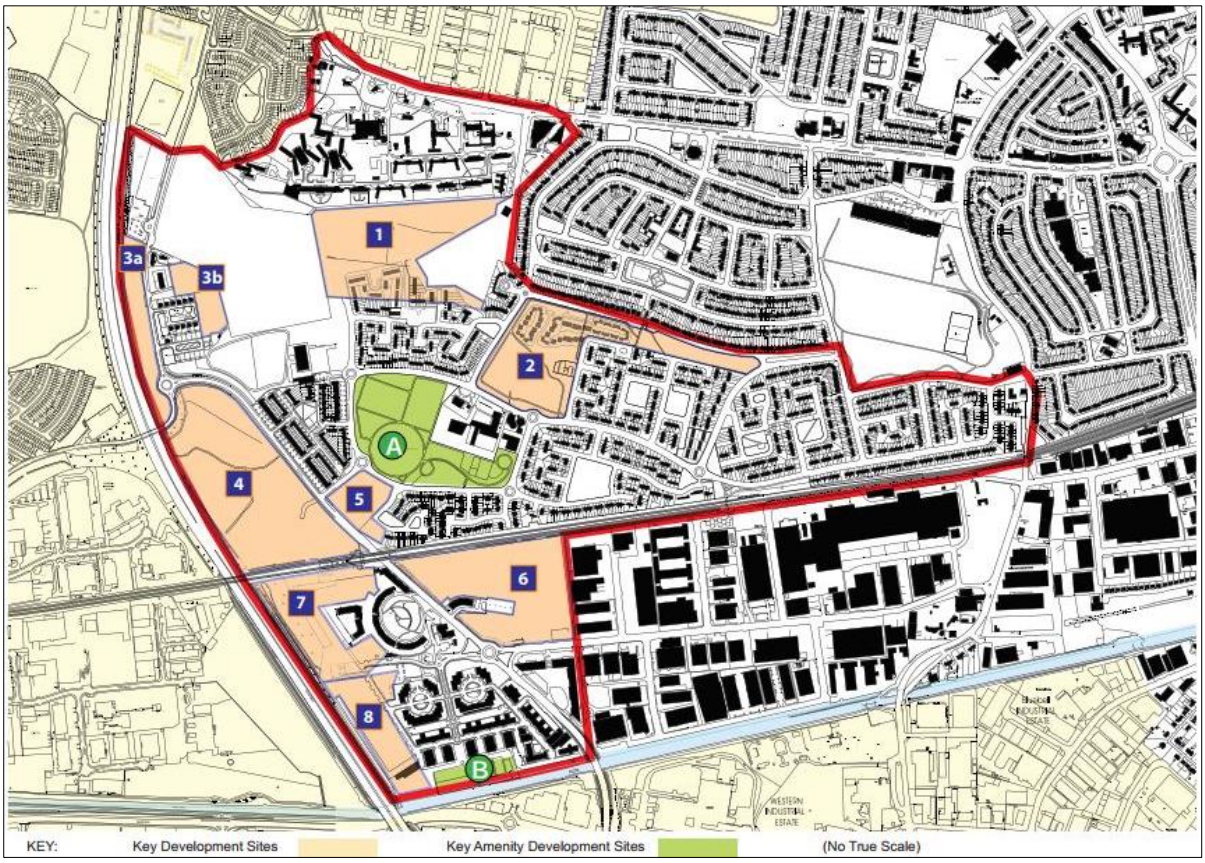


Figure 4.3 Extract from Park West-Cherry Orchard Local Area Plan 2019 (Key Development Sites)

4.3 Do Nothing Alternative

The 'Do-Nothing' alternative is not to progress the proposed development and to leave the site as it is.

'Doing-Nothing' would be an inefficient and unsustainable use of zoned and serviced lands, particularly ones that are owned by Dublin City Council. The opportunity to deliver many modern, high-quality, N-ZEB dwellings beside excellent railway and bus connections plus an improved public realm and a new neighbourhood park would be lost.

This scenario be a setback for the existing and future residents of Cherry Orchard and Ballyfermot at a time of great housing need, and the existing community would continue with inadequate social infrastructure in a road-dominated environment, all giving rise to the potential for anti-social behaviour.

The site is currently greenfield and is vulnerable to trespass and anti-social behaviour, which poses an ongoing source of concern for nearby residents and the Garda Síochána. Park West Avenue is not a pleasant or overlooked street to use for bus and rail, which undermines sustainable policies to encourage active travel and a modal shift away from private cars.

Figure 4.4 Existing Site (photograph by architect)

4.4 Alternative Land Uses

The site is zoned under the Dublin City Development Plan 2022-2028 as Z14 Strategic Development and Regeneration Area (SDRA). SDRA's are sites considered to be capable of delivering significant quantities of homes and employment for the city, with an overarching framework and individual sets of guiding principles to promote the delivery of compact and sustainable growth under the headings of Architectural Design and Urban Design, Phasing, Access and Permeability, Height, Urban Greening and Biodiversity, Surface Water Management, Flood Risk, River Restoration, Sustainable Energy, Climate Change and Cultural Infrastructure.

In addition to the SDRA zoning, the subject site is located within the boundaries of a Local Area Plan zoning objective, and the Park West-Cherry Orchard Local Area Plan (LAP) which was adopted by the elected members in 2019. The LAP addresses overall strategies relating to broad issues such as urban function, land use, access, movement, development, and 'place'. Site briefs for 8 key development sites are set out in the LAP, and the subject lands are located within Site 4 the 'M50-Cedarbrook Avenue Site'.

Alternative land uses to *'Mixed Use: Predominantly Residential'*, such as *primarily* Commercial/Employment across the entire site, would be in direct contravention of the objectives of the SDRA and the LAP and is not a feasible design solution.

Site 4: M50-Cedarbrook Avenue Site

Site Area:	**11.5Ha**
Ownership & Availability:	**Dublin City Council owned and available immediately.**
Proposed Use:	**Mixed Use: Predominantly Residential, with enterprise and commercial along the M50 and next to the Train Station. (c. 80/20 split).**
Density	**75 DPH average (Ranging from 50 – 125 DPH).**
Heights:	**Ranging from 2-4 storeys up to 7-8 storeys (24m) in close proximity to Train Station, with opportunity for place marker landmark building of up to 60m.**
Estimated Capacity	**600 – 700 no. units subject to detailed design.**
Supporting Infrastructure Requirements:	**Convenience retail to be provided.**
	Local Park and Ride facility be provided including provision for cycle parking facilities, as one of the supporting requirements when development site 4.

Figure 4.5 Extract from Park West-Cherry Orchard Local Area Plan 2019 (Site Brief for Site 4)

4.4.1 Alternative A: Indicative Site Layout as per Local Area Plan

The Park West-Cherry Orchard Local Area Plan provides 'indicative' site layouts and massing models for each of the 8 key development sites.

The proposed development is within Site 4, the 'M50-Cedarbrook Avenue Site' and the LAP's indicative site layout shows a simple orthogonal grid block plan of predominantly perimeter courtyard blocks with linear blocks along the M50 boundary. Vehicular access is from Park West Avenue with cul-de-sac slip roads along Park West Avenue and the M50, connected by the central link street and principal public amenity space. The layout and massing model designates residential buildings up to 4-storeys high in the northern half of the site, increasing to 5-8 storeys in the centre and 9-10 storeys in the southern section. A landmark building of up to 60m high is shown close to the train station, with the indication of public plaza or enhanced public realm on Park West Avenue in this higher density zone. Commercial and enterprise uses (non-residential) are identified along the M50 boundary and to the railway line for part of the southern boundary.

Figure 4.6 Extract from Park West – Cherry Orchard Local Area Plan 2019 (Indicative Site Layout and Indicative Massing Model)

There are specific development objectives to provide mixed-use, including a large convenience store to the immediate north of the station. Other objectives included retention of old field boundaries where feasible, a green buffer zone to the M50, examination of the possibility of local park and ride facilities by the station, and the provision of a glass bottle recycling bank.

The execution of a very literal interpretation of the indicative LAP site layout was considered at the outset of the detailed scheme design but was deemed to be inappropriate or unfeasible on environmental grounds for the following reasons:

- The dimensions of the urban blocks are not compliant or compatible with 'normal' residential building depths and separation distances.
- The dimensions of the urban blocks would struggle to meet the appropriate updated daylight and sunlight standards.
- Provision of a slip road along Park West Avenue does not meet the objectives for new urban developments as described in the Design Manual for Urban Roads and Streets (DMURS).

- The indicative site layout is designed to accommodate private cars throughout the scheme, i.e. there is a substantial quantity of road space shown on the plan. Local and strategic policy has increasingly looked towards more sustainable use of land and more 'active' travel means that reduce car ownership and usage, especially for short trips.
- The provision of a park and ride was considered by the design team in consultation with the Transport Section of the Local Authority and, in keeping with the aim to promote active travel, deemed to be unnecessary. Improvements to pedestrian and cycle infrastructure to encourage walking and cycling would be prioritised over car usage.
- Desire to explore stronger green route connections to other parts of the neighbourhood, and particularly the relationship between the new development and the primary school in New Cherry Orchard Park.

4.4.2 Alternative B: Low-Medium Density Design Solution

An alternative design solution that comprises low-medium density development of houses, duplex buildings and walk-up apartments across the entirety of LAP Site 4 was not considered for several reasons:

- Client brief was to provide a medium to high-density cost-rental scheme for the subject lands with a specific number of 1, 2 and 3 bedroom apartments.
- Brief was to provide car parking spaces to be provided at a minimum rate, thereby improving efficiencies in land use.
- A low to mid density scheme of 35-50 units per hectare would materially contravene the objectives of the SDRA and the LAP Site Brief Objectives.
- A low to mid density scheme is not a sustainable use of serviced lands with existing quality public transport on and adjacent the development (BusConnects and railway, soon to be upgraded to DART).
- In order to improve the nature of Park West Avenue, and to make it a safe, attractive place to use, building edges and overlooking need to be of a scale that can supervise the street.
- Higher, denser development around the station will contribute to a new sense of place and character that will define the new neighbourhood.
- Covered car parking for the large retail box would be difficult to justify in a low to medium density development. Higher density development can 'absorb' the visual impact of a retail carpark within its urban block, and offset the costs against a greater number of dwellings.
- Housing demand in the Cherry Orchard and Ballyfermot area requires a large number of 1 and 2-bed apartments to accommodate smaller families and single people and will balance the large number of existing 3-bed houses that characterise much of the Barnville, Croftwood, Oranmore and Claddagh estates.

Figure 4.7 Sketch Layout for a Low-Medium Density Alternative (3D model view)

4.4.3 Alternative C: Preliminary Site Development Layout

The preliminary scheme design for the development sought to resolve those issues identified in the appraisal of the LAP indicative layout. The number of urban blocks was reduced from 7 to 6 to allow for sufficient separation distances between buildings, and to improve daylight and sunlight compliance.

The central amenity space is envisaged as a continuous green park running the length of the site and is a car-free zone. Urban blocks have a U-shaped plan that opens onto this central space and are angled away from the primary geometry of the layout to avoid any single-aspect north-facing dwellings. A landmark building is located on the corner of Park West Avenue and the developments' principal access street ('New Street'), and a large retail box is proposed immediately adjacent to the station where it will benefit from commuter footfall.

The slip road running parallel to Park West Avenue has been omitted in favour of multiple short shared-surface streets between blocks and building edges have been brought closer to the carriageway. The shared-surface streets provide a small amount of surface parking and access to covered carparks in the higher-density blocks.

The movement strategy emphasises a pedestrian priority route from the northern end of the scheme to the higher density section, connecting directly to the railway station, shops, and on to New Cherry Orchard Park with minimum road crossings.

The confluence of 3 townland boundaries in the centre of the site was retained by locating the widest part of the Central Park over and around them.

Figure 4.8 Preliminary Scheme Design of U-Shaped Blocks (June 2022)

4.4.4 Alternative D: Evolving Scheme

The evolving design scheme for the subject lands addressed issues that arose during the detailed design process. Urban blocks were 'closed' on all 4 sides to make a continuous edge to the large central park and mitigate against potential anti-social behaviour. This amendment resolved the issue of the private and public interface by making clearly defined public (central park), semi-private (internal courtyards) and private (terraces) open space. Daylight and sunlight studies were made of the block scheme and resulted in changes to building height on certain corners as necessary to comply with the appropriate standards. The confluence of the 3 townland boundaries was retained by making small adjustments to the urban blocks and by stepping the block footprints around them.

Efficiencies in car parking and car storage were achieved by reducing the ratio of cars to dwellings, and by providing additional car storage in the higher density section beside the station. This allowed for the omission of two podium car parks in the medium density section.

The landmark building on the corner of Park West Avenue and the 'New Street' was designed with regard to the necessity for a particular slenderness ratio and presented as a 12-storey block of 5 units per core.

In March 2023, Irish Rail sought approval from An Bord Pleanála for the electrification of the railway line between Heuston Station and Hazelhatch in Kildare, the DART + South West Order Application. Part of the Irish Rail works are to provide a large sub-station in the southwest corner of the development lands and to utilise a portion of the site for a compound during the construction phase. The site development layout for the proposed scheme can accommodate both compound and sub-station without materially impacting on the urban plan or density.

Figure 4.9 Evolving Scheme Design (December 2022) (3D model view)

During the course of pre-planning consultations with the Local Authority, the design team were asked to re-consider the proposed junction arrangement between Park Avenue West, Cedarbrook Way and the development. A staggered junction was originally proposed which prioritised pedestrian and cycle movements to New Cherry Orchard Park as a continuation of the green park route that stitches the overall development together and links the development lands with New Cherry Orchard Park and the wider neighbourhood. Consideration was given to amending the layout to provide a crossroads in lieu of the stagger, and the impacts were assessed as follows:

- Car movements across the junction are given priority over pedestrians and cyclists.
- 'New Street' is a minor link road into a site that is effectively landlocked to the west by the M50. The crossroads suggests that this is a through-route and of greater importance than the reality whereas Park West Avenue is the dominant street.
- Staggering the junction allows for closure of vistas by the new buildings providing legibility and reinforcing the hierarchy of the 'Main Street' element of Park West Avenue.
- The crossroads has a greater visual impact than the staggered junction as the amount of carriageway is not dispersed by the stagger.
- The high density section will increase in area, as will the number of units and the gross area of double-deck carparking, which becomes less cost-effective.
- The urban blocks pattern will shift north and impact on the future development of low to medium density blocks in the northern part of the site.
- The overall area of central park and % of public open space decreases.

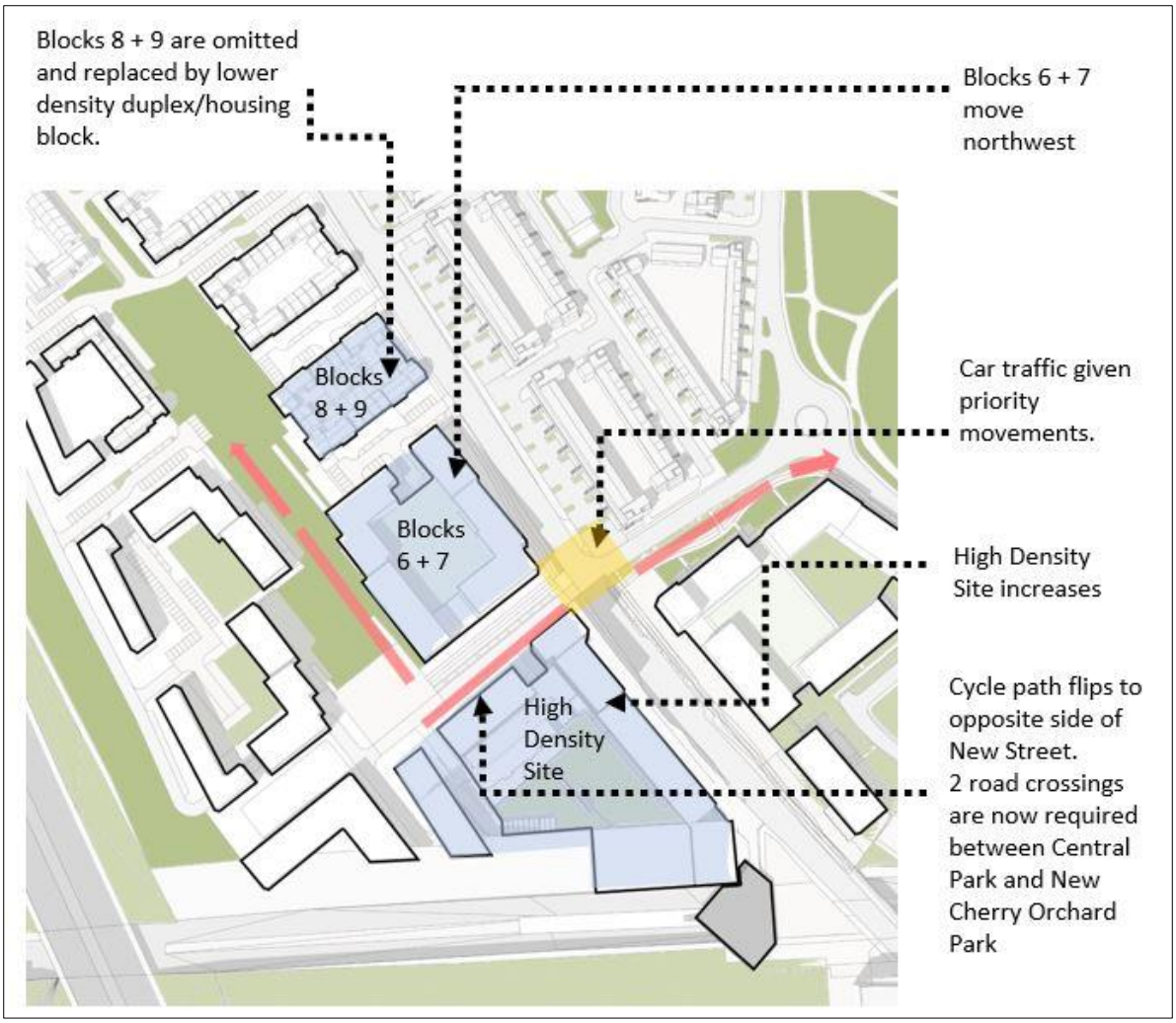


Figure 4.10 Alternative Junction on Park West Avenue (March 2023)

An acceptable design solution was found that meets the need for safe, active travel across Park West Avenue and facilitates vehicular movements to the satisfaction of the Transport Section of Local Authority. This involves a slight change in the alignment of Cedarbrook Way as it intersects with Park West Avenue, and is the basis for the current, proposed site layout.

4.5 Summary of Alternatives Considered

Table 4.1 Summary of Alternatives Considered

Alternative	Description	Commentary and Consideration
Alternative A	Indicative Site Layout as per Local Area Plan	A literal interpretation of the LAP layout has compliance issues with efficient building depths, separation distances, daylight and sunlight, and with the treatment and frontage of Park West Avenue. Opportunities exist to develop a detailed scheme design that meets the Site Brief objectives and address these issues.
		Environmental Considerations
		• Non-compliance with current daylight and sunlight requirements; orientation and plot depths. • Priority for private car movements within the site layout over active travel (cycling and walking).

		• Slip road to Park West Avenue non-compliant with DMURS and 'doubles up' on road take. • Park and Ride not conducive to promotion of 'green' travel modes over private cars.
Alternative B	Low-Medium Density Development	A low-medium scheme of housing, duplex and walk-up apartments across the subject lands would not meet the objectives of the LAP, nor would it be sustainable form of development on serviced lands with excellent public transport links.
		Environmental Considerations
		• Lower density does not provide sufficient quantum of much needed social and affordable cost-rental housing. • Lower population does not support rail or quality bus transport modes. • Lower population does not support local retail or community assets.
Alternative C	Preliminary Site Development Layout	The urban block plan meets requirements for separation distances, daylight and sunlight, and density but has issues with the public and private interface along the central park. Covered/podium car parks in the higher density blocks are cost-prohibitive for a cost rental scheme.
		Environmental Considerations
		• Podium carparks in mid-density section promote unsustainable car ownerships and trips over 'green' modes. • Podium carparks account for substantial quantity of concrete and embodied carbon, with more complex SUDs than an 'at-grade' landscaped courtyard. • Open u-blocks don't provide sufficient enclosure and over-looking of the central open space, leaving it vulnerable to anti-social behaviour, vandalism and under-utilisation of a high quality amenity.
Alternative D	Evolving Scheme	The penultimate site development plan addressed issues raised by both the Client and Local Authority during the design process. The principals of the scheme were established subject to the finalisation of certain details.
		Environmental Considerations
		• Shifting the urban grid to accommodate the crossroads shown on Fig. 4.11 impacts on the high amenity public open space. Natural play, bio-diversity, community uses and social capital are negatively affected. • Crossroads impacts on the plot depth of the high-density site and increases the double-deck carpark, thus increasing and promoting car usage over active travel. • Crossroads impacts on the plot depth of the mid-density site and renders the urban block dimensions sub-optimum for sustainable and compact development.

4.6 References

- Dublin City Development Plan 2022-2028
- Park West – Cherry Orchard Local Area Plan 2019
- Design Manual for Urban Roads and Bridges (DMURS)
- Sustainable Residential Development in Urban Area: Guidelines for Planning Authorities (2009)
- Urban Design Manual: A Best Practice Guide (2019)
- National Cycle Manual (2011 and draft May 2023)
- Safe Routes to Schools (2020)

5 Air Quality

5.1 Introduction

This chapter assesses the likely air quality impacts associated with the proposed development at Cherry Orchard. A full description of the development is available in Chapter 2.6 – Description of Scheme.

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.

5.2 Methodology

5.2.1 Criteria for Rating of Impacts

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 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 5.1).

Table 5.1: Air Quality Standards Regulations 2022

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	Annual limit value for the protection of vegetation	30 µg/m^3 NO + NO_2
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3 PM_{10}
		Annual limit for protection of human health	40 µg/m^3 PM_{10}
Particulate Matter (as $PM_{2.5}$) Stage 1	2008/50/EC	Annual limit for protection of human health	25 µg/m^3 $PM_{2.5}$
Particulate Matter (as $PM_{2.5}$) Stage 2	2008/50/EC	Annual limit for protection of human health	20 µg/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 5.2), the IT4 targets by 2030 and the final targets by 2040 (shown in Table 5.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/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 5.2: WHO Air Quality Guidelines 2021

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 $PM_{2.5}$	10µg/m^3 $PM_{2.5}$	5µg/m^3 $PM_{2.5}$

Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). The EU ambient air quality standards outlined in Table 5.1 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.

5.2.2 Construction Phase

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.

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 14 Material Assets (Traffic and Transport) this EIAR. As per Chapter 14, it has been determined by Waterman Moylan that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, or that the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria. A detailed air quality assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality with respect with human or ecological receptors.

5.2.3 Operational Phase

Traffic Impacts

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 5.2.2 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 14 Material Assets (Traffic and Transport). 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 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 200 m of impacted road links should be assessed; roads which are more than 200 m 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 5.1).

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.

Traffic Data Used in Modelling Assessment

Traffic flow information is detailed in Table 5.3 as 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 2027 and Design Year 2042 were provided. A conservative growth factor has been applied to the traffic data to allow for cumulative development within the area. Specific cumulative

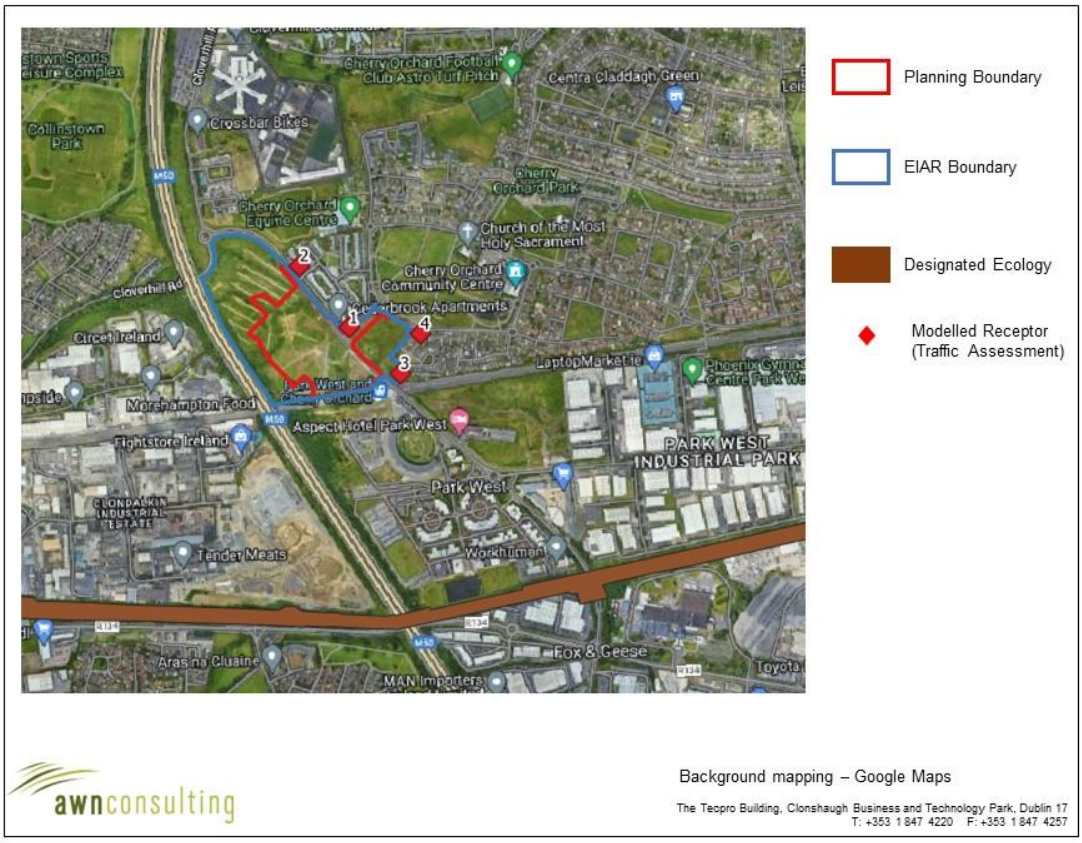
developments were also investigated but it was found that there were no specific permitted developments that would lead to cumulative traffic impacts due to their increased distance from the site (see Chapter 14 for further details).

The modelling assessment has been undertaken for road links that were within 200 m of receptors. Background concentrations have been included as per Section 5.3.2 of this chapter based on available EPA background monitoring data (EPA, 2022).

Table 5.3: 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	50	9709 (511)	8101 (517)	12432 (654)	11938 (628)	1490 (15)
Junction 1_Arm B	50	10344 (544)	10316 (543)	172 (9)	12178 (641)	4694 (96)
Junction 1_Arm C	50	7390 (472)	172 (9)	12942 (681)	734 (39)	1469 (30)
Junction 2_Arm A	50	9020 (475)	10338 (544)	1469 (77)	0 (0)	1403 (14)
Junction 2_Arm B	30	166 (2)	0 (0)	11797 (753)	0 (0)	507 (10)
Junction 2_Arm C	50	9040 (476)	8976 (573)	1937 (20)	0 (0)	12482 (657)
Junction 2_Arm D	30	0 (0)	1937 (20)	12923 (680)	12172 (641)	9418 (1164)
Junction 3_Arm A	50	7790 (497)	10319 (543)	734 (39)	11457 (603)	14663 (1104)
Junction 3_Arm B	30	1787 (18)	0 (0)	12178 (641)	9010 (575)	5237 (107)
Junction 3_Arm C	50	9023 (475)	9088 (478)	6384 (130)	11425 (601)	10058 (529)
Junction 3_Arm D	30	0 (0)	4226 (86)	13694 (721)	192 (10)	10058 (529)
Junction 4_Arm A	50	7888 (415)	11270 (593)	1957 (103)	11450 (603)	0 (0)
Junction 4_Arm B	50	3732 (76)	0 (0)	4682 (96)	0 (0)	0 (0)
Junction 4_Arm C	50	9728 (512)	3535 (72)	2646 (27)	11797 (753)	0 (0)
Junction 4_Arm D	30	0 (0)	1342 (14)	6392 (130)	1937 (20)	13973 (735)
Junction 5_Arm A	50	3135 (64)	4234 (86)	2614 (53)	12923 (680)	13573 (714)
Junction 5_Arm B	50	1198 (12)	1324 (27)	1868 (19)	734 (39)	9315 (595)
Junction 5_Arm C	50	3739 (76)	1264 (13)	1842 (38)	10058 (529)	13541 (713)
Junction 6_Arm A	50	1181 (24)	456 (9)	13689 (720)	4685 (96)	192 (10)
Junction 6_Arm B	50	1126 (11)	11264 (593)	9597 (1186)	12467 (656)	14054 (740)
Junction 6_Arm C	30	420 (9)	8493 (1050)	14461 (1088)	0 (0)	1469 (77)
Junction 7_Arm A	50	9895 (521)	13241 (997)	4722 (96)	3921 (80)	12755 (814)
Junction 7_Arm B	50	7522 (930)	4722 (96)	11938 (628)	1490 (15)	2157 (22)
Junction 7_Arm C	50	11561 (870)	9088 (478)	12178 (641)	4694 (96)	14033 (739)
Junction 7_Arm D	30	4189 (85)	9088 (478)	734 (39)	1469 (30)	734 (39)
Junction 8_Arm A	50	7888 (415)	0 (0)	0 (0)	1403 (14)	13148 (692)
Junction 8_Arm B	50	7888 (415)	0 (0)	0 (0)	507 (10)	6843 (140)
Junction 8_Arm C	30	0 (0)	0 (0)	0 (0)	12482 (657)	14891 (784)

Figure 5.1 Sensitive Receptors and Indicative Road Links Included in Operational Phase Air Quality Modelling Assessment



Traffic Ecological Impacts

For routes which pass within 2 km of a European designated area of conservation or within 200 m of an area of either Irish or European designation, the TII guidance (TII, 2022a) requires the air quality specialist to consult with the project ecologist. Sites identified within these parameters are considered Key Ecological Receptors. The TII guidance (TII, 2022a) and the Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

Further guidance can also be found in the IAQM document A Guide to The Assessment of Air Quality Impacts on Designated Nature Conservation Sites (IAQM, 2020) and in the TII guidance (TII, 2022a), both of which describe NO_X and ammonia emissions as the most likely source of significant impacts from road traffic. Pollutants such as CO_2, CO, SO_2 and volatile organic compounds are not considered in this guidance and have been scoped out of detailed assessment.

The following assessment criteria, in accordance with TII guidance, is used to determine whether an assessment for nitrogen and acid deposition should be conducted:

- There is a designated area of conservation within 200 m of the Proposed Scheme; and
- There is a significant change in AADT flows (see Section 5.2.2).

For road transport sources within 200 m of a designated habitat, individual ecological receptors along a transect at 10 m intervals are modelled. Ecological receptors are modelled up to a maximum distance of 200 m regardless of whether the habitat extends beyond 200 m. It is considered that the greatest impacts will have occurred in proximity to the road. The TII guidance (TII, 2022a) notes that only sites

that are sensitive to nitrogen and acid deposition need to be included in the assessment, it is not necessary to include sites for example that have been designated as a geological feature or water course. The ecological receptors along the 200 m transect are modelled using the methodology for sensitive human receptors in Section 5.2.3 – Traffic Impacts.

The Grand Canal pNHA (Site Code: 002104) is within 200 m from the road link Junction 7 Arm C impacted by the proposed development. Therefore, there is the potential for impacts to ecology as a result of nitrogen oxide emissions or nitrogen deposition and an assessment is required.

Chapter 8 (Biodiversity) includes further details on the ecological sensitivities associated with these sites.

The Air Quality Regulations outline an annual critical level for NO_X for the protection of vegetation and natural ecosystems in general. The CAFE Directive defines 'Critical Levels' as *'a level fixed on the basis of scientific knowledge, above which direct adverse effects may occur on some receptors, such as trees, other plants or natural ecosystems but not on humans.*'

The United Nations Economic Commission for Europe (UNECE) Critical Loads for Nitrogen defines a 'Critical Load' as a *'a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge'* (UNECE, 2003). The UNECE also provides critical loads within the subsequently updated in the 2010 Review and Revision of Empirical Critical Loads and Dose-Response Relationships (UNECE, 2010).

The TII guidance (TII, 2022a) recommends the use of the EPA's research papers 'Research 323: Critical Loads and Soil-Vegetation Modelling' (EPA, 2020) and 'Research 390: Nitrogen-Sulfur Critical Loads: Assessment of the Impacts of Air Pollution on Habitats' (EPA, 2021) provides information regarding background concentrations and critical loads.

The TII guidance (TII, 2022a) outlines a methodology to derive the road contribution to dry deposition and thereafter to compare with the published critical loads for the appropriate habitat. In order to calculate the nitrogen deposition, the NO_X / NO_2 concentration determined through modelling including the background concentration must be converted firstly into a dry deposition flux using the equation below which is taken from UK Environment Agency publication 'AGTAG06 – Technical Guidance On Detailed Modelling Approach For An Appropriate Assessment For Emissions To Air' (EA, 2014):

Dry deposition flux (µg/m^2/s) = ground-level concentration (µg/m^3) x deposition velocity (m/s)

Deposition velocities are provided in both the TII (TII, 2022a) and AGTAG06 (EA, 2014) guidance for NO_2 in grassland and forestry:

- Grassland and similar habitats: 1µg/m^3 of NO_2= 0.14 kg N/ha/yr
- Forest and similar habitats: 1µg/m^3 of NO_2= 0.29 kg N/ha/yr

Once the dry deposition flux (µg/m^2/s) is calculated it must then be converted to nitrogen deposition and nitrogen equivalent acidification flux (keq/ha/year, where keq is a unit of equivalence (a measure of how acidifying the chemical species can be)) for comparison with critical loads.

In order to convert the dry deposition flux from units of µg/m^2/s to units of nitrogen deposition (kg/ha/year) the dry deposition flux is multiplied by the conversion factors shown in Table 5.4, and provided in AGTAG06 (EA, 2014). For NO_2 this factor is 95.9.

Nitrogen (N) deposition (kg/ha/yr) = Dry deposition flux (µg/m^2/s) x N deposition conversion factor

In order to convert the dry deposition flux from units of µg/m^2/s to units of acid deposition (keq/ha/year) the dry deposition flux is multiplied by the conversion factors shown in Table 5.4, and provided AGTAG06 (EA, 2014). For NO_2 this factor is 6.84.

Acid (N) deposition (keq/ha/yr) = Dry deposition flux (µg/m²/s) x Acid deposition conversion factor

The TII guidance (TII, 2022a) simplify these two rates to an acid deposition conversion factor, which is applicable to all habitats of 1 kg N/ha/yr= 0.071429 keq N/ha/yr.

Nitrogen deposition and acid deposition is calculated in this manner for both NO_2, and these are then summed for total nitrogen deposition and acid deposition at each sensitive designated habitat.

Table 5.4 Dry Deposition, Nitrogen and Acid Deposition Fluxes for NO_2

Chemical Species	Habitat Type	Recommended Deposition Velocity (m/s)	Dry Deposition Flux (µg/m²/s) Conversion Factor to N Deposition Flux (kg/ha/yr)	Dry Deposition Flux (µg/m²/s) Conversion Factor to Acid Deposition Flux (keq/ha/yr)
NO_2 (as N)	Grassland	0.0014	95.9	6.84

5.2.4 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 5.5 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 5.5: 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

5.3 Baseline Environment

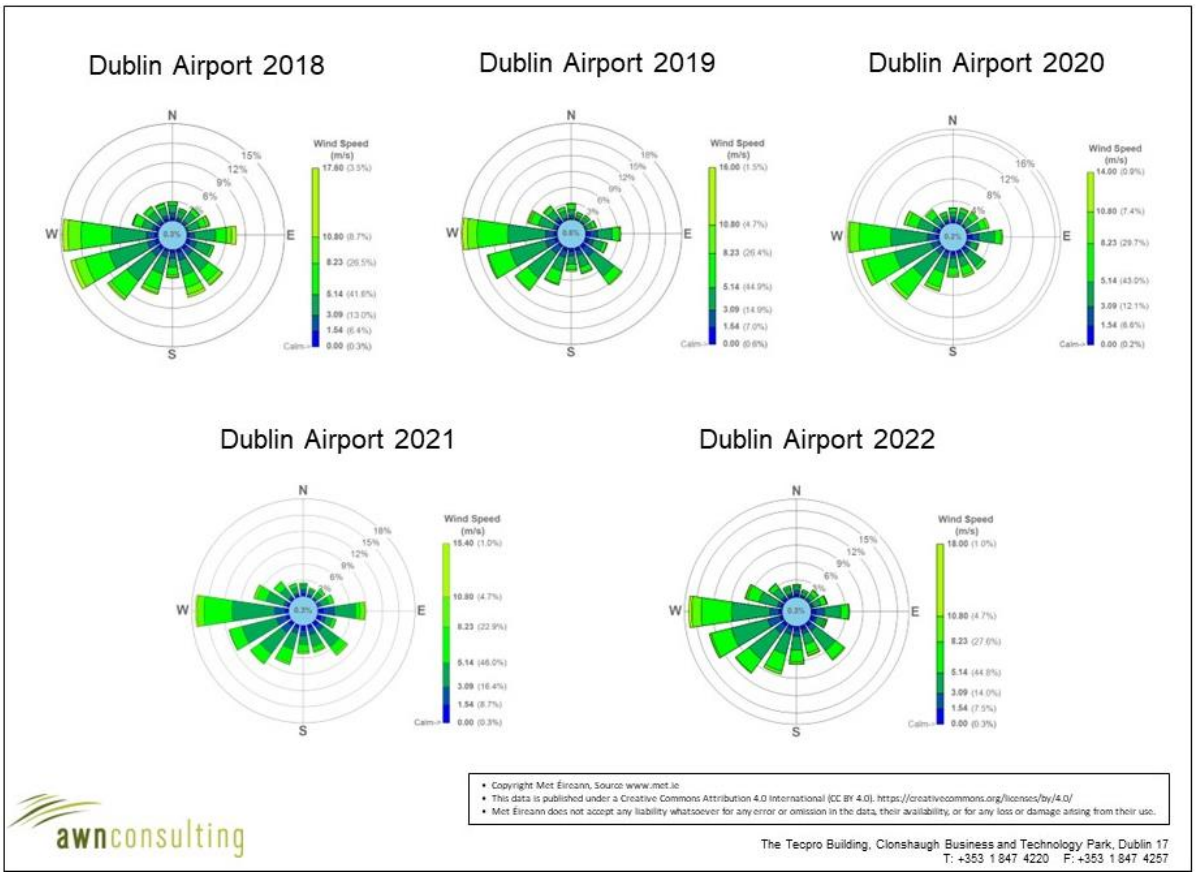
5.3.1 Meteorological Data

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, 2021). 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 15 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 5.2). For data collated during five representative years (2018 – 2022), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.4 m/s over the 30-year period of 1990 - 2020 (Met Éireann, 2023).

Figure 5.2 Dublin Airport Windrose 2018 – 2022



Source: Met Éireann, 2023

5.3.2 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.

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, 2022a). 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 2020, the EPA reported (EPA, 2022a) that Ireland was compliant with EU legal air quality limits at all locations. 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 monitoring site in Ballyfermot is the most representative of the proposed development location, it is located 1.8 km to the west of the Proposed Development. The NO_2 annual average for Ballyfermot over a six-year period suggests an upper average limit of no more than 20 µg/m^3 (Table 5.6). Concentrations of NO_2 at the Ballyfermot site ranged from 13 – 20 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 20 µg/m^3.

Table 5.6: 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 NO_X monitoring carried out at the Zone A suburban background locations, shown in Table 5.7, showed annual mean concentrations ranging from 15 - 20 µg/m^3 in 2021. Sufficient data is available to observe trends over the period 2017 – 2021, with annual mean NO_X concentrations ranging from 15 – 34 µg/m^3.

The suburban background location of Ballyfermot is considered representative of background NO_X concentrations in the sensitive designated habitats within the Proposed Scheme's air quality zone of influence, with a conservative maximum annual mean NO_X concentration of 28 µg/m^3. This is close to the annual mean limit value of 30 µg/m^3.

Table 5.7 Annual Mean Background NO_X Concentrations for Zone A

Station	Site Classification	Averaging Period	Year				
			2017	2018	2019	2020	2021
Ballyfermot	Suburban Background	Annual mean (µg/m^3)	21	25	28	17	18
Rathmines	Suburban Background	Annual mean (µg/m^3)	27	33	34	21	20
Swords	Suburban Background	Annual mean (µg/m^3)	22	23	21	15	15

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 5.8). 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 5.8: 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} (µg/m^3)	11	12	16	14	12	12
	24-hr Mean > 50 µg/m^3 (days)	0	1	0	7	2	0
Dún Laoghaire	Annual Mean PM_{10} (µg/m^3)	13	12	13	12	12	11
	24-hr Mean > 50 µg/m^3 (days)	0	2	0	2	0	0
Tallaght	Annual Mean PM_{10} (µg/m^3)	14	12	15	12	10	10
	24-hr Mean > 50 µg/m^3 (days)	0	2	1	3	0	0
Rathmines	Annual Mean PM_{10} (µg/m^3)	15	13	15	15	11	12
	24-hr Mean > 50 µg/m^3 (days)	3	5	2	9	2	0
Phoenix Park	Annual Mean PM_{10} (µg/m^3)	11	9	11	11	10	10
	24-hr Mean > 50 µg/m^3 (days)	0	1	0	2	0	0

Note1 *Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2022). Daily limit value - 50 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No.* 739 *of 2022).*

Average $PM_{2.5}$ levels in Ballyfermot over the period 2016 - 2021 ranged from 7 - 10 µg/m^3, with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.44 – 0.71 (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 µg/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 to predict future pollutant concentrations. This is in line with the TII methodology (TII, 2022a).

5.3.3 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 sensitive receptors in proximity to the EIAR boundary including currently occupied residential properties. There are up to 10 sensitive residential receptors within 10 m of the EIAR boundary and 10-100 within 50m. Based on the IAQM criteria outlined in Table 5.9, the worst-case sensitivity of the area to dust soiling is considered medium.

Table 5.9: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Numberof 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. There are up to 10 highly sensitive residential receptors within 10 m of the EIAR boundary and 10-100 within 50m based on the IAQM criteria outlined in Table 5.10. The worst-case sensitivity of the area to human health is considered low.

Table 5.10: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<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 50 m from the site and 50 m from site access roads, up to 500 m for the site entrance. There are no sensitive ecological receptors that meet these criteria. Based on the IAQM criteria outlined, ecology impacts are considered to be scoped out with respect to construction phase dust.

5.4 Predicted Impacts

5.4.1 Proposed Development

Construction Stage – 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 5.3.3). The major dust generating activities are divided into four types within the IAQM (2014) 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 within the EIAR application 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 5.3.3, 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 5.11 and Table 5.12, combining the large dust emission magnitude with a medium sensitivity to dust soiling and low sensitivity to human health impacts, results in an overall medium risk of dust impacts. This risk is as a result of the proposed earthworks activities in the absence of mitigation.

Table 5.11: Criteria for Rating Risk of Dust Impacts – Earthworks (IAQM, 2014)

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 5.12: Risk of Dust Impacts – Earthworks

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust-Related Impacts
Dust Soiling	Medium	Large	Medium
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 large as a worst-case, as the total building volume will be greater than 100,000 m^3 (GFA of c. 66,282 m^2). As outlined in

Table 5.13 and

Table 5.14, combining the large dust emission magnitude with a medium sensitivity to dust soiling and low sensitivity to human health impacts, results in an overall medium risk of dust impacts. This risk is as a result of the proposed construction activities in the absence of mitigation.

Table 5.13: Criteria for Rating Risk of Dust Impacts – Construction (IAQM, 2014)

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 5.14: Risk of Dust Impacts – Construction

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Construction	Risk of Dust-related Impacts
Dust Soiling	Medium	Large	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 5.15 and

Table 5.16, combining the large dust emission magnitude with a medium sensitivity to dust soiling and low sensitivity to human health impacts, results in an overall medium risk of dust impacts. This risk is as a result of the proposed trackout activities in the absence of mitigation.

Table 5.15: 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 5.16: Risk of Dust Impacts – Trackout

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Trackout	Risk of Dust-related Impacts
Dust soiling	Medium	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 5.17 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 medium risk of dust impacts must be implemented. When the dust mitigation measures detailed in the mitigation section of this chapter (Section 5.9.1) and Appendix 5.1 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, slight and non-significant.

Table 5.17: Summary of construction phase dust impact risk used to define site-specific mitigation

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Ecology	N/A	N/A	N/A	N/A
Dust Soiling	N/A	Medium Risk	Medium Risk	Medium Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk

Construction Stage - Traffic

There is also the potential for traffic emissions to impact air quality with respect to human health and ecology 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 5.2.2.

It can therefore be determined that the construction stage traffic will have an imperceptible, neutral, short-term and non-significant impact on air quality.

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 PM_{10} and $PM_{2.5}$ emissions. As per section 5.3.3 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 5.17). Therefore, in the absence of mitigation, there is the potential for imperceptible, negative, short-term, non-significant impacts to human health as a result of the proposed development.

Operational Stage – 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 2027 and Design Year 2042 are shown in Table 5.18. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2027 and 2042. Concentrations of NO_2 are at most 46% of the annual limit value in 2027 and 59% of the annual limit value in 2042. 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 5.18). 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 0.99 µg/m^3 at receptor R1, this is a 2.5% change from the air quality limit standard. Where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 5.1) and there is less than a 5% change in concentrations compared with the Do-Nothing scenario, then, the impact is considered neutral as per the TII significance criteria (see Table 5.5). Therefore, the impact of the proposed development on NO_2 concentrations is neutral.

The results of the assessment, in relation to changes in PM_{10} concentrations as a result of the proposed development, can be seen in Table 5.19 for the Opening Year 2027 and Design Year 2042. The annual average concentration is in compliance with the limit value at the worst-case receptors in Opening Year 2027 and Design Year 2042. Concentrations of PM_{10} are at most 49% of the annual limit value in Opening Year 2027 and Design Year 2042. 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 1.0 µg/m^3 at receptor R1, this is a 2.5% change compared to the air quality standards. As with NO_2, where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 5.1) 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 5.5). Therefore, the impact of the proposed development on PM_{10} concentrations is neutral.

The results of the assessment, in relation to changes in $PM_{2.5}$ concentrations as a result of the proposed development, can be seen in Table 11.18 for the Opening Year 2027 and Design Year 2042. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2027 and 2042. Concentrations of $PM_{2.5}$ are at most 53% of the annual limit value in 2027 and 2042. 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 0.55 µg/m^3 at receptor R1, this is a 2.2% compared to the air quality limit value. As with NO_2, where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 5.1) 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 5.5). 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 5.18: 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	22.4	23.4	0.99	Neutral	21.2	21.6	0.44	Neutral
R2	21.9	22.3	0.38	Neutral	21.0	21.1	0.09	Neutral
R3	21.3	21.6	0.28	Neutral	20.6	20.8	0.11	Neutral
R4	20.3	20.7	0.37	Neutral	20.17	20.32	0.15	Neutral

Table 5.19: 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	18.4	19.4	1.00	Neutral	18.6	19.6	0.98	Neutral
R2	17.9	18.3	0.39	Neutral	18.2	18.4	0.20	Neutral
R3	17.4	17.6	0.28	Neutral	17.5	17.7	0.24	Neutral
R4	16.3	16.6	0.31	Neutral	16.3	16.7	0.31	Neutral

Table 5.20: 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	12.6	13.1	0.55	Neutral	12.6	13.2	0.53	Neutral
R2	12.2	12.5	0.22	Neutral	12.4	12.5	0.11	Neutral
R3	12.0	12.1	0.16	Neutral	12.0	12.1	0.13	Neutral
R4	11.4	11.6	0.17	Neutral	11.4	11.6	0.16	Neutral

Operational Stage – 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, imperceptible and non-significant.

Operational Stage – Ecology

An assessment of the impact of the Proposed Scheme has been undertaken using the approach outlined in the IAQM guidance document A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020) and the TII guidance (TII, 2022a). An assessment of the ecologically sensitive sites listed in Section 5.2.3 has been carried out.

As outlined in Section 5.2.3, the Grand Canal pNHA (Site Code: 002104) is within 200 m of the road link (Junction 7 Arm C) effected by the Proposed Development (See Table 5.3).

Nitrogen and acid deposition levels have been compared to the relevant critical loads in Table 5.21 for the worst-case ecologically sensitive receptor. The ground level concentrations, nitrogen deposition flux and acid deposition flux are presented for the closest locations within the ecological sites to the nearest road.

Table 5.21: Predicted Nitrogen and Acid Deposition Results at Closest Point within Ecological Sites to Road

Sensitive Ecology	Scenario	Predicted Ground Level NOX Concentration (including background	Total Nitrogen Deposition Flux (kg/ha/yr)	Total Acid Deposition Flux (keq/ha/yr)
Opening Year (2027)				
Grand Canal pNHA (Site Code: 002104)	Do- Minimum	35.37	0.55	0.04
	Do- Something	35.88	0.59	0.04
	DS-DM	0.51	0.04	0
	Change relative to lower critical load (%)		0.8%	
Design Year (2042)				
Grand Canal pNHA (Site Code: 002104)	Do- Minimum	31.56	0.29	0.02
	Do- Something	31.67	0.3	0.02
	DS-DM	0.11	0.01	0
	Change relative to lower critical load (%)		0.2%	

Note 1 A NO_2 background concentration of 28 µg/m^3 added to modelled road contribution.

The EPA's research papers 'Research 323: Critical Loads and Soil-Vegetation Modelling' (EPA, 2020) and 'Research 390: Nitrogen-Sulfur Critical Loads: Assessment of the Impacts of Air Pollution on Habitats' (EPA, 2021) provides information regarding background concentrations and critical loads. The results are all lower than the most conserative Critical Loads for nitrogen deposition of 5-10 KgN/ha/yr. In order to be conserative a critical load of 5 KgN/ha/yr is used on this project.

The impact of the Proposed Development on the nearby ecologically sensitive areas within 200m of roads impacted by the Proposed Development, as defined in Section 5.2.2, is outlined in Table 5.21. The annual mean NO_X concentration has been compared to the critical level of 30µg/m^3 at each of the designated habitat sites. The Grand Canal pNHA exceeds the critical level for NO_X in both the DM and the DS scenarios, however this exceedance was present prior to the Proposed Development and does not occur as a result of it. The project ecologist has been advised on the findings of the air quality impact assessment.

The guidance states that where the process contribution is greater than 1% of the critical level / load it is recommended that the project ecologist be consulted. The worst-case change for the Proposed Development is 0.8% and therefore the project ecologist does not have to be contacted as per guidance. However, in order to ensure a robust EIAR project ecologist has been advised of these impacts.

In accordance with the EPA Guidelines (EPA, 2022) the ecological impacts associated with the Operational Phase traffic emissions on ecology are overall negative, slight and long-term which is not significant in EIA terms.

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.

5.5 Mitigation Measures

5.5.1 Proposed Development

Construction Stage

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 mitigation measures for controlling dust are listed below and can also be found in the Dust Management Plan in Appendix 5.1. These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. An outline CEMP has been prepared and is enclosed separately.

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following measures draw on best practice guidance from Ireland, the UK (IAQM (2014), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997).

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 5-2 for the windrose for Dublin Airport). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- 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 working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 20 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

- Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002).
- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
  The specification of effective measures to deal with any complaints received.

Operational Stage

There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be neutral and imperceptible.

5.5.2 Cumulative Mitigation

Construction Stage

Prior to commencing construction, it will be the responsibility of the contractor to identify any other significant developments within 500m of the site that are also undergoing construction. The contractor shall undertake communication with other identified significant developments within a 500m radius to ensure any potential cumulative construction dust impacts are managed and mitigated.

Operational Stage

There is no mitigation required for the cumulative operational phase of the development as impacts to air quality are predicted to be neutral.

5.6 Residual Impacts

5.6.1 Proposed Development

Construction Stage

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 5.1). 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 5.1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is negative, direct, short-term, imperceptible and non-significant.

Operational Stage

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 5.4 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.

With respect to ecological impacts due to operational phase traffic, there is a are overall negative, slight and long-term which is not significant in EIA terms.

Worst Case Impact

Conservative assumptions have been made throughout this assessment including for background air quality and requirements for dust mitigation measures. Therefore, the impacts can be considered inherently worst-case.

5.6.2 Cumulative

Construction Stage

According to the IAQM guidance (2014), 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. A review of other permitted developments within 350m of the site was conducted in order to identify other developments with the potential for overlapping construction phases that may result in cumulative construction dust impacts. The following permitted developments were identified as having the potential for cumulative impacts should the construction phases coincide: 4313/22, 312290, 3403/21, SD19A/0098, SD19A0185, SD20A/0309, ABP-316119. Additionally there are 2 no. sites within the LAP lands which have the potential for future development by Dublin City Council, these include Site 1 and Site 2 of the LAP lands which have plans for social and affordable housing schemes. Provided the mitigation measures outlined in Section 5.5.1 and Appendix 5.1, are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted.

With mitigation measures (as per Section 5.5.1) in place, there are no significant cumulative impacts to air quality predicted for the construction phase. Impacts will be short-term, localised, negative, imperceptible and non-significant.

Operational Stage

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 14 Material Assets - 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 and neutral with regards to air quality and therefore, not significant.

5.7 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

5.8 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, negative and non-significant with respect to population and human health during construction, and long-term, imperceptible, neutral and non-significant during the operational phase.

Interactions between air quality and traffic (Chapter 14) 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. These interactions have the potential to impact both human health (Chapter 13) and ecology (Chapter 8).

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 6). 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 11 (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.

5.9 Monitoring

5.9.1 Construction Phase

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 2 m above ground level. The TA Luft limit value is 350 mg/m^2/day during the monitoring period of 30 days (+/- 2 days).

5.9.2 Operational Phase

No monitoring required.

5.10 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 (2015) Advice Notes for Preparing Environmental Impact Statements – Draft
- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Environmental Protection Agency (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) (2014) 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 (2021) Air Quality Guidelines (and previous Air Quality Guideline Reports 1999 & 2000 & 2006)

6 Climatic Factors

6.1 Introduction

This chapter assesses the likely climate impacts associated with the proposed development at Cherry Orchard. A full description of the development is available in Chapter 2.6 – Description of Scheme.

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.

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6.2 Methodology

The principal guidance and best practice documents used to inform the assessment of potential impacts on Climate are summarised below. In addition to specific climate guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022); and
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).

The assessment has 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 (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).

6.2.1 Criteria for Rating of Impacts

Climate Agreements

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Act). The purpose of the 2015 Act was to enable Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050' (3.(1) of No. 46 of 2015). This is referred to in the 2015 Act as the 'national transition objective'. The 2015 Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the 2015 Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023.

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 also provides for "carbon budgets and a decarbonisation target range for certain sectors of the economy". The 2021 Climate Act defines the carbon budget as "the total amount of greenhouse gas emissions that are permitted during the budget period".

In relation to carbon budgets, the 2015 Act (as amended) states '*A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period'*)'. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 6.1. 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 sectoral emission ceilings for 2030 were published in July 2022 and are shown Table 6.2. Buildings (Residential) have a 40% reduction requirement and a 2030 emission ceiling of 4 $MtCO_{2eq}$[1].

Table 6.1: 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025 (Government of Ireland 2022)

Budget Period	Carbon Budget	Reduction Required
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.

Note 1 Table derived from Department of the Taoiseach press release 28 July 2022 from 'Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change'

Table 6.2 Sectoral Emission Ceilings 2030

Sector	Reduction Required	2018 Emissions ($MtCO_2$eq)	2030 Emission Ceiling ($MtCO_2$eq)
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

Note 1 Table derived from Department of the Taoiseach press release 28 July 2022 from 'Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change'

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.

[1] Mt CO_{2eq} denotes million tonnes carbon dioxide equivalent.

In April 2023 the Government published a Long-term Strategy on Greenhouse Gas Emissions Reductions (Government of Ireland, 2023b). 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.

6.2.2 Construction Phase

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 6.3.1). 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. 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[2] 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 the carbon impact of the Proposed Project. The tool includes build ups common in the Irish market, and some alternatives. Inputs used for the OneClickLCA tool were reviewed by Van Dijk Architects while inputs for the TII Carbon Tool were provided by Waterman Moylan and McGahon Surveyors.

Construction Traffic Emissions 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 operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

[2] https://www.igbc.ie/carbon-designer-for-ireland/

- 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 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.

6.2.3 Operational Phase

Greenhouse Gas Assessment – Operational 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) scoping criteria outlined in Section 6.2.2 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, 2022b) 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 2027 and design year 2042. 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 5 Air Quality (Table 5.3).

Climate Change Risk 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 6.3, 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 6.3.1). 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 6.4

6.2.4 Climate Assessment Criteria

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 6.2).

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 6.3 (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 6.3 Significance Criteria for GHGA

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.

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.

$$Vulnerability = Sensitivity \times Exposure$$

The vulnerability assessment takes any proposed mitigation into account Table 6.4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can therefore considered to be not significant. However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

Table 6.4 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

6.3 Baseline Environment

6.3.1 Climate Baseline

PE-ENV-01104 (TII, 2022c) 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.

6.3.1.1 Greenhouse Gas Emissions

Data published in July 2023 (EPA, 2023) predicts that Ireland exceeded (without the use of flexibilities) its 2022 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.72 Mt CO_2eq. When the available flexibilities are taken into account, the limit is exceeded by 1 MtCO_2eq. The sectoral breakdown of 2021 GHG emissions is shown in Table 6.5. The sector with the highest emissions in 2022 was agriculture at 38.4% of the total, followed by transport at 19.1%. For 2022 total national emissions (excluding LULUCF) were estimated to be 60.76 Mt CO_2eq as shown in Table 6.5 (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, 2022c) 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 6.5: Total National GHG Emissions in 2022

Category	2022 Kilotonnes CO_2eq	% of Total GHG emissions
Waste	23.34	38.41%
Energy Industries	11.63	19.15%
Residential	10.08	16.58%
Manufacturing Combustion	6.11	10.05%
Commercial Services	4.29	7.06%
Public Services	2.29	3.77%
Transport	0.74	1.22%
Industrial Processes	0.77	1.26%
F-gases	0.66	1.08%
Agriculture	0.87	1.43%
Total	60.76	100%

6.3.1.2 Climate Change Vulnerability

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021b):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's State of the Irish Environment Report (Chapter 2: Climate Change) (EPA, 2020c) 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 per cent 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, 2020c) 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 and that 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, 2020c). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020c).

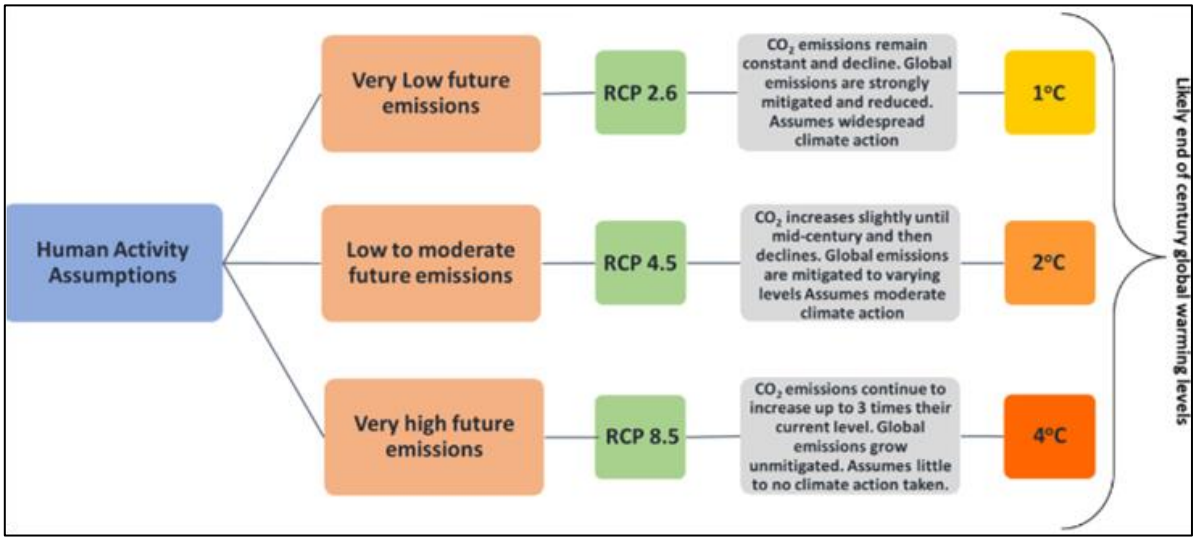
TII's Guidance document PE-ENV-01104 (TII 2022c) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate, while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st 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 2020d). 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. Wind turbines need a specific range of wind speeds to operate within and droughts or low ground water levels may impact hydroelectric energy generating sites. 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 Irelands 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.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023b) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change, see Figure 6.1

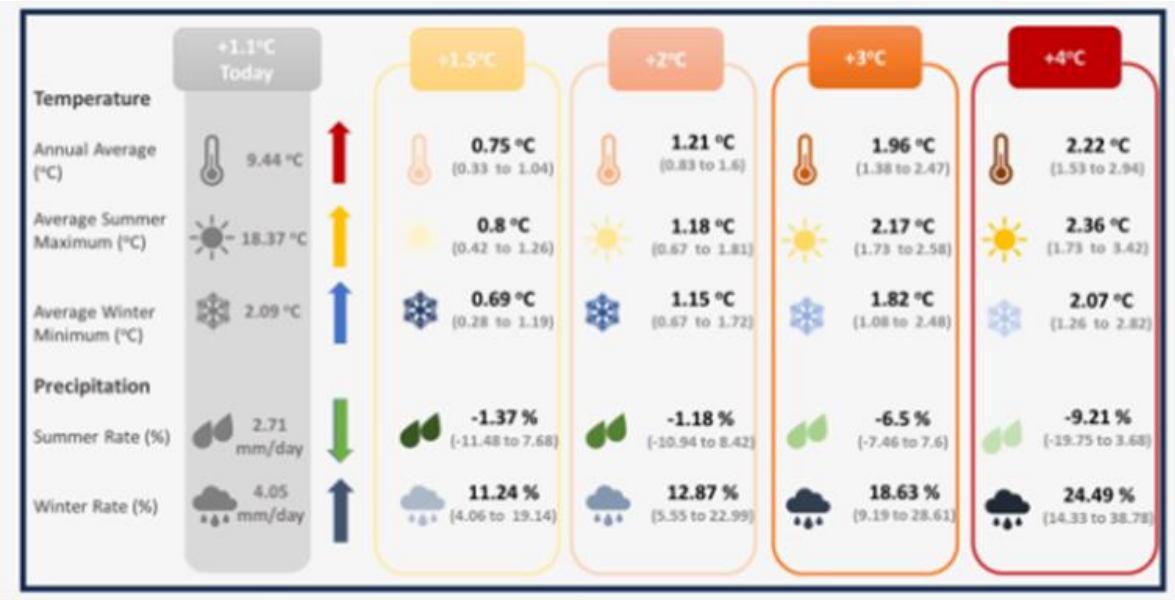
Figure 6.1 Representative Concentration Pathways associated emission levels



*Source: TRANSLATE project storymap (*Met Éireann *2023)*

TRANSLATE (Met Éireann, 2023b) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5˚C ,2˚C, 2.5˚C, 3˚C or 4˚C. Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SST)s (Met Éireann, 2023b). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24% (See Figure 6.2). Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.

Figure 6.2 Change of climate variables for Ireland for different Global warming thresholds



*Source: TRANSLATE project storymap (*Met Éireann, *2023b)*

6.4 Predicted Impacts

6.4.1 Proposed Development

Construction Stage - 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 has 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. The assessment has been conducted with the best available information at the time of carrying out this assessment. Exact material types and material quantities were not fully known at this early stage of the development and will be further progressed at the detailed design stage. Therefore, this assessment has been conducted with the best available information possible in order to estimate the potential impacts to climate. As shown in Table 6.6, 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 41,693 tonnes embodied CO_2eq for the product and construction processes. This is equivalent to 0.28% of the 2030 Buildings (Residential) or Industrial sector budgets (both have same 2030 budget) when annualised over the project lifespan (assumed 50 years). It should be noted that this is an estimate of the emissions associated with the project for the EIAR, the assessment has identified the areas where the greatest carbon impacts will occur and further consideration on how to reduce carbon impacts is to be conducted at detailed design phase. This can be done by selection of lower carbon alternative material types for example.

In the absence of mitigation the impact to climate as a result of GHG emissions is short-term, negative and significant.

Table 6.6: Construction Stage Greenhouse Gas Emissions

Activity	Tonnes CO_2e
Pre-Construction (TII Carbon Tool)	5.7
Embodied Civil Carbon (Civils - roads, drainage etc) (TII Carbon Tool)	4,772
Building Materials, transport, Construction/installation process, maintenance and end of life (OneClickLCA)	36,801
Construction Waste (TII Carbon Tool)	114
Total	**41,693**
As % of 2030 residential sectoral budget	1.04%
As % of 2030 industrial sectoral budget	1.04%
Annualised as % of 2030 residential sectoral budget	0.021%
Annualised as % of 2030 industrial sectoral budget	0.021%

Construction Stage - 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 in more detail with respect to the operational phase of the proposed development in the sections below. 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.

Throughout detailed design and construction phase, guidance documents to inform with design detail decisions. For example, The EU Commission technical guidance on Adapting Buildings to Climate Change (European Commission (2021a), LETI emergency design guide (LETI 2020), and the latest IPCC report.

Operational Phase - 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 5.2.2 (TII, 2022a) and a detailed climate assessment of traffic emissions was conducted.

The predicted concentrations of CO_2 for the future years of 2027 and 2042 are detailed in Table 6.7. These are significantly less than the 2027 and 2030 targets set out under EU legislation (targets beyond 2030 are not available). It is predicted that in 2027 the proposed development will increase CO_2 emissions by 0.00009% of the EU 2027 target. Similarly low increases in CO_2 emissions are predicted to occur in 2042 with emissions increasing by 0.00006% of the EU 2030 target.

The development will meet the requirement of the provision of ducting for the future installation of car charging points to be made in all carparks with more than 10 parking spaces associated with multi-unit residential buildings. The development will also ensure that individual / own-door dwellings which have on curtilage parking are provided with ducting infrastructure to allow the future installation of e-car charging. The development will also include a total of 1,538 bicycle parking spaces to facilitate the update of active travel.

Table 6.7: Climate Traffic Impact Assessment

Year	Scenario	CO_2eq (tonnes/annum)
2027	Do Nothing	1,987
	Do Something	2,455
2042	Do Nothing	1,808
	Do Something	2,148
Increment in 2027		32
Increment in 2042		21
Emission Ceiling (Tonnes) 2027		37,869,352
Emission Ceiling (Tonnes) 2030		33,381,312
Impact in 2027 (%)		0.00009%
Impact in 2042 (%)		0.00006%

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

During the operational phase the energy requirements from the buildings will be low. They will be constructed as Nearly Zero Energy Buildings (NZEB) which means a building that has a very high energy performance. The development will have to comply with the requirements of the Dublin City Council Development Plan 2022-2028. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. Target U-values have been set out in the Climate Action Energy Statement prepared as part of the planning application by Waterman Moylan. Table 6.8 lists the compliance values (Part L Dwellings and BOTDI), the proposed U-values, and the London Energy Transformation Initiative (LETI) recommendations for U-Values (LETI 2000). LETIs recommendations aim is to support the transition of the capital's-built environment to net zero carbon. The proposed ranges for the proposed development are within the ranges recommended by LETI.

Table 6.8: Target U-Values

Values	Range of Target Values Proposed	Part L 2022 (Dwellings) Compliant Values	Part L 2022 (BOTDl) Compliant Values	LETI Recommendations (Large Scale Housing)	LETI Recommendations (Commercial)
Floor	0.10 to 0.18 W/m²K	0.18W/m²K	0.21W/m²K	0.08 - 0.10 W/m²K	0.10 - 0.12 W/m²K
Roof (Flat)	0.12 to 0.20 W/m²K	0.20 W/m²K	0.20 W/m²K	0.10 - 0.12 W/m²K	0.10 - 0.12 W/m²K
Roof (Pitched)	0.10 to 0.16 W/m²K	0.16 W/m²K	0.16 W/m²K	0.10 - 0.12 W/m²K	0.10 - 0.12 W/m²K
Walls	0.10 to 0.18 W/m²K	0.18 W/m²K	0.21 W/m²K	0.13 - 0.15 W/m²K	0.12 - 0.15 W/m²K
Windows	0.9 to 1.4 W/m²K	1.4W/m²K	1.6W/m²K	1.0 (triple glazing) W/m²K	1.0 (triple glazing) W/m²K

Operational Phase - 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 6.9 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 6.4. The results of the vulnerability assessment are detailed in Table 6.9.

Table 6.9: Climate Change Vulnerability Assessment

Climate Hazard	**Sensitivity**	**Exposure**	**Vulnerability**
Flood (coastal, pluvial or fluvial)	2 (Medium)	2 (Medium)	4 (Medium Risk)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low Risk)
Extreme Cold	2 (Medium)	2 (Medium)	4 (Medium 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)

With future climate change increased flood, heat, cold, drought or wind events are likely to occur and therefore the exposure is classed as medium. The site is considered flat, as can be seen in site sections - surrounding lands are similar in plain makeup, with no steep slopes or forested areas which indicates a low risk for landslides.

The proposed development has a worst-case medium vulnerability to extreme cold due to vulnerability of landscaping to extreme temperatures and the proposed development has a worst-case medium

vulnerability potential for flood risk. The Site-Specific Flood Risk Assessment (SSFRA) was carried out by Waterman Moylan and submitted with this planning application. The proposed development is outside the 1 in 1,000-year flood event zones for coastal and fluvial. There is a potential for pluvial flooding on the site, however this vulnerability has been considered within the design and therefore the risk has been mitigated to a medium sensitivity and low exposure. All drainage and flood risk calculations include an additional 20% for future climate change, this is in line with medium risk future scenarios for climate change (RCP4.5). An additional 30% allowance for additional rainfall as a result of future climate change (i.e. the high risk scenario RCP8.5) has not been included within the design of the development at this stage. Vents serving the basement/undercroft areas will have their openings located at least 0.5m above flood levels, and also be 0.5m minimum above the top of water levels for the open attenuation areas.

The Site-Specific Flood Risk Assessment (SSFRA) notes that the residual 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 300mm higher than the surrounding area. Vents serving the basement/undercroft areas will have their openings located at least 0.5m above flood levels. Sustainable Drainage Systems (SuDS) are employed in this scheme, and will include raingardens, swales, permeable paving, an underground stormtech attenuation store, green roofs, and a bio retention tree pit. Surface water discharging from the development will be limited due to these inclusions.

Excess storm water from the main catchment is to be attenuated in underground tanks / crate systems with sufficient volume for the 1-in-100-year storm (accounting for a 20% increase due to climate change), to limit the runoff from the site and minimise the discharge rate into receiving waters. 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 2 l/s/Ha, which is lower than the current greenfield runoff rate, and in line with Dublin City Council requirements.

The architects have planned “woonerf” streets into the design, which propose wider streets for social space, landscaping and street furniture. Greenery acts as an absorbent material for excess rainfall and flooding. The plants chosen will be of stress tolerant crop varieties and promote irrigation. There is a prioritisation of native species, and ornamental pollinator friendly species. The focus in this project is also on foraging species, fruit bearing trees and shrubs and herbs. The species have been chosen to align with all Ireland pollinator plan and to increase biodiversity. The landscaping for the proposed development has been designed for the long term and takes account of the need for climate resilience.

The apartment buildings have green roof designs to alleviate pressure on the drainage systems. Each building also has solar panels on the roof, totalling around 34% of the total roof area. Openable windows are included in all apartments for cross ventilation and consideration has been made for the potential impact of increased heat and cold events within the design.

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. Throughout detailed design phase, the architects will be using guidance documents to inform with design detail decisions including; The EU Commission technical guidance on Adapting Buildings to Climate Change (European Commission (2021a), LETI emergency design guide (LETI 2020), and the latest available IPCC report. In addition, should the updated EuroCodes be published prior to completion of detailed design, which will include consideration for climate impacts, these design standards will be taken into account. The proposed development has been designed to reduce the impact to climate where possible (see the project Climate Action Energy Statement prepared by Waterman Moylan 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. However, these design elements in addition to reducing

energy demand within the building also ensure that buildings are more resistant to extreme temperature events.

Therefore, overall the proposed development has a worst-case medium vulnerability due to potential future flooding. The design is currently in line with a low vulnerability to the moderate-risk future scenario (RCP4.5).

Landscaping has been assessed as having a medium vulnerability to extreme cold temperatures based on the information available at the time of undertaking this assessment. The proposed planting scheme will need to take extreme cold temperatures into account which will reduce the vulnerability of the landscaping elements to low. All other vulnerabilities have been identified as low and therefore are not a significant risk.

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.

6.5 Mitigation Measures

6.5.1 Proposed Development

Construction Stage

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. The following measures to reduce the embodied carbon of the construction works are:

- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.
- Target embodied carbon rates for detailed design (LETI 2020):
    - Housing units: Reduce embodied carbon to <500 $kgCO^2/m^2$
    - Commercial units: Reduce embodied carbon or to <600 $kgCO^2/m^2$

Operational Stage

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 6.2.3). Landscaping planting elements will need to be chosen with consideration for extreme cold temperatures as a result of climate change in future years.

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. The Climate Action 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 $m^3/m^2/hr$;
- Achieve a minimum of an A3 BER Rating
- Ensure thermal bridging details are designed to achieve thermal bridging factors of 0.15W/m^2K or less;
- Meet or exceed minimum U-Value standards identified in *Part L 2022 Dwellings* (see Table 6.8);
- Provide an appropriate combination of technologies to ensure energy consumption is in line with *Part L 2022 Dwellings* requirements; and
- Out of 442 car parking spaces; 221 number spaces equipped with fully functional EV Charging Point(s) and the remaining 221 spaces designed to facilitate the relevant infrastructure to accommodate future EV charging. On-site car sharing scheme through Go-Car (3 spaces).

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 including the Climate Action Plan and objectives of the Dublin City Council Development Plan 2022-2028, including climate mitigation measures.

6.5.2 Cumulative Mitigation

With respect to cumulative mitigation, there is no geographical constraints and therefore the normal approach for cumulative assessment in EIA is not considered applicable as per PE-ENV-01104 (TII, 2022c). When considering cumulative mitigation, all other emitters of GHGs within Ireland should aim for alignment with Ireland's GHG trajectory to net zero by 2050. This is in line with IEMA Guidance (IEMA, 2022), TII (TII 2022a) states that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".* However the ability to ensure this alignment is not under the control of the Proposed Development.

6.6 Residual Impacts

6.6.1 Proposed Development

Construction Stage

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 6.3 the impact of the proposed development in relation to GHG emissions is considered long-term, minor adverse and not significant in EIA terms based on the information available at the time of compiling this assessment.

Operational Stage

The proposed development will result in some impacts to climate through the release of GHGs, however the projects Climate Action 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 6.3 the impact of the proposed development in relation to GHG emissions is considered long-term, minor adverse and not significant in EIA terms based on the information available at the time of compiling this assessment.

In relation to climate change vulnerability, it has been assessed that there is a low risk as a result of the majority of future climate change hazards with the exception of flooding and extreme cold associated with landscaping elements which have a medium risk. The design is currently in line with a low vulnerability to the moderate-risk future scenario (RCP4.5). Landscaping has a medium vulnerability to extreme cold temperatures. Available mitigation for this will be considered during detailed design. All other vulnerabilities to future climate change have been identified as low. The identified climate vulnerabilities are not considered a significant risk in relation to the proposed development based on the information available at the time of compiling this assessment.

Throughout detailed design phase, the architects will be using guidance documents to inform with design detail decisions including; The EU Commission technical guidance on Adapting Buildings to Climate Change (European Commission (2021a), LETI emergency design guide (LETI 2020), and the latest available IPCC report. In addition, should the updated EuroCodes be published prior to completion of detailed design, which will include consideration for climate impacts, these design standards will be taken into account.

Worst Case Impact

The GHG assessment conducted has been based on the best available information at the time of completing this assessment. Exact material types were not known when carrying out this assessment and a worst-case approach was applied when inputting materials which will potentially over-estimate associated GHG emissions. There is the potential for the development to have lower GHG emissions once constructed if lower carbon intensive materials are chosen as part of the detailed design. However, this assessment has been based on a conservative, worst-case approach.

With respect to the climate risk assessment, in accordance with TII's Guidance document PE-ENV-01104 (TII 2022c), the high risk (RCP8.5) future climate change scenario has been considered. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken. This is considered the worst case scenario.

6.6.2 Cumulative

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 will demonstrate 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.

6.7 Difficulties Encountered

There were no significant difficulties encountered when compiling this assessment.

6.8 Interactions

Climate has the potential to interact with a number of other environmental attributes.

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. Interactions between climate and hydrology are not considered significant.

Interactions between climate and Material Assets – Waste can occur. 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. Therefore, no significant interactions between climate and waste are predicted.

No other significant interactions between climate and other environmental topics have been identified.

6.9 Monitoring

There is no monitoring required for the construction or operational phases.

6.10 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 (2015) Advice Notes for Preparing Environmental Impact Statements – Draft
- 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 (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Environmental Protection Agency (EPA) (2023) Ireland's Draft Greenhouse Gas Emissions
- 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.
- 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
- LETI (2020) Climate Emergency Design Guide
- 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

7 Noise and Vibration

7.1 Introduction

AWN Consulting Ltd has been commissioned to carry out a noise and vibration impact assessment of the proposed development on lands at Cherry Orchard.

In terms of the site, noise and vibration will be considered in terms of two aspects. The first is the outward impact of the development (i.e. the potential impact of the Proposed Development on existing sensitive receptors in the study area) and the inward impact of existing noise and vibration sources on the development itself (with a particular focus on road traffic and rail noise).

7.2 Methodology

The study has been undertaken using the following methodology:

- Baseline noise monitoring has been undertaken across the development site to determine the range of noise levels at varying locations across the site;
- A review of the relevant standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development, this is summarised in the following sections;
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the project at the nearest sensitive locations (NSL's) to the site;
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the development site;
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development, and;
- The inward impact of noise of the surrounding environment (e.g. rail and road noise) into the proposed buildings has also been assessed to determine the requirements, for additional noise mitigation to provide suitable residential amenities.

7.2.1 Construction Phase 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* with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from Part One of the standard Noise.

7.2.1.1 Residential Receptors

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 impact is associated with the construction activities. Note that, in accordance with the BS5228 guidance, this assessment criteria are only applicable to residential receptors.

The closest neighbouring noise sensitive properties to the proposed development are the residential dwellings on Cedarbrooke Estate that bound the east of the site, these are located approximately 40m from the development site at their closest point.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 7.1 sets out the values which, when exceeded, indicate a significant effect at the facades of residential receptors.

Table 7.1 BS5228 ABC Methodology

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A	Category B	Category C
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends	55	60	65
Night Time	45	50	55

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

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 at this location can be considered Category A to B and a 65 to 70 dB $L_{Aeq,12hr}$ threshold should be applied. Figure 7.1 presents a map indicating properties that are identified as either Category A or B. If the construction noise exceeds the appropriate category value, then a significant effect is deemed to occur, depending on context. A description of each receptor is provided below:

R1 – Residential estate on St Olivers Park located approximately 60m to the north of the proposed masterplan site. A 65 dB $L_{Aeq,12hr}$ threshold is proposed at this location.

R2 – Residential estate on Ceder Brooke Avenue located approximately 40m to the east of the proposed masterplan site. A 70 dB $L_{Aeq,12hr}$ threshold is proposed at this location.

R3 – Residential estate on Barnville Park located approximately 65m to the south-east of the proposed masterplan site. A 70 dB $L_{Aeq,12hr}$ threshold is proposed at this location.

R2 – Residential estate off Park West Avenue located approximately 80m to the south-east of the proposed masterplan site. A 70 dB $L_{Aeq,12hr}$ threshold is proposed at this location.

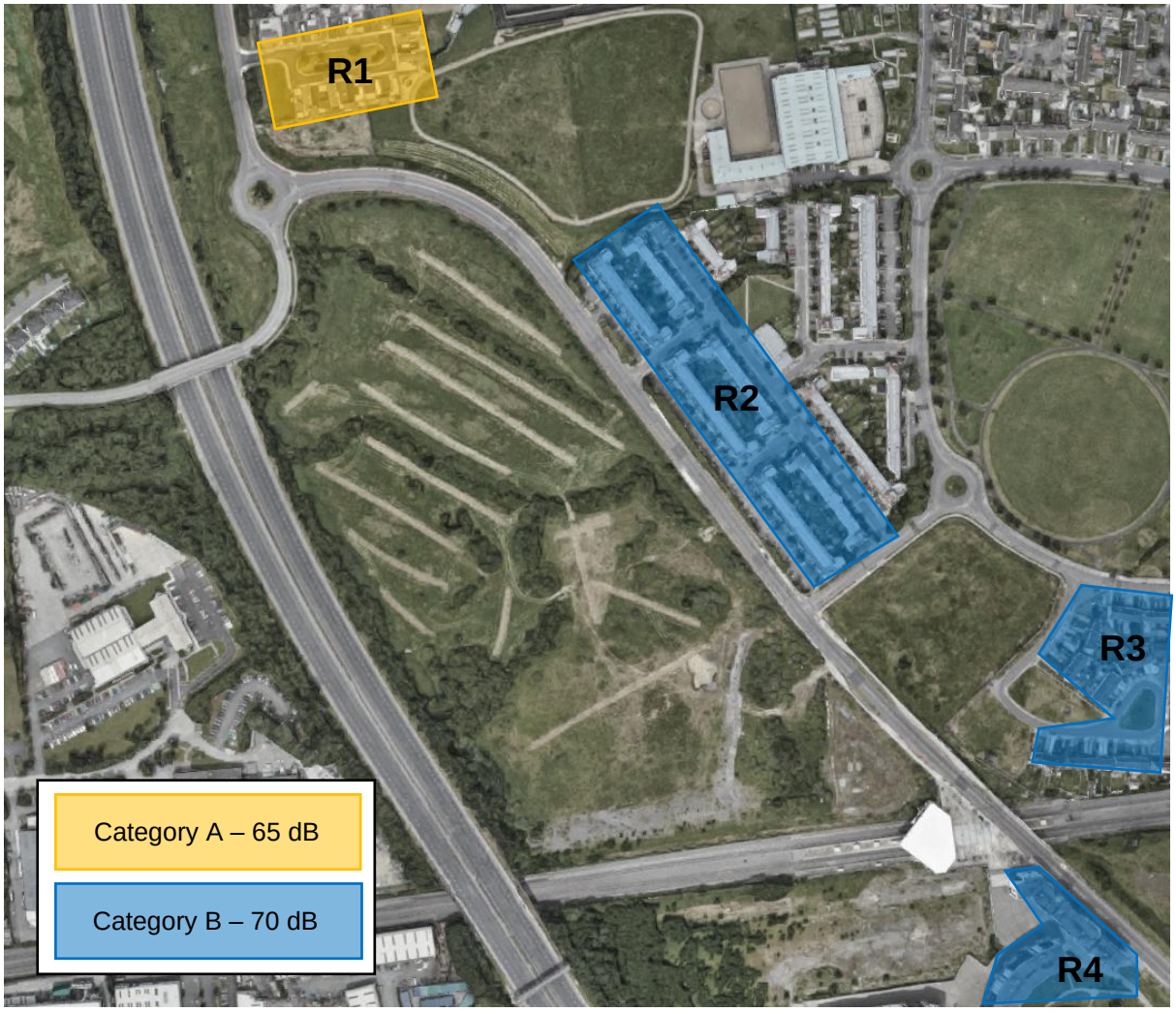


Figure 7.1 Construction Categories

7.2.1.2 Commercial Receptors

BS5228-1:2009+A1 gives several examples of acceptable limits for construction or demolition noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states:

> *"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."*
>
> *Paragraph E.2 goes on to state:*
>
> *"Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:*
>
> *70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise.*
>
> *75 decibels (dBA) in urban areas near main roads in heavy industrial areas".*

For non-residential locations it is considered appropriate to adopt the 75dB(A) criterion during the day. The non-residential properties are only considered to be noise sensitive during office hours.

7.2.1.3 Proposed Threshold Noise Levels

Considering the proposed documents outlined above and referring to the baseline noise environment monitored around the development site (see Section 7.3), BS 5228-1:2009+A1:2014 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development: -

- For residential NSLs it is considered appropriate to adopt 65 - 70 dB(A) CNT depending on existing noise level. The appropriate categories are identified in Figure 7.1.
- For non-residential NSLs it is considered appropriate to adopt the 75 dB(A) CNT, given the urban environment, in line with BS 5228-1:2009+A1:2014 Annex E2.

7.2.1.4 Interpretation of CNT

In order to assist with interpretation of CNTs, Table 7.2 includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of DMRB: Noise and Vibration and adapted to include the relevant significance effects from the EPA Guidelines (EPA 2022).

Table 7.2 BS5228 ABC Methodology

Guidelines for Noise Impact Assessment Significance (DMRB)	CNT 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	
Significant	Above CNT +15 dB	Very Significant to Profound	

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely impacts during the construction stages.

7.2.2 Construction Phase Vibration Criteria

There are two aspects to the issue of vibration that are addressed in the standards and guidelines: the risk of cosmetic or structural damage to buildings and human perception of vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s. There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- BS 7385: Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration (1993); and
- BS 5228: 2009 +A1 2014: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.

Building Damage

BS 7385-2 and BS 5228-2 advise that, for soundly constructed residential properties and similar light-framed structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above for transient vibration. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table B.2 of BS 5228-2 may need to be reduced by up to 50%. On a cautious basis, therefore, continuous vibration limits are set as 50% of those for transient vibration across all frequency ranges. For buildings or structures that are structurally unsound, lower vibration magnitudes will apply, typically 50% of those for structurally sound buildings. Protected or historic buildings are not automatically assumed to be more vulnerable to vibration unless they have existing structural defects. The values are summarised in Table 7.3 relating to transient vibration.

Table 7.3 Transient Vibration Guide Values for Cosmetic Building Damage

Type of Building	Peak component particle velocity in frequency range of predominant pulse	
	4Hz to 15Hz	15Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	
Unreinforced or light framed structures. Residential or light commercial building types.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above.

Note 1 Values referred to are at the base of the building.*

Note 2 At frequencies below 4Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.*

BS 5228-2 and BS 7485-2 state that minor structural damage can occur at vibration magnitudes greater than twice those in Table 7.3 and major structural damage can occur at vibration magnitudes greater than four times those in Table 7.3.

The guide values contained in Table 7.3 relate to transient vibration which does not give rise to resonant responses in structures, and to low rise buildings.

Human Perception

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of traffic, vibration is perceptible at around 0.5 mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration, however, are typically tolerated for single events or events of short duration. For example, during piling, one of the primary sources of vibration during construction, vibration levels may typically be tolerated at up to 2.5mm/s. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant to such activities during the night-time (or if they are trying to sleep during the daytime).

BS 5228-2 and DMRB Noise and vibration (UKHA 2020) provides guides relating to the assessment of human response to vibration in terms of the peak particle velocity (PPV). Table 7.4 summarises the range of vibration values and the associated potential effects on humans.

Table 7.4 Guidance on effects of human response to PPV magnitudes

Vibration Level, PPV	Likely Effect (DMRB)	Significance Ratings (EPA)
≥10 mm/s PPV	Major	Significant to Very Significant
≥1 to <10 mm/s PPV	Moderate	Moderate to Significant
≥0.3 to <1 mm/s PPV	Minor	Not Significant to Slight

≥0.14 to 0.3mm/s PPV	Negligible	Imperceptible to Not significant
Less than 0.14 mm/s PPV		Imperceptible

7.2.3 Operational Noise Criteria

7.2.3.1 Additional Traffic on Public Roads

In order to consider the potential noise impact associated with the proposed development introducing additional traffic onto the existing road networks and given that vehicle movements on public roads are assessed using a different parameter (the ten-percentile noise level; L_{A10}), it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development in terms of the L_{A10} parameter.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 7.5 offers guidance as to the likely impact associated with any change in traffic noise level (Source DMRB).

Table 7.5 Likely Impact Associated with Change in Traffic Noise Level

Change in Sound Level (dB L_{A10})	Subjective Reaction	DMRB Magnitude of Impact	EPA Classification Magnitude of Impact
0	Inaudible	No Change	Neutral
0.1 – 2.9	Barely Perceptible	Negligible	Imperceptible
3 – 4.9	Perceptible	Minor	Slight
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate
10+	Doubling of loudness and above	Major	Significant

7.2.3.2 Inward Noise Impact

The Professional Guidance on Planning & Noise (ProPG) document was published in May 2017. The document was prepared by a working group comprising members of the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). Although not a government document, since it's adoption it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

The ProPG outlines a systematic risk based 2-stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- Stage 1 - Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and,
- Stage 2 – Involves a full detailed appraisal of the proposed development covering four "key elements" that include:
  - Element 1 - Good Acoustic Design Process.
  - Element 2 - Noise Level Guidelines.
  - Element 3 - External Amenity Area Noise Assessment; and,
  - Element 4 - Other Relevant Issues.

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment. Figure 7.2 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.

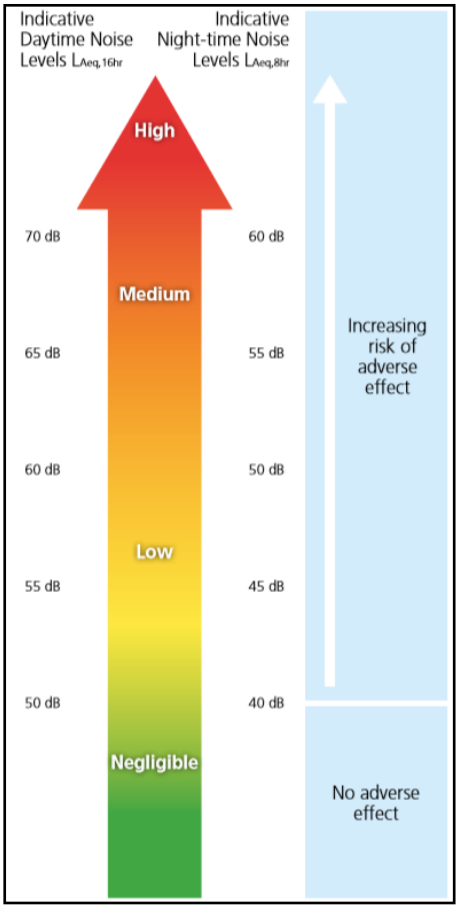


Figure 7.2 ProPG Stage 1 - Initial Noise Risk Assessment

It should be noted that a site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times a night.

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233 (2014). The recommended indoor ambient noise levels are set out in Table 7.6 and are based on annual average data, they omit occasional events where higher intermittent noisy events may occur.

Table 7.6 ProPG Internal Noise Levels

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living Room	35 dB $L_{Aeq, 16hr}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq, 16hr}$	-
Sleeping	Bedroom	35 dB $L_{Aeq, 16hr}$	30 dB $L_{Aeq, 8hr}$ 45 dB L_{AFmax}

*Note - The document comments that the internal $L_{AFmax, T}$ noise level may be exceeded no more than 10 times per night without a significant impact occurring.

In addition to these absolute internal noise levels ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5 dB can still provide reasonable internal conditions.

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 $L_{Aeq,16hr}$."*

7.2.3.3 Outward Noise Impact

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.

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, 4dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

The following definitions as discussed in BS 4142 as summarised below:

"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.

7.2.4 Construction Vibration Criteria

In terms of vibration, British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration recommends that, for soundly constructed residential property 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 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. The standard also notes that below 12.5mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking the above into consideration the vibration criteria in Table 7.7 are recommended.

Table 7.7 Construction Vibration Criteria

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
12 mm/s	20 mm/s	50 mm/s

7.2.5 Operational Vibration Criteria

There are no expected sources of vibration associated with the operational phase, therefore vibration criteria have not been specified for this phase.

7.3 Baseline Environment

7.3.1 Description

The site is in Cherry Orchard, Dublin10, Ireland. The site is bound by the M50 to the West and Park West Ave to the East. The south of the site adjoins the Park West rail station.

7.3.2 Environmental 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.

7.3.3 Choice of Measurement Positions and Survey Times

The attended noise survey was conducted between the following periods:

- 14:30 on 6th of July 2022 to 15:34 on 6th of July 2022.

The unattended noise survey was conducted between the following periods:

- 13:30hrs on 6th of July 2022 to 13:45hrs on 8th of July 2022.

The measurements cover a period that was selected in order to provide a typical snapshot of the existing noise climate, with the primary purpose being to ensure that the proposed noise criteria

associated with the development are commensurate with the prevailing environment. The weather during the survey periods was variable with some heavy rainfall. Data for analysis has omitted these periods of adverse weather conditions and typical noise levels have been selected from a day and night of calm and dry weather.

Measurement locations were selected as shown in Figure 7.3 below.

Figure 7.3 Noise level measurement locations at the Cherry Orchard.

7.3.4 Personnel and Instrumentation

All measurements were performed by AWN Consulting. Attended and unattended measurements were made using a Rion NL-52 Sound Level Meter. Sample periods were 15 minutes for attended noise measurements and 5 minutes for unattended noise measurements.

Before and after the survey the measurement instruments were check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

7.3.5 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_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

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.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

L_{day} is the average L_{Aeq} noise level measured over the course of the daytime period, defined as 07:00hrs to 19:00hrs

$L_{evening}$ is the average L_{Aeq} noise level measured over the course of the daytime period, defined as 19:00hrs to 23:00hrs

L_{night} is the average L_{Aeq} noise level measured over the course of the daytime period, defined as 23:00hrs to 07:00hrs

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2x10-5 Pa.

7.3.6 Survey Results and Discussion

The results of the surveys at the unattended monitoring locations are summarised in Table 7.8 to Table 7.11 below. Note that L_{Aeq} values are logarithmic averages over the stated period, whereas L_{A90} values are arithmetic averages.

Table 7.8 Unattended Survey Results at Location UT1

Date	Period	Measured Noise levels	
		dB $L_{Aeq,T}$	dB $L_{A90,T}$
06/07/2022	Day (07:00 – 23:00hrs)	65	59
	Night (23:00 – 07:00hrs	58	51
07/07/2022	Day (07:00 – 23:00hrs)	63	55
	Night (23:00 – 07:00hrs)	58	50
08/07/2022	Day (07:00 – 23:00hrs)	64	59

Table 7.9 Unattended Survey Results at Location UT2

Date	Period	Measured Noise levels	
		dB L_{Aeq}	dB $L_{A90,T}$
06/07/2022	Day (07:00 – 23:00hrs)	64	62
	Night (23:00 – 07:00hrs	60	55
07/07/2022	Day (07:00 – 23:00hrs)	63	61
	Night (23:00 – 07:00hrs)	59	54
08/07/2022	Day (07:00 – 23:00hrs)	64	62

Table 7.10 Attended Noise Measurements at Location AT1

Date/Time	Measured Noise levels				
	L_{Aeq}	L_{AFmax}	L_{Amin}	L_{A10}	L_{A90}
06/07/2022 14:30	62	71	58	63	60
06/07/2022 15:18	65	78	59	67	62
06/07/2022 16:09	64	73	58	66	61

Table 7.11 Attended Noise Measurements at Location AT2

Date/Time	Measured Noise levels				
	L_{Aeq}	L_{AFmax}	L_{Amin}	L_{A10}	L_{A90}
06/07/2022 14:57	62	67	59	63	61
06/07/2022 15:34	62	69	59	66	61
06/07/2022 16:29	61	74	57	64	58

Road traffic noise from the M50 motorway road was the dominant source of noise at the West side of the site. During the attended survey it was noted that noise emissions from the adjacent rail line intermittently contributed towards the overall noise levels, at location UT2.

L_{Amax} Results at Location UT2.

Given the proximity of the rail line it is appropriate to consider the maxima results at this location to account for rail movements during the more sensitive night period. Taking into account the allowance by the guidance for 10 maximum events to exceed the threshold per night, it can be concluded that the typical L_{Amax} level is 67 dB at this location.

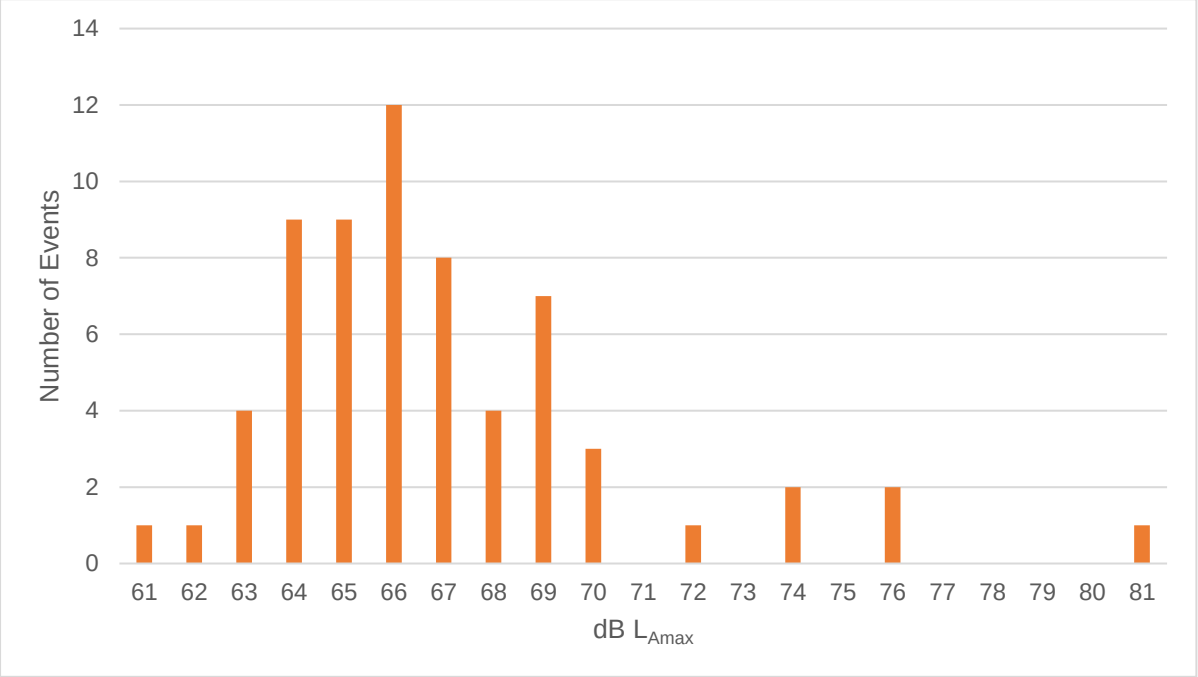


Figure 7.4 Night time maxima events

7.4 Predicted Impacts

7.4.1 Construction Phase – Noise Impact

The largest noise and vibration impact of the proposed development will occur during the construction phase due to the operation of various plant machinery and HGV movement to, from and around the site. However, the construction phase can be classed as a short-term phase.

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to site clearance, ground excavation and loading lorries (dozers, tracked excavators and wheeled loaders) reach a maximum of 81 dB $L_{Aeq,T}$ at a distance of 10 m. For this assessment, a worst-case scenario is assumed of 3 no. such items with a sound pressure level (SPL) of 81 dB at 10 m operating simultaneously along the closest works boundary. This would result in a total noise level of 86 dB at 10 m and an equivalent combined sound power level of 114 dB L_{WA}. This conservative scenario is the typical assumption made for developments of this size, on the basis that it is unlikely that more than 3 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other.

Guidance on the approximate attenuation achieved by barriers surrounding the site 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 the noise screen completely hides the sources from the receiver.

For this scenario it is assumed that construction will be partially screened from the local receptors by way of typical 2.4m site hoarding. Table 7.12 shows the potential noise levels calculated at various distances based on the assumed sound power level, a percentage on time of 66% and attenuation provided by the barrier of 5 dB.

Table 7.12 Predicted construction noise levels at varying distances

Description of Noise Source	Sound Power Level (dB Lw(A))	Calculated noise levels at varying distances (dB $L_{Aeq,T}$)				
		10m	20m	40m	60m	80m
3 no. items each with SPL of 81 dB at 10 m operating simultaneously.	114	80	74	68	64	62

The closest Category A receptors from the area of construction works are residential properties at R1 – St Oliver's Park at distances of greater than 60m. The construction noise predictions indicate that noise levels from construction works will be below the CNT set out within BS5228 and above the baseline noise levels. Reference to Table 7.2 indicates a negative, slight to moderate and brief to short-term construction noise impact will be experienced at these locations. Given the calculated noise levels are below the CNT, the overall impact will is determined to be not significant.

The closest Category B receptors from the area of construction works are residential properties at R2 - Cedar Brooke Avenue at distances of greater than 40m. The construction noise predictions indicate that noise levels from construction works will be below the CNT set out within BS5228 and above the baseline noise levels. Reference to Table 7.2 indicates a negative, slight to moderate and brief to short-term construction noise impact will be experienced at these locations. Given the calculated noise levels are below the CNT, the overall impact will is determined to be not significant.

Construction Traffic

In terms of the additional construction traffic on local roads that will be generated as a result of this development the following comment is presented. In order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25% along the local road network. Additional traffic introduced onto the local road network due to the construction phase of the proposed development will not result in a significant noise impact.

7.4.2 Construction Phase – Vibration Impact

During rock breaking, there is potential for vibration to be generated through the ground. Empirical data for this activity is not provided in the BS 5228-2:2009+A1:2014 (BSI 2014b) standard, however the likely level of vibration from this activity is expected to be significantly below the vibration criteria for building damage on experience from other sites. AWN Consulting Ltd (the Author of the Noise and Vibration chapter) have previously conducted vibration measurements under controlled conditions, during trial construction works,works on a sample site where breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator; and
- 6 tonne hydraulic breaker on large Liebherr tracked excavator.

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 0.25 PPV (mm/s) to 0.2548 PPV (mm/s) at distances of 10m to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.4 PPV (mm/s) to 0.24 PPV (mm/s) at distances of 10m to 50m respectively.

Whilst these measurements relate to a breaking of concrete, the range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity. Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Section 7.2.4.

The predicted vibration impacts are not significant, and the worst-case effects can be described as short-term, negative, and imperceptible to not significant.

Potential for vibration impacts during the construction phase programme are likely to be limited given that rock breaking is not expected. In terms of piling, this activity is not expected to occur within 35m distance to the nearest noise sensitive property. Expected vibration levels during piling assuming augured or bored piles have been determined through reference to published empirical data. The British Standard BS 5228 – Part 2: Vibration, publishes the measured magnitude of vibration of rotary bored piling using a 600mm pile diameter for bored piling into soft ground over rock, (Table D.6, Ref. No. 106):

0.54mm/s at a distance of 5m, for auguring.

0.22mm/s at a distance of 5m, for twisting in casing.

0.42mm/s at a distance of 5m, for spinning off, and.

0.43mm/s at a distance of 5m, for boring with rock auger.

Considering the distance to the receptors vibration emissions from this activity will be significantly reduced. Vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 7.5 to avoid any cosmetic damage to buildings. Vibration levels are also expected to be below a level that would cause disturbance to building occupants. The impacts are predicted to be short-term, negative and not significant.

7.4.3 Operational Phase – Additional Traffic on Existing Public Roads

The Traffic Impact Assessment predicts the following changes to Annual Average Daily Traffic (AADT) in the design year 2042. This is shown in Table 7.13 along with approximate corresponding changes to noise level. Note that all figures take account of committed developments in the area and the overall masterplan lands. Figure 7.5 presents the location of each assessed junction.

Figure 7.5 Location of assessed junctions

Table 7.13 Predicted changes in noise level with and without the development in place

Junction Arm	24 Hour AADT for Opening Year (2025)		
	Without Development	With Development	Increase (dB)
Junction 1_Arm A	12,813	14,709	0.6
Junction 1_Arm B	12,060	14,288	0.7
Junction 1_Arm C	9,585	9,910	0.1
Junction 2_Arm A	12,026	14,254	0.7
Junction 2_Arm B	202	202	0.0
Junction 2_Arm C	12,052	14,794	0.9
Junction 3_Arm A	12,550	13,569	0.3
Junction 3_Arm B	1,957	2,179	0.5
Junction 3_Arm C	13,603	14,771	0.4
Junction 3_Arm D	773	773	0.0
Junction 4_Arm A	10,588	13,840	1.2
Junction 4_Arm B	4,781	6,983	1.6
Junction 4_Arm C	13,123	15,675	0.8
Junction 5_Arm A	4,001	5,171	1.1
Junction 5_Arm B	1,505	2,821	2.7
Junction 5_Arm C	4,790	6,992	1.6
Junction 6_Arm A	1,499	2,816	2.7
Junction 6_Arm B	1,417	2,026	1.6
Junction 6_Arm C	518	1,932	5.7
Junction 7_Arm A	13,138	15,691	0.8

Junction Arm	24 Hour AADT for Opening Year (2025)		
	Without Development	With Development	Increase (dB)
Junction 7_Arm B	10,583	11,822	0.5
Junction 7_Arm C	15,767	17,079	0.3
Junction 7_Arm D	5,344	5,344	0.0
Junction 8_Arm A	10,588	13,588	1.1
Junction 8_Arm B	10,588	13,840	1.2

The assessment indicates that a moderate noise impact may occur at Junction 6, Arm C due to a change in noise level. All other assessed junctions indicate that noise impacts will be imperceptible to slight and not significant with reference to Table 7.5.

Given that Junction 6 Arm C is indicating a moderate noise impact, it is appropriate to undertake a more detailed calculation to predict the noise level from road traffic at the receptor locations near to this junction.

The noise level associated with an event of short duration, such as a passing vehicle movement, may be expressed in terms of its Sound Exposure Level (L_{AX}). The Sound Exposure Level can be used to calculate the contribution of an event or series of events to the overall noise level in a given period.

The appropriate formula is given below:

$L_{Aeq,T} = L_{AX} + 10\log10(N) - 10\log10(T) + 10\log10(r1/r2)$ dB

where:

$L_{Aeq,T}$ is the equivalent continuous sound level over the time period T (in seconds);

L_{AX} is the "A-weighted" Sound Exposure Level of the event considered(dB);

N is the number of events over the course of time period T;

r1 is the distance at which LAX is expressed;

r2 is the distance to the assessment location.

The assumed mean value of Sound Exposure Level for cars and HGV's is in the order of 73 dB L_{AX} and 88 dB L_{AX} respectively at a distance of 5 metres. These values have been used to calculate the noise levels as a result of cumulative road traffic with the proposed development place and the full development of the masterplan lands.

The resultant noise level for receptors close to Junction 6 Arm C is 55 dB which is in line with baseline noise levels recorded as part of the baseline noise survey and is in line with noted to be a "desirable" noise level in accordance with the Dublin City Council noise action plan for daytime periods. Consequently, whilst the change in noise level can be described as a moderate impact, the overall noise level from the junction remains relatively low when considering the urban area and the local noise environment and hence a negative, not significant and long-term impact is calculated.

7.4.4 Inward Noise Impact

The development lands in question are in proximity to the M50 Motorway which lies to the west of the site and a rail line to the south of the site. Noise from the road and rail has the potential to impact the residential development proposed for the site itself.

7.4.4.1 Existing Noise Climate

The existing noise climate within the development lands was surveyed and the results summarised in Section 7.3 of this chapter. The results of the survey have indicated that the M50 contributes significant

noise levels at the measurement locations on the west boundary of the site. In addition to this it was noted that noise emissions from the railway on the south boundary contributed to overall noise levels during the day period.

In order to determine the inward noise impact for noise sensitive properties proposed as part of the development, it is necessary to calculate the internal noise levels within the proposed buildings. These calculated levels can then be compared against appropriate internal noise criteria from BS 8233, as summarised in Table 7.6.

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.).

7.4.4.2 Noise Model of Site

In order to calculate noise levels across the site, an acoustic model was developed in order to initially calibrate against noise survey data recorded on site. Proprietary noise calculation software was used for the purposes of establishing the prevailing noise levels on the proposed site. The selected software, Brüel & Kjær Type 7810 Predictor, calculates noise levels in accordance with the selected source.

The following information was included in the model:

- Site layout drawings of proposed development.
- Topographical survey of the development site, and;
- OS mapping of surrounding environment.

7.4.4.3 Noise Risk Classification of the Site

In order to calculate noise levels across the site, an acoustic model was developed in order to initially calibrate against noise survey data recorded on site. Proprietary noise calculation software was used for the purposes of establishing the prevailing noise levels on the proposed site. The selected software, Brüel & Kjær Type 7810 Predictor, calculates noise levels in accordance with the selected source.

The following information was included in the model:

- Site layout drawings of proposed development.
- Topographical survey of the development site, and;
- OS mapping of surrounding environment.

7.4.4.4 Noise Modelling

Following the methodology outlined in ProPG, as discussed in Section 7.2.3.2, the noise model has been used to predict noise levels across the site. The results of this exercise are presented in Figure 7.6 to Figure 7.9 for day and night periods.

Figure 7.6 Predicted Day Time Noise Contours (1.5m height)

Figure 7.7 Predicted Day Time Noise Contours (10m height)

Figure 7.8 Predicted Night Time Noise Contours (1.5m height)

Figure 7.9 Predicted Night Time Noise Contours (10m height)

Road traffic noise levels calculated across the majority of the site during daytime periods are between 60 and 70 dB $L_{Aeq,16hr}$. Night time noise levels are the order of 55 to 65 dB $L_{Aeq,8hr}$ across the site in this situation.

Giving consideration to the measured and predicted noise levels presented in the previous sections the initial site noise risk assessment has concluded that the level of risk across the site varies from medium to high noise risk.

Additionally, the Stage 1 Noise Risk Assessment requires analyses of the L_{AFmax} noise levels. In the case of the AWN survey, the L_{Afmax} noise levels typically measured less than 80 dB during the night with sporadic events also recorded above this level. ProPG guidance considers 20 night events over 80 dB to be a high risk, therefore this site would be considered a low to medium risk in terms of maxima events.

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

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

High Risk High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice.

Given the above it can be concluded that the development site may be categorised as Medium to High Risk and as such an Acoustic Design Strategy is 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 or high-risk noise levels. It merely identifies the fact that a more considered approach is 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.

Façade Noise Levels

Noise levels have been predicted across the development site during day and night-time periods using the noise model developed to include the development buildings. Where façade noise levels are less than 55 dB $L_{Aeq,16hr}$ during the day and 50 dB $L_{Aeq,8hr}$ at night, it is possible to achieve reasonable internal noise levels while also ventilating the dwellings with open windows. Therefore, for those properties where the façade noise levels are less than 55 dB $L_{Aeq,16hr}$ during the day and 50 dB $L_{Aeq,8hr}$ at night no further mitigation is required.

Where façade levels are above these levels the sound insulation performance of the building façade becomes important and a minimum sound insulation performance specification is required for windows and vents to ensure the internal noise criteria are achieved.

Figure 7.10 identifies those facades where the noise levels are higher and where mitigation in the form of enhanced glazing and ventilation is required. The specification of this enhanced façade is discussed in Section 7.5. Once these mitigation measures are applied the inward impact is neutral, not significant and long-term.

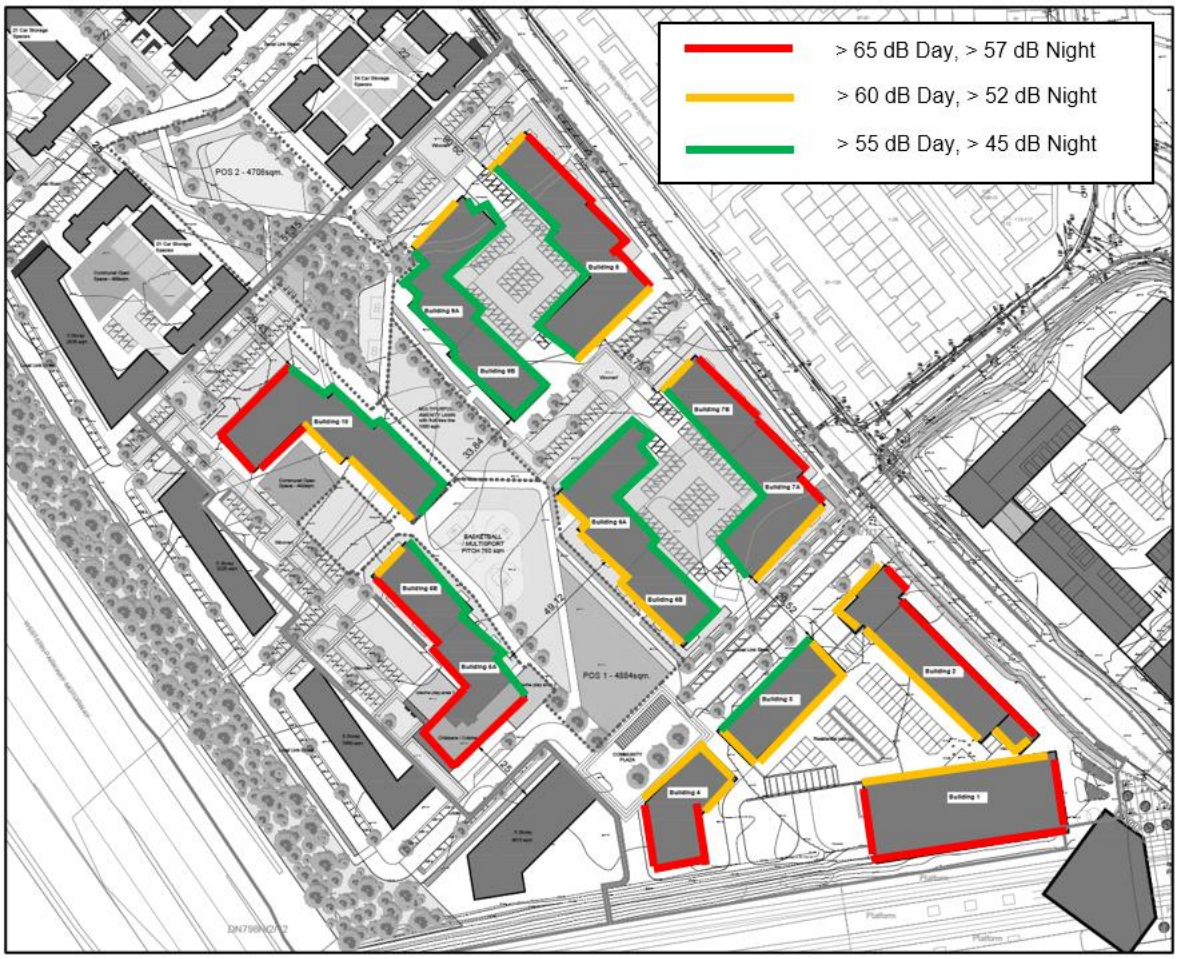


Figure 7.10 ***Façade Noise Levels***

External Noise Levels

Where external amenity areas are protected from traffic noise sources due to the layout of the proposed buildings, Figure 7.11 indicates that there areas will be within the recommended range of noise levels from ProPG of between 50 – 55 dB $L_{Aeq,16hr}$. Typically at areas closer to the M50 noise levels will be higher than the recommended noise levels, however, mitigation in the form of screening around these areas will not be sufficient to reduce noise to recommended levels due to the elevation of the M50 above the site ground floor level. Future phases of the development indicate large commercial buildings will be located closer to the M50, these would drastically reduce noise levels across the site when built.

The ProPG document allows for the impact of higher than desirable external noise levels to be off-set through assessment of a hierarchy of measures including “a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)”.

For this site there is a substantially sized publicly accessible park (New Cherry Orchard Park) available within 150m of the development as depicted in Figure 7.12. Given the distance away from the M50, the park will meet the recommended noise levels for external amenity areas. Hence, given that a large area of space within the development will provide amenity space that meets the ProPG guidance, and an additional public park is accessible in a 2 minute walk from the development, it is considered that the ProPG objectives for external space have been satisfied.

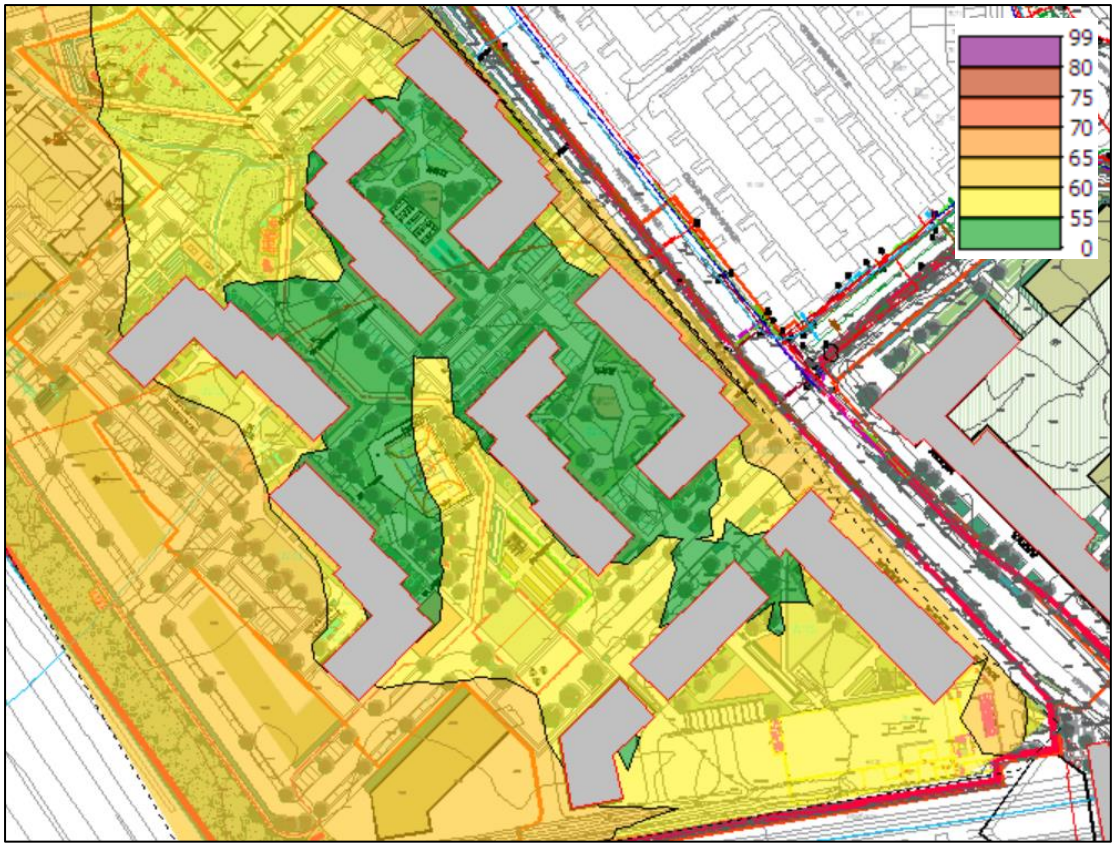


Figure 7.11 External Noise Contours at 1.5m Height

Figure 7.12 Location of Publicly Accessible Park

7.4.5 Operational Noise – Mechanical Plant and Services

BS 4142: 2014 +A1 2019: Methods for Rating and Assessing Industrial and Commercial Sound sets out a method for assessing the impact of a new continuous noise source to a residential environment such as plant items used to service the apartments and amenity areas. Residential units are the most sensitive to this source, therefore, control of impacts at these units ensures control elsewhere. It states that if the rating level of the item exceeds the background noise level by 5 dB, an adverse impact is likely to occur, while an exceedance of 10 dB is likely to cause a significant adverse impact, depending on the context.

The location or type of building services plant has not yet been established, therefore it is not possible to calculate the potential noise levels. In this instance, it is best practice to use the above guidance (BS 4142) to inform the detailed design during the selection and layout of building services for the development.

The background noise level at the boundaries of the site were determined through baseline noise surveys. The lowest average background noise levels were in the range 55 dB $L_{A90,16hour}$ during daytime periods and 50 dB $L_{A90,8hour}$ during night-time periods

Based on the above, it is recommended that cumulative plant noise from mechanical plant associated with the development does not exceed 45 dB $L_{Aeq,15min}$ at the closest existing noise sensitive locations and does not contain audible tones at any noise sensitive locations.

Plant items will be selected, designed and located so that there is no negative impact on sensitive receivers within the development itself. Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, then once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site.

7.5 Mitigation Measures

7.5.1 Construction Noise

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. Predictions indicate that moderate construction noise impacts are expected to occur when work is ongoing at boundary locations adjacent to noise sensitive locations, hence the contractor will ensure that all best practice noise and vibration control methods will be used. In this regard, various mitigation measures will be applied during the construction of the proposed development, such as:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring typical levels of noise and vibration during critical periods and at sensitive locations;
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.
- Furthermore, a variety of practicable noise and vibration control measures will be employed. These will include as standard:
- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around noisy processes and items such as generators heavy mechanical plant or high duty compressors;

- placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

7.5.2 Mechanical Plant and Services

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 noise-sensitive locations within the development. Due to the relative proximity of the NSLs within the development, this will also prevent a negative impact on NSLs in the surrounding area. The over-riding requirement is that the criteria in Section 7.4.5 is adhered to through implementation of best practice measures at the design stage including the following:

- Where ventilation is required for plant rooms, consideration will be given to acoustic louvers or attenuated acoustic vents, where required, to reduce noise breakout;
- Ventilation plant serving plant rooms and car parks will be fitted with effective acoustic attenuators to reduce noise emissions to the external environment;
- The use of perimeter plant screens will be used, where required, for roof-top plant areas to screen 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;
- Installed plant will have no tonal or impulsive characteristics when in operation.

7.5.3 Inward Noise Impact

As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. block work or concrete and spandrel elements) 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.

In this instance the facades highlighted in Figure 7.10 will be provided with glazing that achieves the minimum sound insulation performance as set out in Table 18.1. Any passive ventilation units will have to be carefully selected at the design stage to ensure that the composite sound reduction index of the façade is not compromised.

Table 7.14 Sound Insulation Performance Requirements for Glazing, SRI (dB)

Façade Ref	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
Red	28	23	32	38	42	44	35
Orange	22	20	26	36	39	31	31
Green							

The overall R_w outlined above is provided for information purposes only. The over-riding requirement is the Octave Band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same level of sound insulation performance set out in Table 18.1 or greater.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. 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 assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

7.6 Residual Impact

7.6.1 Construction Noise

Mitigation defined in Section 7.5.1 will provide a further reduction of approximately 5 dB to construction noise levels. Given the distance to local receptors and the mitigation applied the residual construction noise impacts are predicted to be negative, short-term and slight to moderate. Overall the impact is predicted to be not significant.

7.6.2 Construction Vibration

Given the distance to local receptors the residual vibration impacts are predicted to be negative, short-term and not significant.

7.6.3 Operational Stage – Inward Noise Impact

Following implementation of the sound insulation mitigation the residual impacts are predicted to be long-term, neutral and not significant.

7.6.4 Operational Stage – Additional Traffic on Public Roads

All assessed junctions indicate that impacts will be neutral to negative, imperceptible to slight and long term.

7.6.5 Operational Stage – Mechanical Plant

Once noise emissions from operational plant and activities are designed in accordance with BS 4142 Methods for Rating and Assessing Industrial and Commercial Sound the residual impacts are predicted to be long-term, negative and not significant.

7.7 Cumulative Effects

7.7.1 Construction Stage

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, including the following:

Table 7.15 Development Planning permissions that can potentially overlap with the development

Reference	Location	Development Description	Status	Decision Date
4313/22 (Part 8 Application)	Cherry Orchard Green, Dublin 10	Proposed construction of a residential development comprising **172 no. dwellings** (141 no. 3-bedroom two-storey terraced houses and 31 no. 2-bedroom two-storey terraced houses), 2 public open spaces approx. 0.83 ha /14% of site area, associated site infrastructure works/ supporting infrastructure, landscaping, public lighting, access roads/pavements, boundary treatments and provision for a link road/ pavements and cycleways to Ballyfermot	City Council – Approved	03.10.2022
312290	Park West Avenue and Park West Road, Park West, Dublin 12	**750 no. apartments**, creche and associated site works.	Granted	16.06.2022
3403/21	Site (1.26 ha) at Blocks 70 and 72 Park West Avenue and Park West Road, Park West, Dublin 12	Planning permission for the proposed development will consist of modifications to the permitted residential development of **86 no. residential units** over retail/restaurant uses (reg. ref. 3798/18, 3941/20, 2517/21) within blocks 70 and 72.	Granted	21.10.2021
SD188/0006 (Part 8 Application)	New Nangor Road, Clondalkin, Dublin 22.	Social Housing Development comprising of two and three storey housing and apartment units (**44 units in total**) on a site located at New Nangor Road, bounded by Riversdale Estate & Mayfield Park, Clondalkin, Dublin 22. The proposed development shall consist of: 19no. 3-bed, two storey houses, 1no. two storey specially adapted unit and 24no. 2-bed apartments in 3 storey building.	Part 8 Approved by Council	08.10.2018

5311/22	Block 7, Parkwest Business Campus, Parkwest, Dublin 12	The development will consist of the change of use of the ground, first and second floors from class 3 office use to class 8 for use as a health centre / clinic along with all associated works.	Granted	05.04.2023
312290	Park West Avenue and Park West Road, Park West, Dublin 12	Residential Development with a mix of other uses: **Retail Unit – 156 sqm** Block A Crèche – 410 sqm 84 child spaces **Café/bar – 91 sqm** Block G	Granted	16.06.2022
3999/21	Unit 55, Park West Road, Park West Industrial Park, Dublin 12, D12 X9F9	The development will consist of **extension of the existing office space at second floor level resulting in an overall office floorspace increase of 125 sqm approximately, construction of a new mezzanine level in the warehouse area (circa 257 sqm)** and a new stairwell. Creation of 2no. openings to the south elevation and 1no. opening to the west elevation and associated site development works. The development will also include the retention of **the existing office space at ground and first floor level of 250 sqm approximately**.	Granted Permission and Retention Permission	22.03.2022
SD21A/0100	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Construction of a revised two storey mono-pitched Discount Foodstore (with ancillary off-licence use), with an increased **total gross floor space of 2,415sq.m** and an **increased net retail sales area of 1,650sq.m (2,144sq.m and 1,400sq.m respectively permitted under SD19A/0286);** Associated reconfiguration of site layout and all other associated and ancillary modifications to SD19A/0286 above and below ground level, including modifications to pedestrian access and a new electricity substation and switch room building.	Granted	22.07.2021
SD20A/0309	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22	Provision of 4 new information and communications technology (ICT) Facility buildings and associated development at the subject site, **superseding elements of the extant planning permissions on site (Reg. Ref.: SD18A/0068 and Reg, Ref.: SD19A/0185).**	Granted	04.05.2021

		The proposed development will comprise the following: The construction **of 4 ICT Facility buildings (ICT Facilities 1, 2, 3, and 4) with a combined total gross floor area {GFA) of c. 47,564.5 sq. m.**		
SD19A/0185	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22.	Alterations to approved plans (Grant of Permission ref PL06S.243151 and PA Reg Ref SD13A/0271 and SD18A/0068) to the previously granted planning permission for the construction of an ESB 110kV Gas Insulated Substation for the use by Crag Digital Limited in support of the development and to incorporate an ESB Network Substation to improve and upgrade power supply to Clondalkin and adjoining areas; **the proposed ESB 110kV Gas Insulated Substation is a two storey building of gross floor area of 1,586sq.m and Client Control Room building of an area of 116sq.m**	Granted	09.09.2019
SD19A/0098	Unit E20, Cloverhill Industrial Estate, Ballymanaggin, Clondalkin, Dublin 22	(1) Demolition of front single storey entrance building and rear storage area; removal of trees to facilitate vehicular entrance, road and associated site preparation work; (2) **630sq.m. two storey front entrance building including café and office space** with flat roof and building signage; 206sq.m. single storey dispatch fridge with flat roof, level loading dock and canopy complete with associated plant; (3) roller shutter door and canopy and pedestrian doors to existing building; (4) enclosed bin store; (5) reorganisation of parking to provide 49 total parking spaces; (6) enlargement of the existing side plant enclosure; (7) all associated site, civil, drainage and landscaping works required for the construction and usage of the proposed building.	Granted	16.09.2019
SD19A/0100	Unit 1, Elmfield Court, Ninth Lock Road, Clondalkin, Dublin 22	Change of use for part of existing retail unit to Off-Licence sales area (**Site area 0.025 ha**)	Granted	01.07.2019

SD19A/0286	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Demolition of existing single storey discount food store (with ancillary off-licence use) measuring 1758sq.m gross floor space with a net retail sales area of 1286sq.m; **two storey mono-pitch discount food store (with ancillary off-licence use) measuring 2144sq.m gross floor space with a net retail sales area of 1400sq.m**	Granted	16.12.2019
316119	DART+ South West Electrified Heavy Railway Order - Hazelhatch & Celbridge Station to Heuston Station, and Hesuton Station to Glasnevin		Lodged	Case Due by 18.09.2023

Additionally to the above Table 7.15 there are additionally Local Area Plan sites that have been advised by Dublin City Council (DCC)l that could potentially overlap with proposed development during the construction phase, these are as follow:

Site 1 - DCC Affordable Purchase scheme delivering 172 new homes, targeting a construction completion date of Q1 2026.

Site 2 - Currently at design stage. A Part 8 is to be brought to council in Q1 2024 by DCC PPP section. Current iteration outlines 126 social and 47 affordable homes. There will be 3-4 shops. One 250sqm and the others in the region of 120sqm as per the LAP requirements.

The majority of the sites are located at distances greater than 200m from the proposed development and consequently there is likely to be no significant cumulative impacts associated with these developments.

Application 3403/21 is noted to be approximately 50m from the proposed development, however, given that other sensitive receptors with the potential to be impacted by the cumulative noise are located approximately 85m from the proposed development it can be concluded that cumulative construction noise will not be significant at these locations.

If further phases of the overall masterplan for the proposed development proceed simultaneously then elevated construction noise emissions due to cumulative noise are likely to occur at receptor locations proximate to two or more construction sites as well as a potential increase in the length of time that the receptor will be exposed to construction noise. Hence, cumulative construction impacts will need to be considered and managed during the construction phase. It is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors. With mitigation in place the impact of phases being constructed simultaneously will be negative, slight to moderate and brief to short-term.

7.7.2 Operational Stage

Traffic data already accounts for other projects within the area and also for the latter stages of the overall Cherry Orchard masterplan, hence, the cumulative assessment has already been accounted for.

7.7.3 Do Nothing Impact

Under the Do Nothing Scenario no construction works will take place and the previously identified impacts will not occur. Impacts from increased traffic volumes also not occur. The local noise and vibration levels 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 noise and vibration.

7.8 Interactions

The main interaction with noise and vibration and other / topics media are set out below.

Traffic and Transportation

With increased traffic movements, the noise levels in the surrounding area have the potential to increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be imperceptible to not significant on all junctions.

7.9 Difficulties Encountered

No difficulties were encountered during this assessment.

7.10 References

- BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings.
- British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound
- Design Manual for Roads & Bridges – LA111 Revision 2, 2020.
- British Standard BS 5228 (2009 +A1 2014): Code of Practice for Control of Noise and Vibration on Construction and Open Sites Part 1: Noise & Part 2: Vibration.
- British Standard BS 7385 (1993): Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- Calculation of Road Traffic Noise, Department of Transport Welsh Office, HMSO, 1988.
- ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.
- ISO 9613 (1996): Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.
- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, (May 2022).
- Professional Guidance on Planning & Noise (ProPG), (IoA, 2017).

8 Biodiversity

8.1 Introduction

The project subject of this Biodiversity assessment screening will comprise of the construction of medium and high-density residential development with some commercial and public realm works at Cherry Orchard, Dublin 10.

The summary description of the proposed development is:

The proposed development (GFA of c. 66,399sqm) involves the construction of a residential led mixed use scheme across 16 blocks contained within 9 buildings ranging in height from 4 to 15 storeys. The development includes the provision of 708no. residential apartments comprising 547no. cost rental and 161no. social / affordable units (28no. studio units, 263no. one-bed units, 368no. two-bed units and 49no. three-bed units, together with a convenience retail supermarket (2,523sq.m GFA), 7no. retail / commercial units (totalling 373sq,m GFA), community, arts and cultural spaces delivered across 13no. community and arts / cultural units (totalling 1,222sq.m GFA), and associated external events space and community gardens (1,157sq.m) and a childcare facility (672sq.m GFA) with associated external playing space (200sq.m) and all ancillary accommodation including sub stations, plant, refuse stores, cycle stores, and metre / comms rooms. The proposed development also includes the provision of landscaped public open space of 6,123 sq. m. including a public plaza, play space, outdoor fitness trail, communal amenity space of 5,596 sq. m. Private open space for the apartment units is achieved through the provision of balconies or terraces for all individual apartments.

The proposed development will also involve the provision of sufficient car parking (including accessible car parking) and bicycle parking spaces at undercroft and surface level throughout the development. The development will also provide for all associated ancillary site development infrastructure including site clearance, boundary treatment, associated public lighting, internal roads and pathways, ESB substations, switch room, water tank rooms, storage room, meter room, sprinkler tank room, comms room, bin storage, bicycle stores, green roofs, hard and soft landscaping, play equipment, attenuation area, green and blue infrastructure including green roofs, PV panels and all associated works and infrastructure to facilitate the development including connection to foul and surface water drainage and water supply.

Figure 8.1 Map showing the Development Site (in blue), with the Application boundary demarcated in red.

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the proposed development may have on Biodiversity, Flora and Fauna and sets out the mitigation measures proposed to award, reduce, or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance.

These include species and habitats with national and international protection under the Wildlife Acts 1976-2019, EU Habitats Directive 92/43/EEC.

The introduction provides a description of the legislation, guidance and policy context applicable to Biodiversity, Flora and Fauna. This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors. A description of the Baseline Ecological Conditions and Receptor Evaluation is then provided.

Potential Cumulative effects in combination with other projects are fully assessed. Proposed mitigation and best practice measures to avoid, reduce or offset the identified effects are described and discussed. This is followed by an assessment of residual effects taking into consideration the effect of the proposed

mitigation and best practice measures. The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity, Flora and Fauna.

The following defined terms are utilised in this chapter:

- For the purposes of this chapter, the entire project is referred to as 'the Proposed Development'.
- For the purpose of this chapter "Key Ecological Receptor" (KER) is defined as a species or habitat occurring within the zone of influence of the development upon which likely significant effects are anticipated.
- "Zones of Influence" (ZOI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.

8.1.1 Statement of Authority for Gerard Tobin BSc. (Zoology) MA

Gerard Tobin, BSc (Zoo), M.A., is an Ecological Consultant with 25 years' experience. He is a member of the Ecologist Panel with N.P.W.S. and a member of the Bat Expert Panel with both N.P.W.S and the Heritage Council.

His sample client list includes Tipperary County Council, South Dublin County Council, McConville and Associates Landscape Architects, Heritage Council, NPWS, William McGarry Engineers, Muyllaert & Associates Environmental Consultants., Fewer Harrington Lawlor & Partners Architecture & Engineering Specialists, Bluett and O`Donoghue Architecture and Engineering Specialists, among others.

He has been an ecological consultant on Hen Harrier and Corn Crake Farm Plans administered by NPWS under the Rural Environmental Program.

He worked for two years with Conservation Education Trust (CET), an environmental NGO in South County Dublin ,where he liaised with Dun Laoghaire Rathdown County Council`s Parks Department.

He has advised South Dublin County Council on the control and management of Giant Hogweed and Japanese Knotweed in the area around Loughlinstown, Co. Dublin.

He has advised farmers in the Hen Harrier Farm Plan scheme and landowners with planning applications on the control of Japanese Knotweed.

He is currently under contract to Russell Environmental and Sustainability Services to provide ecological reports about bats, squirrels and owls.

He is currently providing in-house ecological services for Mount Juliet Estate in Kilkenny.

From 1998 to 2019 he was a visiting lecturer in UCD, in the Science and Archaeology Departments, lecturing at post graduate (Masters Degree) level to students in a Sustainable Development Module (MSc. World Heritage Management).

8.2 Assessment Methodology

8.2.1 National Legislation

The Wildlife Act, 1976–2018, is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora. These species are therefore considered in this report as ecological receptors. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment)

Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2020).

The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order. It is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy The National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2017) (the “Plan”) demonstrates Ireland’s continuing commitment to meeting and acting on its obligations to protect Ireland’s biodiversity for the benefit of future generations through a series of targeted strategies and actions. The main objective of the Plan is to bring biodiversity into the mainstream of policy and decision-making. Objective 1 (Mainstream biodiversity into decision-making across all sectors) of the Plan identifies the following relevant measures in relation to future developments: “Incorporate into legislation the requirement for consideration of impacts on biodiversity to ensure that conservation and sustainable use of biodiversity are taken into account in all relevant plans and programmes and relevant new legislation; Public and Private Sector relevant policies will use best practice in SEA, AA and other assessment tools to ensure proper consideration of biodiversity in policies and plans; All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure; Strengthen ecological expertise in local authorities and relevant Government Departments and agencies; Local Authorities will review and update their Biodiversity and Heritage Action Plans; Local Authorities will review and update their Development Plans and policies to include policies and objectives for the protection and restoration of biodiversity; Develop a Green Infrastructure at local, regional and national levels and promote the use of nature based solutions for the delivery of a coherent and integrated network; 1 https://www.npws.ie/protected-sites/nha (accessed 15 May 2023). Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors; Integrate Natura 2000 and Biodiversity financial expenditure tracking into Government Programmes internal paying agency management procedures including linkage to the Prioritised Action Framework and this NBAP; Develop a Natural Capital Asset Register and national natural capital accounts by 2020, and integrate these accounts into economic policy and decision-making; Initiate natural capital accounting through sectoral and small scale pilot studies, including the integration of environmental and economic statistics using the framework of the UN System of Experimental-Ecosystem Accounting (SEEA); Establish a national Business and Biodiversity Platform under the CBD’s Global Business Partnership; Ensure Origin Green produces tangible benefits for biodiversity with increased emphasis on conservation and restoration of biodiversity; Implement actions from Ireland’s Biodiversity Climate Change Sectoral Adaptation Plan; Identify and take measures to minimise the impact of incentives and subsidies on biodiversity loss, and develop positive incentive measures, where necessary, to assist the conservation of biodiversity; Establish and implement mechanisms for the payments of ecosystem services including carbon stocks, to generate increased revenue for biodiversity conservation and restoration; Develop and implement a National Biodiversity Finance Plan to set out in detail how the actions and targets of this NBAP will be delivered from 2017 and beyond; and Monitor the implementation of the Plan” Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process.

8.2.2 European Legislation

The EU Habitats Directive (92/43/EEC) (the “Habitats Directive”) (together with the Birds Directive (79/409/EEC), (as subsequently codified by Council Directive 2009/147/EC on the conservation of wild birds) forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The Habitats Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The Habitats Directive and Birds Directive, which were transposed into Irish law through Part XAB of the Planning and Development Acts 2000-2023 (as amended) (from a land use planning perspective) recognise the significance of protecting rare and endangered species of flora and fauna, and more importantly, their habitats. Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Habitats Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures.

In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV. The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) is expressly forbidden.

Council Directive 2009/147/EC on the conservation of wild birds (the “Birds Directive”) instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4). In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment. A detailed assessment of the likelihood of the proposed development having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs, SPAs or cSPAs) has been carried out in the Appropriate Assessment Screening Report. A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions have been cross-referenced and incorporated.

8.2.3 Scoping/Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA)’s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the

development type. In addition, the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment: Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018). This assessment has been carried out in accordance with this guidance (i.e. We will provide an introduction, an assessment methodology, describe the baseline environment, describe the predicted impacts and and difficulties encountered.)

In addition to the above, the following legislation applies with respect to habitats, fauna and water quality in Ireland and has been considered in the preparation of this report: The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971) S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC). Planning and Development Acts 2000 – 2019. The following legislation applies with respect to non-native species:

Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011). This assessment has been prepared with respect to various planning policies and strategy guidance documents.

A detailed bat survey report is provided. This document provides a detailed description of survey methodologies undertaken at the site during the survey period. Full details of the survey times and dates and the methodologies followed are provided.

Survey design and effort was created in accordance with the best practice guidelines available at the time, ‘Bat Surveys: Good Practice Guidelines’ prepared by the Bat Conservation Trust (Hundt, 2012). Surveys undertaken were undertaken in strict accordance with those prescribed in SNH (2019) This is in line with standard best practice industry guidelines. 3 CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: https://cieem.net/resource/competencies-for-species-survey-css/ Accessed: 20.06.2023 4 NBDC, 2019.

8.3 Baseline Environment

8.3.1 Identification of Target Receptors and Key Ecological Receptors

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following a comprehensive desk study, initial site visits (main ecological surveys of the site undertaken; Site Visits 06/07/2022, 07/07/2022, 10/07/2022, 11/07/2022, 23/05/2023,24/05/2023 not including bat surveys) and stakeholder consultation; “Target receptors” likely to occur in the zone of influence of the development were identified. The target receptors included habitats and species that were protected under the following legislation:

- Annexes of the EU Habitats Directive Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely zone of impact.
- Species protected under the Wildlife Acts 1976-2019
- Species protected under the Flora Protection Order 2015

Habitats were identified using “Guide to Habitats in Ireland”, Fossitt J., Heritage Council 2000.

The site hasone main habitat classification within the study area:

Mosaic of Dry Meadows and Grassy Verges (GS2), Recolonising Bare Ground (ED3).

There are associated hedgerows (WL1) with an area of Scrub(WS1) to the east across the road .

The timing has certain limitations and certain flora and fauna may be missed due to the time of year. This limitation has been minimized by choosing seasonally diverse fieldwork timings.

Mosaic habitat

- Holly (Ilex aquilfolium)
- Elder (Sambucus niger)
- Bramble (Rubus spp)
- Elm suckers.(Ulmus spp,)
- Ash (Fraxinus excelsior)
- Willow (Salix spp.)
- Lonicera spp. hedge.
- Sycamore. (Acer pseudoplatanus)
- Holly (Ilex spp)
- Clevers, (Galium aparine),
- Creeping buttercup, (Ranunculus repens,
- Chickweed, (Stellaria media),
- Nettle, (Urtica dioica),
- Dock, (Rumex obtusifolius),
- Bindweed, (Convolvulus arvensis),
- Thistle, (Cirsium arvense),
- Bramble, (Rubus fruticosus),
- Sun spurge,(Euphorbia helioscopia),
- Ribwort Plantain (Plantago lanceolata),
- Dandelion,(Taraxacum officinale),
- Hawks beard,(Crepis capillaries),
- Clover, (Trifolium pratense),
- Herb Robert,(Geranium robertianum),
- Groundsel, (Senicio vulgaris),
- Cranesbill,(Geranium dissectum),
- Rose bay willow herb, (Epilobium angustifolium,
- Daisy, (Bellis perennis),
- Ivy (Hedra helix),
- Fathen (Chenopodium album)
- Fumitory (Fumaria officinalis),
- Lesser Celidine (Ranunculus ficaria),
- Fools Parsely (Aethusa cynapium),
- Buddleja,
- Yarrow, (Achillea millefolium),
- Ragwort (Senecio jacobaea),
- Hogweed (Heracleum sphondylium),
- Burdock (Artium lappa)
- Teasel (Dipsacus fullonum)
- Alder (Alnus glutinosa)
- Birch (Betula pubescens)
- Silverweed (Potentilla anserine)
- Blackthorn (Prunus spinosa)
- Meadowsweet (Filipendula ulmaria)
- Oxford Ragwort (Senecio squalidus) Along the boundary with the railway.

- Willow (Salix spp)
- Marsh Orchd (Dactylorhiza spp.)
- Pyramidal Orchis (Anacamptis pyramidalis)
- Sedges (Carex spp)
- Rushes (Juncus spp.)
- and grasses including; Yorkshire fog (Holcus lanatus) Scutch (Elymus repens), Annual meadow grass (Poa annua), Cocksfoot (Dactylis glomerata) and False oat (Arrhenatherum elatius).

This is a heavily modified habitat as a result of human interference. The mosaic nature of the habitat stems from the years of neglect and has resulted in the encroachment of hedgerow into the meadow habitats. The grasses within the study area are all lodged and ungrazed.

The orchids are found clustered around the western boundary with the motorway in the recolonising bare ground section of the site at GR IO 07758 32794.

The sedges and rushes appear to occupy an area that at some stage was waterlogged within the recolonising bare ground.

The area currently bounding the railway track is characterised by Buddleia and Alder (Alnus spp.)

The scrub Area is characterised by Willow (Salix spp.), Buddleia and Mallow (Malva sylvestris) and is located across the road and east of the main site.

The boundary with the motorway is a substantial hedgerow with dense tree and ground flora. This area is outside the boundary of the development site.

Fauna

Fauna was identified by visual, and spraint evidence and the probable presence of certain species was ascertained by the availability of suitable habitat. Terrestrial vertebrate and invertebrate fauna on-site can be assumed to be mobile and capable of movement between the various habitats.

Invertebrates

- Cinnabar Moth
- Shield Bug (Acanthasomosa haemorrhoidale)
- Earwig (Forficula auricularia)
- Honey Bee (Apis mellifera spp.)
- Ladybird (Coccinell 7-punctata)
- Garden Spider (Araneus diadematus)
- Woodlouse (Oniscus asellus)
- Orange Tipped Butterfly (Anthocaris cardamines)

This is not an exhaustive list of the invertebrate species and is merely representative of the species found during field work.

Birds

- Pied wagtail (Motacilla alba)
- Thrush (Turdus philomelos)
- Blackbird (Turdus merula)
- Blue Tit (Parus caerulus)
- Great Tit (Parus major)
- Chaffinch (Fringilla coelebs)
- Greenfinch (Carduelis chloris)

- Magpie (Pica pica)
- Jackdaw (Corvus monedula)
- Hooded Crow (Corvus corone)
- Rook (Corvus frugilegus)
- Sparrow Hawk (Accipiter nisus)
- Robin (Erithacus rubecula)
- Starling (Sturnus vulgaris)
- Wren (Trogolodytes trogolodytes)
- Dunnock (Prunella modularis)
- Woodpigeon (Columba palumbus)
- Feral Pigeon (Columba livia)
- Goldcrest (Regulus regulus)
- Swallow (Hirundo rustica) ,
- Greenfinch (Carduelis chloris)
- House Sparrow (Passer domesticus)
- Tree Creeper (Certhia familiaris)
- Meadow pipit (Anthus pratensis) nesting in the recolonizing bare ground
- Herring Gull (Larus argentatus)
- Buzzard (Buteo buteo)

The above species were all seen and heard on visits to the site.

Brent Geese are unlikely to forage in the area as they need cropped grass as a food source and the hedgerows present will prevent access to the open area for a species that need a glide path to land.

Mammals

No suitable roosting areas were seen for Bats (Chiroptera) within the site but a foraging presence is present (see bat survey G. Tobin 06/07/2022 and 07/07/2022. 23/05/2023, 24/05/2023)

- Pipistrelle (Pipistrellus pipistrellus)(Red Data Book 2,Hab. Dir. 4,Bern Convention 3)
- Soprano Pipistrelle (P. pygmaeus) (as per common)
- Leislers Bat(Nyctalus leisleri)(Red Data Book 2,Hab. Dir. 4,Bern Convention3)
- Fox (Vulpes vulpes) denning within the site
- Rat (Rattus norvegicus)
- Hedgehog (Erinaceus europaeus) (Red Data Book 2,Bern Convention 3)
- Field mouse (Apodemus sylvaticus)
- Pygmey shrew (Sorex minitus)
- Rabbit (Orcytolagus cuniculus)
- Stoat (Mustela erminea)
- Can all be expected on-site.

No badger setts were found and the absence of available forage areas would suggest that badgers are absent as a breeding species in the locality.

8.3.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a

hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

High Value:

- International
- National
- County

Low Value:

- Local Importance

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned.

Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and are of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors. Any ecological receptors that are determined to be of National or International, County or Local importance (Higher Value) following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

There are no Key Ecological Receptors present on site. The mosaic habitat is of Local Importance only (Low Value).

8.3.3 Desktop Study

A survey of published material was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology known to occur in the existing environment. Material reviewed includes the Site Synopses for designated sites within the zone of influence, as compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht, bird and plant distribution atlases and other research publications.

Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Development

The potential for the proposed development to impact on sites that are designated for nature conservation was considered in this chapter of the EIAR. Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as ‘European Sites’. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report that accompanies this application. As per EPA draft Guidance 2017, “a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement” but should “incorporate their key findings as available and appropriate”.

The potential for effects on these designated sites is fully considered in this chapter of the EIAR. Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these

designated sites is fully considered in this Biodiversity chapter of the EIAR. The following methodology was used to establish which sites that are designated for nature conservation have the potential to be impacted by the proposed development: Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 06/05/2023.

The datasets were utilised to identify Designated Sites which could feasibly be affected by the proposed development. All designated sites within a distance of 15km surrounding the development site were identified. In addition, the potential for connectivity with European or Nationally designated sites at distances of greater than 15km from the proposed development was also considered in this initial assessment.

All European Designated Sites are fully described and assessed in the Screening for Appropriate Assessment report submitted as part of this planning application. The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 01/08/2023. Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.

Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in Cherry Orchard, within which the proposed development site is located.

The site is not nationally important and is of Low value, Local Importance.

A review of bat roost records for the area did not identify any roosts within or immediately adjacent to the proposed development. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits. The desk study also provided useful information to inform the ecological surveys undertaken on site as well as the identification of pathways for potential impact on sensitive ecological receptors.

8.3.4 Ecological Walkover Survey Results

Description of Habitats and Flora within the Ecological Survey Area. The habitats on the site of the proposed development were the subject of a detailed survey and assessment. No invasive species, listed on the Third Schedule of the S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011, were recorded within the study area. The only non-native invasive species recorded on site include butterfly bush (Buddleja davidii). Although an invasive species, this are not listed on the Third Schedule. No botanical species protected under the Flora (protection) Order (1999, as amended 2022) were recorded during the survey.

Invasive species survey

During the walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

Buddleia davidii appears to be the sole invasive non-native species present especially in the plot across the main road to the east of the main site.

Significance of Habitats

Ecological evaluation follows a methodology that is set out in Chapter 3 of the ‘Guidelines for Assessment of Ecological Impacts of National Roads Schemes’ (NRA, 2009). The habitats within and adjacent to the development site were evaluated in accordance with the criteria developed by the NRA (2009b), which classifies sites in terms of their ecological importance, i.e. ‘international importance’, ‘national importance’, ‘county importance’, ‘local importance (higher value)’ or ‘local importance (lower

value)'. Following the extensive surveys that were undertaken, it is concluded that the habitats within the study are those that are classed as Low value, Local Importance.

Fauna

Dedicated faunal walkover surveys were undertaken at the site on the following dates: 06/07/2022, 07/07/2022, 10/07/2022, 11/07/2022, 23/052023,24/05/2023.

In addition to the above targeted surveys, additional faunal signs/sightings were also recorded during other surveys including habitat assessments, bat surveys and bird surveys. The site was also visited on numerous additional occasions during the undertaking of bat surveys throughout the period of time that site walk overs were undertaken.

Bats Bat surveys were undertaken on 06/07/2022 and 07/07/2022. 23/05/2023, 24/05/2023 in accordance with Scottish Natural Heritage Guidance (SNH 2019), form the core dataset for the assessment of effects on bats at the proposed development site. It is supplemented by additional data derived from surveys undertaken on the site which were designed in accordance with the Bat Conservation Trust's guidelines. Bat surveys included roost survey, manual transects surveys and ground-level static surveys.

Other Fauna

During the walkover survey, signs of the following mammal species were recorded: Fox (Vulpes vulpes) scat was recorded at various locations throughout the study area. As signs of fox were regularly recorded throughout the site, the distribution of the species has not been mapped. Hare (Lepus timidus hibernicus) was not recorded throughout the study area nor were its droppings and footprints. The species would be expected to be widespread throughout the habitats present but local trespass and poaching are a factor in its non-occurrence.

Small mammal species such as pygmy shrew (Sorex minutus) and wood mouse (Apodemus sylvaticus) but also larger mammals such as stoat (Mustela ermina) and mink (Mustela vison) were detected or expected from the proposed development site.

Limited suitable habitat occurs on site for protected faunal species. No signs of any additional protected fauna were recorded within the study area during the field survey. The study area provides habitat for a range of other faunal species as described in the preceding sections.

However, due to the footprint and nature of the proposed development, they are likely to be significantly affected by the proposed development. They are however not considered to be Key Ecological Receptors. For this reason, these species are not considered further in this EIAR. Incidental records of invertebrate were recorded during the walkover surveys of the site.

Bats

The habitats surrounding the proposed works location are likely to be utilised by a bat population of Local Importance (higher value). All bat species in Ireland are protected under both national legislation – (Wildlife Act, 1976, as amended in 2017) and European legislation – (Habitats Directive (92/43/EEC). Bats are likely to forage and commute within the vicinity of the proposed development. No potential bat roosting features were identified within or adjacent to the development footprint.

Commuting and foraging recorded during field work indicates that species are currently following a route through the southern tip of the proposed development. The bats are flying at an approximate height of 30m (based on receiver strength of the bat detectors and infra-red observation).

8.4 Predicted Impacts

8.4.1 Characterisation of Impacts and Effects

The proposed development will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the corresponding EPA guidance (EPA 2017). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below: Positive or Negative. Assessment of whether the proposed development results in a positive or negative effect on the ecological receptor.

Extent

Description of the spatial area over which the effect has the potential to occur.

Magnitude: Refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population. Duration is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.

Frequency and Timing. This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.

Reversibility. This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

Determining the Significance of Effects The ecological significance of the effects of the proposed development are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018). For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018). When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed
- There will be an effect on the nature, extent, structure and function of important ecological features
- There is an effect on the average population size and viability of ecologically important species.
- There is an effect on the conservation status of important ecological habitats and species.

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2017) and the Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines. The terminology used in the determination of significance follows the suggested language set out in the EPA Guidelines (2017)

Criteria for determining significance of effect, based on (EPA, 2017) guidelines.

Effect Magnitude Definition:

- No change : No discernible change in the ecology of the affected feature.
- Imperceptible effect : An effect capable of measurement but without noticeable consequences.
- Not Significant: An effect which causes noticeable changes in the character of the environment but without significant consequences.
- Slight effect :An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate effect: An effect that alters the character of the environment that is consistent with existing and emerging trends.
- Significant effect: An effect which, by its character, its 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 effect : An effect which obliterates sensitive characteristics. As per TII (NRA, 2009) and CIEEM (2018) best practice guidelines, the following key elements should also be examined when determining the significance of effects.

The likely effects on 'integrity' should be used as a measure to determine whether an impact on a site is likely to be significant (NRA, 2009). A 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018). Integrity In the context of EcIA, 'integrity' refers to the coherence of the ecological structure and function, across the entirety of a site, which enables it to sustain all of the ecological resources for which it has been, valued (NRA, 2009). Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

There are no habitats or species characterised as Key Ecological Receptors on site.

Conservation Status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows: Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

As defined in the EU Habitats Directive 92/43/EEC, the conservation of a habitat is favourable when:

- Its natural range, and areas it covers within that range, are stable or increasing
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future
- The conservation status of its typical species is favourable.

The conservation of a species is favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future
- There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

According to the NRA/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e., local, county, national, international).

Incorporation of Mitigation Section assesses the potential effects of the proposed development to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on sensitive ecological receptors are predicted, mitigation is incorporated into the project design or layout to address such impacts. The implemented mitigation measures avoid or reduce or offset potential significant residual effects, post mitigation.

8.4.2 Do-Nothing Effect

If the proposed development were not to proceed, the site would continue to deteriorate as more scrub intrusion and trespass/fly tipping become more prevalent.

8.4.3 Effects on Designated Sites

None of the elements of the proposed development are located within the boundaries of any Nationally or European designated sites important for nature conservation. There will be no direct effects on any designated site as a result of the construction and operation of the proposed development.

The Screening process was carried out to ascertain if the project was likely to have significant effects on the Natura 2000 sites within the threshold distance of the project site . If this were the case, then it would be necessary to carry out an Appropriate Assessment.

Following the review of the project in accordance with the Guidance for Planning Authorities entitled “Appropriate Assessment of Plans and Projects in Ireland”, the screening has established that the project poses no potential for significant effects and as such requires no further appropriate assessment. The proposed development will result in the loss of areas of habitat that are of Local Importance (Lower Value) and are not identified as KERs. Any direct or indirect impacts on these habitats are not significant in either a local or national context.

8.4.4 Effects on Protected Fauna During Construction

The proposed development has the potential to result in habitat loss and disturbance impacts on faunal species that were recorded on the site but were not included as KERs. Although foxes are not a protected species should fox dens be discovered during construction work then avoidance of the den site will be initiated until completion of breeding is achieved.

8.4.5 Effects on Habitats Post Construction

The operation of the proposed development will not result in any additional negative impacts on protected species or habitats.

These habitats are not considered to be a KER in the context of the operation of the proposed development.

The addition of new plantings post construction will broaden the habitat base resulting in new “niche” opportunities opening for both flora and fauna.

8.4.6 Effects on Fauna during Operation

The operation of the proposed development has the potential to result in significant effects on the terrestrial fauna at the site of the proposed development. There is alternative habitat available within the current road margins along the M50 and species may relocate here. None of the species currently occurring are deemed to be Key Ecological Receptors.

8.5 Mitigation Measures

There are **NO** Key Ecological Receptors on site and as such mitigation measures are unnecessary to protect these. Equally there are NO Key Ecological Receptors in proximity or connected to the proposed development saite and as such mitigation measures are unnecessary to protect these.

Bats currently commute/forage along the southern boundary with the railway at a height of c. 30 m (Bat surveys G, Tobin). The current proposed development will not negatively impact on this activity.

8.6 Cumulative Impacts

The proposed development was considered in combination with other plans and projects in the area that could result in cumulative impacts on European Sites, Nationally designated sites and protected species. This included a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects.

Assessment of Cumulative Effects The residual construction and post operational/construction impacts of the proposed development are considered cumulatively with other plans and projects as described above. Particular focus has been placed on those plans and projects that are in closest proximity to the proposed development.

There are a total of 4 no. residential planning applications, of which 3 are within the Dublin City administrative boundary in close proximity to the proposed development. The residential planning pipeline includes a total of 1,052 units.

List of Residential Development within the 1km buffer of the Subject Site

4313/22 (Part 8 Application) Cherry Orchard Green, Dublin 10: Proposed construction of a residential development comprising 172 no. dwellings (141 no. 3- bedroom two-storey terraced houses and 31 no. 2-bedroom two-storey terraced houses), 2 public open spaces approx. 0.83 ha /14% of site area, associated site infrastructure works/ supporting infrastructure, landscaping, public lighting, access roads/pavements, boundary treatments and provision for a link road/ pavements and cycleways to Ballyfermot City Council – Approved 03.10.2022.

312290 Park West Avenue and Park West Road, Park West, Dublin 12: 750 no. apartments, creche and associated site works. Granted 16.06.2022.

3403/21 Site (1.26 ha) at Blocks 70 and 72 Park West Avenue and Park West Road, Park West, Dublin 12: Planning permission for the proposed development will consist of modifications to the permitted residential development of 86 no. residential units over retail/restaurant uses (reg. ref. 3798/18, 3941/20, 2517/21) within blocks 70 and 72. Granted 21.10.2021.

SD188/0006 (Part 8 Application) New Nangor Road, Clondalkin, Dublin 22: Social Housing Development comprising of two and three storey housing and apartment Part 8 Approved by Council 08.10.2018.

The area is heavily developed with many residential and commercial projects already completed.

Potential proposals for the remainder of this site will entail similar connection to existing services and little impact from this accumulation of construction projects, both completed and proposed, is expected.

Cumulative impacts are of greater concern when there are Key Ecological Receptors present or where there is a potential to negatively impact on national or internationally important sites. In this proposed development there are no KER`s present and no potential to impact national or international sites.

In considering this proposal the current mix of residential and commercial units on all adjoining sites was considered as was the potential for future development on the remaining portion of this site. Future plans for sites elsewhere in the locality are constrained by the paucity of available, suitable, sites. Any

future developments in this area will not cumulatively impact the present site as it is already degraded by fly tipping, antisocial behaviour, lack of grazing and the pressures on flora and fauna resulting from these.

The residual construction and post operational/construction impacts of the proposed development are considered cumulatively with other plans and projects as described above. Particular focus has been placed on those plans and projects that are in closest proximity to the proposed development.

All other construction activity in the locality is completed with mixed commercial and residential units evident in adjoining sites.

Potential future plans for the remainder of this site have been considered.

As such, there is no potential for the proposed development to contribute to any significant cumulative habitat loss when considered in combination with any other plans and projects.

No significant effects as a result of the proposed development in relation to disturbance, displacement or mortality of faunal species has been identified. Therefore, there is no potential for the proposed development to contribute to any cumulative effect in this regard. The proposed development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects. In the review of the projects that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development.

Specifically, there will be no loss of Key Ecological Receptor habitats or species. There will be no impact on population numbers of Key Ecological Receptors.

There will be no fragmentation of Key Ecological Receptor habitats or species.

There will be no negative impacts on Natura 2000 sites within the potential impact zone.

There will be no effect on the natural range of protected habitats or species, and areas they cover within that range, are stable or increasing.

The specific structure and functions which are necessary for the long-term maintenance of species and habitats exist and are likely to continue to exist for the foreseeable future.

The conservation status of habitats and species is favourable.

There will be no effects on the population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats.

The natural range of the species will neither being reduced nor is likely to be reduced for the foreseeable future.

There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

8.7 Biodiversity Interactions

All environmental factors are interlinked to a degree such that interrelationships exist on numerous levels. Interactions within the study area can be one-way interactions, two-way interactions and multiple-phase interactions which can be influenced by the proposed development. The purpose of examining these interactions is to draw attention to significant interaction and interrelationships in the existing environment. In preparing and co-ordinating this EIAR, each of the specialist consultants liaised with each other and dealt with the likely interactions between effects predicted as a result of the

proposed development, ensuring that appropriate mitigation measures were incorporated into the design process.

Biodiversity / Soils

When soil is exposed after vegetative clearance there may be increased run-off and evaporation. Mitigation measures will be implemented during construction to prevent this run-off water from discharging directly to watercourses. Potential construction stage effects arising from the general loss and fragmentation of some habitats and reduction of associated opportunities for biodiversity are considered neutral to slight negative during the construction phase, while potential operational stage effects are considered imperceptible neutral as new planting/landscaping matures. Residual soils arising as a result of excavation at the development site will be used in landscaping works in the proposed public open space as much as possible rather than transporting off-site.

Biodiversity / Water

When land surfaces are exposed after vegetative clearance there may be increased run-off and evaporation. Mitigation measures will be implemented during construction to prevent this run-off water from discharging directly to watercourses. As concluded in the Appropriate Assessment Screening Statement submitted with the application there are no elements of the proposed development that are likely to give rise to significant effects on the local Natura 2000 sites. The implementation of construction and operational phase soils and water management proposals, together with the site drainage design will adequately reduce such potential impacts arising from the development site on these aquatic habitats in the wider area. Potential construction and operational phase effects on biodiversity associated with aquatic habitats in the wider area are considered /imperceptible neutral with the implementation of soils and water management proposals.

Biodiversity / Noise /Air Quality

Increased noise levels during the construction phase will only be temporary and are not expected to have a long-term significant adverse effect upon remaining fauna within the wider landscape. Operational noise will be audible at a low level in the ambient noise and the impact is predicted to be minor.

Exposed soil during the construction phase of the proposed scheme may give rise to increased dust emissions. However, the implementation of dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust.

Biodiversity / Landscape

The landscape masterplan proposed as part of the development will retain and enhance the remaining hedgerows features with native planting, tree cluster/treelines, small areas of wildflower meadow and parkland/garden habitat. Potential construction stage effects arising from the general loss and fragmentation of some habitats and reduction of associated opportunities for biodiversity are considered neutral to slight negative during the construction phase, while potential operational stage effects are considered imperceptible neutral as new planting/landscaping matures. Due to the existing degraded nature of the habitats on site the loss of these will have little residual negative impact on this locality and no residual impact in the national or international context. Otherwise, the successful implementation of the mitigation measures as outlined in this EIAR and accompanying documents, together with the landscape masterplan will minimise the potential impacts of the proposed development on local biodiversity such that its residual impact on other habitats, flora and fauna will be imperceptible neutral overall. There will be an increase in ecological niche availability associated with the post construction phase of this development. The removal of some vegetation within the development footprint and surrounding areas is likely to result in a change to the visual landscape during the construction phase, which will become part of the normal landscape of the wider area for the duration of the operational phase. The visual effect of this change is considered to be long-term, localised, and slight.

8.8 Difficulties Encountered

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys on numerous dates during all seasons and over 2 years; provides an accurate prediction of the likely ecological effects of the proposed development; prescribes best practice and mitigation as necessary; and, describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. The habitats and species on the site were readily identifiable and comprehensive assessments were made during the field visit. No significant limitations in the scope, scale or context of the assessment have been identified.

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed.

8.9 Conclusions

Following desktop and fieldwork scoping studies it can be shown that there will be no significant adverse effects as a result of the proposed development in relation to disturbance, displacement or mortality of faunal species has been identified.

Equally it has been shown that there will be no significant adverse impacts on habitats or species of conservation concern.

Therefore, there is no potential for the proposed development to contribute to any cumulative effect to a loss of Key Environmental Receptors. The proposed development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects.

Specifically:

- there will be no loss of Key Ecological Receptor habitats or species. There will be no impact on population numbers of Key Ecological Receptors.
- There will be no fragmentation of Key Ecological Receptor habitats or species.
- There will be no negative impacts on Natura 2000 sites within the potential impact zone.
- There will be no effect on the natural range of protected habitats or species, and areas they cover within that range, are stable or increasing.
- The specific structure and functions which are necessary for the long-term maintenance of species and habitats exist and are likely to continue to exist for the foreseeable future post construction.
- The conservation status of habitats and species is favourable.
- The natural range of species of conservation concern will neither be reduced nor is likely to be reduced for the foreseeable future.
- There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.
- There will be a net increase in biodiversity post construction with the creation of new habitats and an increase in available ecological niches.

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9 Archaeological, Architectural and Cultural Heritage

9.1 Introduction

This archaeological, architectural and cultural heritage assessment was undertaken at Cherry Orchard, Dublin 10 in advance of future development. The objective of the study was to identify and record the location, nature and dimensions of archaeological or cultural heritage features, fabric or artefacts that may be impacted by proposed development, gauge the level of impact and include recommendations for potential mitigations necessary. The study included an examination of existing documentary sources, which was completed in tandem with non-intrusive walkover, geophysical survey and licensed archaeological test trench assessment.

The study was undertaken by Maeve McCormick BA MSc Archaeological Director with Archer Heritage Planning Ltd who has 6 years experience in archaeological and cultural heritage impact assessments with an additional 10 years of archaeological field experience. She has been eligible to conduct licenced archaeological excavations (under Section 26 of the National Monuments Act 1930 (as amended) since 2019.

Site 4 covers an area of c.11.28ha (hectares). It is roughly rectangular in shape and bounded by high galvanised steel fencing on all sides. Remnants of land divisions which can be related to early OSI map sources can be identified in the form of hedgerows. The boundary between Clondalkin and Ballyfermot parishes runs roughly through the middle of this site. The southern half was previously stripped of topsoil. The northern part comprises three smaller fields.

The subject Site is c. 12.86 hectares and is located within the *Park West – Cherry Orchard Local Area Plan 2019* lands. It is comprised of two separate parcels of land; Site 4 (M50/ Cedarbrook Avenue) and Site 5 (Bernville), as identified in the LAP.

Site 4 covers an area of c.11.28ha (hectares). It is roughly rectangular in shape and bounded by high galvanised steel fencing on all sides. Remnants of land divisions which can be related to early OSI map sources can be identified in form of hedgerows. The border between Clondalkin and Ballyfermot parishes runs roughly through the middle of this site. The southern half was previously stripped of top soil and disturbed during previous construction activities unrelated to the current application. The northern part comprises a Greenfield area set out in rough pasture.

Site 5 covers an area of c.1.58ha. It is irregular in shape and bounded by galvanised steel fencing to the NW and NE, Park West Avenue to the SW and a cinder block wall to the SE. The site appears to be covered by mounds of soil from previous construction activities in the area.

9.1.1 Definitions

Heritage is anything of value which may inherited from previous generations and which is worthy of preservation. For the purposes of this chapter, a distinction is made between tangible and intangible heritage assets.

Tangible heritage assets are taken to refer to ‘man-made’ things such as monuments, buildings, architecture, landscapes and objects of heritage value. These could be collectively termed as built heritage.

Intangible heritage assets are taken to include language, place names, folklore, storytelling and local knowledge. These could be collectively termed as cultural heritage.

9.1.2 Consultations

Consultation with the following statutory bodies was undertaken at different stages during the archaeological assessment. These are set out below.

A licence application and methodology to use a detection device for archaeological purposes was submitted to the DHLGH under Section 2 of the National Monuments Act 1987 (as amended). The application was approved by DHLGH in consultation with the NMI (licence 22R0221). A final report was submitted on 24th June 2022.

A licence application and methodology to excavate test trenches was submitted to the DCHG and NMI under Section 26 of the National Monuments Act 1930 (as amended). The application was approved by DCHG in consultation with the NMI (22E0522). A final report was submitted on 5th August 2022.

9.2 Assessment Methodology

The Cultural Heritage and Archaeology study included a desk-based study where relevant databases and sources were consulted to determine the archaeological potential of the general area. In addition to the desktop assessment and site inspection, geophysical survey and test excavation assisted in providing an understanding of the receiving archaeological and cultural heritage environment and potential.

9.2.1 Desktop Study Methodology

The desktop study collated data from the Record of Monuments and Places (RMP), the Topographical files of the National Museum of Ireland (NMI), cartographic sources, aerial photography, documentary research and relevant on-line databases.

9.2.1.1 Record of Monuments and Places (RMP)/ Sites and Monuments Record.

The Record of Monuments and Places (RMP) is a statutory inventory of archaeological sites protected under the National Monuments Acts 1930-2004 (Section 12, 1994 Act), compiled and maintained by the Archaeological Survey of Ireland (ASI). The inventory concentrates on pre-1700 AD sites and is based on a previous inventory known as the Sites and Monuments Record (SMR) which does not have legal protection or status (see www.archaeology.ie).

9.2.1.2 Topographical Files of the National Museum of Ireland.

The National Museum of Ireland Topographical Files is the national archive of all known antiquities recorded by the National Museum listed by county and townland/ street. These files relate primarily to artefacts but also include references to monuments and contain a unique archive of records of previous archaeological excavations. The Museum files present an accurate catalogue of objects reported to that institution from 1928.

9.2.1.3 Aerial Photography

Aerial photography (and other forms of remote sensing) may reveal certain archaeological features or sites (earthworks, cropmarks, soil marks) that for many reasons may not be appreciated at ground level. There are a number of available collections including the National Monuments Section, Geological Society of Ireland (1970–73), Ordnance Survey of Ireland (1995, 2000, 2005), National Museum of Ireland (St Joseph CUCAP Collection) and Air Corps (1950s–1970s).

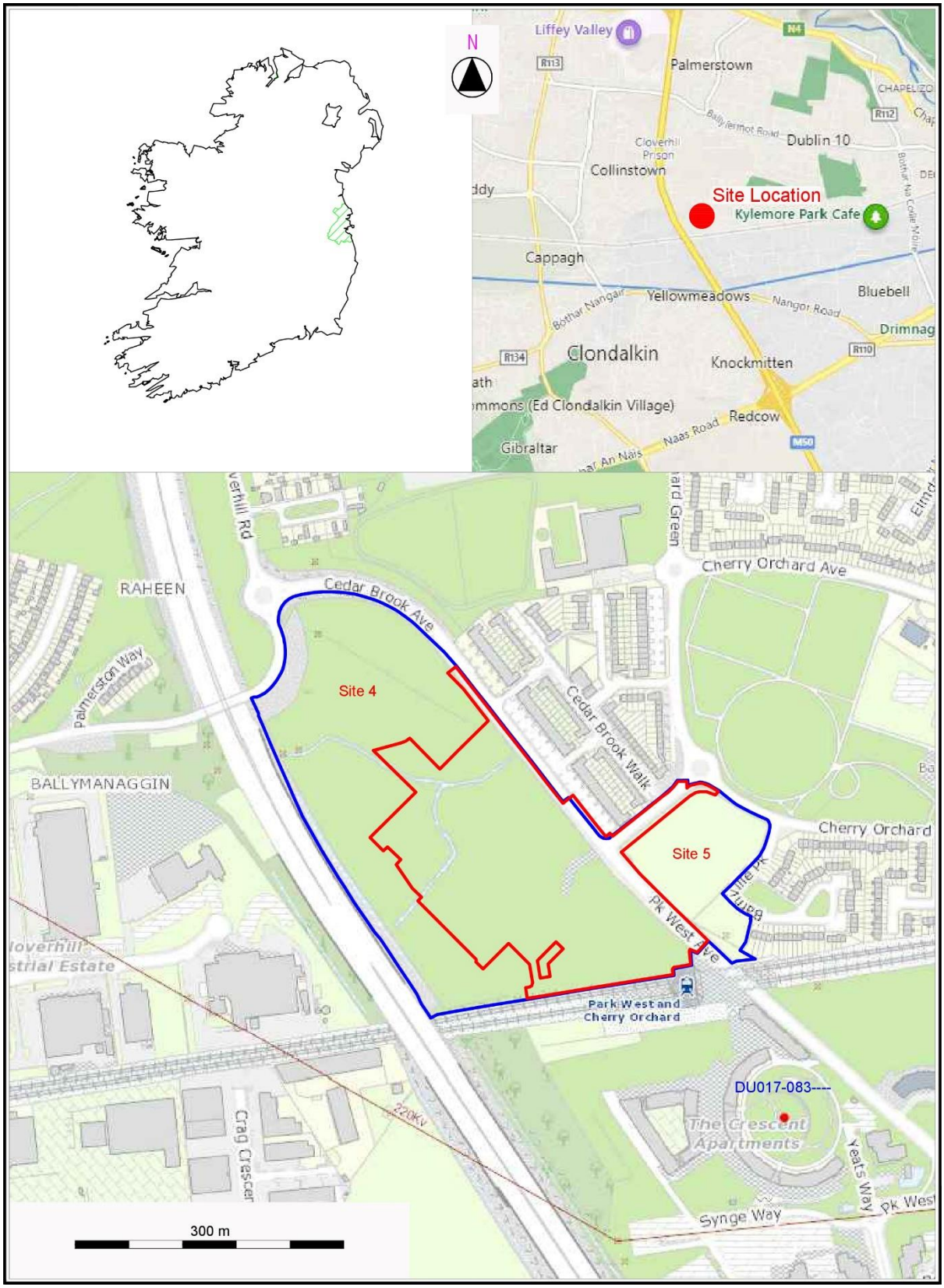

Figure 9.1 Site Location and Surrounding RMPs

9.2.1.4 Historical Maps

Analysis of historic mapping can show human impact on landscape over a prolonged period. Large collections of historical maps (pre- and early Ordnance Survey maps as well as estate or private maps) are held at the Glucksman Map Library, Trinity College and other sources (UCD Library, Ordnance Survey Ireland, local libraries and published material).

9.2.1.5 Record of Protected Structures & National Inventory of Architectural Heritage

Local Authorities have a statutory responsibility to safeguard architectural heritage in accordance with Part IV of the Planning and Development Act 2000. Under S.51 (1), a County Council must compile a Record of Protected Structures (RPS), which lists all structures that are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The protection, unless otherwise stated, includes the exterior and interior of the structure, lands lying within its curtilage (boundary), other structures and their interiors within the curtilage, plus all fixtures and fittings that form part of the interior or exterior of any of these structures. Buildings can be added to, or deleted from the RPS at any time, though generally this occurs when the county development plan is being reviewed.

The National Inventory of Architectural Heritage (NIAH) was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. It is intended to provide a basis for recommendations of the Minister for Culture, Heritage and the Gaeltacht to Local Authorities for the inclusion of particular structures in Records of Protected Structures (RPS).

9.2.2 Field Survey

9.2.2.1 Site Walkover Survey

Site inspection was undertaken on 31st May 2022 by Bart Korfanty MA of Archer Heritage Planning Ltd. This involved a systematic, non-intrusive walkover survey. This survey assessed current land-use patterns, site topography, site access and the presence of any previously unrecorded sites of archaeological and cultural heritage interest.

9.2.2.2 Geophysical Survey

A magnetic gradiometer survey was carried out by Bart Korfanty and Aidan O'Connell of Archer Heritage Planning Ltd in June 2022 under Licence No 22R0221. The objective of the survey was to identify and describe magnetic anomalies within the site that may represent unrecorded archaeological features or deposits. High resolution magnetic gradiometer survey was undertaken on c. 2.13 ha.; the portion suitable for geophysical survey within the subject site. The remainder of the area was not surveyed due to obstructive vegetation (large hedges between fields) and a southern portion of the site was heavily disturbed by previous construction works.

9.2.2.3 Licensed Archaeological Test Excavation

Licensed archaeological test excavations were undertaken in July 2022 by Maeve McCormick of Archer Heritage Planning Ltd. under licence 22E0522. The aim of the test trenching was to test geophysical anomalies and the general archaeological potential of the site. A total of 14 trenches were excavated measuring 1584 linear metres (3168 m sq). Trenches were mechanically excavated with the aid of a 16-ton tracked excavator equipped with a 1.8m grading bucket under constant archaeological supervision. The trenches were located to assess the potential of the general area. Excavation proceeded in level spits no greater than 0.2m to the top of the first archaeological horizon or the natural glacial till. Each revealed surface was inspected for archaeological remains and any features present recorded appropriately.

9.2.3 Guidance and Legislation

Archaeological and cultural heritage protection in Ireland is provided by several international and national mechanisms. These include but are not limited to:

- National Monuments Acts 1930-2014;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999;
- Planning & Development Act. 2000 (as amended);
- European Convention on the Protection of the Archaeological Heritage. 1992.

The Framework and Principles for the Protection of the Archaeological Heritage (1999) publication outlines the State's general principles in relation to the management and protection of archaeological heritage. It states that avoidance of developmental impacts on archaeological heritage and preservation in situ of archaeological sites and monuments are always the preferred option. When a site, or part of a site, must be removed due to development, then preservation by record must be undertaken (i.e. through licensed excavation and recording).

9.2.3.1 Dublin City Development Plan 2022-2028.

The Dublin City Development Plan 2022-2028 sets out general policies and standards for development within the city. The current plan contains lists of cultural heritage sites, including national monuments, recorded monuments and protected structures within the city. It is recognised that the city's heritage contributes significantly to the collective memory of its communities and to the richness and diversity of its urban fabric. It is key to the city's character, identity and authenticity and is a vital social, cultural, and economic asset for the development of the city.

The city's historic buildings, streetscapes, villages, Georgian terraces and squares, Victorian and Edwardian architecture, industrial heritage, institutional landmarks, modernist buildings of the 20th century, urban core and the Medieval City, together with its upstanding monuments and buried archaeology, contribute to its local distinctiveness and help create a strong sense of place for citizens and visitors to the city and its neighbourhoods.

The Development Plan plays a key role in valuing and safeguarding built heritage and archaeology for future generations. The plan guides decision-making through policies and objectives and the implementation of national legislation to conserve, protect and enhance our built heritage and archaeology.

Objective **BHA26** pertains to Archaeological Heritage and is outlined in the Development Plan as follows:

1. To protect and preserve Monuments and Places listed on the statutory Record of Monuments and Places (RMP) as established under Section 12 of the National Monuments (Amendment) Act 1994 which have been identified in the Record of Monuments and Places and the Historic Environment Viewer (www.archaeology.ie) and all wrecks over 100 years old including those in the Shipwreck Inventory of Ireland.

2. To protect archaeological material in situ by ensuring that only minimal impact on archaeological layers is allowed, by way of re-use of standing buildings, the construction of light buildings, low impact foundation design, or the omission of basements (except in exceptional circumstances) in the Monuments and Places listed on the statutory Record of Monuments and Places (RMP) as established under Section 12 of the National Monuments (Amendment) Act 1994.

3. To seek the preservation in situ (or where this is not possible or appropriate, as a minimum, preservation by record) of all archaeological monuments included in the Record of Monuments and

Places; all wrecks and associated objects over 100 years old and of previously unknown sites, features and objects of archaeological interest that become revealed through development activity. In respect of decision making on development proposals affecting sites listed in the Record of Monuments and Places, the council will have regard to the advice and/or recommendations of the Department of Housing, Heritage and Local Government.

4. Development proposals within the Record of Monuments and Places (RMP) as established under Section 12 of the National Monuments (Amendment) Act 1994, notification of sites over 0.5 hectares size with potential underwater impacts and of sites listed in the Dublin City Industrial Heritage Record, will be subject to consultation with the City Archaeologist and archaeological assessment prior to a planning application being lodged.

5. To preserve known burial grounds and disused historic graveyards. Where disturbance of ancient or historic human remains is unavoidable, they will be excavated according to best archaeological practice and reburied or permanently curated.

6. Preserve the character, setting, and amenity of upstanding and below ground town wall defences.

7. Development proposals in marine, lacustrine and riverine environments and areas of reclaimed land, shall have regard to the Shipwreck Inventory maintained by the Department of Housing, Local Government and Heritage and be subject to an appropriate level of archaeological assessment.

8. To have regard to national policy documents and guidelines relating to archaeology and to best practice guidance published by the Heritage Council, the Institute of Archaeologists of Ireland and Transport Infrastructure Ireland.

9.2.3.1 Park West-Cherry Orchard Local Area Plan 2019

The buildings and structures we inherit from the past often make significant contributions to an areas identity, and to the richness and diversity of the urban fabric. The Park West Cherry Orchard area contains a number of features of historic and social historical merit and it is the policy of the City Council to preserve such features where they make a positive contribution to the character, appearance and quality of the area.

It is an objective of Dublin City Council:

- **H1** To protect and conserve the special character of all built heritage features both within the plan area as well as those within the immediate surrounding areas.
- **H2** To safeguard known National Monument sites and to agree strategies for the protection of potential future sites in conjunction with the City Archaeologist,
- **H3** To protect the buildings, structures and features of industrial heritage within the Park West – Cherry Orchard LAP area along with their related artefacts and plant where appropriate.
- **H4** To undertake a feasibility appraisal for the former Gallanstown waterworks which features an underground brick arched reservoir and to explore and identify a compatible, sustainable and viable future use which will ensure the conservation of the built fabric and add to the amenity and vibrancy of the area.

9.2.4 Baseline Environment

9.2.5 Archaeological and Historical Background

The placename Ballyfermot is derived from the Irish '*Baile Formaid*' which is thought to owe its origin to the Irish chief *Diarmuid MacGillamocholmog*. The earliest document references to the area relate to the transfer of title from William Fitzwilliam and Avicia his wife, who before 1307 assigned a third of the manor of Ballyfermot to Thomas Cantock, Bishop of Emly and Chancellor of Ireland. After the Fitzwilliam's, Robert de Clahull appears as owner of the manor. By the 16th century, Robert Newcomen was resident in the castle at Ballyfermot (Ball 1902-20). It is likely that the castle was located on the manorial site. On his death in 1629 Sir Robert Newcomen was succeeded at Ballyfermot by his eldest son Sir Beverly Newcomen.

The parish church at Ballyfermot was founded prior to 1212 and dedicated to St. Lawrence. It formed part of the possessions of the Knights Hoispitallers of St. John of Jerusalem. In 1615, the church and chancel were described as being in ruins. There is now no surviving trace of the church, the ruins of which survived until the 1950's (Ni Mharcaigh 1997), although Wren (1982) noted a mound at the at the south-east end of Le Fanu Park covering the ruins of the 'churchyard of the rectory church of St Laurence'. Ball (1902-20) described the church as one of the larger ruined churches in the county, the measurement being some fifty-four feet by nineteen, and displaying no architectural feature of interest. This church served Ballyfermot and the surrounding townlands into the late seventeenth century (Wrenn 1982).

The parish of Clondalkin was anciently called *Cluain Dolcáin* or '*Dolcáin's* Meadow'. It was the site of an early Christian monastery from the seventh century, which occasionally features in contemporary annals (Doherty 2000). The most visible relict of this monastery is the round tower (DU017-041006, Located 0.9km to NW) on Tower Road. Surviving largely intact, the tower is constructed of limestone with a granite finish on the door and window jambs. The curving boundary of the former monastic enclosure, preserved in parts of Orchard Lane and Main Street (estimated diameter c. 310m), surround a number of other relicts of this period, including a wall fragment of the medieval parish church in the grounds of St. Johns Church of Ireland. Two granite cross fragments and a rectangular font are also located in the grounds of St. Johns Church. Beyond these remains and occasional annalistic entries, little is known about the foundation and early development of Clondalkin. It is known to have had a Scandinavian settlement; a fortress called *Dunawley* (Joyce 1920; Lewis 1837; Doherty 2000). In AD865, there was a massacre of one hundred Vikings and the burning of *Dunawley* by the Irish (Joyce ibid). Other references to Clondalkin before the Anglo-Norman invasion relate to subsequent attacks on the monastery in 1071 and 1076 (Ball 1899, 1902–20; Lewis 1837).

In 1171, Roderic O'Connor, King of Leinster, marched to Clondalkin to engage a force of Anglo-Normans, under the command of Richard de Clare who was laying siege to Dublin at the time (Lewis 1837). In the following period, the lands of Clondalkin monastery were given to the Archbishop of Dublin, and Clondalkin became the centre of one of the largest manors belonging to the metropolitan see. In the thirteenth century, the Archbishop of Dublin established a borough here, and an extent of 1326 states the size of the town as thirty-two burgages. By the close of the fourteenth century there were at least five streets in the borough (Mill Street, Steeple Street, Pope Lane, New Street and Mahow Street; Bradley 1998, 130-1; Thomas 1992). A small church site perhaps associated with medieval settlement was excavated in the 1960's on Watery Lane (Rynne 1967).

In January 1642 the village was burned by a troop of horse cavalry sent from Dublin and in June of that year, many of the castles in the parish were destroyed at this time to remove any potential strongholds in the vicinity of the city (Ball 1902–20). Castles such as Neilstown Castle, Ballymount Castle and Tully's Castle were likely destroyed at this time. The Down Survey (1657) recorded the ruins of a castle at Clondalkin with thatched houses and the round tower (Bradley ibid, 131).

Construction of the Grand Canal (Located c.1.5km N of the subject area) began in the mid-eighteenth century and by 1759 two sections had been completed at the Bog of Allen and near Sallins, Co. Kildare. In 1772 the Grand Canal Company was established to oversee its continued construction and the section from Dublin to Sallins was opened in 1779. It eventually reached the Shannon in 1803 (Delaney 2004). This general area of Clondalkin is referred to as the Ninth Lock and became a focus for a small hamlet of early nineteenth century cottages on Ballymanaggin Lane.

By the 1830s, this area mainly comprised fertile arable land. There were a large number of good limestone quarries in the area and brick manufacture was also carried out (Lewis 1837). A railway station was built on the Kildare line in 1846, with access from Station Road, along which a number of cottages were built. The station was closed in 1947 but reopened for a period between 1994 and 2008 when the station was moved to facilitate a line upgrade.

9.2.6 Record of Monuments and Places

There are no Recorded Monuments within the either Site 4 or Site 5. The closest Recorded Monument to the subject site is DU017-083---- (Burial Ground), which is located c. 200m SE of the subject site (see Figure 9.1). This burial ground was identified during topsoil-stripping carried out for the development of a business park. Human remains were revealed on a very low mound towards the north-west of the development and the site was interpreted as an early medieval (AD 400-1200) cemetery. Additional monuments are recorded within 1.5 km of the subject site. These are generally of medieval and later date. Details of individual sites are outlined below in Table 9.1.

Table 9.1 Table of RMP/SMR sites within 1.5km of the subject area

SMR No	Class	Townland	ITM	Distance to site	Description
DU017-083----	Burial ground	Gallanstown (Castleknock By.)	708085, 732612	c.0.5km SE	Pre-development testing in 1999 revealed a very low mound which covered three east-west oriented skeletons (Purcell 2000, 83). The remains were those of two adult males and one adolescent aged 12-16 years. The site is thought to be an Early Christian burial mound.
DU017-032001-	Castle – unclassified	Neillstown	706498, 732931	c.1.2km W	The castle was marked on the Down Survey (1655-6) map, approximately on the site of Neillstown House which was formerly located N of the present 9th lock on the Grand Canal. Described in the Civil survey (1654-6) as 'the ruins of an old castle', (Simington 1945, 292). The site has been built on. Not visible at ground level.
DU017-032002-	House – 16th/17th century	Neillstown	706498, 732931	c.1.2km W	L. Ball (1906,118) mentions three or four cottages associated with the castle (DU017-032001-). These may be the ' three or four cabins' which are mentioned in the Civil Survey(1654-6). The area has been built on. Not visible at ground level.
DU017-041007-	Font	Clondalkin	707201, 731535	c.1.5km SW	S of St. John's church is a rectangular granite font (dims. L 1.20m, Wth 0.95m, D 0.60m) with a dressed N face and an irregular S face with a channel inside the rim (Ball 1899, 98).

SMR No	Class	Townland	ITM	Distance to site	Description
DU017-041009-	Water mill – unclassified	Clondalkin	706856, 731576	c.1.5km SW	The Mill Centre Shopping complex NW of Clondalkin Village occupies the site of a medieval mill. This mill is mentioned in Archbishop Alen's Register 1326 (McNeill 1950, 187; Ua Broin1944, 210-211) and is presumably the castellated mill described by Austin Cooper in 1780 (Price ed. 1942, 56). Not visible at ground level.
DU017-043----	Enclosure	Knockmitten	707972, 731483	c.1.5km SE	Situated on a NE facing slope close to the Camock River. An aerial photograph taken in 1971 (FSI 227/8) shows cropmark evidence for a subcircular enclosure (diam. c. 38m). Possibly a levelled ringfort. There is a housing estate on the site. Not visible at ground level.
DU017-067----	Castle – unclassified	Rowlagh	706632, 734011	c.1.5km NW	Duncan's map (1821) shows 'Rowlagh Castle, defaced'. Today there is a housing estate on the site.Not visible at ground level.

9.2.7 Summary of Previous Archaeological Fieldwork

No previous archaeological excavation works have been undertaken within the subject areas. However, three E/W oriented articulated skeletons were recorded during test excavations in 1999 (99E0108; E. Purcell) c. 200m SE of the Site 4 (DU017-083----). This discovery is thought to be an Early Christian burial mound. For further details see Table 9.2, below.

Table 9.2 Table of previous archaeological excavations within the surrounding landscape

Licence No.	RMP/ SMR	OS Ref	Location	Ex. Bulletin Ref.	Author	Results
07E0298	N/A	707797, 732728	Kildare Rail Route Project, Section 1, Ballyfermot to Cappagh, Dublin	2007: 428	C. Moriarty	Testing in advance of railway. No archaeology found.
02E0161	N/A	707966, 733121	Cherry Orchard Avenue, Dublin	2002: 527	N. O' Flanagan	Monitoring of groundworks. No archaeology found
-	N/A	710827, 731827	Drimnagh Castle, Ballyfermot, Dublin	1992: 038	C. Mullins	Full excavation. Modern finds.
06E0927	N/A	710438, 733176	Ballyfermot Lower	2006: 661	M. Saunderson	Testing in advance of development. No archaeology found.
98E0367	18:31	709586, 733218	Ballyfermot Upper, Dublin	1998: 120	E. O' Donovan	Testing in advance of development. Graveyard wall and undated human remains recorded.

Licence No.	RMP/ SMR	OS Ref	Location	Ex. Bulletin Ref.	Author	Results
01E1015	N/A	707797, 733018	Parkwest Distributor Road,	2001: 327	G. Scally	Testing in advance of road development. No archaeology found.
03E1393	N/A	708449, 732120	Parkwest, Gallanstown	2005: 488	T. Bolger	Monitoring in advance of commercial development. No archaeology found
19E0022	N/A	707760, 732450	Ballymanaggin, Gallanstown & Yellowmeadows	2019: 457	R. Ó Maoldúin	Monitoring and excavation in advance of development.Seven areas of archaeological significance, largely prehistoric.
-	N/A	708228, 732927	Parkwest, Gallanstown	1997: 178	D. Murphy	Monitoring of development works. No archaeology found.
01E1015 ext.	N/A	707797, 733018	Parkwest Distributor Road,	2002: 642	R. Tobin	Monitoring of road construction. No archaeology found.
03E1393	N/A	707908, 732594	Parkwest, Gallanstown	2003: 603	C. Baker	Monitoring of development works. No archaeology found.
00E0267	17:83	708194, 732447	Parkwest, Gallanstown	2000: 299	A. Purcell	Further assessment surrounding RMP DU017-018. Additional human remains recorded.

9.2.8 Cartographic Analysis

The development of the site and its vicinity was recorded through the eighteenth to twentieth century cartography are described in Table 1 below (Figure 9.2-9.3). No potential archaeological features were recorded within the subject site during analysis of Historical Mapping. The parish boundary between Clondalkin and Ballyfermot bisects Site 4. In addition, the townland boundary between Raheen and Ballymanaggin townlands is present on the same site.

Table 9.3 Cartographic Sources relating to the site

Map	Date	Description
1st Edition OS	1844	Site 4 encloses fragments of 6 fields across 2 parishes and 3 townlands. All the fields appear to be agricultural land on this map.
2nd Edition OS	1871 5	The only change is appearance of railway along the southern edges of site 4
Cassini	1906-9	No change from previous
Map	Date	Description

9.2.9 Aerial Photography

Site 4 is depicted on the Aerial photograph sources between 2000 and 2008 as partially disturbed by construction activity, mainly at the southern end. From 2009 onwards, the area is observed as fallow

Greenfield. No potential archaeological features were recorded during analysis of Aerial Photography (Figure 9.4 and Figure 9.5).

9.2.10 Topographical Files of the National Museum of Ireland

There are no artefacts listed in the Topographical Files as found within the surrounding townlands of; Gallanstown, Blackditch, Ballyfermot Upper, Fox and Geese, Fox and Geese Common, Knockmitten, Yellowmeadows, Ballymanaggin, Neillstown, Collinstown and Bluebell.

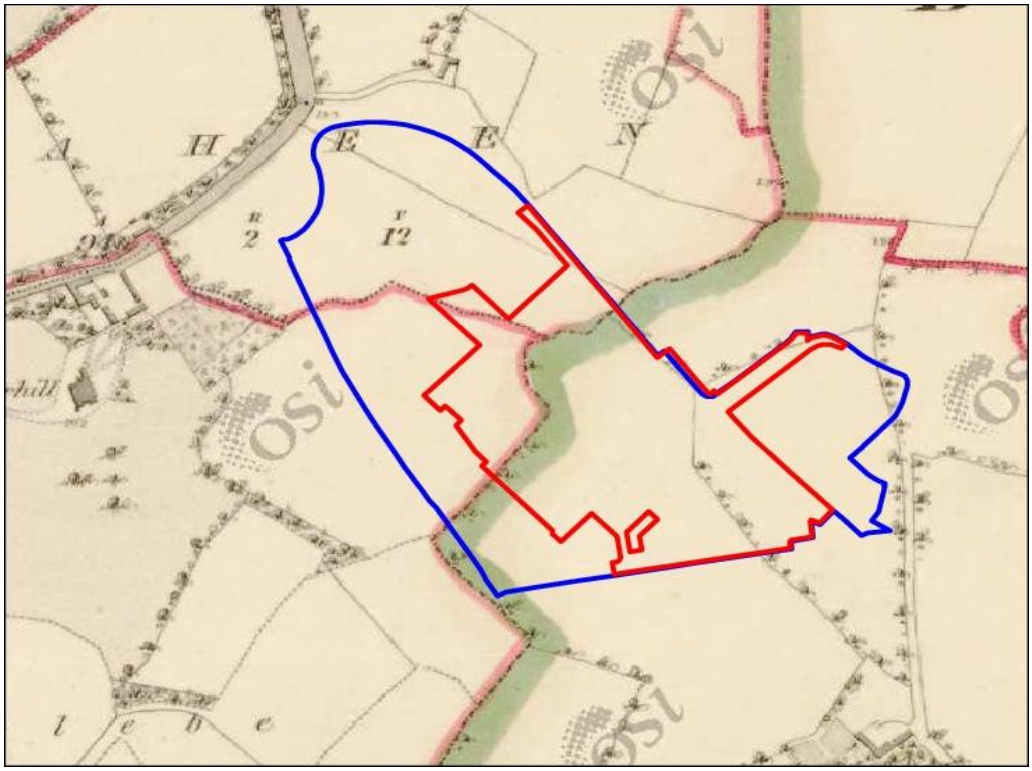

Figure 9.2 1st edition OS – 1844

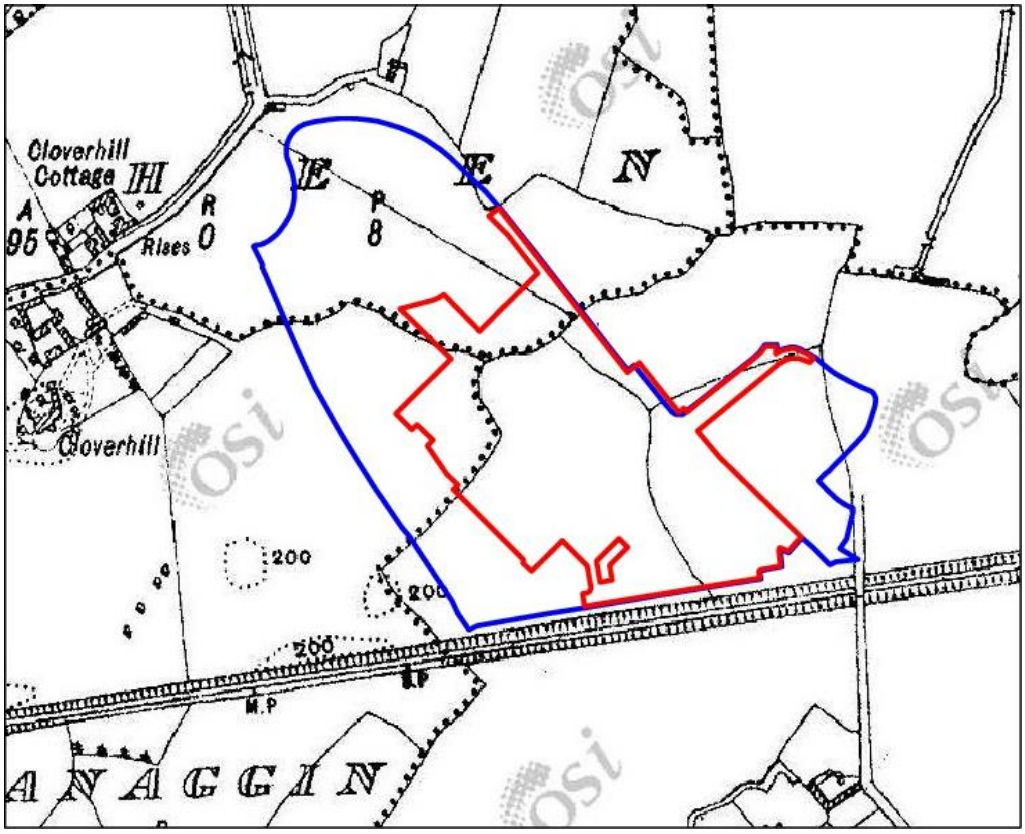

Figure 9.3 Cassini 1906-9

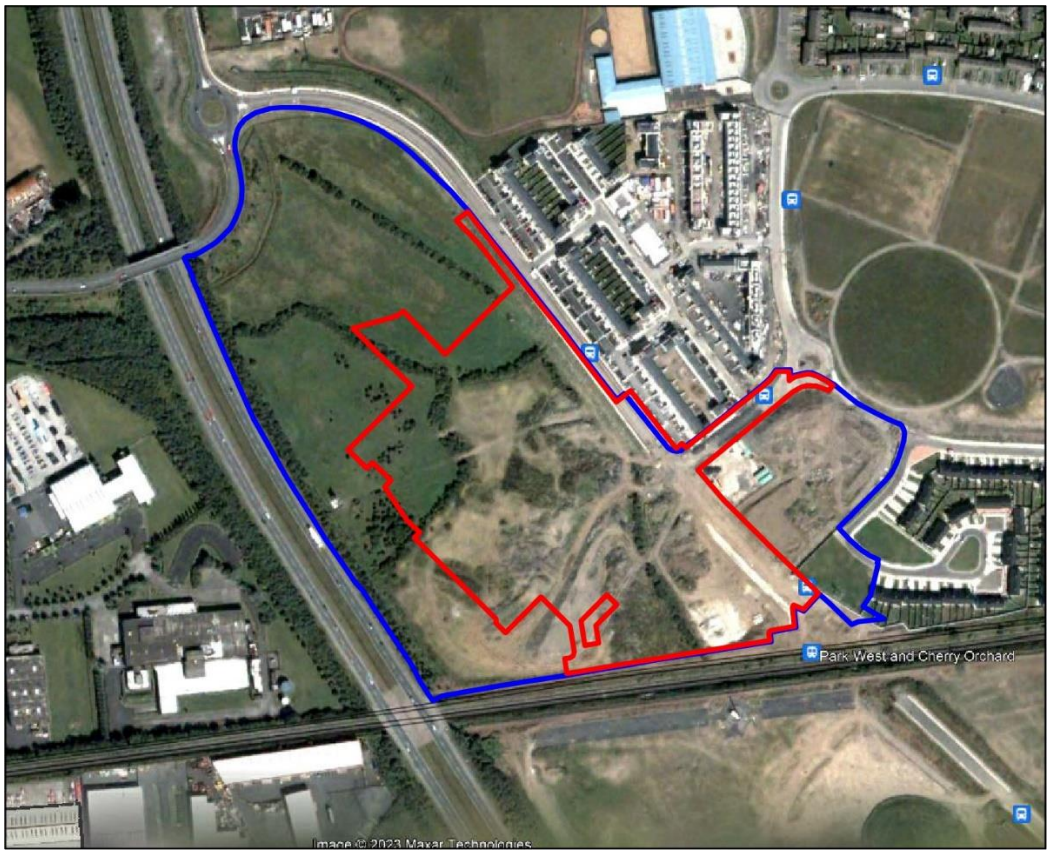

Figure 9.4 Google Earth 09-2003

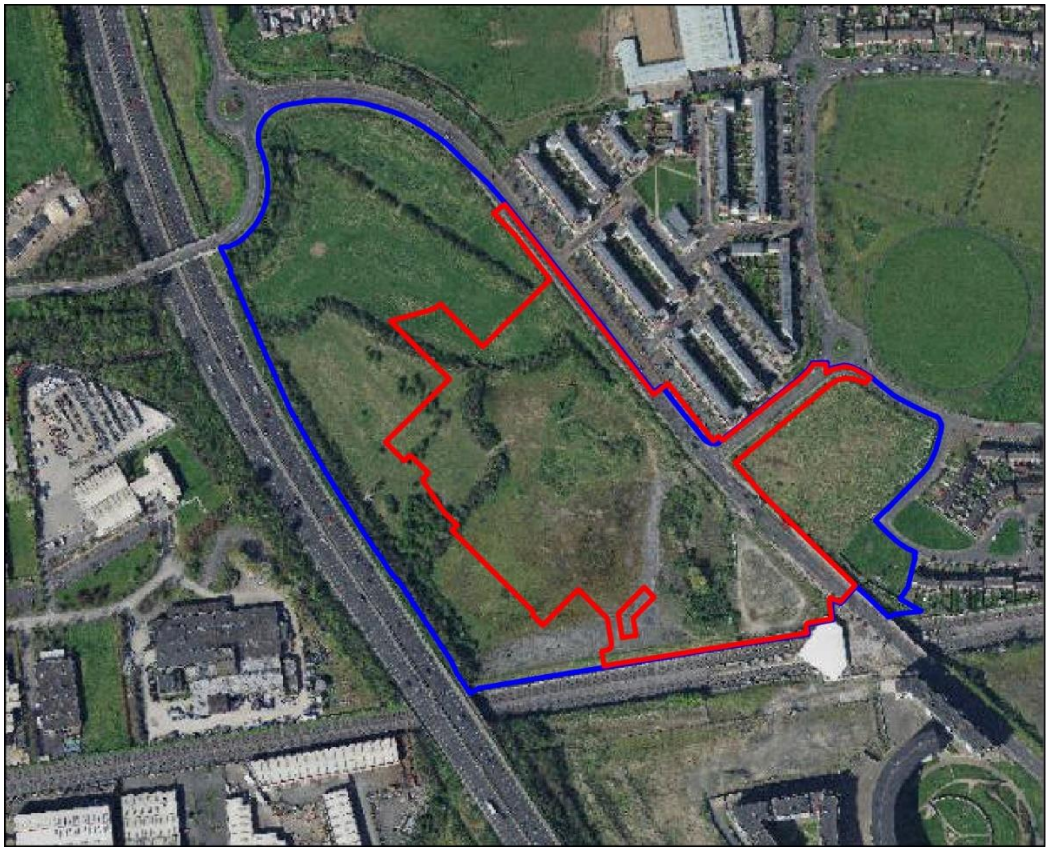

Figure 9.5 OSi Aerial Photography 2013-18

9.2.11 National Inventory of Architectural Heritage

There are no Protected Structures within the Subject Area and no protected structures within 2km radius of the site.

9.2.12 Summary of Geophysical Survey

Geophysical survey was undertaken by Bart Korfanty of Archer Heritage Planning Ltd under Licence No 22R0221. It identified a variety of magnetic anomalies (Figure 9.6 & Figure 9.7). The overwhelming majority of registered anomalies appeared to be directly associated with underlying geology (yellow). None of the readings were interpreted as potential archaeological features. The surveyed area contained a large amount of magnetically active objects within the soil. This most probably represents the presence of various iron fragments in the topsoil. Mean magnetic response across the area was -0.05 nT. Randomly distributed localised spikes of between 25 and 45 nT across the site are likely to be naturally occurring magnetised minerals. Localised strongly dipolar magnetic anomalies indicate modern material spread across the site (red).

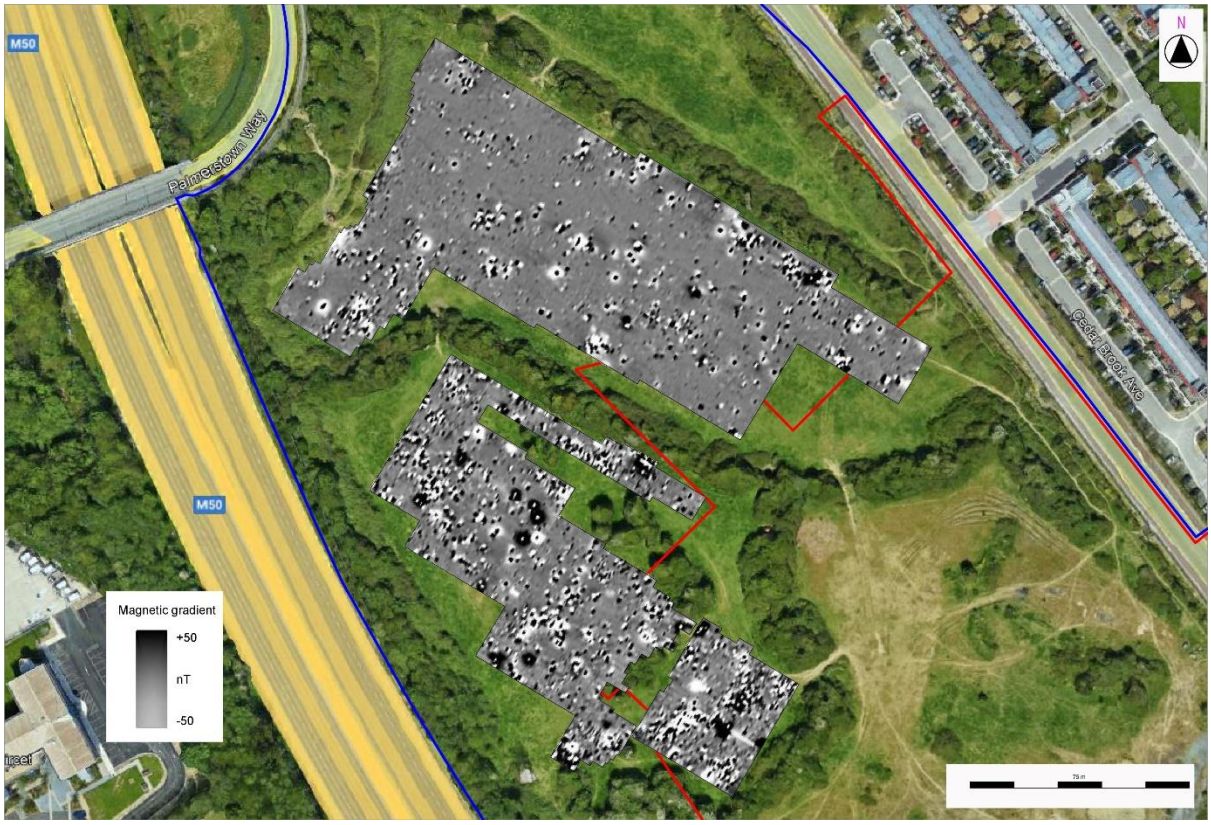

Figure 9.6 Grayscale plot of geophysical anomalies

Figure 9.7 Interpretation plot of geophysical anomalies

Following the Geophysical survey it was recommended that test excavations should be carried out across the site to determine exact nature of geophysical findings and whether archaeological features exist in the wider area that have not left a magnetic trace.

9.2.13 Summary of Archaeological Testing Results

Test excavation was undertaken on the 11-13th July 2022 in sunny conditions under Licence No 22E0522 to Maeve McCormick of Archer Heritage Planning Ltd. A total of 14 trenches were excavated measuring 1584 linear metres (3168 m sq) using a 14-ton tracked excavator with a 1.8m grading bucket under constant archaeological supervision (Figure 9.8 & 9.9).

9.2.13.1 Constraints on methodology

An overhead power line is located in the north of Site 4 and affected the location of Trench 5 requiring it to be reorientated from N/S to NE/SW and reducing the length of Trench 1 by c.10m to the north. Similarly, Trench 9 was also reorientated slightly from NW/SE to NNW/SSE due to overhead powerlines. Trench 11 was reorientated slightly from N/S to NNW/SSE due to overgrown shrubs and bushes. Finally, Trench 12 was shortened by c.20m due to heavily disturbed ground on its eastern end.

9.2.13.2 Results

Topsoil (C1) was dark, orange-brown, silty-clay between 0.15-0.0.4m in depth with compact, brownish-yellow, stoney clay subsoil (C2). Archaeological features in the form of patches of burnt mound material were recorded in Trench 12 located in the south-east of Site 4 (Figure 9.9). In order to investigate these features, five small perpendicular trenches were added to Trench 12; 4 to the north aligned N/S, measuring between 2 and 5m long and one to the south aligned N/S measuring 3.5m long. See Table 9.4 and Section 9.3.9.2 for further details. No further features or artefacts of archaeological significance were recorded during the excavation.

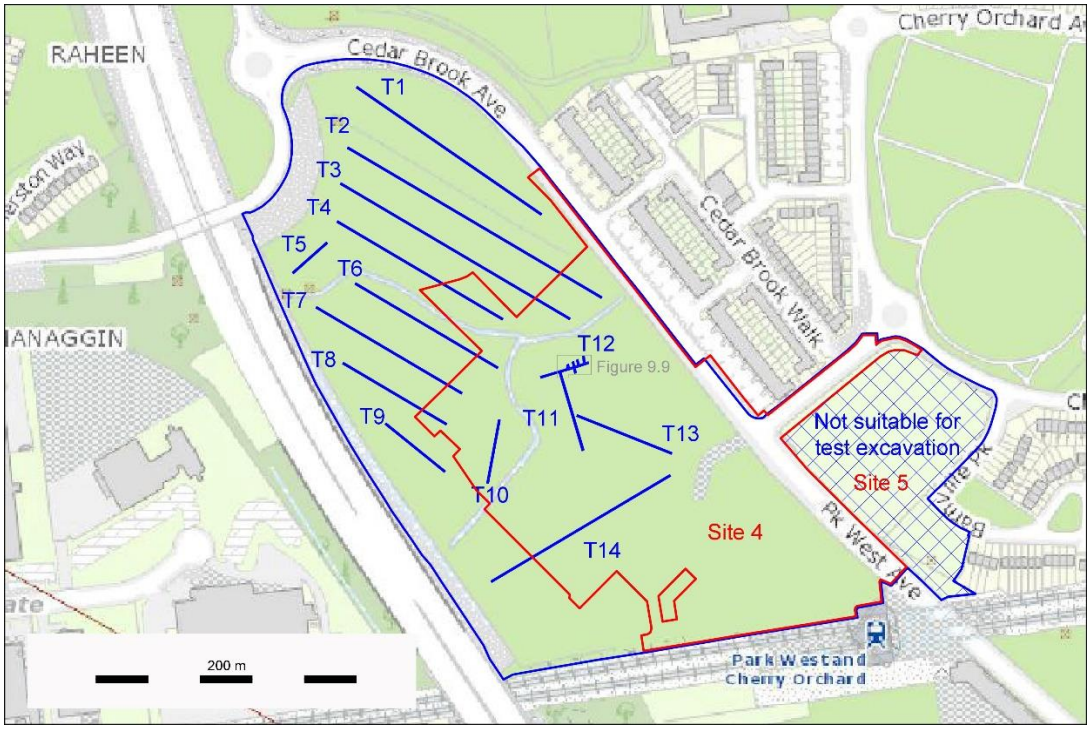

Figure 9.8 Test Trench Location

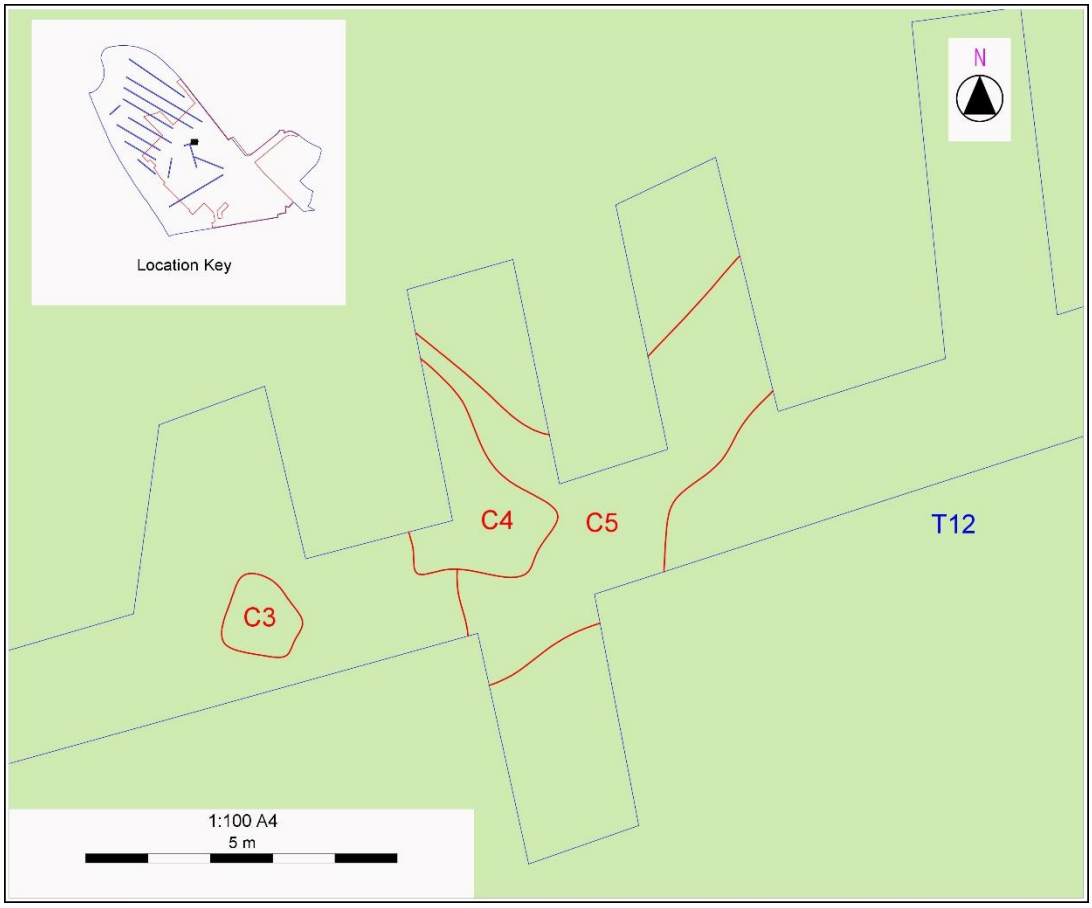

Figure 9.9 Detail of Trench 11 and 12

Table 9.4 Test Trench Details

Trench	L x B x D (metres)	Orientation	Description
1	170 x 2 x 0.4	NW/SE	Trench reduced in length by 10m to the north due to power lines. No Archaeology
2	225 x 2 x 0.3	NW/SE	No Archaeology
3	205 x 2 x 0.4	NW/SE	No Archaeology
4	148 x 2 x 0.3	NW/SE	No Archaeology
5	35 x 2 x 0.3	NE/SW	Reorientated from N/S to NE/SW due to overhead powerlines No Archaeology
6	127 x 2 x 0.4	NW/SE	No Archaeology
7	130 x 2 x 0.25	NW/SE	No Archaeology
8	92 x 2 x 0.25	NW/SE	No Archaeology
9	59 x 2 x 0.35	NW/SE	Reorientated from NW/SE to NNW/SSE due to overhead powerlines No Archaeology
10	50 x 2 x 0.35	N/S	No Archaeology
11	63 x 2 x 0.15	NNW/SSE	Reorientated slightly from N/S to NNW/SSE due to shrubs and bushes No Archaeology
12	40 x 2 x 0.2	ENE/WSW	Trench shortened by c.60m due to disturbed ground. 5 x small perpendicular trenches placed to investigate archaeological material.

			Trench contained one patch of burnt mound material measuring c.1.3m diameter, One patch of burnt stone in grey clay measuring 3.8m N/S and one large patch of grey clay measuring 7.1m NE/SW.
13	80 x 2 x 0.5	NW/SE	No Archaeology
14	160 x 2 x 0.1	NE/SW	No Archaeology
Total	1584 linear metres 3168 m sq		

9.2.13.3 Details of archaeology

Archaeological features were recorded in Trench 12, located towards the south-east of Site 4 (Figure 9.8). The features comprised a concentration of burnt mound activity (Figure 9.9-9.12). They consisted of one sub-circular pit (C3; 1.4m in diameter) which may represent the remains of a trough located at ITM 707741, 732960. The fill consisted of burnt and heat shattered stone in a matrix of black carbonised silty clay. A spread of burnt stone in a matrix of grey clay (C4; 3.8m N/S x 2.3m E/W) was located c. 2m to the east. This spread was less carbonised and may be material raked out from the original burnt mound. No trace of the putative covering mound was identified during test excavation. However, a large irregular concentration of grey clay (C5; 7.1m NE/SW x 5m NW/SE) was identified to the east of C4 and centred on ITM 707746, 732962. This may mark the location of a large pit or well.

The features are suggestive of burnt mound/fulacht fia deposits. Burnt mounds/fulachtaí fia are prehistoric sites that use hot stones to heat/boil water for one or a variety of domestic, industrial or ritual purposes. They are commonly found throughout Ireland and are usually associated with wet or boggy areas such as pool- or riverside locations. Additional test trenching was undertaken around the archaeological features in order to define their horizontal extent (see Figure 9.9).

No further features or artefacts of archaeological significance were recorded during the excavation of the remaining trenches.

Figure 9.10 Trench 12, Circular feature (C3), facing N

Figure 9.11 Trench 12, irregular features C4 & C5 facing N

Figure 9.12 Trench 12, C3, C4 & C5, facing NW

9.2.14 Cultural Heritage

The subject area is located across three townlands; Raheen, Gallanstown and Ballymanaggin. Raheen and Ballymanaggin are both located in the Barony of Uppercross and the Parish of Clondalkin. Gallanstown is located in the Barony of Uppercross and the Parish of Ballyfermot. Analysis of cartographic sources (see above Section 9.3.4) shows the location of townland and parish boundaries in relation to the site. The townland name Raheen is derived from '*an Ráithín*', the small ring-fort. This may indicate the presence of an enclosed early medieval settlement within the townland. The townland name Gallanstown is derived from '*Baile an Ghalóntaigh*', the town/homestead of An Ghaltóntach and refers to a previous landholder with the surname Galónt. The townland name Ballymanaggin is derived from '*Baile Mhic Cnagáin*', and again, refers to a townland/town/homestead of an individual named Mac Cnagáin.

9.2.15 Field Inspections

The sites were visited by Bart Korfanty of Archer Heritage Planning Ltd on 31st of May 2022 The subject site is divided into two sections; Site 4 and Site 5.

Site 4: This is a large, roughly rectangular flat greenfield area. It is bisected by hedgerows which mark the location of townland and parish boundaries. The southern portion of the site, which was previously disturbed by construction activities is now partially covered with hardcore material. This site is bounded on all sides with galvanised steel fencing (Figure 9.5).

Site 5: This is an irregularly shaped field with uneven ground surface. It appears to be disused and overgrown, was heavily disturbed during previous construction activity in the area (Figure 9.5). The ground level in this area is significantly higher than all surrounding areas, indicating the presence of 'made ground' across this site.

9.2.16 Conclusions

This archaeological impact assessment undertaken at Cherry Orchard, Dublin 10, Site 4 (ITM 707702, 732953,

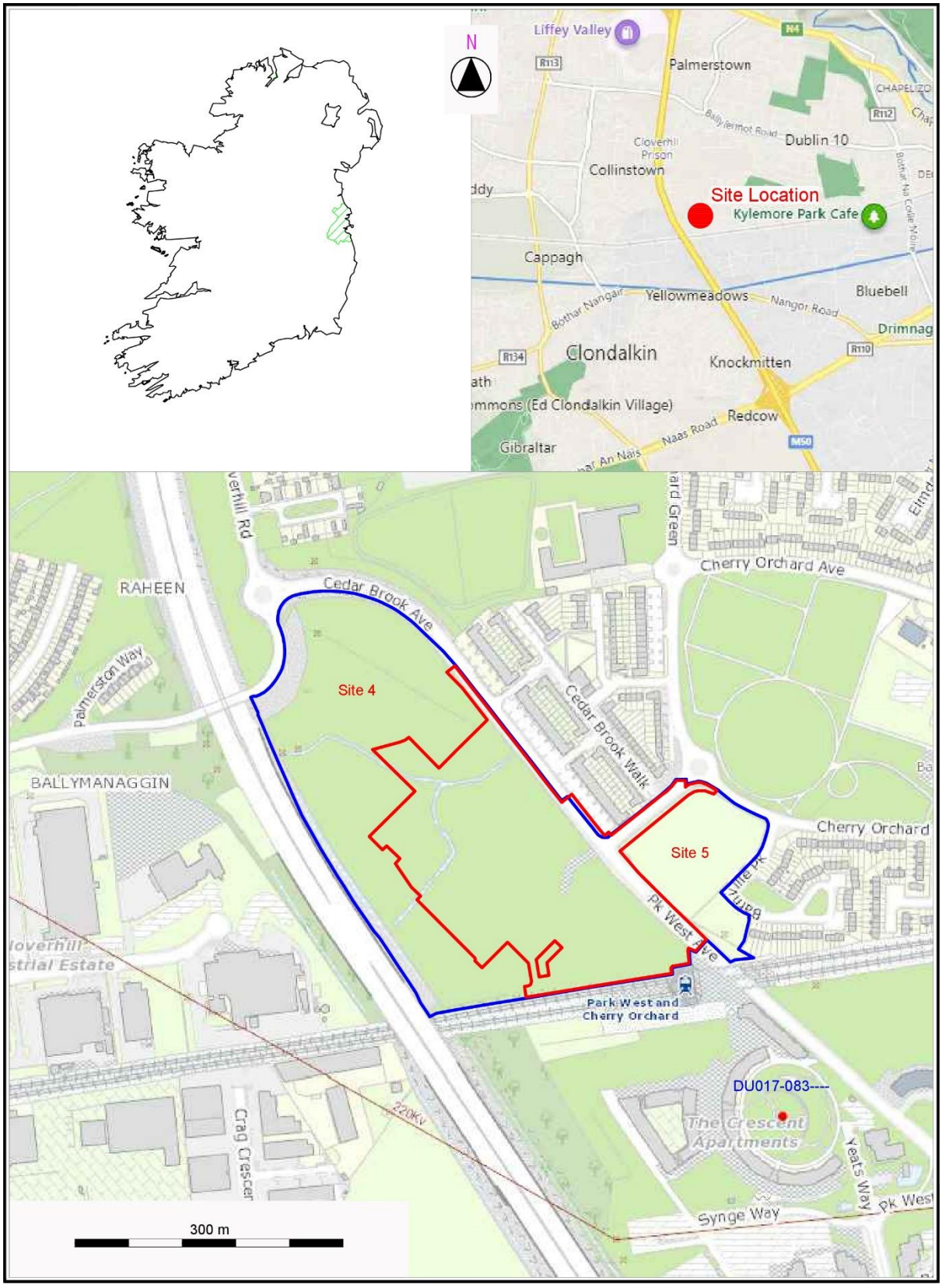

Figure 9.1 Site Location and Surrounding RMPs) comprises a desktop study, a geophysical survey under licence No 22R0221 and licensed test-excavations undertaken under licence 22E0522. The test excavation was carried out between 11th and 13th of July 2022. The following factors were identified:

- The subject site is large in scale at 11.28 Hectares
- There are no artefacts listed in the Topographical Files as found within or in close proximity to the subject site.
- There are no RMP's within the site. Burial Ground (DU017-083) is located c. 200m SE of Site 4.
- A series of townland boundaries and a parish boundary were recorded on cartographic sources.
- No potential archaeological features were recorded within the subject site during analysis of aerial photographs. The site was observed as having previously been disturbed by construction activity.
- No previous archaeological excavation works were undertaken on subject site.
- There are no Protected Structures within either subject area and the site does not lie within an ACA.
- No potential archaeological features were recorded during the site walkover survey. Site 4 appears partially disturbed by previous construction activities; only the northern part seems to be undisturbed green field.
- Licensed geophysical survey (22R0221) did not discover any potential archaeological features.
- Licensed Test Excavation (22E0522) uncovered three features of archaeological significance were identified in Trench 12. They comprised the ploughed out remains of a fulacht fia.

The features in Trench 12 are likely to be prehistoric and appear to be associated with burnt mounds/fulachtaí fia, a relatively common site-type found throughout the country.

9.3 Predicted Impacts

9.3.1 Methodology

The description of the likely significant effects on the archaeological features, architecture and cultural heritage 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.'

9.3.2 Significance of Effects

Significance of effects is usually understood to mean the importance of the outcome of the effects (the consequences of the change). Significance is determined by a combination of (objective) scientific and subjective (social) concerns.

The proposed development will involve considerable ground disturbance works across the subject site including excavations and other groundworks (e.g. provision of access roads and service trenches), movement of machines and storage of material in sensitive areas. Open area topsoil stripping has the greatest potential to expose and damage these remains.

No upstanding archaeological remains have been identified within the proposed development site. Therefore, there will be no direct or indirect impacts on any known archaeological sites or monuments during the construction phase of the proposed development. The greatest threat to buried archaeological deposits occurs during large-scale removal of topsoil during the initial construction phase groundworks.

9.3.3 Archaeology

Future development would involve ground disturbances over the entirety of the subject area. Test excavations revealed the remains of a Fulacht Fia within Trenches 11 and 12. The potential impact is based on Guidelines for the Information to be contained in Environmental Impact Assessment Reports (EPA 2022). It is concluded that, in the absence of the mitigation measures described below, significant impacts on the potential buried archaeological remains at the site would be **Profound, Negative, Permanent and Direct**.

9.3.4 Architecture

There are no Protected Structures within the Subject Area and no protected structures within 2km radius of the site. Consequently, the effect of future development on architecture would be **None**.

9.3.5 Cultural Heritage

Townland boundaries and a parish boundary have been identified within the subject site following analysis of cartographic sources and place name evidence. In the absence of the mitigation measures described below, significant impacts (removal of hedgerow or ditches marking interfaces) on the townland boundaries within the site would be **Profound, Negative, Permanent and Direct**.

9.4 Do Nothing Impact

If the proposed development were not undertaken, any remaining buried archaeological features within the subject site would be preserved beneath the existing ground surface. Consequently, the remains of the Fulacht Fia uncovered in Trench 11 and 12 would be preserved in situ.

However, 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 to promote the provision of high quality new residential environments with good layout and design, with adequate public transport and cycle links and within walking distance of community facilities. The impact on the archaeological environment would likely be similar to this proposed development.

9.5 Worst Case Impact

Should the development proceed within the subject area in the absence of mitigation measures, the effect of groundworks on archaeological remains would be Profound, Negative, Permanent and Direct.

9.6 Mitigation Measures

Mitigation measures shall be undertaken as directed by the DHLGH in compliance with national policy guidelines and statutory provisions for the protection of archaeology and cultural heritage.

9.6.1 Archaeology

Advance archaeological assessments were commissioned at the site at design stage in order to identify adverse effects on archaeological and cultural heritage sites/features at an early stage and to inform the design process.

9.6.1.1 Pre-Construction Phase Mitigation

Due to the discovery of a Bronze Age Fulacht Fia within the subject area, it is recommended as mitigation prior to any further ground works within the subject area that a full archaeological excavation take place in order to preserve the identified archaeological features by record (Policy and Guidelines on Archaeological Excavation Page 19(d)).

9.6.1.2 Construction Phase Mitigation

All ground disturbance works across the development site will be monitored by a suitably qualified archaeologist. In the event that further archaeological material is recorded during monitoring, discussion/consultation with the DHLGH will be sought in order to ascertain the appropriate treatment (i.e. preservation by record/preservation in situ) of any additional archaeological remains. Should the DHLGH recommend preservation by record/full archaeological excavation, this work will be undertaken under the appropriate licence. The DHLGH may recommend preservation in situ, should avoidance of any newly discovered archaeological remains be possible.

9.6.1.3 Operational Phase Mitigation

No operational phase mitigation is anticipated. Issues of archaeological and cultural heritage interest will have been resolved prior to or during the construction phase.

9.6.2 Architecture

There are no Protected Structures or structures entered on the NIAH located within or in the immediate vicinity of the subject area. No mitigation measures are required.

9.6.3 Cultural Heritage

9.6.3.1 9.7.3.1 Pre-Construction Phase Mitigation

It is recommended that the likely removal of existing townland boundaries be mitigated by the creation of a descriptive, drawn and photographic record.

9.7 Residual Impacts

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented. It is not anticipated that there will be any residual impacts with the appropriate mitigation measures in place during the construction phase. No significant residual impacts are predicted in light of the mitigation measures identified above

9.8 Cumulative Impacts

It is noted that previous archaeological assessment and excavation has been carried out in advance of development to the west of the M50 Motorway at Gallanstown/Yellowmeadows/Ballymanaggin townlands. This work identified a ring ditch, burnt spreads and metalworking, largely of prehistoric date. Also, previous pre-development assessments at the Parkwest commercial complex identified an early medieval cemetery. Consequently the likely cumulative impacts of the proposed development are site specific and the proposed mitigation outlined in this Chapter will ensure that cumulative effects will not be significant.

9.9 Interactions

Should archaeological material be recorded in the course of monitoring, this may necessitate areas being left open to the elements for a period in order to facilitate consultation with DHLGH, processing of licences and/or full excavation/preservation-by-record of archaeological features. Consequently, in this scenario, there may be interactions (should a possible find be preserved in-situ) with landscape and visual (Chapter 9 Landscape and Visual) land and soils (Chapter 10 Land, Soils and Geology).

9.10 Monitoring

All ground disturbance works across the development site will be monitored by a suitably qualified archaeologist. In the event that archaeological material is recorded during monitoring, further discussion/consultation with the DHLGH will be sought in order to ascertain the appropriate treatment

(i.e. preservation by record/preservation in situ) of any additional archaeological remains. Should the DHLGH recommend preservation by record/full archaeological excavation, this work will be undertaken under the appropriate licence. The DHLGH may recommend preservation in situ, should avoidance of any newly discovered archaeological remains be possible. All future archaeological works will be undertaken under the appropriate licence and subject to approval of proposed method statements by the DHLGH in consultation with the NMI

9.11 Difficulties Encountered

No major difficulties were encountered during the course of the assessment. Some minor changes were made to the approved method statement for archaeological on account of overhead powerlines and ground conditions. Some negative interaction with local youths was experienced during test excavations, although no injury or loss/damage to persons or equipment occurred.

9.12 References

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9.12.1 Cartographic Sources

- 1 Edition OS Map (1844) - https://maps.archaeology.ie/HistoricEnvironment/
- 2nd Edition OS (1871-5) - https://maps.archaeology.ie/HistoricEnvironment/
- Cassini (1906-9) - https://maps.archaeology.ie/HistoricEnvironment/

9.12.2 Electronic Sources

- Online Archaeological Survey of Ireland www.archaeology.ie [accessed July 2022]
- Cartographic sources http://map.geohive.ie/mapviewer.html [accessed July 2022]
- Aerial Photography http://map.geohive.ie/mapviewer.html [accessed July 2022]
- Online Excavations bulletin www.excavations.ie [accessed July 2022]
- National Inventory of Architectural Heritage www.buildingsofireland.ie [accessed July 2022]
- Placename information www.logainm.ie [accessed July 2022]
- Dublin City Development Plan 2022-28 https://www.dublincity.ie/sites/default/files/2022-12/Final%201-11%20Built%20Heritage%20and%20Archaeology.pdf [accessed January 2023]

- Park West – Cherry Orchard Local Area Plan (2019) https://www.dublincity.ie/sites/default/files/2020-11/park-west-cherry-orchard-lap-2019_reduced.pdf [accessed January 2023]

10 Landscape and Visual

10.1 Introduction

This Landscape and Visual Impact Assessment (LVIA) report assesses the potential effects of the proposed development on the receiving environment in respect of the landscape and key views/visual amenity.

Mitchell + Associates was engaged on behalf of the Land Development Agency, by Van Dijk Architects in February 2022, to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed Cherry Orchard Point residential scheme. The development site is located to the north of Cherry Orchard railway station and Park West, between the M50 motorway and Park West Avenue.

This LVIA has been prepared with reference primarily to the 'Guidelines for Landscape and Visual Impact Assessment', prepared by the Landscape Institute and the Institute of Environmental Assessment, 3rd Edition 2013 (GLVIA) and with reference to the 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' - Environmental Protection Agency (EPA), May 2022.

The assessment has been carried out by Feargus McGarvey BA(Hons) Dip LA Greenwich University, Associate Director with Mitchell + Associates, Landscape Architects. Feargus is a full member and former president of the Irish Landscape Institute, the professional body for landscape architects in Ireland. He has over 33 years' experience in working as a Landscape Architecture. He has written and collaborated on many LVIA and VIA in both an urban and rural context, including Dundrum Town Centre LVIA, Donaghcumper Cellbridge Town Centre LVIA, Wonderful Barn Leixlip LVIA, Dun Laoghaire HarbourCruise Berth Marina LVIA, Hermitage Clinic, Liffey Valley VIA, Office Development Dawson Street/ Nassau Street Dublin LVIA, Merrion Road Office Development VIA, Marry's Pig Farm Boyne Valley LVIA, Rathgar (Rathdown Motors) Residential Development VIA, Chivers Coolock LVIA, Project Liver (Naas Rd) LVIA and Southwest Gate (also Naas Rd) LVIA

Figure 10.1 Aerial view of the proposed Cherry Orchard Point scheme (courtesy CCK architects)

10.2 Methodology

This LVIA describes the impact of the proposed development on the landscape character and visual amenity of the site and on the contiguous landscape and its environs. It describes the landscape character of the subject site and its hinterland, together with the visibility of the site from key viewpoints in the locality. It includes descriptions of the receiving environment (baseline), an outline of the methodology utilised to assess the effects, descriptions of the potential impacts of the development and of the resultant potential effects. Mitigation measures introduced to ameliorate or offset impacts are outlined and the resultant predicted (residual) effects are assessed.

'Landscape' can be described broadly as the human, social and cultural experience of one's surroundings. It is derived from the interplay between the physical, natural and cultural components of our surroundings, as experienced by people. The combination of these components elicits responses whose significance will be partially dependent on how people perceive a particular landscape and how much changes will matter in relation to other senses, as experienced and valued by those concerned. This assessment seeks to understand the potential effects of a development on the landscape as a 'resource', but also considers the aesthetic, perceptual and experiential aspects of landscape that make a place distinctive. Despite the extremely large part played by our visual experience in forming our views on landscape, one's perception and indeed memory also play an important part, if the changes brought about in landscape character are to be fully understood. It is clear therefore that different people doing different things will experience the surrounding landscape in different ways. Such sensitivities and variations in response, including where and when they are likely to occur, are broadly taken into consideration in the assessment.

Visual amenity as expressed through views, refers to the interrelationship between people and the landscape. In accordance with the guidelines, the effects on views and visual amenity are assessed separately from the effects on landscape, though the two are inherently linked. Visual assessment is concerned with the changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity. Generally these are evidenced by the comparison of baseline (existing) images and photomontages illustrating the proposed development in context.

10.2.1 Use of the Term 'Effect' vs 'Impact'

The Guidelines for Landscape and Visual Impact Assessment recognise the complex and potentially confusing nature of terminology used within LVIAs as part of Environmental Impact Assessments, particularly the use of the words 'impact' and 'effect.' The Guidelines advise that these terms should be clearly distinguished and consistently used in the preparation of an LVIA and that these terms should clearly be defined at the outset to avoid any confusion or misinterpretation.

'Impact' is defined as the action being taken. In the case of the proposed works, the impact would include the construction of the proposed development.

'Effect' is defined as the change or changes resulting from those actions, e.g., a change in landscape character, or changes to the composition, character and quality of views in the receiving environment. This report focuses on these effects.

10.2.2 Methodology for Landscape Assessment

The assessment of potential landscape effects involves (a) classifying the sensitivity of the receiving environment (i.e., the nature of receptors), and (b) identifying and classifying the magnitude of landscape change (i.e., the nature of the effect), which would result from the proposed development. These factors are combined to arrive at a classification of significance of the landscape effects.

10.2.2.1 Landscape Sensitivity

The sensitivity of the landscape is a function of its land use, patterns and scale, visual enclosure, the distribution of visual receptors, and the value placed on the landscape. The nature and scale of the development in question is also taken into account, as are any trends of change, and relevant policy. Five categories are used to classify sensitivity (refer to Table 10.1, below).

Table 10.1 Categories of Landscape Sensitivity

Sensitivity	Description
Very High	Areas where the landscape exhibits very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The landscape character is such that its capacity to accommodate change is very low. These attributes are recognised in policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change.
High	Areas where the landscape exhibits strong, positive character with valued elements, features and characteristics. The landscape character is such that it has limited/low capacity to accommodate change. These attributes are recognised in policy or designations as being of national, regional or county value and the principal management objective for the area is the conservation of existing character.
Medium	Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The landscape character is such that there is some capacity for change. These areas may be recognised in policy at local or county level and the principal management objective may be to consolidate landscape character or facilitate appropriate, necessary change.
Low	Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character is such that it has capacity for change; where development would make no notable change or would make a positive change. Such landscapes are generally unrecognised in policy and the principal management objective may be to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the landscape exhibits negative character, with no valued elements, features or characteristics. The character is such that its capacity to accommodate change is high; where development would make no discernible change or would make a positive change. Such landscapes include derelict industrial lands, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the landscape through development, repair or restoration.

10.2.2.2 Magnitude of Landscape Change

The magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape by the proposed development, with reference to its key elements, features and characteristics (also known as 'landscape receptors'). Landscape receptors include individual aspects of the landscape, e.g., landform/topography, vegetation, and the density, mix, pattern and scale of building typologies, which may be directly changed by the development. The surrounding landscape character areas are also receptors whose character may be altered by these changes. Five categories are used to classify magnitude of change (refer to Table 2, below).

Table 10.2 Categories of Magnitude of Landscape Change

Magnitude of Change	Description
Very High	Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the landscape, and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the landscape.
High	Change that is moderate to large in extent, resulting in major alteration to key elements, features or characteristics of the landscape, and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the landscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is limited in scale, resulting in no alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that are characteristic of the context. Such development results in no change to the landscape character.

10.2.2.3 Landscape Effects

A conclusion on the relative importance of landscape effects (whether on the physical landscape elements or on the landscape character), can be arrived at by combining the landscape sensitivity and the magnitude of landscape change - this is indicated in Table 10.3 below.

Table 10.3 Classification of the relative importance of Landscape Effects

		Sensitivity of the Landscape				
		Very High	High	Medium	Low	Negligible
Magnitude of Change to the Landscape	Very High	Profound	Profound	High	High-Moderate	Moderate-Slight
	High	Profound	High	High-Moderate	Moderate	Moderate-Slight

	Medium	High	High-Moderate	Moderate	Moderate-Slight	Slight
	Low	High-Moderate	Moderate	Moderate-Slight	Slight	Imperceptible
	Negligible	Moderate-Slight	Moderate-Slight	Slight	Imperceptible	Imperceptible

The classifications of the relative importance of landscape effects as set out in Table 10.3 above and as used throughout this LVIA, may be defined as follows:

Table 10.4 Description of the classifications of Landscape Effects

Importance	Description
Imperceptible	An effect which may be capable of measurement but is without important consequences.
Slight	An effect which causes few noticeable changes in the character of the environment but without important consequences.
Moderate-Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with the landscape context and with existing and emerging baseline trends.
High-Moderate	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
High	An effect which, by its character, magnitude, duration or intensity, alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

10.2.2.4 Quality of effects

The quality of potential visual and landscape effects is assessed according to EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports Table 10.5 Descriptions of Effects as follows:

Table 10.5 Quality of Effects

Quality	Definition
Positive Effects	Changes which affect the quality of the landscape/view.
Neutral Effects	Changes which do not affect the quality of the landscape/view.
Negative Effects	Changes which reduce the quality of the visual environment or adversely affect the character of the landscape.

10.2.3 Methodology for Visual Assessment

*10.2.3.1 Methodology for Assessment of **Visual** Effects*

Assessment of visual effects involves identifying a number of key viewpoints in the site's receiving environment which overall, are representative of the existing visual environment, and for each viewpoint: (a) classifying the visual sensitivity of the viewpoint/visual receptor (i.e., the nature of the receptor), and (b) classifying the magnitude of change imposed on the view by the proposed development (i.e., the nature of the effect). These factors are combined to arrive at a classification of relative importance of the effects on the visual amenity/views.

10.2.3.2 Visual Sensitivity

Viewpoint/visual receptor sensitivity is a function of two main considerations:

Susceptibility of the visual receptor to change; this depends on the occupation or activity of the people experiencing the view, and the extent to which their attention is focussed on the views or visual amenity they experience at that location. Visual receptors most susceptible to change include for example, residents at home, people engaged in outdoor recreation focused on the landscape (e.g., trail users), and visitors to heritage or other attractions and places of community congregation where the setting contributes to the experience. Visual receptors less sensitive to change include for example, travellers on road, rail, and other transport routes (unless on recognised scenic routes), people engaged in outdoor recreation or sports where the surrounding landscape does not influence the experience, and people in their place of work or shopping where the setting does not influence their experience.

Value attached to the view; this depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g., scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status.

Five categories are used to classify a viewpoint/visual receptor's sensitivity (refer to Table 10.6, below):

Table 10.6 Categories of Viewpoint Sensitivity

Sensitivity	Description
Very High	Iconic viewpoints (views towards or from a landscape feature or area) that are recognised in policy or otherwise designated as being of national or international value. The composition, character and quality of the view are such that its capacity for change is very low. The principal management objective for the view is its protection from change.

High	Viewpoints that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (such as views from houses or outdoor recreation features focused on the landscape). The composition, character and quality of the view may be such that its capacity for accommodating change may or may not be low. The principal management objective for the view is its protection from change that reduces visual amenity.
Medium	Views that may not have features or characteristics that are of particular value, but have no major detracting elements, and which thus provide some visual amenity. These views may have capacity for appropriate change and the principal management objective is to facilitate change to the composition that does not detract from visual amenity, or which enhances it.
Low	Views that have no valued feature or characteristic, and where the composition and character are such that there is capacity for change. This category also includes views experienced by people involved in activities with no particular focus on the landscape. For such views an important management objective is to facilitate change that does not detract from visual amenity or enhances it.
Negligible	Views that have no valued feature or characteristic, or in which the composition may be unsightly (e.g., in derelict landscapes). For such views the principal management objective is to facilitate change that repair, restores, or enhances visual amenity.

10.2.3.3 Magnitude of Change to the Visual Amenity/Views

Classification of the magnitude of change takes into account the size or scale of the intrusion of development into the view (relative to the other elements and features in the composition, i.e., its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g., in full view, partial or peripheral view, or in glimpses). It also takes into account the geographical extent of the change, as well as the duration and reversibility of the visual effects.

Five categories are used to classify magnitude of change to visual amenity/views (refer to Table 10.7, below):

Table 10.7 Categories of Magnitude of Visual Change

Magnitude of Change	**Description**
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs valued features or characteristics, or introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context,

	to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

10.2.3.4 Visual Effects

As for landscape effects, to classify the relative importance of visual effects, the magnitude of change to visual amenity/views is measured against the sensitivity of the viewpoint and a conclusion on the relative importance of visual effects (whether on visual amenity or on the views), can be arrived at by combining the visual sensitivity and the magnitude of visual change - this is indicated in Table 10.8 below.

Table 10.8 Classification of the relative importance of Visual Effects

		Sensitivity of the Visual Amenity/View				
		Very High	High	Medium	Low	Negligible
Magnitude of Change to the Visual Amenity/View	Very High	Profound	Profound	High	High-Moderate	Moderate-Slight
	High	Profound	High	High-Moderate	Moderate	Moderate-Slight
	Medium	High	High-Moderate	Moderate	Moderate-Slight	Slight
	Low	High-Moderate	Moderate	Moderate-Slight	Slight	Imperceptible

	Negligible	Moderate-Slight	Moderate-Slight	Slight	Imperceptible	Imperceptible

The classifications of the relative importance of visual effects as set out in Table 10.8 above and as used throughout this LVIA, may be defined as follows:

Table 10.9 Description of the classifications of Visual Effects

Importance	Description
Imperceptible	An effect which may be capable of measurement but is without important consequences.
Slight	An effect which causes few noticeable changes in the character of the environment but without important consequences.
Moderate-Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with the visual context and with existing and emerging baseline trends.
High-Moderate	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
High	An effect which, by its character, magnitude, duration or intensity, alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

10.2.3.5 The Use of Photomontages and the Selection of Viewpoints

The primary method adopted for the assessment of visual effects relies largely on a comparative visual technique, whereby accurate verified views (photomontages), incorporating the proposed development are compared to the existing corresponding baseline photograph so that an assessment of effects can be made. These 'before' and 'after' images are prepared for each of the selected viewpoints.

The selection of viewpoints has been carried out in accordance with the 'Guidelines for Landscape and Visual Impact Assessment', prepared by the Landscape Institute and the Institute of Environmental Assessment, published by Routledge, 3rd Edition 2013. The guidance on viewpoint selection and baseline photography requires that the proposed development is considered in context and that photomontages used to illustrate the proposed development include sufficient landscape context for proper assessment. Whilst the potential for views was considered up to a radius of approx. 1 km from the proposed development site, practical choices have to be made regarding the viewpoints which are most likely to illustrate the greatest maximum impact. This resulted in the selection of the 14 views

submitted, which are representative of the landscape context and the proposed development. They range from approx. 750m to 100m distant from the site, with the additional at the request of the local authority for 2 further views at the perimeter of less than 50m distant from the site at the junction of Cedarbrook Way and Parkwest Avenue. The photomontages are prepared by experienced specialists, to a specific detailed methodology to ensure accuracy. The adopted methodology for the preparation of photomontages is described by the photomontage specialist in the A3 document of photomontages (verified views) submitted with the planning application. The timescale of the project allowed for winter and summer views to be assessed as best practice and in the interest of thorough evaluation of the visual effects.

In recognition of the potential sensitivities of this location and to enable a full and detailed assessment of the development proposal, a total of 16 views were selected for photomontage preparation. Figure 14 below illustrates the location of viewpoints selected for assessment and for which photomontages are included in the separate A3 document prepared by GNET3D Ltd, submitted with the planning application.

10.2.4 Quality and Timescale

10.2.4.1 Quality of Effects (Landscape and Visual)

The quality of effects can be assessed as 'positive' or 'negative' depending on whether the change is considered to improve or reduce the quality of the landscape character or visual environment. The quality of impact/effect may also be assessed as 'neutral' if the quality of the environment is unaffected. The assessment of quality needs to consider and weigh-up a range of issues and potentially conflicting standpoints. The nature of the proposed change, its context, appropriateness, quality of design and the sensitivities of the viewers may all be important considerations for this aspect of assessment.

10.2.4.2 Duration of Effects (Landscape and Visual)

The duration of effects is another aspect of assessment needing consideration. Effects may range from temporary to permanent. The temporary/short term effects during the construction of the proposed development are also considered in this assessment. The categorisation of effect duration outlined in the EPA 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' 2022, (Section 3.7 Assessment of Effects), is used for this assessment, whereby effects arising from the proposed development may be considered in terms of duration as follows:

- Temporary: Effects lasting less than one year
- Short-term: Effects lasting one to seven years
- Medium-term: Effects lasting seven to fifteen years
- Long-term: Effects lasting fifteen to sixty years
- Permanent: Effects lasting over sixty years

10.3 Baseline Environment

10.3.1 Receiving Environment – Policy Context: Dublin City Development Plan

10.3.1.1 Planning context

The Dublin City Development Plan 2022-2028 sets out policies and objectives for the city. Chapter 10 contains specific landscape-related policies and objectives under the heading of Green Infrastructure and Recreation. These include Policies specifically relevant to: Green Infrastructure including Ecosystem Services; Biodiversity; Landscape; Parks and Open Spaces; Rivers and Canals; the Coast and Dublin Bay; Urban Forest; and Sports, Recreation and Play.

Chapter 13 sets out Strategic Development Regeneration Areas (SDRA), with SDRA 4 Park West/Cherry Orchard identifying sites 4 & 5 of the development plan for this project, noting the drive in development of the area which stalled at the time of the economic downturn, leaving many vacant sites, including the subject site.

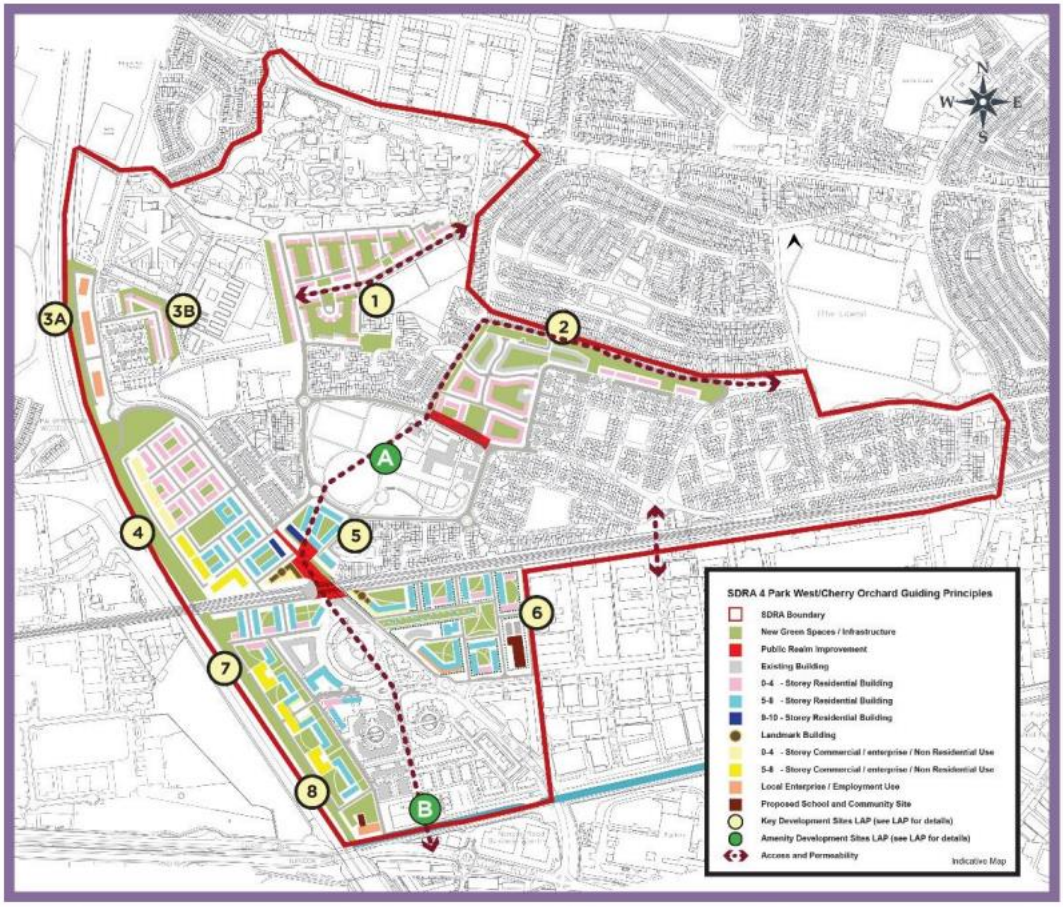


Figure 10.2 Extract of the SDRA4 Park West/Cherry Orchard 'Guiding Principles' map.

The SDRA4 identifies guiding principles of the area, including an adjacent landmark building to the south-east of the railway station. It also advocates a landmark building to the north of the railway station on the site, as well as varying heights for residential buildings from 0-4, 5-8 and 9-10 storeys on the development site, as well commercial buildings to 8 storeys. It is based on the earlier Park West and Cherry Orchard Local Area plan dating from 2019 which also addresses urban planning, compact cities, climate change resilience, and green infrastructure issues. This in turn in is underpinned by national and regional policies such as:

- National Planning Framework: Ireland 2040 - Our Plan
- National Adaption Framework: Planning for a Climate Resilient Ireland 2018
- Smarter Travel – A Sustainable Transport Future 2009 – 2020
- Regional Spatial and Economic Strategy (RSES) 2019-2031
- Transport Strategy for the Greater Dublin Area 2016 – 2035
- Dublin City Development Plan 2016-2022 (now superseded by CDP 2022-2028 and including SDRA4)
- Dublin City Biodiversity Action Plan 2015 – 2020
- Dublin City Local Economic and Community Plan (LECP)

- "Making Cherry Orchard Better" Area Action Plan 2017

10.3.1.2 Zoning

The proposed development is located within the lands covered by the Park West and Cherry Orchard Local Area Plan and the CDP Land-Use Zoning refers back to the SDRA4 noted above.

10.3.1.3 Protected Spaces

There are no protected spaces in the vicinity of the site. However, the development objectives in the Park West and Cherry Orchard LAP 2019 indicate that the townland boundaries should be retained where feasible, along with the green buffer along the M50 corridor as follows:

- *The residential quarter shall include provision of a new neighbourhood park linking into the overall Green Strategy for the LAP. Where feasible, retention of planting to old field boundaries will be encouraged.*

- *A green buffer zone shall be accommodated along the boundary with the M50 as part of a green corridor. Existing green infrastructure in the form of mature trees and hedgerows shall be retained and incorporated into landscape proposals for the central open space to be provided within the residential development area of the site, and the open space located at the northern end of the site.*

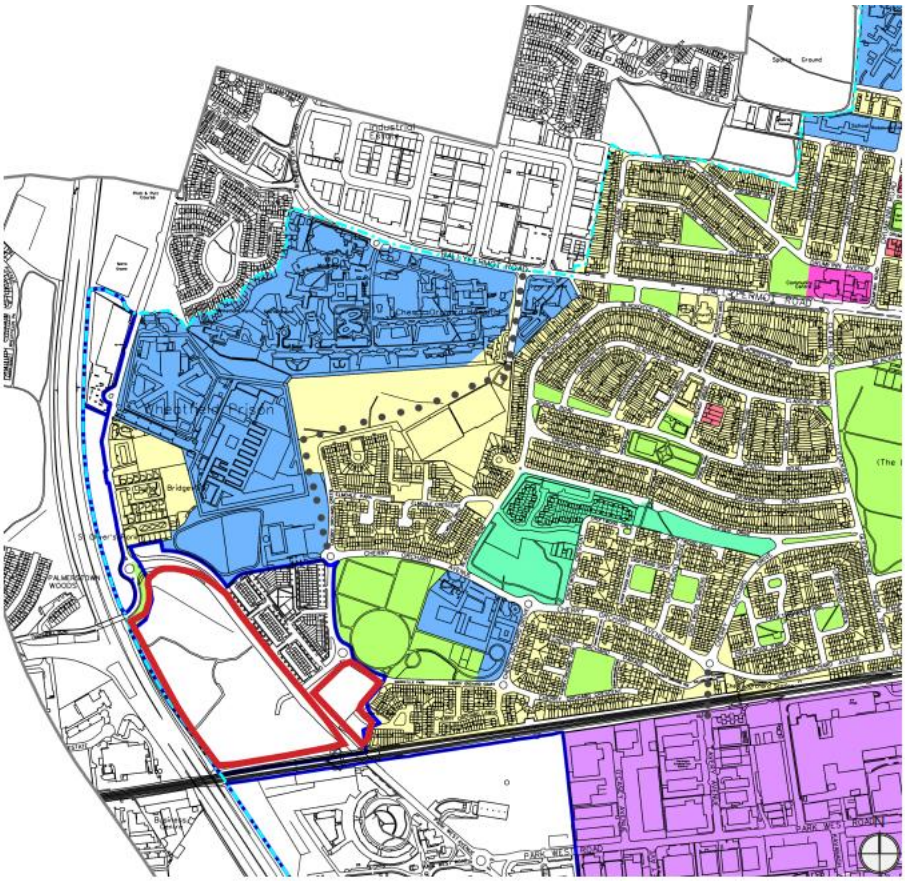


Figure 10.3 Extract from Dublin City Development Plan 2022-2028. Areas within the city boundary to the east of the M50 are part of the SDRA4. (Site mark-up in red courtesy of CCK architects)

10.3.1.4 Views

There are no protected views in the vicinity of the site.

The Urban Development and Building Heights Guidelines for Planning Authorities, published in 2018 sets out the approach to the location and design of tall buildings, in order to achieve a more compact city. Appendix 3 of the Dublin City Development Plan 2022-2028 deals with the criteria for assessment of tall buildings in its area, including its effect on landscape (cityscape) and visual qualities. This is primarily dealt with in the Architectural Design Statement, and the 10 objectives overlap with this assessment:

1. To promote development with a sense of place and character
2. To provide appropriate legibility
3. To provide appropriate continuity and enclosure of streets and spaces
4. To provide well connected, high quality and active public and communal spaces
5. To provide high quality, attractive and useable private spaces
6. To promote mix of use and diversity of activities
7. To ensure high quality and environmentally sustainable buildings
8. To secure sustainable density, intensity at locations of high accessibility
9. To protect historic environments from insensitive development
10. To ensure appropriate management and maintenance

10.3.2 Built Heritage

There are no conservation areas or protected structures in the vicinity of the site.

10.3.3 Receiving Environment – Site Character

10.3.3.1 Introduction

The proposed development site is part of a development plan site within the Park West Cherry Orchard Local Area Plan. It is currently a brownfield site of approx. 11.5 ha. It is located to the north of Cherry Orchard railway station and to the west of residential area of Cherry Orchard, where the M50 motorway forms its western boundary, screened by tree planting. The main body of the site is defined on its eastern boundary by Parkwest Avenue, and by the Dublin to Galway railway line which is in a cutting to the south. To the south, from parts pf the site, the Dublin mountains are visible beyond high voltage cables, with one pylon being approx. 120m from the site. A smaller pylon is located in the development site on the east of Park West Avenue. Part of the site lies to the east, along Cedarbrook Way, with a parcel of land forming the balance of the development plan site to the south of Cedarbrook Way. The site therefore is very much defined by large scale infrastructure around its edges.

10.3.3.2 Physical context – land use, topography and vegetation

The broader landscape setting is of the long-established Cherry Orchard residential area to the east, consisting of two-storey terraced housing forming a ring around Cherry Orchard Park. In between, Cedarbrook is a more recent residential development of 2-4 storey apartments. To the south, beyond the railway station, are the Academy, Crescent and Concert buildings which are residential and commercial. A vacant site sits between the Academy building, and another vacant site is on the eastern side of Park West Avenue to the south of the railway line. The site in discussion therefore forms another development site in a series of sites to the west of Cherry Orchard.

The site consists of the remnants of fields, including hedgerows across the site which are the boundaries of 3 townlands; Raheen to the north, Ballymanaggin to the west and Gallanstown to the south. Much of the land is degraded pasture, and there are large swathes stripped of soil which are regenerating. The land is secured by a high palisade fence along Parkwest Avenue, behind which the boundary is mounded, reducing visibility into the site. Within the site, at the time of the initial site visit, there were horses grazing, amongst horse carcasses and burnt out cars.

The lands are relatively flat, and levels are defined by the adjacent infrastructure, with the M50 elevated to some extent, and Park west Avenue rising southwards to a bridge that crossed over the M50. There are maturing trees to the southern end of the site – at this point part of the overall development plan site – presumably planted as part of the Parkwest Avenue and bridge scheme. To the south, with the railway line in a cutting, Parkwest Avenue rises to the Cherry orchard railway station which sits on a bridge over the railway line.

The only structures on site a remains of the steel structure for advertising boards, and some concrete and steel pads used at an earlier stage for construction activities.

There are no water courses on the site, although the ditch and dyke formation of the townland boundary hedgerows forms a channel in places, and the compacted quality of the stripped soil also holds water after rain.

Figure 10.4 A view across Cherry Orchard Park with a swale in the foreground, and horses grazing on pitches beyond. View shows two storey housing to the right, punctuated by taller buildings with Wheatfield prison in the middle distance, Cedarbrook to the left.

Figure 10.5 View of the southern boundary, railway cutting and Cherry Orchard railway station, with the Concert and Crescent buildings in the background. Note the pylon on the left, located within the development site.

Figure 10.6 View from the site looking southwards. Note the embankment vegetation to the right with Cedarbrook beyond, the Parkwest buildings to the south an the townland hedgerow to the right.

Figure 10.7 Looking south-westwards across the site towards the M50 and the pylons, note the remains of a advertising hoarding structure to the right. The stripped and compacted ground holds water after rain.

Figure 10.8 View looking southwards with remnants of a fire. Pylons and M50 are visible in the background, with Dublin mountains beyond.

10.3.4 Views and Visual Amenity

10.3.5 Summary of Landscape Characteristics and Values

10.3.5.1 Introduction

The design for the proposed development is outlined in the submitted drawings. The Architectural Design Report, prepared by JVA and CCK Architects, contains a full description of the development, including the design rationale, and materials proposed. It also includes a Tall Buildings Assessment required by the Dublin City Development Plan 2022-2028 for buildings over 50m tall. The Park West and Cherry Orchard LAP 2019 permits building sup to 60m high. The proposed landmark building is 51.725m high.

The Landscape Design Report prepared by Mitchell + Associates describes the proposed landscape strategy and design for the scheme. These are all included separately with the submission. documents.

10.3.6 Project Description

10.3.6.1 Proposed Scheme Design

The development will consist of the construction of a residential led mixed use scheme containing 708no. residential apartments comprising 547no. cost rental and 161no. social / affordable units, a convenience retail supermarket, independent retail / commercial units, dedicated internal and external community and arts / cultural spaces, a childcare facility with associated outdoor play area, landscaped public open space including community plaza, multipurpose amenity lawn, play space, outdoor fitness trail, multi-use games area (MUGA), playground and all associated site and development works. The proposed development represents Phase 1 of the overall planned development for Development Sites 4 and 5 of the LAP lands.

Figure 10.9 Aerial mark up of the site (courtesy of Google and CCK)

The scheme is centred around a linear open space which links to the streetscape leading southwards to the Cherry Orchard railway station and eastwards towards Cherry Orchard Park. This open space structure is supporting the built framework. This essentially creates a higher density residential and commercial area at the southern end of the site (i.e. close to the railway station), including a landmark building, and reduces in density towards the northern end of the site. This generates a completed and active streetscape along Park West Avenue which become more commercial as it approaches the

railway station. The massing of the building forms therefore reflects the use and density,and emphasises and supports the railway station's importance in a consolidated urban setting.

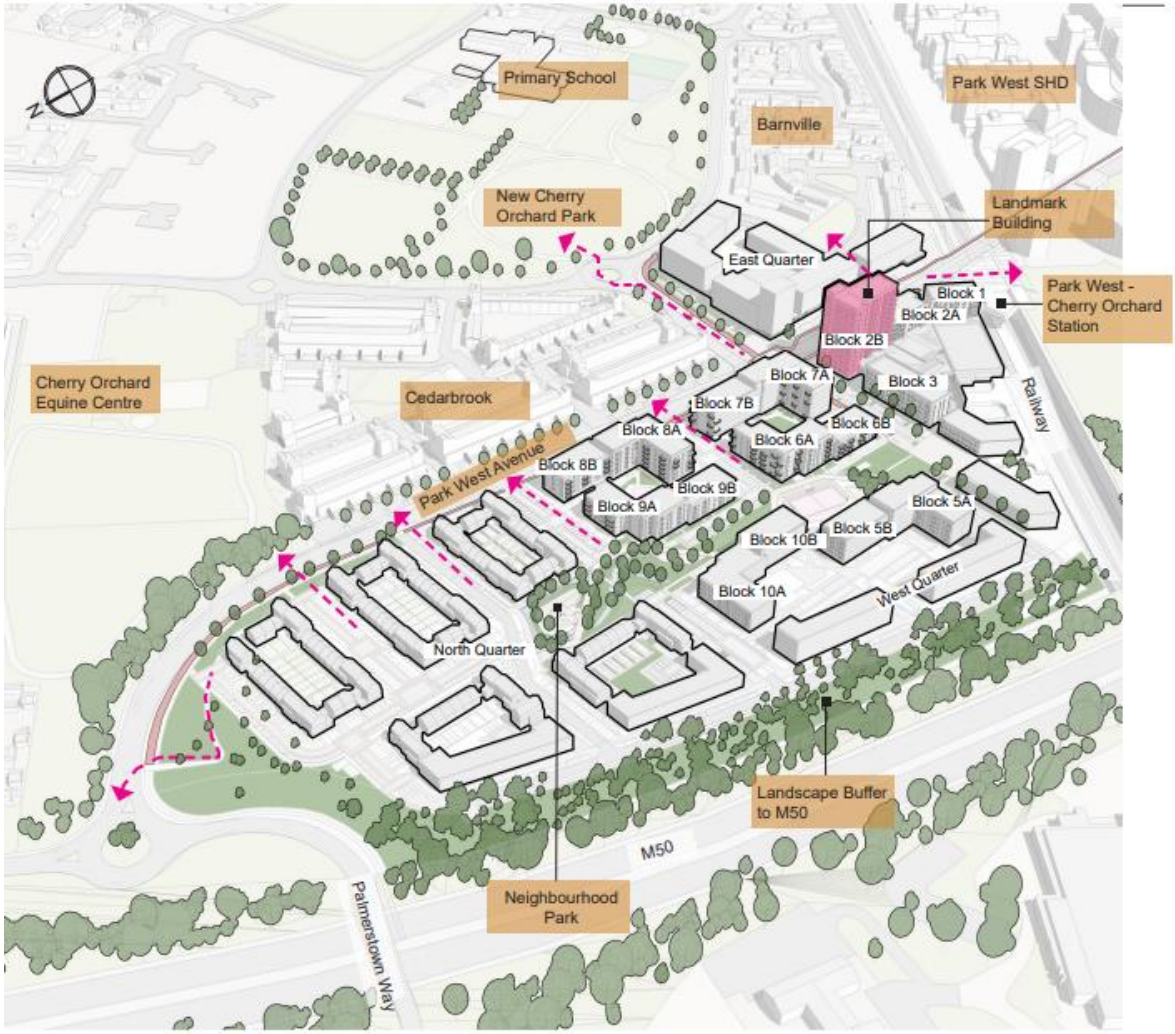


Figure 10.10 Aerial diagram of the development plan for the site (courtesy CCK Architects)

The integrity of the open space is gained through avoiding roadways through the space, and instead creating a series of homezones which lead towards it. This therefore allows pedestrians and cyclists through the open space and connecting through to Cherry Orchard Park and associated amenities, including schools. The definition of the open space within the scheme allows for the retention of part of the townland boundary hedgerows, at the point where the three townlands intersect, retaining both the cultural and natural heritage of that aspect of the site.

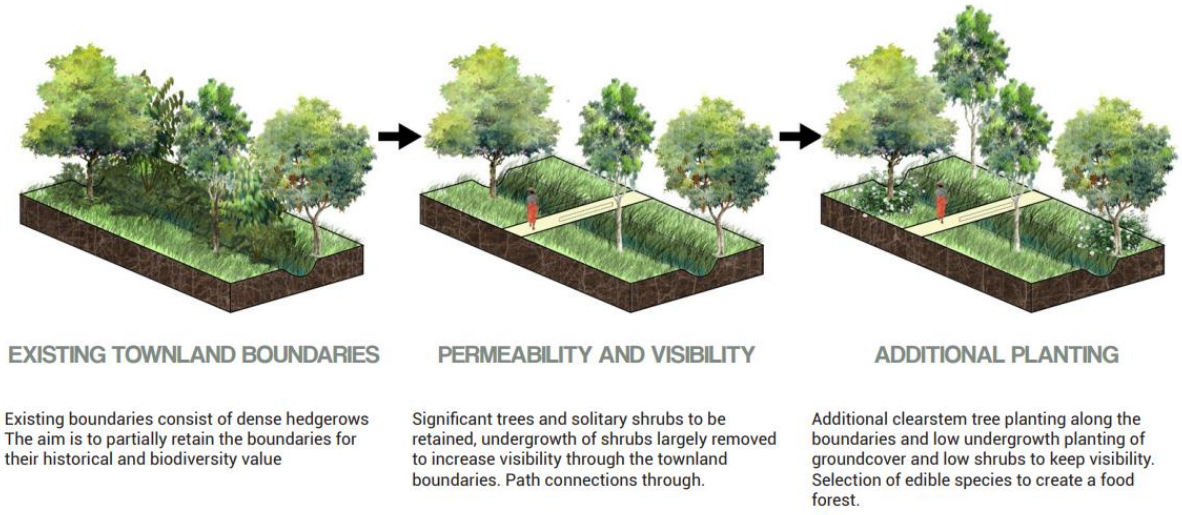


Figure 10.11 Diagram illustrating the retention and management of townland boundary hedges. (M+A)

The central open space is structured in a way to have passive supervision over a series of amenities, including children's play areas, incidental and free play, Multi Use Games Area, civic space for event sand community gardens. These amenities are supported by communal courtyards which in turn have smaller scale amenities including play for smaller children. This hierarchy of linked spaces responds to the ambitions of the Park West and Cherry Orchard Local Area Plan in relation to Green Infrastructure. It supports biodiversity and climate change resilience through its retention and creation of habitats and inclusion of nature-based drainage systems that ultimately link to groundwater or the river Camac.

Figure 10.12 CGI of a homezone/woonerf in the scheme. (Courtesy CCK)

Figure 10.13 CGI view across the public open space towards the landmark building (courtesy CCK Architects)

10.4 Predicted Impacts

10.4.1 Introduction

A proposed development such as this has the potential to impact upon the landscape and visual aspects of the existing environment in a number of ways, at both construction and operational stages. Effects can be short or long term; temporary or permanent. The purpose of this section of the report is to outline and describe the potential effects of such proposed development; upon the visual and landscape aspects of the immediate area, and further afield, where relevant.

10.4.2 Construction Phase

Potential impacts during the construction phase are related to temporary works, site activity, and vehicular movement within and around the subject site. Vehicular movement may increase in the immediate area, and temporary vertical elements such as cranes, scaffolding, site fencing, gates, plant and machinery etc., will be required and put in place. Most of the construction impacts will be temporary, and may include the following:

- Site preparation works and operations (including tree protection measures as appropriate);
- Site excavations and earthworks;
- Site infrastructure and vehicular access;
- Materials storage, spoil heaps etc;
- Construction traffic, dust and other emissions;
- Temporary fencing/hoardings, site lighting and site buildings (including office accommodation);
- Cranes and scaffolding;

Where trees are to be felled, or hedgerows cleared, these impacts will be permanent, however any proposed new planting will offset such effects, increasingly so as the proposed development matures.

10.4.3 Operational Phase

The designed scheme seeks to consolidate a key part of the urban plan and harmonise and integrate the development within the existing landscape and the broader urban environment, in line with the Dublin City Development Plan 2022-2028, the Park West and Cherry Orchard LAP, and associated policies and objectives. It must do this whilst adhering to national planning policy which seeks the densification and the provision of increased height on appropriate urban sites. The design rationale and detail employed seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Establishing an integrated relationship between the proposed development and surrounding buildings, infrastructure and the broader urban landscape beyond, incorporating aspects of current and emerging trends in built-form, scale, texturing, colour and materials;
- The insertion, positioning and detailed modelling of the buildings, in order to assist in the appropriate visual assimilation of their mass
- Appropriate architectural detailing to assist in the integration of the external building facades – including the modulation of openings and fenestration;
- Rationalisation of all services elements and any other potential visual clutter and its incorporation internally within building envelopes (as far as practically possible);
- Simplification and rationalisation of the proposed roof lines, including green roofs
- Use of appropriate materials in the architectural expression of the buildings. In this instance, brick is used in the facades across the scheme, with variation in colour, pattern, texture and tone occurring in the individual character areas or emphasising specific parts of facades. This approach reinforces the articulation of the massing of the blocks, as well as lending importance and interest to specific areas.
- The provision of community uses within the development, including public open space and associated amenities, in turn combining with internal cultural spaces.
- The provision of secure communal spaces with each residential block.
- Sustainable approach to drainage and biodiversity
- Detailing in the architectural and landscape design to mitigate wind and shadow effects to create good microclimates.

In terms of potential visual impacts, whilst the proposed scheme is not uncharacteristic within the broader context, there is a clear change of building scale between the relatively greenfield site and what is proposed. The taller scale of the proposed buildings does make it potentially more visible from the immediate environs and further afield. Sensitivities may well be somewhat dulled by the degraded nature of the site and the expectation of substantial new buildings and infrastructure. However, the quality of the proposed building and their setting offers a coherent and vibrant completion of this quarter. The potential for a measure of visual impact, experienced by people visiting, living in, or using these areas, is therefore reasonably high. The selected viewpoints for the preparation of photomontages takes this into account by taking views from corresponding locations.

The design rationale adopted and the architectural and landscape architectural approach to the design of the proposed scheme and the details employed, seek to respond to such issues and to mitigate negative effects on both the broader landscape character and visual amenity of the area – these are outlined further in Section 10.4.5, Mitigation Measures, below.

10.4.4 Landscape Effects

PREDICTED EFFECTS

In assessing landscape and visual effects there are two main inter-related aspects to be addressed in considering the impact of the development proposals:

- The landscape as a resource and landscape character – these relate primarily to the landscape's physical components, which may include: topography; vegetation; built elements etc, and how they translate into the perceived character of the existing landscape of the site in its context. How is this physical landscape impacted by the proposal and how do people perceive the change? This will include assessment of the effects of the proposed development on the social and cultural amenity aspects of landscape. The predicted landscape effects are outlined in Section 1.4.2.2 & 1.4.2.3, below;
- The visual amenity and the proposed views of the development, relative to the existing site and the associated impact on the visual environment and on visual amenity. These are outlined in Section 1.4.3, below.

The effects of each are assessed for the Operational Phase of the proposed development, in accordance with the methodology for each, as set out in Sections 1.4.2.3-1.4.2.6, and 1.4.3.1-1.4.3.2 respectively and a qualitative value is included. The duration of effects is assessed in Section 1.4.2.1, below, and the Construction Phase effects are considered and assessed in Section 1.4.2.2, below. The cumulative effects caused by the proposed development when considered in conjunction with other proposed developments of the same or different types, are assessed in Section1.4.4, below.

10.4.4.1 Duration of effects

The duration of effects is determined by the life of the proposed development, as tempered by any mitigating effect of the maturing designed landscape which is proposed as an integral part of the development. In this case the development may have an expected/design life of up to 60 years or beyond. Effects on both landscape character and visual amenity during the Operational Phase of the proposed development are therefore deemed to be of **long-term or permanent** duration in this instance. Construction Phase effects are generally of much shorter duration and are considered in Section 8.3 below.

10.4.4.2 Construction Phase Effects

Initially the erection of site hoarding and hedgerow/ tree protection measures will be completed, site access points established, and site accommodation units placed. Early in the construction period, demolitions, surface/topsoil stripping, tree/shrub removal and the required excavations for the construction of building foundations will commence. The erection of cranes and/or scaffolding as appropriate will take place and temporary site lighting will be established. Removal and/or storage of excavated materials from site and the delivery of construction materials will generate increased traffic within, to and from the site. As construction progresses over the construction period, impacts will vary with the on-going business of construction, delivery and storage of materials, the erection of the buildings, etc. Mitigation measures have been proposed as per Section 10.4.5, to minimise the impact of the construction works on the site environs and generally where this occurs, they are effective in limiting construction phase effects.

The landscape and visual effects of these changes are most likely to be experienced as adverse effects by adjacent residents and users of Park West Avenue and Cedarbrook Way.

Generally, landscape and visual effects during the Construction Phase are likely to vary from **slight and neutral** to **moderate and negative**, depending on the stage of construction, and the intensity of site activity. The construction impacts will be of **short-term** duration.

10.4.4.3 Operational Phase - Landscape Effects

The landscape of the site currently has a rather degraded nature and appearance. The poor quality across the site represents a neglect through lack of impetus in developing the site dating since the most recent economic downturn. The proposed new buildings, infrastructure and its associated landscape provide an appropriate contemporary and designed solution for the area which fits with the longer term aspiration as expressed in its development plan and the Local Area Plan. The resultant proposed scheme is not uncharacteristic within the context of this and similar parts of the city close to transport hubs. The design for the proposed development is a well-considered, high-quality scheme which is appropriate to the area and includes both design and specific mitigation measures that successfully address localised potential adverse landscape impacts. It also creates a number of landscape, public realm and civic improvements with positive attributes and which, with the appropriate future maintenance and management will further improve as the scheme and its community mature over time.

10.4.4.4 Landscape Sensitivity

The existing site is a degraded greenfield and brownfield site. It has no landscape designations or policies which protect its status. In light of its current condition and the contrast this represents with its surroundings, it is not considered sensitive to change. Overall, the sensitivity of the landscape subject to change, is assessed to be **low**.

10.4.4.5 Magnitude of change

The scale of change proposed may be considered substantial in terms of the quantum of development and building height proposed, The proposed changes are from a degraded greenfield site to a new urban quarter, and associated improvements in scale and character to the adjacent streetscapes. The magnitude of change is assessed as **high**.

10.4.4.6 Landscape effects

It is important to note that the proposed development is located on lands on the urban periphery which are zoned for the proposed type of residential and mixed use development. The regeneration of degraded lands for higher density residential and mixed use is an ongoing trend in this landscape context.

The proposed development has been designed to introduce a consolidated urban quarter and greater connectivity to and through the site by way of the integration with the existing network of routes in the area, taking into account the potential for future phases through a development plan, and in respect of the Local Area Plan. Landscape effects created by such new development on this compartmentalised site are relatively localised and will not be notably evident in the wider landscape.

The landscape effect resulting from a low landscape sensitivity, and a high magnitude of change, is **moderate**. Qualitatively the landscape effect is **positive**.

10.4.5 Visual Effects

10.4.5.1 Operational Phase - Visual Effects

The assessment of visual effects, using comparative 'before' and 'after' photomontages assists in identifying the nature and magnitude of the proposed change on the visual environment. The value placed on these is inevitably influenced by the perceptions of the receptor and what they are engaged in at the time. The visual effects of the proposed development will primarily be felt by students and staff who use the campus frequently or by people who live nearby, in this case, to the west of the site. In these cases, the effects of the development are experienced by people in and near to the site, where the effect is potentially greater and is frequently recurring. Views from a distance tend to occupy smaller portions of the field of view and there are many more competing elements within the view – this creates a diluting effect. It should also be remembered that the visual qualities of a place contribute significantly to its character, and these create a large proportion of one's memory of a place – this is particularly so for say, visitors whose experience is often fleeting.

The photomontages are important in illustrating the effects of the proposed scheme from the more sensitive viewpoints. In this instance, they also serve to support and illustrate an aspect of the assessment of effects on landscape character. It is important to remember that whilst photomontages are a useful tool in illustrating comparative visual impact, they are recognised as having their limitations and potential dangers. The guidelines for their use in assessment clearly advocate their use in the context of a site visit to the viewpoint locations and point out that photomontages alone should not be expected to capture or reflect the complexity underlying the full visual experience (refer to the GLVIA, 3rd Edition).

In general, the changes to the visual environment created by this proposed development will produce noticeable visual effects upon a range of receptors that are considered **moderate,** where visible, in the context of the LAP and the local developments that it is driving. The definition of moderate in the EPA Guidelines is *An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends*. The illustrated views are a representative selection of views from around the proposed development site, which are considered potentially the most sensitive. In accordance with the guidelines, they are also selected in order to provide sufficient landscape context to be able to properly assess the nature and scale of the effect.

Because the expected life of the proposed development is up to 60 years or beyond, the duration of predicted visual effects for all views is assessed as **long term or permanent** - as is the case for predicted landscape effects.

10.4.5.2 Assessment of views

A total of 16 viewpoints has been selected for which photomontages (verified views) have been prepared - these are included in the submission documents, within a separate A3 report prepared by GNET3D Ltd. The locations are illustrated in Figure 10.14 below. They illustrate the visual effect of the proposed development on the selected views taken from the surrounding landscape.

Figure 10.14 Map showing view locations (courtesy GNET)

The assessment of the visual effects of the proposed development from these viewpoints is provided as follows:

View 1

Existing View 1

This is a view from the Cloverhill Road bridge over the M50. It is close to the northern end of the development plan site looking south eastwards in the direction of Cherry Orchard railway station. It is looking through the protective mesh fence on the bridge. The foreground consists of the degraded greenfield site and scrub vegetation, and tree screening and acoustic barrier to the M50 motorway. In the distance to the left is the Cedarbrook development, and to the right are the apartment buildings of the development to the south of the railway station at Park West.

Proposed view

The proposed view shows the scheme in the middle distance with the lower building blocks to the front, rising to the landmark building towards the back. The existing buildings are no longer visible. The angle of the view looks diagonally across the rectilinear layout, giving an understanding of the depth and articulation of the blocks. At this distance, the pale and red brick are discernible. There is a sense of urban consolidation and generation of place.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 2

Existing View 2

This is a view is looking southwards towards the site from close to the junction of Park West Avenue

and Cloverhill Road. The view is directly of the galvanised palisade security fence to the site. There is a similar fence on the left hand side of Park West Avenue as it sweeps around the corner towards the Cedarbrook residential blocks. The scale Cedarbrook gives a welcome definition to the alignment of Park West Avenue in an otherwise poor quality setting defined by road infrastructure and palisade fencing.

Proposed view 2

The proposed view shows the palisade fencing retained and little has changed in the foreground. The proposed scheme can be seen in the middle distance, in the middle of the image and to the right. The stepping effect of the blocks rising from 4 storeys to the 15 storey landmark building is notable.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 3

Existing View 3

This is a view looking south-westwards across Cherry Orchard Park. The foreground is a raised grass plain. The railway station can be seen to the far left of the image, and Cedarbrook is visible through winter trees on the right. Between them lies the site, with some glimpses of road infrastructure and the high voltage pylon that is to the south west of the site.

Proposed view 3

The proposed view dramatically re-focusses the scale of the landscape by defining the alignment of Park West Avenue with a series of coherent elevations. The 15 storey landmark building is directly in front of the viewer, and buildings step down towards the railway station to the left, and along Park West Avenue to the south. There is a gap between the elevations that looks through the site. In the summer view, the trees have a grounding effect on the buildings in this view, and Cedarbrook is no longer as visible.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 4

Existing View 4

This is a view from Cherry Orchard Court, which is adjacent to the Cherry Orchard Park, looking westwards towards the site. This view along the street shows two storey red brick and render terraced houses to the left, looking across to Cherry Orchard Park on the right. The park is defined by a green fence on a plinth wall. Cedarbrook Way is seen in the distance. The street has no tree planting, but maturing trees are within the park boundary.

Proposed view 4

The proposed view shows the development terminating the vista at the end of the street, which is further consolidated by the park's trees when viewed in summer. The landmark tower can be seen above the houses on the right. At this distance, the tone and colours of the brick facades is discernible, and helps to define the massing of the blocks, and emphasise the vertical qualities of the landmark building.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 5

Existing View 5

This is a view along the same street as view 4, now called Barneville Park, but closer to the site. Site 5 of the LAP which forms part of the overall development plan is more visible as a fenced and mounded field of rough grass. Cedarbrook is also more visible to the right. The two storey red brick and render houses are to the left.

Proposed view 5

The proposed view shows the alignment of Park West Avenue consolidated by the coherent elevations of the buildings on the street that terminate the view. The landmark building is to the left. The brick facades help to articulate the massing of the buildings, particularly the taller element of the landmark building.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 6

Existing View 6

This is a view from the front of the Cherry Orchard railway station looking northwards towards the site. The open and unfinished streetscape lacks a civic quality and demonstrates the stall in the development in the area. There is unregulated parking on the edge of the station's plaza.

Proposed view 6

The proposed view shows the scheme addressing the station and Park West Avenue. The buildings are grounded by the street tree planting which is particularly effective in summer. The streetscape is also demonstrating civic amenity in planting, seating. The formalisation of parking bays allows the unregulated parking to be removed. At this distance, the pale and warm brick facades also show detailing in texture which emphasises form and pattern, particularly associated with the windows and balconies. The balconies serve to add life and vibrancy above street level, indicating a vitality to the scheme.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 7

Existing View 7

This is a view from south of Cherry Orchard railway station along Park West Avenue close to the roundabout junction with Park West Road. The view is looking northwards towards the site. The Park West area is typical of many mixed use business zones in that there are large swathes of grass that represent constraints in infrastructure (note the pylon for high voltage cables to the left); signage and artwork that are needed to generate a sense of place and reinforce wayfinding; and buildings of

individual styles. There is a sense of the road corridors not being fully developed, as sites have yet to be completed, but the maturing tree planting assists in giving character and structure.

Proposed view

The proposed view in winter illustrates the scheme at the end of the vista along Park West Avenue. Of note the visibility of the landmark building which lends definition and the anticipation of a destination to the scene. In summer, the trees in this specific view is obscure much of the view towards the site, but the top of the landmark building is still visible.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 8

Existing View 8

This is a view taken from the bridge over the Grand Canal on Park West Avenue looking towards the site. The view illustrates the green infrastructure corridor links of the Grand Canal joining and the planted road corridor of Park West Avenue. The tall office block in the view signals the Park West office campus, and its massing is emphasised by the use of brick and glass on the façade which reduces its visual bulk and make sit appear slender. That is a similar design technique to buildings in the proposed development.

Proposed view

The proposed scheme is outlined in red – it is not visible from this location.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **imperceptible**.

View 9

Existing View 9

This is a view taken from the bridge over the railway on Cloverhill Road, to the west of the site looking eastwards. The view looks towards a commercial warehouse which is spart of the Clover Hill Industrial Estate. The railway corridor leading to Cherry Orchard Railway station can be seen to the right. High voltage overhead cables cross between two pylons in the view. The scene is of large infrastructure and light industry.

Proposed view 9

The proposed view shows the top part of the landmark building glimpsed over the roof of the light industrial building, behind a pylon.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **slight** and **neutral**.

View 10

Existing View 10

This is a view is taken from Collinstown Park which lies to the north east of the site across the M50. The view looks across the playing pitches towards the site. A belt of mature tree planting in the park defines the horizon line, and a longer vista of the Dublin Mountains is seen to the right.

Proposed view

The proposed view shows the landmark building beyond the belt of mature trees – which is barely visible in summer, but more clearly seen in the distance through the winter trees. At this distance the detail is hard to see, but there is an impression of the massing being defined by shadow and brick colour.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 11

Existing View 11

This is a view from the northern part of Cloverhill Road, close to St Oliver's Education and Training Centre to the north of the site. It is looking southwards along the road towards the roundabout junction with Park West Avenues. The site's galvanised palisade fence boundary is barely visible in the distance The Dublin mountains can be seen on the horizon. The streetscape is defined by trees and scrub vegetation to the right, and a small boundary wall and some trees to the left, beyond which are some single storey residential buildings and a two storey community hall.

Proposed view

The proposed view shows the upper part of the landmark building appearing above the roofs of the single storey dwellings. At this distance it is difficult to discern detail, but the massing and tone is visible which emphasises the taller slender element of the building.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **slight** and **neutral**.

View 12

Existing View 12

This is a view adjacent to the site looking southwards towards the railway station along Park West Avenue. An imposing galvanised palisade fence runs the length of the site on the left. The residential scheme of Cedarbrook is partially visible beyond trees on the right In the distance, the buildings of the Academy, Crescent and Concert can be seen behind the railway station. The street appears as an uncomfortable place for cyclists and pedestrians, despite the cycle track.

Proposed view

The proposed view shows the landmark building in the distance, with building mass stepping down to the medium density part of the scheme. The articulation of massing and colours of brick facades and balconies are becoming more visible at this distance. The development is beginning to extend along

Park West Avenue creating a greater sense of place, with the summer view demonstrating a strong greening of the streetscape. Much of the foreground remains unchanged.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 13

Existing View 13

This is a view from Blackditch Road which is orientated south-westwards towards the site. The street appears as part of a busy residential area of two storey terraced houses with front gardens, off street parking and pocket park open space and public transport. At the end of the street the Church of the Holy Sacrement, which sits adjacent to Cherry Orchard Park, can be seen with a group of mature trees behind it.

Proposed view 13

The proposed view shows the upper part of the landmark building appearing over the roofs of the houses, locating the environs of Park West Avenue and the railway station. In the summer view, the building is partially obscured. In the winter view, and at this distance, the massing of the building and its finishes can be discerned, demonstrating an articulation that emphasises the slender elements to the building.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 14

Existing View 14

This is a view from the residential area Cedarbrook looking westwards across Park West Avenue towards the site. The view is of the residential street defined by the 3 and 4 storey blocks which are finished in red and buff render and timber cladding. There are maturing trees across the gap between the building that line the edge of Cedarbrook along Park West Avenue. The palisade fence and scrub vegetation of the site can be seen beyond.

Proposed view 14

The proposed view shows the elevation of one of the medium density blocks along Park West Avenue. It is partially screened by the maturing trees in summer. At this distance the detail in the brickwork and the balconies is visible, lending articulation and scale to the buildings.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 15

Existing View 15

This is a view taken from the junction of Cedarbrook and Park West Avenue. Looking directly at the site would not reveal much context at this proximity, so the view looks to the left (southwards) along Park

West Avenue towards the railway station, and view 16 from the same location looks northwards. The palisade fence and the uninviting quality of Park West Avenue dominate the view. The railway station and the Academy, Crescent and Concert buildings beyond are visible in the distance.

Proposed view 15

The proposed view shows the streetscape lined with new buildings an da new junction leading in to the site. The lower park of the landmark building is seen in this view, along with the lively civic and commercial activities at ground level. The street is brought to life and includes sufficient planting that it has a positive effect in both winter and summer views. At this proximity, the articulation of the massing and detail in the façade is clearly visible, adding texture and scale to the buildings.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

View 16

Existing View 16

This is a view from the same location as 15 above, looking northwards along Park West Avenue. The uninviting streetscape is defined by the long galvanised palisade fence to the site's boundary. The scrub vegetation on the mounding behind the fence means the site is screened at street level. There is some respite in the maturing tree planting associated with Cedarbrook on the right side of the image.

Proposed view

The proposed scheme completes this section of Park West Avenue making a composite urban streetscape of cycle route, parking, street trees and nature based drainage swales, buffer planting to define the building edges and balconies overlooking the street. A gap in the block signals one of the homezone routes in to the site.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

10.4.6 Cumulative Effects

10.4.6.1 Introduction

Current guidelines suggest that a determination should be made as to whether cumulative effects are likely to occur – these are outlined in the current GLVIA guidelines (3rd edition) as '*additional effects caused by the proposed development when considered in conjunction with other proposed developments of the same or different types*'. Such determination needs to be made in respect of any permitted development of a similar nature which will have a bearing on the assessment of the proposed development - this is subject to the assessor's judgement in the matter. The predicted cumulative effects currently related to the proposed development are discussed below.

A list of permitted schemes in the area is contained in the EIAR at Chapter 13 Population and Human Health, Section 13.7. There are 3 residential schemes and 2 commercial schemes within the LAP area. There is a total of 4 no. residential planning applications, of which the 3 noted above are within the

Dublin City administrative boundary and 1 within the South Dublin administrative boundary. The residential planning pipeline includes a total of 1,052 units. Section 13.7 goes on to say:

It should also be noted that Dublin City Council are intending progressing proposals for the redevelopment of Development Site 2 as identified in the LAP under Part 8 procedures in Q1-Q2 2024. As this scheme has not progressed through the planning process at the time of writing (23 October 2023) and is still therefore liable to material adjustments, both in scale and scope, prior to lodgement, it was not considered appropriate to assess its potential cumulative impacts with the subject development.

The DART + South West is the second of the infrastructural projects of the DART+ Programme expected to be delivered. The Rail Order Application for this has been submitted for statutory approval for its design, as of March 2023.

It is expected that once this project is delivered, it will increase the train capacity to double the current (12) trains per hour per direction and increase passenger capacity from the current peak capacity of approximately 5,000 passengers per hour to around 20,000 passengers per hour per direction.

Córas Iompair Éireann (CIÉ) has applied planning permission to An Bord Pleanála for a Rail Order in relation to the DART+ South West project. The subsequent approval of the Rail Order will authorise CIÉ to carry out all associated railway works necessary to enable construction, operation, maintenance, and improvements to the railway line between Hazelhatch and Celbridge Station, County Kildare to Heuston Station County Dublin (extending c. 16km) on the Cork Mainline, and Heuston Station to Glasnevin via the Phoenix Park Tunnel Branch line.

CIÉ / Iarnód Éireann are proposing a new substation and compound, a temporary access road, a temporary works compound and a track access point, all to be located on the subject lands. Utility diversions on the east side of Park West Avenue, within 'Site 5', are also required

Of the schemes noted above, and excluding those not yet permitted, the permitted scheme with the planning reference 312290 for 750 no. apartments, creche and associated site works. is most relevant, being adjacent to the southern side of the railway line. It too proposes a landmark building. It will consolidate the residential aspects of the LAP at the area adjacent to Park West Avenue and the railway station. Unlike the other schemes noted above, it appears in some of the cumulative views.

10.4.6.2 Cumulative Landscape effects

The cumulative effects are generated by schemes noted above and in the in the context of the Park West Cherry Orchard Local Area Plan. It is clear from the assessment that the gap sites are causing urban dereliction and antisocial behaviour, with a notable effect on the quality of the public realm. The granting of schemes and the completion of permitted development will further consolidate the ambitions of the LAP and SDRA4 of the Dublin City Development Plan. As schemes are permitted following national, regional and local guidance, it is fair to assume that the quality of design remains appropriate. In that regard, the generation of a good senses of place and innate wayfinding in the streetscape, the provision of public realm and activation of civic and public space is seen in a positive light. Increasing the population and amenity in proximity to public transport, and connecting it through green infrastructure to the local area, should be a positive way to make new, integrated communities. The cumulative effects are therefore seen as **moderate** and **positive.**

10.4.6.3 Cumulative Visual Effects

A selection from the 16 verified views have been made to assess the visual cumulative effects. These views represent key aspects of the scheme, noting the proposed subsequent phasing of the development. The basic block forms of buildings are generally shown to demonstrate mass and scale only. The views are based on the winter photography, and the ones selected are 1,2,3,4 & 12, illustrated in Figure 10.14 above The selected views best demonstrate the potential for cumulative effects,

compared to the other verified views (5-11 and 13-16) where the cumulative effects would not be visible.

Cumulative View 1

Cumulative Proposed view

The proposed view shows the next phase of the development plan towards the viewer. They have the effect of completing the scheme by filling in the area of scrub beyond the M50. The blocks obscure the lower parts of the medium density area, but the landmark building can still be seen. The landmark building associated with the grant of permission 312290 appears to be behind the proposed scheme and is not visible in this view. There is a sense of urban consolidation and generation of place.

Visual Effect;

The cumulative visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

Cumulative View 2

Cumulative Proposed View 2

This is a view is looking southwards towards the site from close to the junction of Park West Avenue and Cloverhill Road. The view shows the block massing of the lower density phase of the development plan, along with streetscape amendments which introduce nature based drainage swales and tree planting. The tree planting even in winter filters the view towards the landmark buildings of the proposed development. The upper storeys of the landmark building of permitted scheme 312290 is just visible, however it assists in consolidating the sense of place.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **positive**.

Cumulative View 3

Cumulative Proposed View 3

The proposed view across Cherry Orchard Park dramatically re-focusses the scale of the landscape by defining the alignment of Park West Avenue with a series of coherent elevations. The 15 storey landmark building is now shown behind the block massing of the phase of the development plan on site 5 of the SDRA4. It is clear that the new blocks will address the park, but that is not detailed in the image. The two blocks on Cedarbrook Way step down from the taller block which addresses Park West Avenue, intending to bring the scale down to address Cedarbrook and the park.

Visual Effect;

The visual effect of the proposed development in this view is assessed as **moderate** and **neutral.**

Cumulative View 4

Proposed View 4

This is a view from Cherry Orchard Court, which is adjacent to the Cherry Orchard Park, looking westwards towards the site. This view shows in a clearer manner the massing of the proposed blocks on site 5 of the LAP; the step down from Park West Avenue towards t Cherry Orchard Park, and the existing two storey terraced housing. It has the effect of consolidating the edge of the park, and supporting the landmark building by strengthening the composition of buildings around it.

Visual Effect;

The visual effect of the proposed development in this view is assessed as moderate and positive.

Cumulative View 12

Cumulative Proposed view

The proposed view now shows the low density phase of the development plan in the foreground, and an upgraded streetscape showing nature based drainage, and street trees giving a greener edge, behind which are the facades of the proposed buildings. The landmark building is in the distance, with building mass stepping down to the medium density part of the scheme. The landmark tower of the permitted scheme312290 is just visible in this view. It is behind a cluster of street trees that even in winter obscure it. The articulation of massing and colours of brick facades and balconies are becoming more visible at this distance. The development extends along Park West Avenue creating a greater sense of place. The presence of scheme 312290 consolidates the sense of urban regeneration.

Visual Effect;

The visual effect of the proposed development in this view is assessed as moderate and positive.

The visual effects are summarised in the following table:

Table 10.10 Summary of Views

View	Location	Effects	
1	Cloverhill Road M50 Bridge	Moderate	Positive
2	Park West Avenue	Moderate	Positive
3	Cherry Orchard Park	Moderate	Positive
4	Cherry Orchard Court	Moderate	Positive
5	Barneville Park	Moderate	Positive
6	Cherry Orchard Station	Moderate	Positive
7	Park West Avenue	Moderate	Positive
8	Park West Avenue	Imperceptible	-
9	Cloverhill Rd railway bridge	Slight	Neutral
10	Collinstown Park	Moderate	Positive
11	Cloverhill Road	Slight	Neutral
12	Park West Avenue	Moderate	Positive
13	Blackditch Road	Imperceptible	Positive
14	Cedarbrook	Moderate	Positive
15	Cedarbrook and Park West Avenue	Moderate	Positive
16	Cedarbrook and Park West Avenue	Moderate	Positive
Cumulative			
1	Cloverhill Road M50 Bridge	Moderate	Positive
2	Park West Avenue	Moderate	Positive

3	Cherry Orchard Park	Moderate	Neutral
4	Cherry Orchard Court	Moderate	Positive
12	Park West Avenue	Moderate	Positive

In summary, the assessment from a low baseline of a poor-quality environment, combined with a strong urban design plan that follows the guidance of the Park West and Cherry Orchard Local Area Plan and the SDRA4, as well as thoughtful detailing leads to generally **moderate** and **positive** effects when the scheme is visible.

10.4.7 Construction phase mitigation measures – landscape and visual

10.4.7.1 Construction Phase

The building site including a site compound with site offices, site security fencing, scaffolding and temporary works will be visible during the construction phase, from a range of viewpoints around the site. Such elements are generally viewed as temporary and unavoidable features of construction in any setting. The perimeter site hoarding will screen from view much of the construction activity and materials at ground level. Other mitigation measures proposed during this delivery stage of the development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting, storage of materials, placement of site offices and compounds, control of vehicular access, and effective dust and dirt control measures, etc. Such mitigation will be set out in the Construction Management Plan prepared for the scheme. This will be a working document which will be continually reviewed and amended through the construction phase to ensure effective mitigation throughout.

The Construction Management Plan to be prepared by the appointed contractor, and agreed with the Local Authority prior to the commencement of any construction works, will deal with all issues related to the construction, delivery and management of the scheme during the construction stage and will ultimately include details on the following:

Daily and weekly working hours;

- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Temporary construction entrances to be provided;
- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place if required;
- Temporary construction signage to be put in place and maintained.

The planning application includes an Outline Construction Management Plan, prepared by Waterman Moylan Consulting Engineers, which outlines a range of construction phase mitigation measures, many of which are relevant to the reduction of the temporary impacts on the landscape and visual environment during the construction phase. This Outline Construction Management Plan forms the basis for the required measures to be included in the appointed Contractor's Construction Management Plan. As such it references construction phase mitigation measures which are relevant to the assessment of Landscape and Visual Impact.

10.4.8 Operational phase mitigation measures – landscape and visual

10.4.8.1 Operational Phase

The design rationale and detail employed seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Establishing an integrated relationship between the proposed development and surrounding buildings, infrastructure and the broader urban landscape beyond, incorporating aspects of current and emerging trends in built-form, scale, texturing, colour and materials;
- The insertion, positioning and detailed modelling of the buildings, in order to assist in the appropriate visual assimilation of their mass
- Appropriate architectural detailing to assist in the integration of the external building facades – including the modulation of openings and fenestration;
- Rationalisation of all services elements and any other potential visual clutter and its incorporation internally within building envelopes (as far as practically possible);
- Simplification and rationalisation of the proposed roof lines, including green roofs
- Use of appropriate materials in the architectural expression of the buildings. In this instance, brick is used in the facades across the scheme, with variation in colour, pattern, texture and tone occurring in the individual character areas or emphasising specific parts of facades. This approach reinforces the articulation of the massing of the blocks, as well as lending importance and interest to specific areas.
- The provision of community uses within the development, including public open space and associated amenities, in turn combining with internal cultural spaces.
- The provision of secure communal spaces with each residential block.
- Sustainable approach to nature-based drainage and to enhance biodiversity
- Detailing in the architectural and landscape design to mitigate wind and shadow effects to create good microclimates.

10.5 Residual Impacts

The proposed development will impact on the urban landscape to varying degrees in terms of its perceived nature and scale. These effects are tempered and conditioned by sensitivities associated with the receptor. The duration of such impacts is however determined by the design life of the proposed development. In this case the building development has a design life of up to 60 years. Impacts on landscape character are therefore deemed to be of long-term duration in this instance.

In assessing the landscape character impacts, there are three main inter-related aspects to be addressed in considering the development proposals, namely:

- The perceived character of the area, how it is affected by the proposal and how well it integrates, particularly in the context of a changing environment.
- Effects of the proposed development on social and cultural amenity
- The proposed views of the development, relative to the existing site and context and the associated impact on visual amenity

10.6 Difficulties Encountered

There were no difficulties encountered in the assessment.

10.7 Interactions

The landscape and visual aspects of the development invariably intertwine in relation to the social qualities of passive and active amenities and civic qualities in the public realm, transport, natural heritage particularly relating to enhancing biodiversity and creating resilience to climate change.

Whilst there are relationships with the landscape aspects of the scheme to subjects within the EIAR, The most significant interactions with Landscape and Visual qualities are related to the following:

Air Quality:

The maturing landscape, particularly the tree planting assists in mitigating air pollution at operational stage. This is long term slight and positive.

Climate Factors

The maturing landscape assists in mitigating wind and creating beneficial microclimates including shade in summer and light in winter at operational stage. This is long term moderate and positive.

Biodiversity

The protection of existing vegetation to be retained is beneficial to biodiversity at construction stage, although much of the existing vegetation is removed which is a negative effect in the short term, mitigated by carrying out work in the appropriate seasons. This effect is short term, moderate and neutral. The maturing landscape supports existing and new habitats, thus diversifying the site's habitats at operation stage. This is long term moderate and positive.

Archaeological, Architectural and Cultural Heritage

The retention of the confluence of the 3 townland boundaries is a long term, moderate and positive effect on cultural heritage at operational stage.

Water

The inclusion of nature-based drainage solutions in the landscape design will assist in sustainable water management (filtration, attenuation, replenishing groundwater and habitat creation) at operational stage in a long term, moderate and positive way.

Population and Human Health

The inclusion of a diverse series of amenities to cater to a new community in the setting of a good visual environment will be a long term moderate and positive effect in the operational stage.

Traffic and Transport

The integration of cyclepaths and cycle routes within the landscape design will be a long term, moderate and positive effect at operational stage.

Utilities

By locating utilities underground, and coordinating above-ground services such as service covers, sub stations and lighting, in the landscape design, the visual quality at operational stage is long term, moderate and positive.

Summary

The protection of the landscape elements to be retained at construction stage is an important interaction with Biodiversity and Cultural Heritage. This is long term, moderate and positive.

At operational stage, the implementation of the scheme and its maturing characteristics in the long term will have slight to moderate, positive effects.

10.8 Summary of Mitigation Measures and Residual Impacts

The assessment for Cherry Orchard Point identifies mitigation measures for minimising the impacts and effects of the scheme which are summarised below.

10.8.1 Mitigation Measures

The design rationale and detail employed seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Establishing an integrated relationship between the proposed development and surrounding buildings, infrastructure and the broader urban landscape beyond, incorporating aspects of current and emerging trends in built-form, scale, texturing, colour and materials;
- The insertion, positioning and detailed modelling of the buildings, in order to assist in the appropriate visual assimilation of their mass
- Appropriate architectural detailing to assist in the integration of the external building facades – including the modulation of openings and fenestration;
- Rationalisation of all services elements and any other potential visual clutter and its incorporation internally within building envelopes (as far as practically possible);
- Simplification and rationalisation of the proposed roof lines, including green roofs
- Use of appropriate materials in the architectural expression of the buildings. In this instance, brick is used in the facades across the scheme, with variation in colour, pattern, texture and tone occurring in the individual character areas or emphasising specific parts of facades. This approach reinforces the articulation of the massing of the blocks, as well as lending importance and interest to specific areas.
- The provision of community uses within the development, including public open space and associated amenities, in turn combining with internal cultural spaces.
- The provision of secure communal spaces with each residential block.
- Sustainable approach to drainage and biodiversity
- Detailing in the architectural and landscape design to mitigate wind and shadow effects to create good microclimates.

10.8.1.1 Landscape and Visual

Construction phase mitigation measures – landscape and visual

The Construction Management Plan to be prepared by the appointed contractor, and agreed with the Local Authority prior to the commencement of any construction works, will deal with all issues related to the construction, delivery and management of the scheme during the construction stage and will ultimately include details on the following:

Daily and weekly working hours;

- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Temporary construction entrances to be provided;
- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place if required;
- Temporary construction signage to be put in place and maintained.

10.9 Residual Impacts

The proposed development will impact on the urban landscape to varying degrees in terms of its perceived nature and scale. These effects are tempered and conditioned by sensitivities associated with the receptor. The duration of such impacts is however determined by the design life of the proposed

development. In this case the building development has a design life of up to 60 years. Impacts on landscape character are therefore deemed to be of long-term duration in this instance.

In assessing the landscape character impacts, there are three main inter-related aspects to be addressed in considering the development proposals, namely:

- The perceived character of the area, how it is affected by the proposal and how well it integrates, particularly in the context of a changing environment.
- Effects of the proposed development on social and cultural amenity
- The proposed views of the development, relative to the existing site and context and the associated impact on visual amenity

10.9.1 Landscape and Visual

The degree of impact is seen as **moderate** in the context of a baseline of a brown and greenfield site with appropriate zoning and a landscape character that is not particularly sensitive in this locality.

The design of the scheme produces a neutral to **positive** quality in this context.

10.9.2 Construction Stage

No residual Impacts; the conclusion of the construction stage will be the completion of the scheme, and the temporary nature of the effects will no longer exist. Operational Stage

In demonstrating the trend for increased density for housing as a national policy the scheme is demonstrating an intensification of the current suburban and derelict landscape. The effect is described as **moderate** in that it follows the principles and trends currently extant in the neighbourhood, and **positive** in that it asserts these new spatial definitions in a considered way and brings with it the vibrancy of a consolidated urban plan.

The assessment of visual effects concludes for the most part that the established residential areas will benefit from the views. Moderate effects occur closer to the subject site, and the massing and treatment of the facades tends to lead towards a **positive** effect.

10.10 Cumulative Effects

The cumulative effects are generated by schemes in the context of the Park West Cherry Orchard Local Area Plan. It is clear from the assessment that the gap sites are causing urban dereliction and antisocial behaviour, with a notable effect on the quality of the public realm. The granting of schemes and the completion of permitted development will further consolidate the ambitions of the LAP and SDRA4 of the Dublin City Development Plan. As schemes are permitted following national, regional and local guidance, it is fair to assume that the quality of design remains appropriate. In that regard, the generation of a good senses of place and innate wayfinding in the streetscape, the provision of public realm and activation of civic and public space is seen in a positive light. Increasing the population and amenity in proximity to public transport, and connecting it through green infrastructure to the local area, should be a positive way to make new, integrated communities. The cumulative effects are therefore seen as **moderate** and **positive**

10.11 Summary

In summary, the landscape significance of effects resulting from a **low** landscape sensitivity, and a **high** magnitude of change, is **moderate**. Qualitatively the landscape effect is **positive**.

10.12 References

1. Guidelines for Landscape and Visual Impact Assessment, prepared by the Landscape Institute and the Institute of Environmental Assessment, published by Routledge , 3rd Edition 2013.

2. ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ - Environmental Protection Agency (EPA), May 2022.
3. Visual Representation of Development Proposals: Technical Guidance Note 06/19, Landscape Institute UK (LI) September 2019.
4. Urban Development and Building Heights Guidelines (2018)
5. The Dublin City Development Plan 2022-2028.
6. Park West and Cherry Orchard Local Area Plan 2019

11 Land, Soils, and Geology

11.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) has been prepared by Waterman Moylan Consulting Engineers and provides an assessment of the impact that the proposed development of Cherry Orchard Point at Sites 4 and 5, Park West Avenue, Dublin 10 will have on the surrounding land, soil and geology within the vicinity of the site. It also sets out mitigation and remedial measures and methods of monitoring once the development is operational.

11.2 Assessment Methodology

This assessment has been carried out generally in accordance with the following guidelines:

- Guidelines on the Information to be contained in Environmental Impact Assessment reports (EPA) (2022).
- Guidelines for Planning Authorities & An Bord Pleanála on carrying out an Environmental Impact Assessment (2018).
- Advice notes for preparing Environmental Impact Statements (EPA – DRAFT – 2015).
- Advice notes on Current Practice in the preparation of Environmental Impact Statements (EPA – 2023).
- Guidelines for the preparation of Soils Geology & Hydrogeology Chapters of Environmental Impact Statements (IGI – 2013).
- Geology in Environmental Impact Statements, A Guide (IGI – 2002).
- Control of water pollution from sites (CIRIA – 2001).
- Environmental Handbook for Building and Civil Engineering Projects (CIRIA – 2000).

The assessment follows a phased approach as outlined in the EPA and IGI guidelines.

The **first phase** of this assessment determined the type, scale, and location of the proposed development as well as establishing the baseline conditions via a desktop study to classify the geological features related to the site. The Geological Survey of Ireland (GSI) was consulted, and the following maps reviewed:

- National Irish Historic Maps produced by Ordnance Survey Ireland (OSI)
- Bedrock Geology Map
- Bedrock Aquifer Map
- Groundwater Vulnerability Map

The information obtained were utilised to establish the baseline conditions on site.

The **second phase** of this assessment was the incorporation of direct and indirect investigations and studies. This information was primarily provided by geotechnical site investigations carried out by Ground Investigations Ireland in November 2022 for both sites, Site 4 to the west of Park West Avenue and Site 5 to the east. A further report, Waste Analysis Classification Report, was also produced by GII and referred to in this Chapter. These are both included as appendices to this document.

Phase 2(a) of the assessment was the refinement of the design layout to mitigate by elimination and replacement, any items that would have the potential to negatively impact the environment by their design, material components, or method of construction/installation. It should be noted that in certain circumstances, alternative designs may have been available however, in order to meet the requirements of the Local Authority or Responsible Bodies, these alternatives were not accepted. An example of this would be the preliminary design of the foul drainage for Site 4 which had 2 potential outfall locations.

However, Uisce Eireann have precisely instructed the location for the foul water outfall from Sites 4 & 5, so as to align the drainage design for the proposed development with their strategic infrastructural plans for the locality.

Phase 2(b) of the assessment was a detailed review of the proposed design and a study to determine the potential risks and impacts of the design and strategies.

Phase 3 is a continuation of the Phase 2(b) works whereby the identified risks and impacts where then further assessed against mitigation measures which provided a residual risk. Where a residual risk was determined to be high, the item was isolated and returned to Phase 2(a) to repeat the process of identifying alternatives methods and measures to reduce the residual risk.

Phase 4 was the completion of this EIAR chapter based on a full understanding of the baseline, proposed development design layout, and construction strategies, incorporation of the mitigation measures, identified risks and residual risks.

11.3 Baseline Environment

The subject masterplan development is comprised of 2 No. sites. Site 4 & Site 5 are bisected by Park West Avenue and lie to the west and east of this roadway respectively, as per Figure 11.1 Site Location (Source: Google Earth), overleaf.

The Site Investigation Report undertaken by Ground Investigations Ireland (GII) is included as an appendix, determined that Site 4 is combination of Greenfield and Brownfield, with evidence of fill material in the area of the site previously used as a construction compound. Site 5 is predominantly a brownfield site, with fill material found for the same reason.

Site 4 is bound to the west by the M50, to the south by the Dublin-Kildare rail line and the Park West & Cherry Orchard station, and to the east and north by Park West Avenue. Site 5 is bound to the west by Park West Avenue, the northwest by Cedar Brook Way, the northeast and east by Barnville Park, and to the south by the Dublin-Kildare rail line and the residential unit of 62 Barnville Park.

Site 4 is currently access via a secured gate from Park West Avenue. Site 5 is accessed via a similar arrangement from Cedar Brook Way.

The area of the subject application is indicated by the red boundary line, also on the figure overleaf. A letter of consent has been obtained for the area of public works required from the Local Authority.

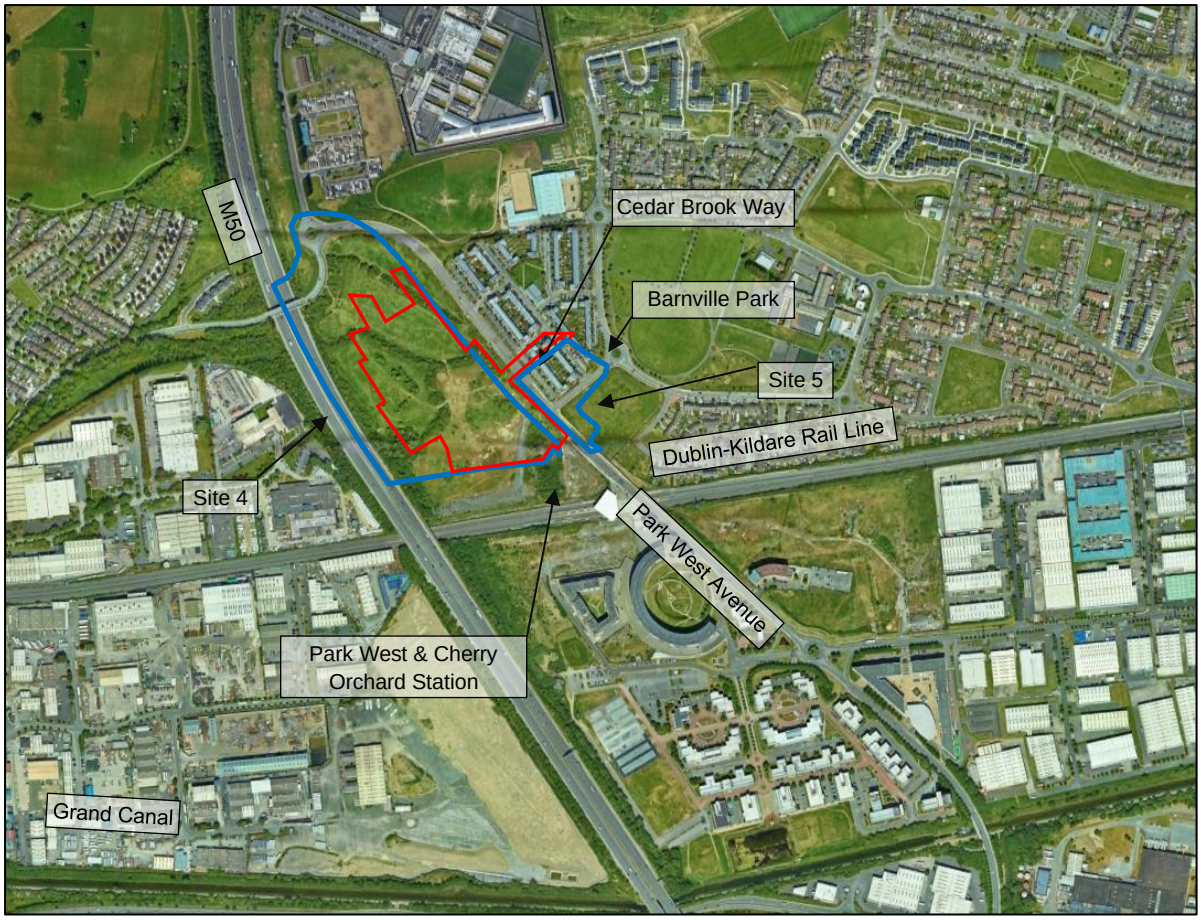


Figure 11.1 Site Location (Source: Google Earth)

The overall masterplan development area as per the blue line boundaries is c. 13.02ha, with Site 4 being c. 11.41 ha and Site 5 being c. 1.61ha. The area of the subject application indicated by the redline boundary, including for works in the public domain, is 6.16ha (61,648m²).

For Site 4, the topographic survey of the area indicates that the low point of the site has a level of 55.72m OD. This is located on the eastern site boundary approximately 140m north of the junction of Park West Avenue and Cedar Brook Way. The remainder of the site generally slopes to this location owing to the embankments and subsequent site grading from the Dublin-Kildare Rail line to the south, M50 to the west, and approach road to the overpass on the M50 to the north.

Site 5 has a central high point with a level of 58.05m OD, and slopes outwards to all boundaries. The boundaries of Site 5 typically have levels between 54.80m and 56.00m, with the higher of these levels being located to the south of the site, adjacent to the retaining wall of the Park West Avenue Bridge over the rail lines.

Ordnance survey and topographic survey mapping indicates that Site 4 contains static ditches with no outfall. These ditches previously had hydrological connectivity and flow, which has been cut-off by the construction of the M50 to the west and the Cedar Brook housing development to the east, as discussed later in this Chapter. These ditches normally remain dry except in heavy rainfall events where water that is not percolated via the site's naturally grassed landscaping, would collect locally in these static ditches for infiltration to the groundwater table. Site 5 does not have any form of surface drainage network and conveys rainfall directly to the soils via its grassed landscape. There is potential during heavy rainfall events, that the ground may become saturated and unable to further infiltrate rainfall, which would then run from the surface, over the boundary and to the adjacent road networks to outfall to the storm drainage networks serving these roads. The sites are located in the catchment of the

Blackditch stream, a tributary of the Camac River which has an ultimate outfall to the River Liffey at Heuston Station.

11.3.1 Site Development

Currently, the sites are primarily greenfield in nature (scrubland) however, it is known that more recently the sites have both been used as construction compounds and are a mix of greenfield and infill material. The Site Investigation Report confirms this.

11.3.2 Historic Land Use

Historic maps for the locality have been reviewed. These do not record any previous settlement or development on the site.

As noted above in respect to the static ditch system, a detailed review of historic maps for the locality, from the national historic maps dashboard produced by Ordnance Survey Ireland (OSI), indicates that the ditch system noted as present in Site 4 previously had hydrological connectivity from the east, merging on the site and flowing to the west. It is clear that this hydrologically connectivity has been cut-off on the west by development of the M50, and to the east by residential development. Refer to Figure 11.2 Site location (Source: OSI Viewer Historic Maps) below for an extract of this historic map.

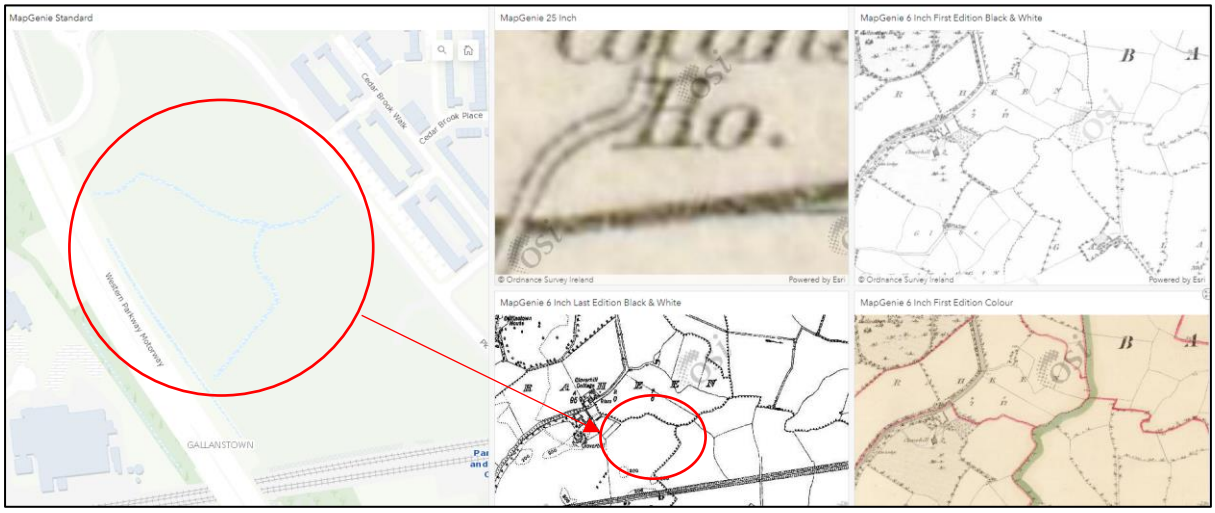


Figure 11.2 Site location (Source: OSI Viewer Historic Maps)

The project archaeologist, Archer Heritage Planning Ltd., has found the ploughed remains of a Fulacht Fia on-site, on the southern side of the confluence of the 2 No. static ditches noted above. The archaeologist has recommended that the remains of the Fulacht Fia be preserved by record, prior to any works commencing on-site. Please refer to the archaeological chapter of this report for further details.

11.3.3 Ground Investigation

Site investigations for both sites were undertaken in 2022 by Ground Investigations Ireland (GII). The technical Ground Investigation report was completed in November 2022, and the Waste Analysis Classification report was completed in October 2022. Both these reports are included as appendices to this document.

The fieldworks comprised a programme of 14 no. trial pits with dynamic probes, and 11 No. soakaway tests. 14 No. Cable percussion and 19 No. rotary boreholes, 3 No. groundwater monitoring and geotechnical and environmental laboratory testing was also undertaken. The locations are indicated on Figure 11.3 Site Investigation Test Locations. The procedures undertaken as part of the site

investigation were in accordance with Eurocode 7 Part 2: Ground investigation and testing (ISEN 1997-2:2007) & B.S. 5930:2015.

Trial pits were excavated using an 8.5T tracked excavator at the locations indicated in Figure 11.3 Site Investigation Test Locations. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The Trial Pits were sampled, logged, and photographed by a Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, ground water encountered, and the characteristics of the strata encountered and are presented on the trial pit logs, which are provided in Appendix 2 of the Site Investigation report.

The soakaway testing was carried out in selected trial pits at the locations indicated. These pits were carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pits were allowed to drain and the drop in water level was record over time as required by BRE digest 365. The pits were logged prior to completing the soakaway test and were backfilled with arisings upon completion. The results are included as an appendix to the Site Investigation report.

The dynamic probe tests (DPH) were carried out at the locations shown in accordance with B.S. 1377: Part 9 1990. The test consists of mechanically driving a cone with a 50KG weight in 100mm intervals and monitoring of the number of blows required. An equivalent standard Penetration test (SPT) “n” value may be calculated by dividing the total number of blows over a 300mm drive length by 1.5. The dynamic probe logs are provided as an appendix to the Site Investigation report.

The cable percussion boreholes were drilled using a Dando 2000 drilling rig with regular in-situ testing and sampling undertaken to facilitate the production of geotechnical logs and laboratory testing. The standard method of boring in soil for site investigation is known as the Cable Percussion method. It consists of using a shell in non-cohesive soils and a clay cutter in cohesive soils, both operated on a wire cable. Very hard soils, boulders and other hard obstructions are broken up by chiselling and the fragments removed with the shell. Where ground conditions made it necessary, the borehole was lined with 200mm diameter steel casing. While the use of the cable percussion method of boring gives the maximum data on soil conditions, some mixing of laminated soil is inevitable. For this reason, thin lenses of granular material may not be noticed. Disturbed samples were taken from the boring tool at suitable depths, so that there is a representative sample at the top of each change in stratum and thereafter at regular intervals down the borehole until the next stratum was encountered. The disturbed samples were then sealed and sent to the laboratory where they were visually examined to confirm the description of the relevant strata. Standard penetration tests were carried out in the boreholes. The results of these tests, together with the depths at which the tests were taken, are shown on the accompanying borehole records in the Site Investigation report. The test consists of a thick wall sampler tube, 50mm external dia., being driven into the soil by a Hammer/Weight weighing 63.5kg and with a free drop of 760mm. For gravels and glacial till the driving shoe was replaced by a solid 60° cone. The standard penetration test number referred to as the “n” value is the number of blows required to drive the tube 300mm, after an initial penetration of 150mm. The number gives a guide to the consistency of the soil and can be used to estimate the relative strength/density at the depth of the test and also to estimate the bearing capacity and compressibility of the soil. The cable percussion borehole logs are provided in Appendix 5 of the Site Investigation report.

The rotary coring was carried out by a track mounted T44 Beretta rig at the locations shown. The rotary boreholes were complete from the ground surface or alternatively, where noted on the individual borehole log, from the case of the cable percussion borehole where a temporary liner was installed to facilitate follow-on rotary coring. The T44 Beretta is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage of the surface. The T44 Beretta utilises a triple tube core barrel system operated using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does note

rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small dia. wire rope or line attached to the “overshoot” recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids. It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring, The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary borehole logs are provided in Appendix 5 of the Site Investigation report.

Groundwater monitoring installations were installed upon the completion of selected boreholes to enable sampling and the determination of the equilibrium groundwater level. The typical groundwater monitoring installation consist of a 50mm uPVC/HDPE slotted pipe with a pea gravel response zone and bentonite seal installed to the engineer’s specification. Where required the standpipe is sealed with a gas tap and finished with a durable steel cover fixed in place with a concrete surround. The installation details are provided on the exploratory hole logs in the appendices of the Site Investigation report.

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design. Environmental and chemical testing as required by the specification, including the Rilta Suite, pH, and Sulphate testing was carried out by Element Materials Technology Laboratory in the UK. The Rilta Suite testing includes both solid waste and Leachate Waste Acceptance Criteria. Geotechnical testing consisting of moisture content, Atterberg limits, Particle Size Distribution (PSD), and hydrometer tests were carried out in Prosoils Geotechnical Laboratory in the UK. The results of the laboratory testing are included in the suite.

Figure 11.3 Site Investigation Test Locations

11.3.4 Geology

Geological Survey Ireland (GSI) produces a wide range of datasets, including bedrock geology mapping, extracted overleaf to Figure 11.4 Extract from GSI Bedrock Geology Map.

The map indicates that the sites lie withing the Lucan Formation. The Lucan Formation is described as comprising dark-grey to black, fine grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar.

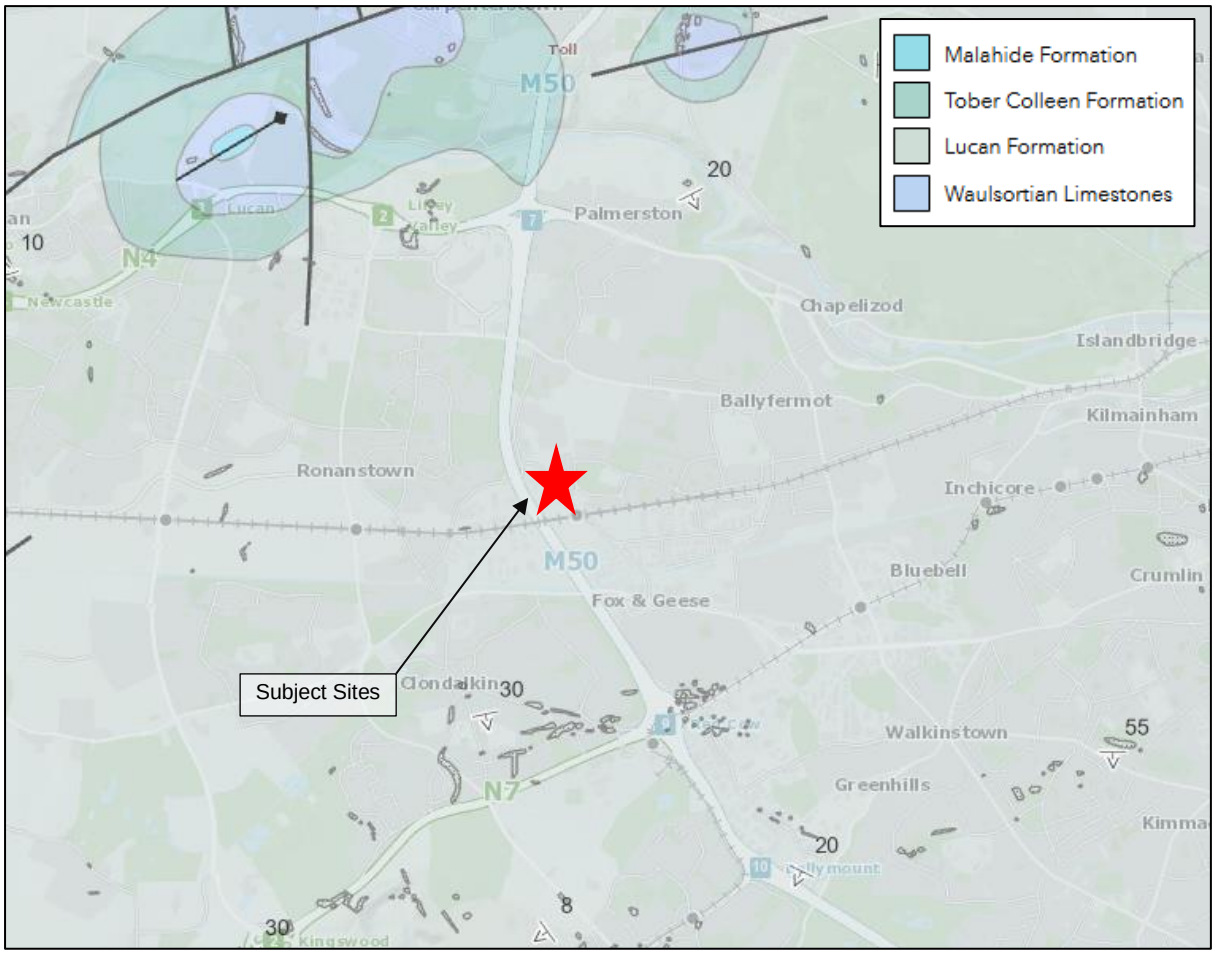


Figure 11.4 Extract from GSI Bedrock Geology Map

The national Aquifer Bedrock Map prepared by the Geological Survey of Ireland was consulted and is extracted to Figure 11.5 Extract from GSI Bedrock Aquifer Map, overleaf.

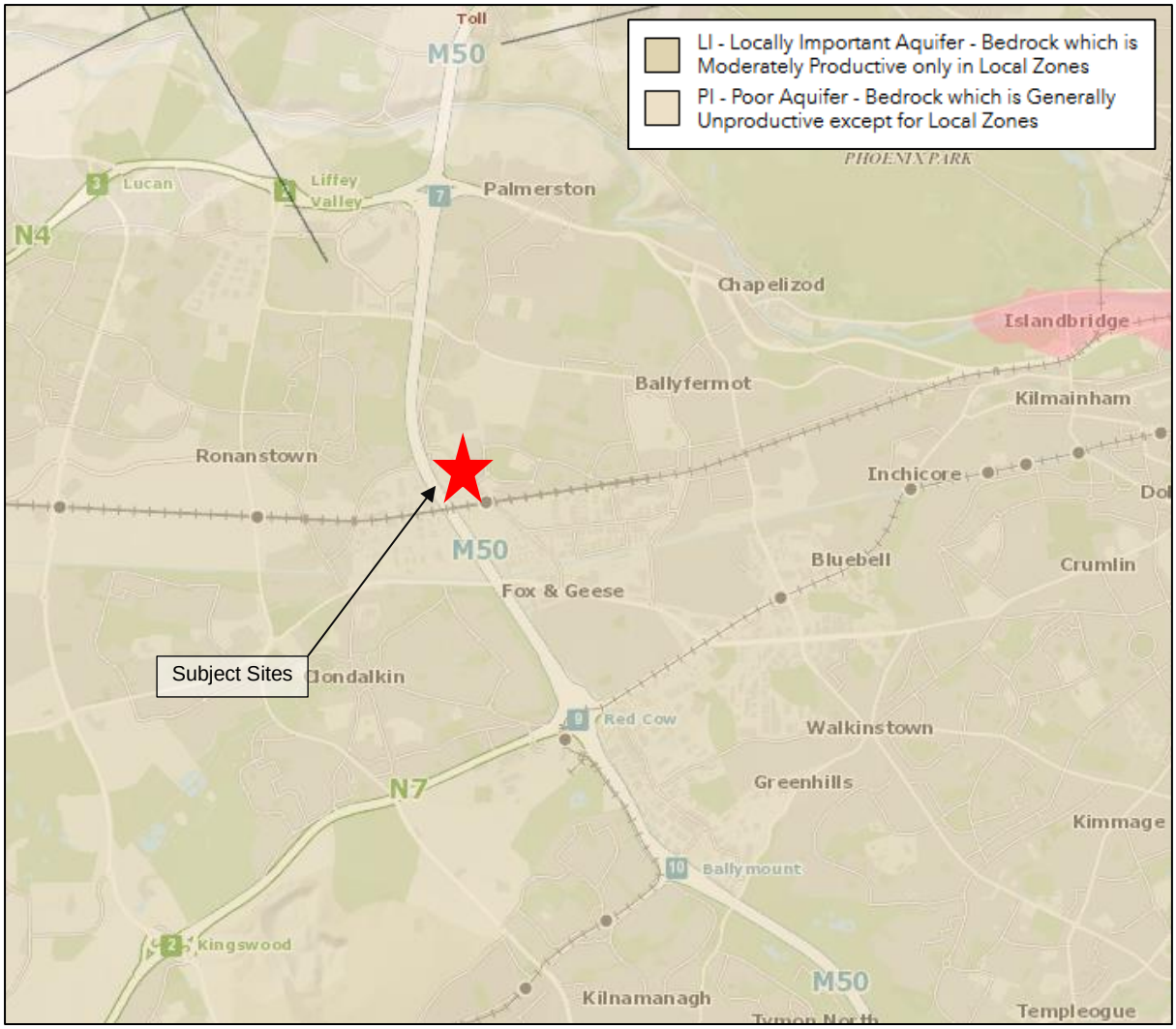


Figure 11.5 Extract from GSI Bedrock Aquifer Map

From the above map extracts, the sites lie in the Lucan Formation which has a designation of LI, which represents Locally Important Aquifer qualities, where the bedrock is moderately productive only in local zones.

The same map viewer series didn't indicate the presence of any groundwater wells or springs in the immediate vicinity of the site.

The groundwater vulnerability in the vicinity of the proposed sites was also examined by referencing the Geological Survey of Ireland. From the GSI groundwater vulnerability map, extracted below, the sites lie within an area of high groundwater vulnerability.

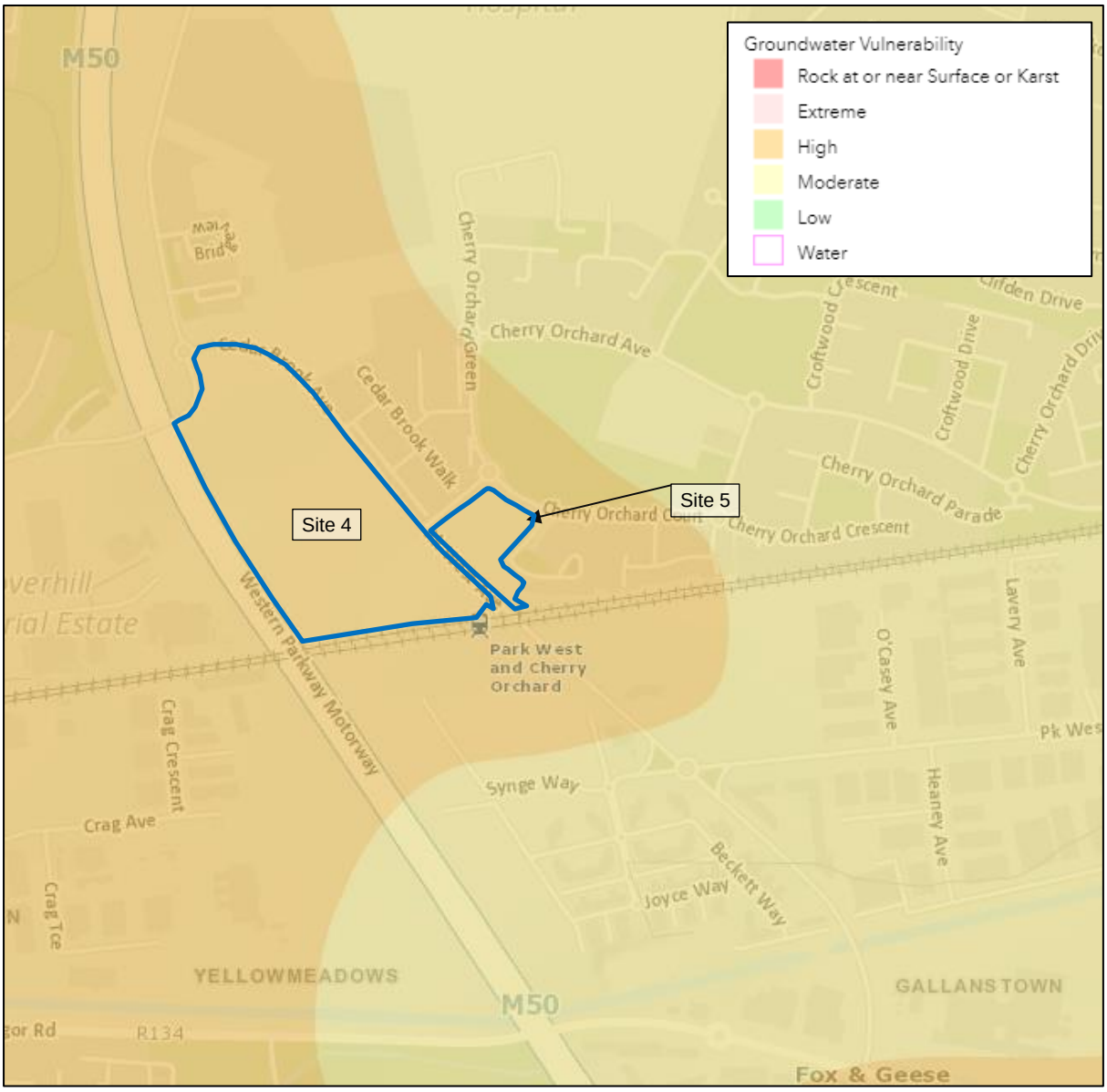


Figure 11.6 Extract from Groundwater Vulnerability Map

11.3.5 Soils

The results of the site investigations are summarised as follows:

11.3.5.1 Topsoil

Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.3m Below Ground Level (BGL). In some areas of the site Gravel Fill was encountered at the surface.

11.3.5.2 Made Ground

On site 4, the Made Ground deposits were encountered beneath the Topsoil/Surfacing and were present to depths of between 0.65m and 1.1m BGL. These deposits were described generally as *brown*

slightly gravelly CLAY with occasional cobbles and contained occasional fragments of red brick, timber, glass, and plastic.

On site 5, to the west of Park West Avenue, the Made Ground deposits were deeper and encountered to depths of up to 3.2m BGL. It should be noted that TP13 refused in the Made Ground at 2.9m BGL so the base wasn't proven at this location. These deposits were described generally *as brown slightly sandy slightly gravelly CLAY with occasional cobbles and contained occasional fragments of concrete, red brick, glass, rope, timber, ceramic, metals, and plastic.*

11.3.5.3 Cohesive Deposits

Cohesive deposits were encountered beneath the Made Ground and were described typically as *brown sandy gravelly CLAY with occasional cobbles and boulders overlying a stiff black sandy gravelly CLAY with occasional cobbles and bounders*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits typically increased with depth and was firm to stiff or stiff below 1.0m BGL in the majority of the exploratory holes on Site 4, and below 3 to 4m BGL on Site 5. These deposits had some, occasional, or frequent cobble or boulder content, where noted on the exploratory borehole logs.

11.3.5.4 Bedrock

The rotary core boreholes recovered Medium strong to very strong grey/dark grey fine to medium grained laminated LIMESTONE interbedded with weak black fine grained laminated Mudstone. Locally the Mudstone was weathered to black clay. This is typical of the Calp Formation, which is noted on the geological mapping of the proposed site. Rare visible Pyrite veins were noted during logging which are typically present within the Calp Limestone. The depth to rock varies from 2.3m BGL in BH03 to a maximum of 5.3m BGL in BH18. The total core recovery is good, typically 100% with some of the uppermost runs dropping to 80 or 90%. The SCR and RQD both are relatively poor in the upper weathered zone, often recovered as non-intact, however, both indices show an increase with depth in each of the boreholes.

11.3.5.5 Groundwater

Groundwater strikes are noted on the exploratory hole logs where they occurred and where possible drilling was suspended for twenty minutes to allow the subsequent rise in groundwater to be recorded. It is noted that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrological regime and groundwater levels would be expected to vary with the tide, time of year, rainfall, nearby construction, and other factors. For this reason, standpipes were installed in BH, BH11, and BH18 to allow the equilibrium groundwater to be determined. The groundwater monitoring is included as Appendix 7 of the Site Investigation report.

11.3.5.6 Geotechnical Laboratory testing

The geotechnical testing carried out on soil samples recovered generally confirm the descriptions on the logs with the primary constituent of the cohesive deposits found to be clay of low to intermediate plasticity. The Particle Size Distribution tests confirm that generally the cohesive deposits are well graded with percentages of sands and gravels ranging between 11% and 56% generally with fines contents of 22% to 56%.

11.3.5.7 Chemical Laboratory Testing

The pH and sulphate testing carried out indicate that pH results are neutral and that the water-soluble sulphate results is low when compared to the guideline values from BRE Special Digest 1:2005. The samples tested classify the soil as a Design Sulphate Level DS-1.

11.3.5.8 Environmental Laboratory Testing

A number of samples were analysed for a suite of parameters which allows for the assessment of the sampled material in terms of total pollutant content for the classification of materials as *hazardous or non-hazardous*. The suite also allows for the assessment of the sampled material in terms of suitability

for placement at licenced landfills (inert, stable, non-reactive, hazardous etc.) The parameter list for the suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (council Decision 2003/33/EC), which for the solid samples are total organic carbons (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

As part of the suite a leachate is generated from the solid sample, which is analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS).

While the laboratory report provides a comparison with the waste acceptance criteria limits it does not provide a waste classification of the material samples nor does it comment on any potentially hazardous properties of the material tested. The possibility for contamination, not revealed by the testing undertaken should be borne in mind particularly where Made Ground deposits are present, or the previous site use or location indicate a risk of environmental variation. The waste classification report is included as an appendix to this document, while the results of the completed laboratory testing are included as Appendix 6 of the Site Investigation report, which is also included as an appendix to this document.

11.3.5.9 Waste Classification

Asbestos fibres were not detected in the samples. The laboratory did not identify asbestos containing material (ACMs) in the samples.

Due to the presence of made ground on site, materials which may be excavated and removed from site would meet the definition of waste under the Waste Framework Directive. Due to the varying levels of anthropogenic materials encountered in the made ground there are potentially two sets of Lists of Waste (LoW) codes with “mirror” entries which may be applied to excavated material to be removed from site.

1. 17-05-03* (soil and stone containing dangerous substances, classified as hazardous) or 04-05-04 (soil and stone other than those mentioned in 17-05-03, not hazardous); or
2. 117-09-03* (other construction and demolition wastes (including mixed wastes) containing hazardous substances) or 17-09-04 (mixed construction and demolition wastes other than those mentioned in 17-09-01, 17-09-02, & 17-09-03).

Where waste is a mirror entry in the List of Waste (LoW), it can be classified via the process of analysis against standard criteria set out in the Waste Framework Directive. The assessment process is described in detail in guidance published by the Irish (EPA Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous, June 2015) and UK Regulatory Authorities (Guidance on the Classification and Assessment of Waste: Technical Guidance WM3, 2015). The assessment involves comparison of the concentration of various parameters against defined threshold values.

The specific LoW code which should be applied to the material at each sample location is summarised in Table 11.1 Waste Classification as Extracted from the Waste Classification Report below. These codes are only applicable where the material is being removed from site as a waste.

The Waste Classification report utilised HazWasteOnline™, a web based commercial waste classification software tool which assists in the classification of potentially hazardous material. This tool

was used to determine whether the material sampled are classified as hazardous or non-hazardous. The use of the online tool is accepted by the EPA. (EPA 2014).

The conclusions presented are based on GII's Professional Opinion. It should be noted that the environmental regulator (in this case the EPA) and the waste acceptor (in this case a landfill operator) shall decide whether a waste is hazardous or non-hazardous and suitable for disposal at their facility.

11.3.5.10 Landfill Waste Acceptance Criteria (WAC)

WAC have been agreed by the EU (Council Decision 2003/33/EC) and are only applicable to material if it is to be disposed of as a waste to a landfill facility. Each individual member state and licensed landfill operator may apply more stringent WAC. The data obtained from laboratory testing has been compared to the WAC limits set out in the Council Decision as well as the specific WAC which the EPA had applied to the Walshestown and Integrated Materials Solutions (IMS) landfills. These landfills have a higher limit for a range of parameters while still operating under an inert landfill license. The potentially applicable waste categories are summarised as follows:

The waste category sections are divided in 4, lettered A-D, with numbered subcategories, A being suitable for disposal at an unlined soil recovery facility, B an inert landfill, C a non-hazardous landfill, and D a hazardous waste treatment facility.

Category A waste is briefly described as: Soil and stone only which are free from anthropogenic materials such as concrete, brick, timber etc. Soil must be free from contamination e.g., PAHs & hydrocarbons. Material meeting this classification may be disposed of to an unlined soil recovery facility.

Category B1 waste: Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/ EC (2002). Results also found to be non-hazardous using the HWOL application. Material meeting this classification may be disposed of to an inert landfill.

Category B2 waste: Reported concentrations greater thank Category B1 criteria, but less than IMS Hollywood Landfill acceptance criteria, as set out in their waste license W0129-02. Results also found to be non-hazardous using the HWOL application. Material meeting this classification may be disposed of to an inert landfill with a waste license suitable to accept the reported concentrations.

Category C waste: Reported concentrations greater than Category B2 criteria but within non-hazardous landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1993/31/EC (2002). Results also found to be non-hazardous using the HWOL application. Material meeting this classification may be disposed of to a Non-Hazardous landfill.
Note:

Category C1 is as Category C but containing <0.001% w/w asbestos fibres.
Category C2 is as Category C but containing >0.001% and <0.01% w/w asbestos fibres.
Category C3 is as Category C but containing >0.01% and <0.1% w/w asbestos fibres.
Category D – Results found to be Hazardous using HWOL Application (Hazardous Treatment required).
Category D1 – Results found to be hazardous due to the presence of asbestos (>0.1%) (Hazardous Treatment required).

All samples were assessed in terms of waste classification using the HazWasteOnline™ tool and also the WAC set out in Council Decision 2003/33/EC and the Walshestown/IMS specific WAC to give a final waste categorisation to determine the most appropriate route for any waste generated. The final

and most applicable waste category for each sample is set out in Table 11.1 Waste Classification as Extracted from the Waste Classification Report:

Table 11.1 Waste Classification as Extracted from the Waste Classification Report

Sample ID	Sample Depth (m)	Material Type	Sample Date	LoW Code	Waste Category
TP-01	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-03	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-03	1.50	Clay	23/08/2022	17 05 04	Category A
TP-06	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-07	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-09	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-10	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-10	1.50	Clay	23/08/2022	17 05 04	Category A
TP-11	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-11	1.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-12	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-13	0.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-13	1.50	Made Ground	23/08/2022	17 05 04	Category B1
TP-14	0.50	Made Ground	23/08/2022	17 05 04	Category B1

11.3.6 Characteristics of the Proposed Development

The subject application is for Phase 1 of a 4-phase masterplan development as per the figure below.

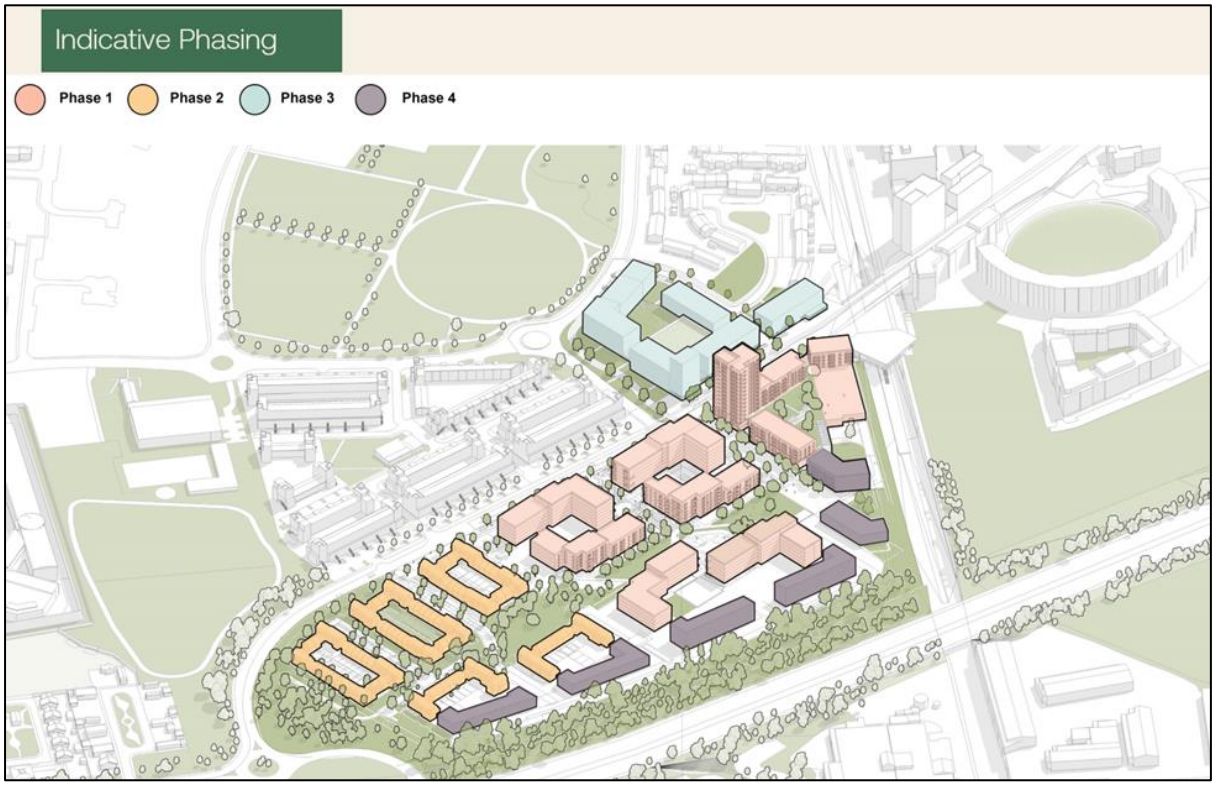


Figure 11.7 Phasing Layout

Phase 1 is the medium and high-density area and the subject application area, which will provide a total of 708 residential units ranging in size from studio to 3-bed apartments, a 2,523m² supermarket, a combined area of 373m² for retail over 7 units, a 672m² creche and 1,222m² of community spaces over 13 buildings. A breakdown of the schedule of accommodation for the subject application is provided overleaf.

Table 11.2 Phase 1 Schedule of Accommodation

Block	Studio	1-bed Apt	2-bed Apt	3-bed Apt	Total	Total Area
1	-	13	-	11	24	-
2A	-	8	14	5	27	-
2B	1	43	66	-	110	-
3	-	12	23	-	35	-
5A	10	16	28	-	54	-
5B	-	10	14	5	29	-
6A	-	20	32	6	58	-
6B	-	8	12	4	24	-
7A	6	35	40	-	81	-
7B	-	5	25	-	30	-
8A	6	17	34	6	63	-
8B	5	13	10	5	33	-
9A	-	29	13	5	47	-
9B	-	8	10	4	22	-
10A	-	16	22	4	42	-
10B	-	10	14	5	29	-
Supermarket					1	2,523m²
Retail					7	373m²
Community					13	1,222m²
Creche					1	672m²

The development includes all associated site works, undergrounding of overhead lines, boundary treatments, drainage, and service connections.

The proposed development, with respect to soils and geology, includes the following characteristics:

- Excavation and disposal of soils unsuitable for reuse to a suitably licenced landfill.

- Stripping of topsoil.
- Excavation for roads and building foundations.
- Excavation for drainage sewers and utilities.
- Regrading and landscaping.
- Disposal of any further surplus excavated soils including any contaminated materials.

The remainder of the phases will be subject to their own planning permission applications; however, their preliminary details are outlined below so that the subject development may be assessed as part of the full masterplan development in its full context. It should be noted that the trunk foul and surface water drainage, including attenuation storage, to serve phases 2, 3, & 4 are part-provided under the subject application for Phase 1.

Phase 2: This is the low-density housing area located to the north of Site 4 and contains 153 residential units comprising 100 apartment/ duplex units and 53 houses.

Phase 3: This will be the development of Site 5, and comprises 254 residential units, 1,200m² of retail space, with community facilities to be confirmed.

Phase 4: This will be the construction of commercial office space over 6 blocks with a total area of c. 16,310m².

11.3.7 Soil Stability

Significant investigations and testing has been carried out on the site to determine the underlying Geotechnical and Environmental aspects of the site soils and geology.

The details of these Investigations and Interpretive reports can be found in the Site Investigation Report and Waste Classification Report, included as an appendix to this document. The procedures used in the investigations were in accordance with IS EN 1997 2:2007 and BS 5930:2015

11.3.7.1 Geotechnical Summary - Foundations

The foundations to the proposed buildings will be supported on the underlying shallow very stiff clays and Limestone bedrock which was found to be present in varying depths of approximately 3m metres below existing ground level throughout the site, as per the Site Investigation Report.

Based on the findings of the site investigations carried out and preliminary foundation load assessments – the foundations used will be traditional shallow pad and strip foundations. Where the structures become very tall (over 10 storeys , as in the case of Block 2B) these structures will be supported on piled foundations bearing directly onto the underlying Limestone bedrock.

11.3.7.2 Environmental Summary

Based on the information presented in the Ground Investigations Ireland Waste Classification Report, included as an appendix to this document, the material that is likely to be excavated and removed from the site has been classified as follows;

- Non-hazardous for transportation.
- Predominantly suitable for disposal at an inert Landfill.

It is noted that all historic maps consulted as part of the investigations indicates that no historic development has taken place on the site.

11.3.7.3 Soil Stability and Retaining Walls

Based on the results of the site investigation works (refer to the previous sections) the proposed foundations will be supported on the stiff clays and Limestone bedrock which exists at relatively shallow depths across the site (approximately 3m below existing ground levels). As a result of the relatively shallow foundation depths – excavations will also generally be shallow and as such excavations will be generally stable in the temporary condition. Lean mix concrete backfill will be used where necessary to ensure practical working depths are provided when installing the foundations. Trench boxes and shoring techniques will also be used to guarantee the temporary stability of all excavations required as part of the works.

It is noted that the proposed finished floor levels of the proposed buildings will be, generally, above the existing ground levels on site – this will help to minimise excavation depths and the requirement for any retaining walls.

Where retaining elements are required – all will be designed in accordance with IS EN 1997: Geotechnical Design (which includes limits to acceptable movements) , while also taking into account the General Principles of Prevention to ensure the chosen designs mitigate and reduce the construction risks on site (whether the risks identified as part of the site specific risk assessment are temporary and / or permanent).

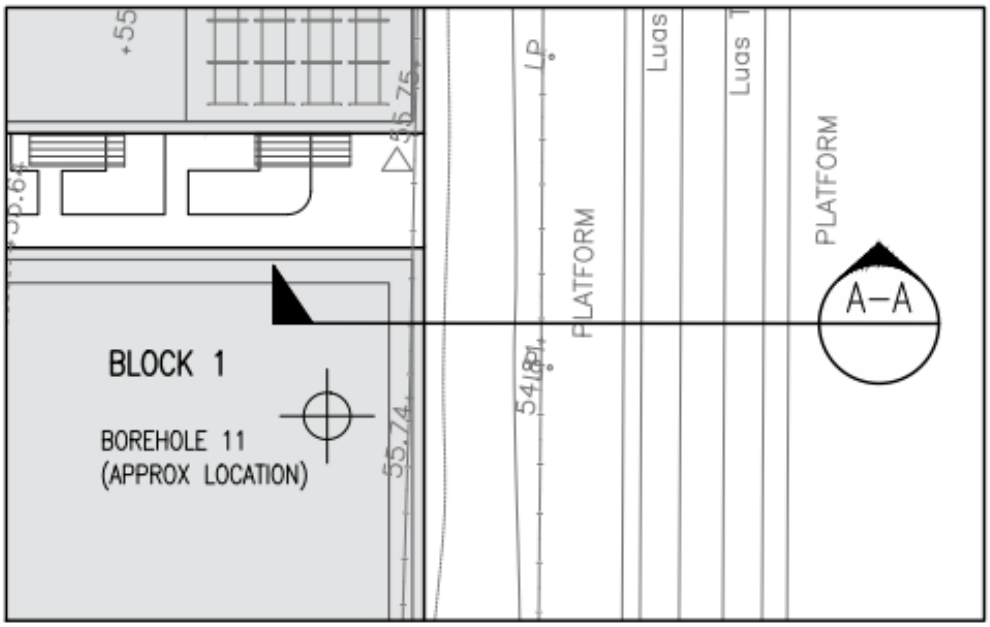
11.3.7.4 Irish Rail Interface

The zone of influence is measured from: 2.0m from the track and then at a gradient of 1:2 (30 degrees).

Block 1 to the southern boundary of the site will be located adjacent to the Rail platform and infrastructure. The proposed building will be approximately 4.8 metres from the nearest point of the platform and approximately 8 m to the edge of the Rail track.

The drawings below demonstrate that the new foundations to block 1 will be below and outside the zone of influence of the rail infrastructure and will not result in any detrimental effects.

The results of the site investigations carried out (BH06 / BH 11 / BH 16) places the limestone bedrock at a level of 53.5m OD along this line – as such all proposed foundations and retaining structures will be founded on this rock level to ensure the stability of the proposed works and protection of the adjacent infrastructure.



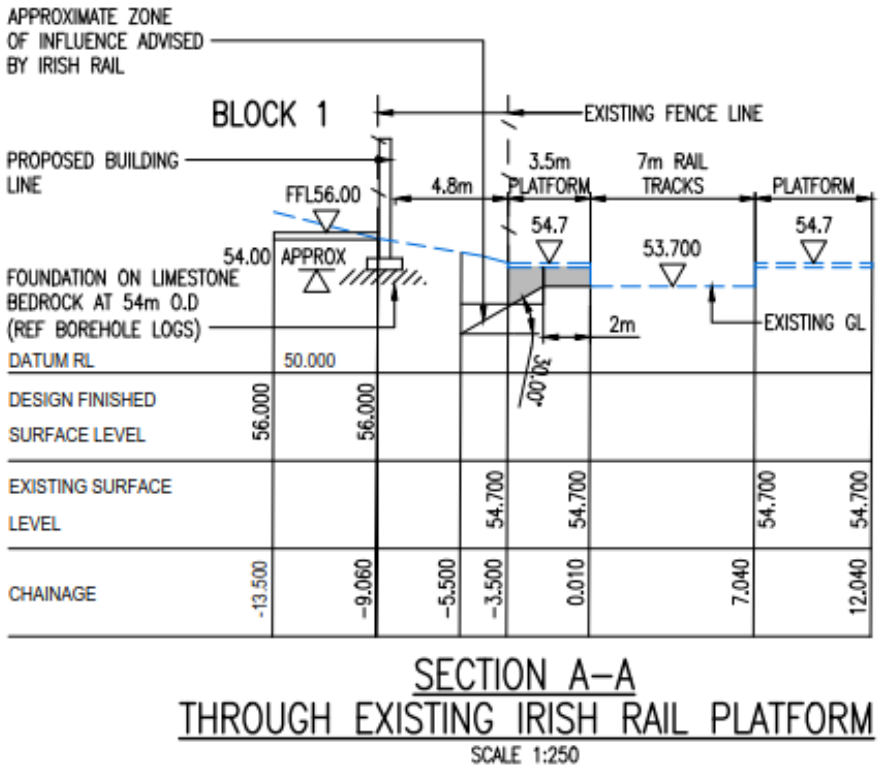


Figure 11.8 Cross section at Railway

11.4 Predicted Impacts

11.4.1 Construction Stage

The removal of topsoil during earthworks and the construction of roads, services, and buildings, in particular roads and building foundations, will expose subsoil to weathering and may result in the erosion of soils during adverse weather conditions, which if unmitigated may have a temporary, negative, slight (non-significant) to moderate (significant) effect.

Construction traffic movements involved in the construction of the proposed development and access roads, may result in localised compaction of the subsoil along haulage routes, having a permanent, slight (non-significant), negative impact on subsoil materials.

Surface water runoff from the surface of the excavated areas, or rainfall on stockpiled material, may result in silt discharges to the local surface water network via overland flow, with the potential to have a permanent, slight, negative impact.

Where feasible, excavated subsoil will be used as part of the construction works with suitable surplus subsoil will be used in areas requiring fill where appropriate. Unsuitable and / or surplus subsoil is required to be disposed of appropriately. Estimated bulk excavation volumes for the overall development are 65,300 m^3, with up to 30,000 m^3 to be removed off-site.

Dust from the site and from soil spillages on the existing road network around the site may be problematic, especially during dry conditions, which will have a short-term, slight negative impact on the geological environment on the site.

Accidental oil or diesel spillages from the construction plant and equipment, in particular at refuelling areas, may result in oil contamination of the soils and underlying geological structures, potentially having a negative, moderate (significant), permanent impact on the geological environment.

Accidental discharges from welfare facilities during the construction stage has the potential to contaminate surface and groundwater courses. with the potential to have a permanent, slight (not significant) to moderate (significant), negative impact.

11.4.2 Operational Stage

During the operational phase of the development, it is not envisaged that there will be any ongoing impacts on the underlying soil as a result of the proposed development. Any hydro-geological impacts are temporary and associated with the construction of the proposed development.

Surface water runoff is directed via SuDS and filtration devices proposed to be provided as part of the development. These will help to remove pollutants from rainwater runoff, ensuring the impact by run-off on the quality of the site soils and groundwater during the operational phase will be considered positive, slight, likely & permanent.

The increase in hardstanding area will result in a reduction in the infiltration potential across the site, which will be negative, slight (not significant) likely, and permanent.

11.5 Mitigation Measures

11.5.1 Construction Stage

The project archaeologist, Archer Heritage Planning ltd., has found evidence of a Fulacht Fia on-site and recommends that this be preserved by record, i.e., subject to full archaeological excavations, in advance of construction. The project archaeologist also recommends that site stripping be monitored by a suitably qualified archaeologist. If any additional archaeology is identified, additional mitigation

strategies will be required following consultation with the DHLGH. Please refer to the Archaeologist reports and EIAR chapter for full details.

The project ecologist, Gerry Tobin, has noted that the area demarcated by Grid Reference GR IO 07758 32794 will remain undeveloped post construction to protect the orchid rich soils. An area running the length of the motorway hedgerow boundary and 5 metres in depth shall form a green area post development and will receive no fertilizers or other artificial inputs. No Shrub flora will be planted in this area and mowing of the grassland will occur only after seed dispersal has occurred in late July/early August annually. Please refer to the Project ecologist's reports and EIAR Chapter for full and further details.

The Site Investigation Reports (S.I. Report) included as an Appendix, has shown that the sites are composed of stratified layers of topsoil, cohesive deposits (brown sandy gravelly clays), and bedrock. Made ground has also been identified on the sites and these deposits are typically composed of brown slightly sandy slightly gravelly clay with occasional cobbles and contained occasional fragments of concrete, red brick, glass, rope, timber, ceramic, metal, and plastic.

Excavated soils to be disposed of will be referenced against the Waste Classification Report also included as part of the Site investigation report. Environmental Laboratory chemical analysis has indicated that the in-fill constituents are non-hazardous. Excavated material from this location will be continuously monitored/inspected for signs of hazardous material contamination during excavation. Should there be any indication of hazardous material contamination, it may be required to be further sampled and analysed to confirm its chemical properties and waste category classification as per the waste landfill facility requirements.

Practical measures have been implemented during the design process to ensure that cut and fill volumes generated have been kept to a minimum by ensure proposed road and building levels match existing ground levels, however, it is anticipated that a volume of cut will be generated on site, that may be suitable for use on the Phase 2 site. This owes to the requirement to raise levels in select areas in order to meet Irish Water's foul drainage strategy for the locality. Furthermore, surplus subsoil and rock may be relocated to other approved areas of the site that may require in-fill, or if required to be removed from site, will be deposited in approved fill areas off-site (Article 27 notification to the EPA required), or to an approved waste disposal facility.

In the case of topsoil careful planning and on-site storage will ensure that this resource is reused on-site as much as possible. Any surplus of soil not reused on site can be sold. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly.

- Topsoil will be kept completely separate from all other construction waste as any cross-contamination of the topsoil can render it useless for reuse.
- Topsoil will be protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas, and site plant and vehicle storage areas.
- Careful separation of builder's rubble packaging and contaminated waste from re-usable material will result in the minimisation of the disposal of material to landfill.
- Spoil heap/stockpiles will not be located within 20m of the existing surface water networks.
- Spoil heaps/stockpiles will be considered for seeding if their storage is likely to be longer than a few seasons.
- Topsoil will be stored in stockpiles less than two metres in height as otherwise the soil matrix (internal structure) can be damaged beyond repair. It will also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

In the unlikely case of a topsoil surplus the Contractor will carry out appropriate environmental chemistry testing in order to determine the waste classification of the soils that are to be excavated and that will include Waste Acceptance Criteria testing. The test regime will be agreed with the receiving landfill operator, if not suitable for an Article 27 transfer, and the testing will be carried out by an accredited laboratory.

Records of topsoil storage, movements and transfer from site will be kept by the C&D Waste Manager. It is projected that all the topsoil will be reused on-site for landscaping purposes in both private residential gardens and public green areas.

A Discharge Licence will need to be obtained from the local Authority by the Main Contractor. If topography doesn't allow for a gravity outfall from the sedimentation/settlement pond, a commercially available modular settlement tank will be utilised for the project, or outfall volumes may instead be pumped. Untreated surface water will not be permitted to flow to any natural or piped surface water network.

Silt traps, silt fences and tailing ponds will be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction phase. All surface water will be treated for silts and sediment prior to disposal to the surface water network. Any and all other conditions, restrictions, or limits associated with the discharge license shall be adhered to.

The provision of wheel wash areas at the exit to the development as necessary will minimise the amount of soil deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis. All trucks carrying soils on the public road will be covered and carry a maximum of 10 cubic metres of material to prevent spillage and damage to the surrounding road network.

Appropriate storage and bunding measures will be implemented throughout the construction stage to prevent contamination of the soil and groundwater from oil and petrol leakage from site plant. Refuelling will be restricted to allocated re-fuelling areas. This storage are is to be an impermeable, roofed, bunded area, designed to contain 110% of the volume of fuel stored. Emergency fuel spill kits are to be stored on-site with designated staff familiar with their usage. Spill kit facilities will be provided for across the site.

If groundwater is encountered during excavations, mechanical pumps will be required to remove that groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

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. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite.

Nuisance dust emissions from construction activities are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution.

The main contractor will be required to demonstrate that both nuisance dust and fine particle emissions from the site are adequately controlled and are within acceptable limits.

Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming airborne, since suppression is virtually impossible once it has become airborne.

The following are techniques and methods which are widely used currently throughout the construction industry, and which will be used in the development.

1. The roads around the site are all surfaced, and no dust is anticipated arising from unsealed surfaces.
2. A regime of 'wet' road sweeping will be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
3. Footpaths immediately around the site will be cleaned by hand regularly, with damping, as necessary.
4. High level walkways and surfaces such as scaffolding will be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
5. Vehicle waiting areas or hard standings will be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
6. Vehicle and wheel washing facilities will be provided at the site exit(s). If necessary, vehicles will be washed down before exiting the site.
7. Netting will be provided to enclose scaffolding in order to mitigate escape of airborne dust from the new buildings.
8. Vehicles and equipment will not emit black smoke from exhaust system, except during ignition at start up.
9. Engines and exhaust systems will be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
10. Servicing of vehicles and plant will be carried out regularly, rather than just following breakdowns.
11. Internal combustion plant will not be left running unnecessarily.
12. Exhaust direction and heights will be such as not to disturb dust on the ground and to ensure adequate local dispersal of emissions.
13. Fixed plant such as generators will be located away from residential areas.
14. The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
15. The transport of dusty materials and aggregates will be carried out using covered / sheeted lorries.
16. Material handling areas will be clean, tidy, and free from dust.
17. Vehicle loading will be dampened down and drop heights for material to be kept to a minimum.
18. Drop heights for chutes / skips will be kept to a minimum.
19. Dust dispersal over the site boundary will be minimised using static sprinklers or other watering methods, as necessary.
20. Stockpiles of materials will be kept to a minimum and if necessary, they will be kept away from sensitive receptors such as residential areas etc.
21. Stockpiles where necessary, will be sheeted or watered down.
22. Methods and equipment will be in place for immediate clean-up of spillages of dusty material.
23. No burning of materials will be permitted on site.
24. Earthworks excavations will be kept damp where necessary and where reasonably practicable.
25. Cutting on site will be avoided where possible by using pre-fabrication methods.

26. Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, will be employed.
27. Where scabbling is to be employed, tools will be fitted with dust bags, residual dust will be vacuumed up rather than swept away, and areas to be scabbled will be screened off.
28. Wet processes will be used to clean building facades if possible. If dry grit blasting is unavoidable, then areas of work will be sealed off and dust extraction systems used.
29. Where possible pre-mixed plasters and masonry compounds will be used to minimise dust arising from on-site mixing.
30. Prior to commencement, the main contractor will identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the main contractor will prepare environmental risk assessments for all dust generating processes, which are envisaged.
31. The main contractor will allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
32. Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced road, the limit shall be 20 kph, and on surfaced roads as site management dictates.

The construction of the proposed development has potential to cause a slight, adverse, temporary, residual impact on soils in the immediate vicinity of the site.

11.5.2 Operational Stage

On completion of the construction phase and following replacement of topsoil, a planting programme will commence to prevent soil erosion.

SuDS and filtration devices are proposed to be provided as part of the development. These will help to remove pollutants from rainwater runoff. They will require periodic inspection and maintenance as per their installation manuals. These have been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works Volume 6.0 (GDRCPDW) and the SuDS Manual CIRIA C753.

Foul drainage and watermains have been designed in accordance with their respective Codes of Practice by Uisce Eireann. A Statement of Design Acceptance has been issued by Uisce Eireann and is included as an appendix to the Engineering Assessment Report, submitted under a separate cover.

Therefore, the risk of accidental discharge has been adequately addressed and mitigated through design.

The operation of the proposed development is not considered to have an impact on soils in the immediate vicinity of the site.

11.6 Residual Impacts

11.6.1 Construction Stage

With the protective measures noted above in place during the excavation works and construction stage, any potential impacts on soils and geology in the area will not have significant adverse impacts, and no significant adverse impacts on the soils and geology of the subject lands are envisaged.

The residual risk associated with site clearance, excavation and construction are considered to be negative, slight (not significant) local, likely and permanent.

11.6.2 Operational Stage

There will be minor permanent regrading of the sites in line with the ground levels proposed for the buildings and roads. Open spaces will be regraded to meet these buildings and roads.

Reinstatement measures in relation to soils consist primarily of the re-soiling of open areas / landscaping and the replanting of these areas. No post development reinstatement works will be required.

On completion of the construction phase and following replacement of topsoil and implementation of a planting programme, no further impacts on the soil are envisaged.

SuDS measures, including permeable paving and infiltration drains, will assist with cleaning surface water runoff while replenishing the natural ground water table and their impact will be positive, slight (not significant) likely, and permanent.

11.7 Cumulative Effects

On completion of the construction phase and following replacement of topsoil and a planting programme, no further impacts on the soil environment are envisaged except for the possibility of contamination of soil from foul water effluent or oil/chemical spills from the site occupier (residents and commercial interests) operations. This is based on the current EIAR assessment of the masterplan lands as a whole rather than just the subject application site. Mitigation measures noted throughout this report apply to the full masterplan lands and their subsequent planning application and not just the subject application.

11.7.1 Other Impacts Anticipated

A potential risk to human health due to the associated works during construction is the direct contact, ingestion, or inhalation of receptors (i.e., construction workers) with any soils which may potentially contain low level hydrocarbon concentrations from site activities (potential minor leaks, oils, and paint).

No human health risks associated with long term exposure to contaminants (via direct contact, ingestion, or inhalation) resulting from the proposed development are anticipated, as the construction stage will be temporary (short-term).

11.8 Monitoring

11.8.1 Construction Stage

Monitoring during the construction phase is recommended, in particular to the following items:

- Excavation of the historic in-fill material.
- Adequate protection of topsoil/subsoil stockpiled for reuse.
- Adequate protection from contamination of soils for removal.
- Monitoring of surface water discharging to the existing surface water drainage system.
- Monitoring cleanliness of the adjoining road network.
- Monitoring measures for prevention of oil and petrol spillages.
- Dust control by dampening down measures, when required due to dry weather conditions.

11.8.2 Operational Stage

During the operation phase, the surface water network (drains, gullies, manholes. AJs, SuDS Devices, attenuation systems etc.) will need to be regularly maintained and where required cleaned out. A

suitable maintenance regime of inspecting and cleaning will be incorporated into the safety file/maintenance manual for the development.

Surface SuDS features can typically be maintained as part of the regular maintenance of the landscape, incorporating litter picking, grass cutting, and inspections. Figure 11.9 Regular Maintenance Requirements for SuDS, is an extract from Section 12.3 of the Council's SuDS Design & Evaluation Guide, and generally describes the regular maintenance aspect for the SuDS.

Type	Activity	Normal site care (Site) or SuDS-specific maintenance (SuDS)	Suggested frequency
Regular Maintenance			
Litter	Pick up all litter in SUDS Landscape areas along with remainder of the site – remove from site	Site	1 visit monthly
Grass	Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. Leaving cuttings in situ	Site	As required or 1 visit monthly
Grass	Mow all dry swales, dry SUDS basins and margins to low flow channels and other SUDS features at 100mm with 150mm max. Cut wet swales or basins annually as wildflower areas – 1st and last cuts to be collected	Site	4-8 visits per year or as required
Grass	Wildflower areas strimmed to 100mm in Sept or at end of school holidays – all cuttings removed Or Wildflower areas strimmed to 100mm on 3 year rotation – 30% each year – all cuttings removed	Site	1 visit annually 1 visit annually
Inlets & outlets	Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	SuDS	1 visit monthly
Permeable paving	Sweep all paving regularly to keep surface tidy	Site	1 visit annually or as required

Figure 11.9 Regular Maintenance Requirements for SuDS

There will still be a remaining requirement for more intensive maintenance tasks to be undertaken however, the severity of these tasks can be reduced by regular inspections and proactive responses being incorporated as a part of the regular maintenance regime discussed above. A table showing the typical requirements for the occasional maintenance tasks and remedial works is extracted from the Council's SuDS Design & Evaluation Guide to the figure overleaf.

Occasional Tasks			
Permeable paving	Sweep and suction brush permeable paving when ponding occurs	SuDS	As required - estimate 10-15 year intervals
Flow controls	Annual inspection of control chambers - remove silt and check free flow	SuDS	1 visit annually
Wetland & pond	Wetland vegetation to be cut at 100mm on 3 – 5 year rotation or 30% each year. All cuttings to be removed to wildlife piles or from site.	Site	As required
Silt	Inspect swales, ponds, wetlands annually for silt accumulation	Site & SuDS	1 visit annually
Silt	Excavate silt, stack and dry within 10m of the SUDS feature, but outside the design profile where water flows. Spread, rake and overseed.	Site & SuDS	As required
Native planting	Remove lower branches where necessary to ensure good ground cover to protect soil profile from erosion.	SuDS	1 visit annually
Remedial Work			
General SuDS	Inspect SuDS system to check for damage or failure when carrying out other tasks. Undertake remedial work as required.	SuDS	Monthly As required

Figure 11.10 Regular Maintenance Requirements for SuDS

11.9 Difficulties Encountered

There were no difficulties encountered.

11.10 Interactions

There will be an interaction between this chapter and the following chapters:

Material Assets - Traffic. There will likely be a requirement for surplus excavated soil volumes to be transported by road for disposal or re-use. Haulage details are discussed in the Traffic and Transport Chapter of this document.

Water: Site preparation works can potentially lead to elevated silt/sediment or other contaminant loading due to construction site runoff. Dewatering of excavations during the construction phase can result in water with elevated silt and possible chemical contaminants requiring discharge to the local drainage system. Construction stage works can potentially impact water due to the risk of accidental spills, cross-contamination due to incorrect waste soils management, use of contaminated material as fill, etc.

Air Quality and Climate: Dust generated during site clearance, reprofiling, excavation, and soil reinstatement works can lead to temporarily diminished air quality.

11.11 References

- Geological Survey of Ireland, Bedrock Maps
- Google Maps
- Site Investigation and Waste Classification Reports
- Ordinance Survey of Ireland Historical Maps
- GII Site Investigation Report
- GII Waste Analysis Classification Report
- Drainage network maps
- Dublin City Council's SuDS Design & Evaluation Guide
- Uisce Eireann Standard Details
- Uisce Eireann Codes of Practice
- Greater Dublin Regional Code of Practice for Drainage Works

12 Water

12.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) has been prepared by Waterman Moylan and provides an assessment of the impact that the proposed development of Cherry Orchard Point at Sites 4 and 5, Park West Avenue, Dublin 10 will have on the surrounding hydrological (surface water), hydrogeological (ground water), foul water, water supply, and flood risk both during the construction and operation phases. The interaction between the surface water drainage proposal as part of the masterplan development will also be assessed in this chapter.

12.2 Assessment Methodology

An initial assessment was carried out which defined the project in terms of location, type & scale, established the baseline condition, established the type of hydrological environments, established the activities associated with the project and initial assessment and impact determination. These objectives were achieved by way of a desktop study and baseline data collection.

The following information sources were used in the assessment of the proposed development site:

- Geological Survey of Ireland (GSI) Website.
- Environmental Protection Agency.
- Office of Public Works (OPW) National Flood Hazard Mapping.
- OPW Catchment Flood Risk and Management Studies.
- Drainage and watermain Records Maps.
- Ordinance Survey Mapping.
- Topographical and GPR Surveys.
- Site Investigation Reports and Soakaway Testing.
- Water Framework Directive (WFD) Status.

Additional information has been compiled through consultation and feedback from stakeholders and the design team.

Under the Water Framework Directive (WFD) and corresponding Regulations, the water quality of Ireland's surface and groundwater is assessed biologically, physically, and chemically. Assessments are conducted by the EPA and Local Authorities and have been compiled and presented in a standardised manner for River Basin Districts. Baseline information on the local and regional surface water bodies, their status, and threats were obtained from a range of documents and online sources including the EPA's Water Quality databased, Ireland's Water Framework Directive "Water Matters" online resource and the Eastern River Basin District (ERBD) website and reports.

A site-specific Flood Risk Assessment report has been undertaken and accompanies is included in this planning application under a separate cover. This assessment considered flood risk to the proposed development from all potential sources and the possible impact of the proposed development on flood risk elsewhere. Relevant sources/mechanisms of flooding include tidal/coastal, fluvial, pluvial, existing drainage and water infrastructure and proposed drainage and water infrastructure and groundwater. This assessment was undertaken in accordance with: The planning system and Flood Risk Management Guidelines for Planning Authorities (Department of Environment, Heritage and Local Governments and the office of Public Works, C624 Development and Flood Risk (Construction Industry Research and Information Association, CIRIA) & the Dublin City Development Plan (2022-2028).

Record information on the existing infrastructure were obtained from Uisce Eireann. Information on all services is supplemented with information obtained from the site topographical survey, Ground Penetrating Radar (GPR Survey), site inspections and Ordnance Survey Mapping.

Assessment of existing and proposed infrastructure for wastewater drainage, water supply, and surface water drainage was conducted in accordance with I.S EN12056: 2000 “Gravity Drainage Systems inside Buildings”, I.S. EN752: 2017 “Drain and Sewer Systems outside Buildings, The Greater Dublin Regional Code of Practice for Drainage Works, Uisce Eireann’s Code of Practice for Wastewater infrastructure, Uisce Eireann’s Code of Practice for Water Infrastructure, and the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS).

Allowable surface water runoff from the proposed development site has been calculated using the GDGDS, The SuDS Manual (CIRIA), and further in accordance with Dublin City Council requirements.

12.3 Baseline Environment

The subject masterplan development is comprised of 2 No. sites. Site 4 & Site 5 are bisected by Park West Avenue and lie to the west and east of this roadway respectively, as per Figure 12.1 Site Location (Source: Google Earth).

The Site Investigation Report undertaken by Ground Investigations Ireland (GII), determined that Site 4 is combination of Greenfield and Brownfield, with evidence of fill material in the area of the site previously used as a construction compound. Site 5 is predominantly a brownfield site, with fill material found for the same reason.

Site 4 is bound to the west by the M50, to the south by the Dublin-Kildare rail line and the Park West & Cherry Orchard station, and to the east and north by Park West Avenue. Site 5 is bound to the west by Park West Avenue, the northwest by Cedar Brook Way, the northeast and east by Barnville Park, and to the south by the Dublin-Kildare rail line and the residential unit of 62 Barnville Park.

Site 4 is currently access via a secured gate from Park West Avenue. Site 5 is accessed via a similar arrangement from Cedar Brook Way.

The area of the subject application is indicated by the red boundary line, also on the figure overleaf. A letter of consent has been obtained for the area of public works required from the Local Authority.

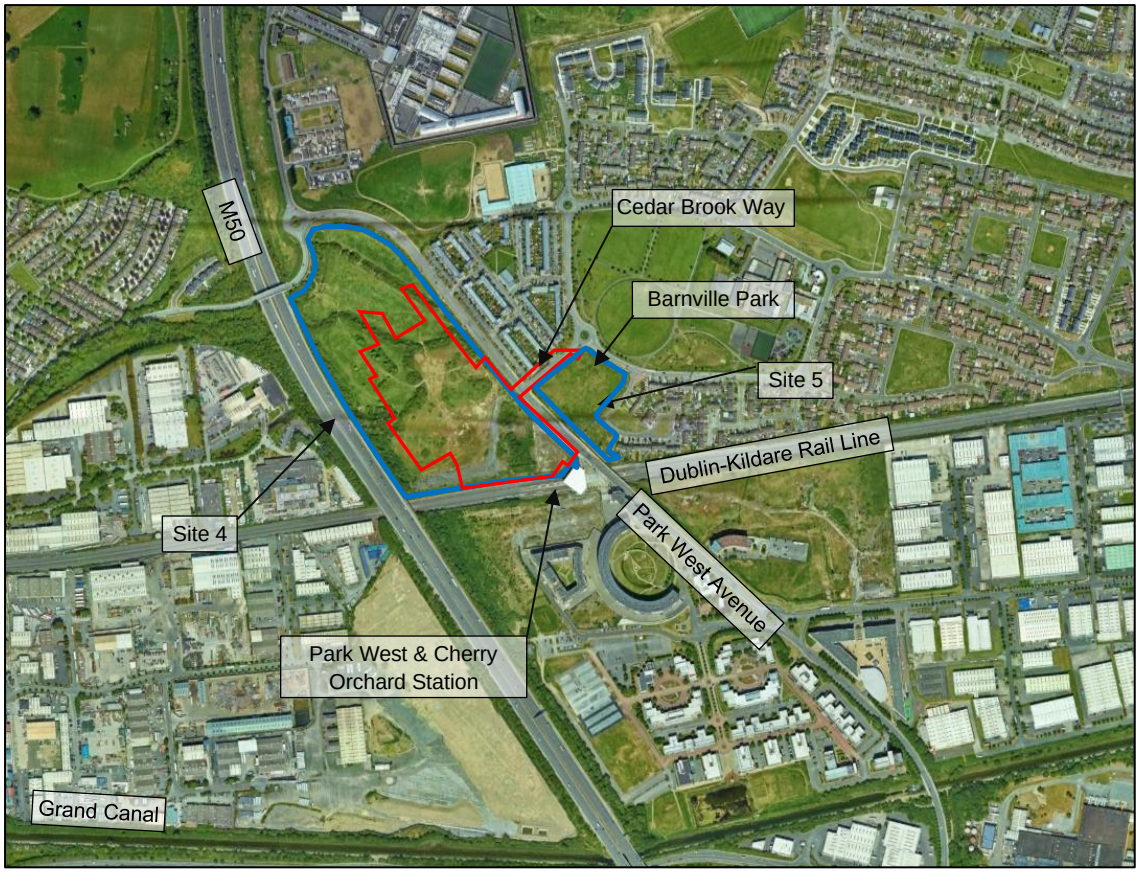


Figure 12.1 Site Location (Source: Google Earth)

The overall masterplan development area as per the blue line boundaries is c. 13.02ha, with Site 4 being c. 11.41 ha and Site 5 being c. 1.61ha. The area of the subject application indicated by the redline boundary, including for works in the public domain, is 6.16ha (61,648m²).

For Site 4, the topographic survey of the area indicates that the low point of the site has a level of 55.72m OD. This is located on the eastern site boundary approximately 140m north of the junction of Park West Avenue and Cedar Brook Way. The remainder of the site generally slopes to this location owing to the embankments and subsequent site grading from the Dublin-Kildare Rail line to the south, M50 to the west, and approach road to the overpass on the M50 to the north.

Site 5 has a central high point with a level of 58.05m OD, and slopes outwards to all boundaries. The boundaries of Site 5 typically have levels between 54.80m and 56.00m, with the higher of these levels being located to the south of the site, adjacent to the retaining wall of the Park West Avenue Bridge over the rail lines.

Ordnance survey and topographic survey mapping indicates that Site 4 contains static ditches with no outfall. These ditches previously had hydrological connectivity and flow, which has been cut-off by the construction of the M50 to the west and the Cedar Brook housing development to the east, as discussed later in this Chapter. These ditches normally remain dry except in heavy rainfall events where water that is not percolated via the site's naturally grassed landscaping, would collect locally in these static ditches for infiltration to the groundwater table. Site 5 does not have any form of surface drainage network and conveys rainfall directly to the soils via its grassed landscape. There is potential during heavy rainfall events, that the ground may become saturated and unable to further infiltrate rainfall, which would then run from the surface, over the boundary and to the adjacent road networks to outfall to the storm drainage networks serving these roads. The sites are located in the catchment of the Blackditch stream, a tributary of the Camac River which has an ultimate outfall to the River Liffey at Heuston Station.

EPA mapping advises that the River Waterbody WFD status 2016-2021 for the Camac_040 (River Camac), European Code: IE-EA_09C020500 has a status of “poor”, and a risk status of “at-risk”. The status of the Camac River is based on monitoring stations, with the nearest of these stations, downstream of the Blackditch Stream discharging to the River Camac, being National Water Monitoring Station Ref: RS09G080100.

The project archaeologist, Archer Heritage Planning Ltd., have identified the ploughed out remains of a Fulacht Fia located centrally on site 4, adjacent to the convergence of 2 No. static ditches on their southern side. The archaeologist has recommended that the remains of the Fulacht Fia be preserved by record prior to further works being undertaken on site.

12.3.1 Site Development

Currently, the sites are primarily greenfield in nature (scrubland) however, it is known that more recently the sites have both been used as construction compounds and are a mix of greenfield and infill material. The Site Investigation Report confirms this.

12.3.2 Hydrology (Surface Water)

Historic maps for the locality have been reviewed. As noted above in respect to the static ditch system, a detailed review of historic maps for the locality, from the national historic maps dashboard produced by Ordnance Survey Ireland (OSI), indicates that the ditch system noted as present in Site 4 previously had hydrological connectivity from the east, merging on the site and flowing to the west. It is clear that this hydrologically connectivity has been cut-off on the west by development of the M50, and to the east by residential development. Refer to Figure 12.2 Site Location (Source: OSI Viewer Historic Maps) below for an extract of this historic map.

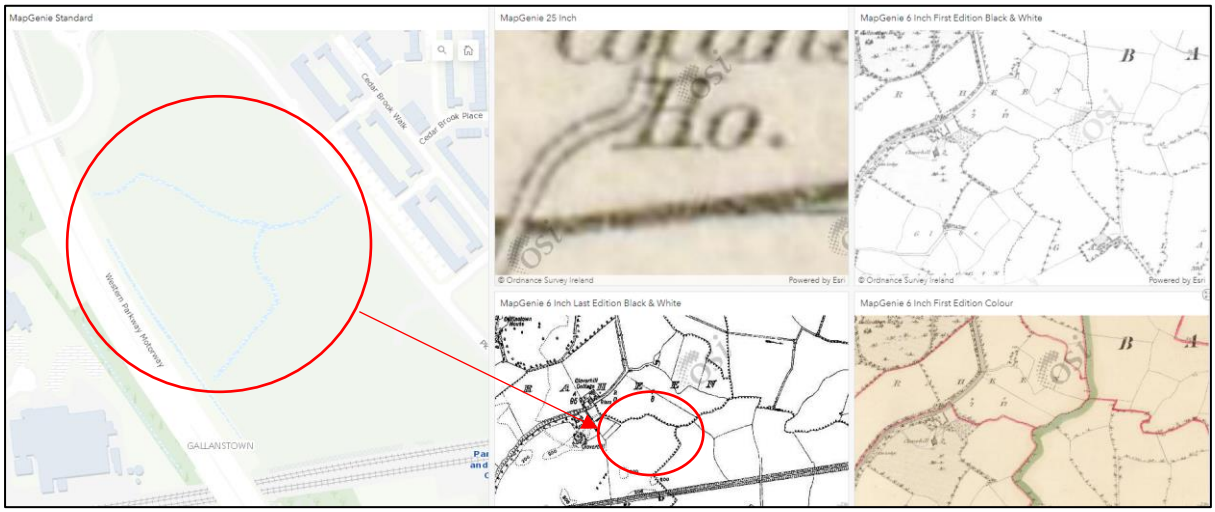


Figure 12.2 Site Location (Source: OSI Viewer Historic Maps)

Due to the topography, as discussed previously, and geological conditions discussed in following sections, it is likely that rainfall from lesser events are percolated on-site, while heavy storm events likely flow off the surface to the adjacent road networks and ultimately the surface water drainage network associated with these roads.

12.3.3 Hydrogeology & Groundwater

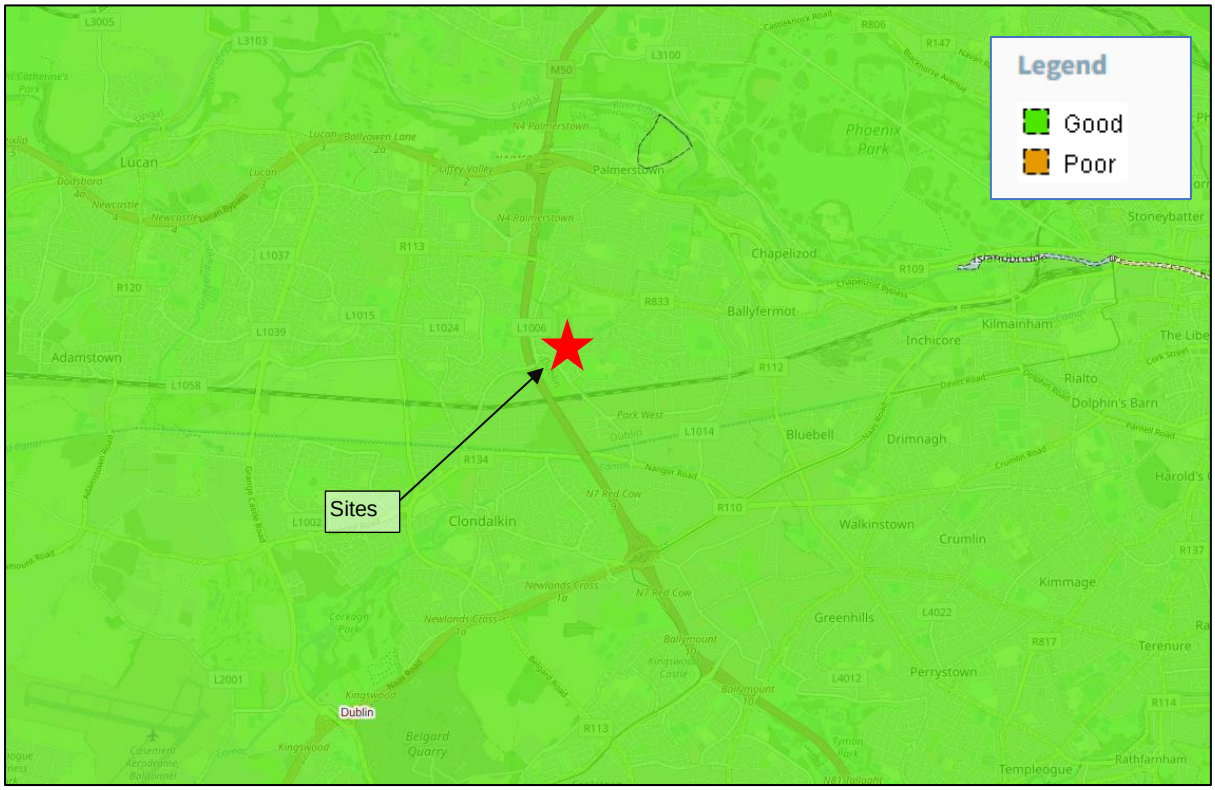


Figure 12.3 EPA's Ground Waterbody Status Map

A review of the EPA's (Environmental Protection Agency) website database classifies the ground waterbody (2016-2021) status as good, as per the extract shown in Figure 12.3 EPA's Ground Waterbody Status Map below.

The national Aquifer Bedrock Map prepared by the Geological Survey of Ireland was consulted and is extracted in Figure 12.4 Extract from GSI's Bedrock Aquifer Map, overleaf.

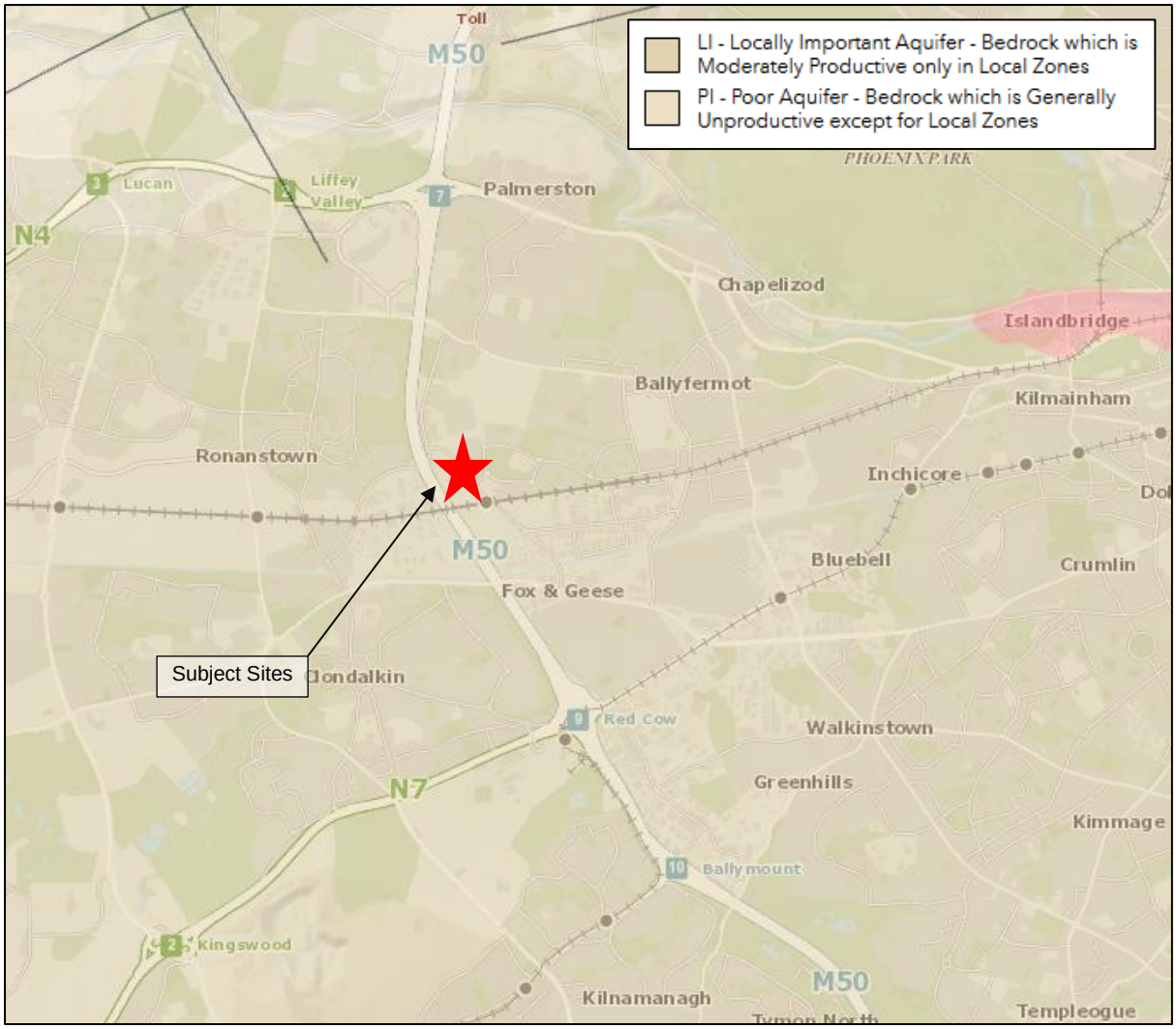


Figure 12.4 Extract from GSI's Bedrock Aquifer Map

From the above map extracts, the sites lie in an area which has a designation of LI, which represents Locally Important Aquifer qualities, where the bedrock is moderately productive only in local zones.

The same map viewer series didn't indicate the presence of any groundwater wells or springs in the immediate vicinity of the site.

The groundwater vulnerability in the vicinity of the proposed sites was also examined by referencing the Geological Survey of Ireland. From the GSI groundwater vulnerability map, extracted overleaf, the sites lie within an area of high groundwater vulnerability.

Flood Risk Assessment

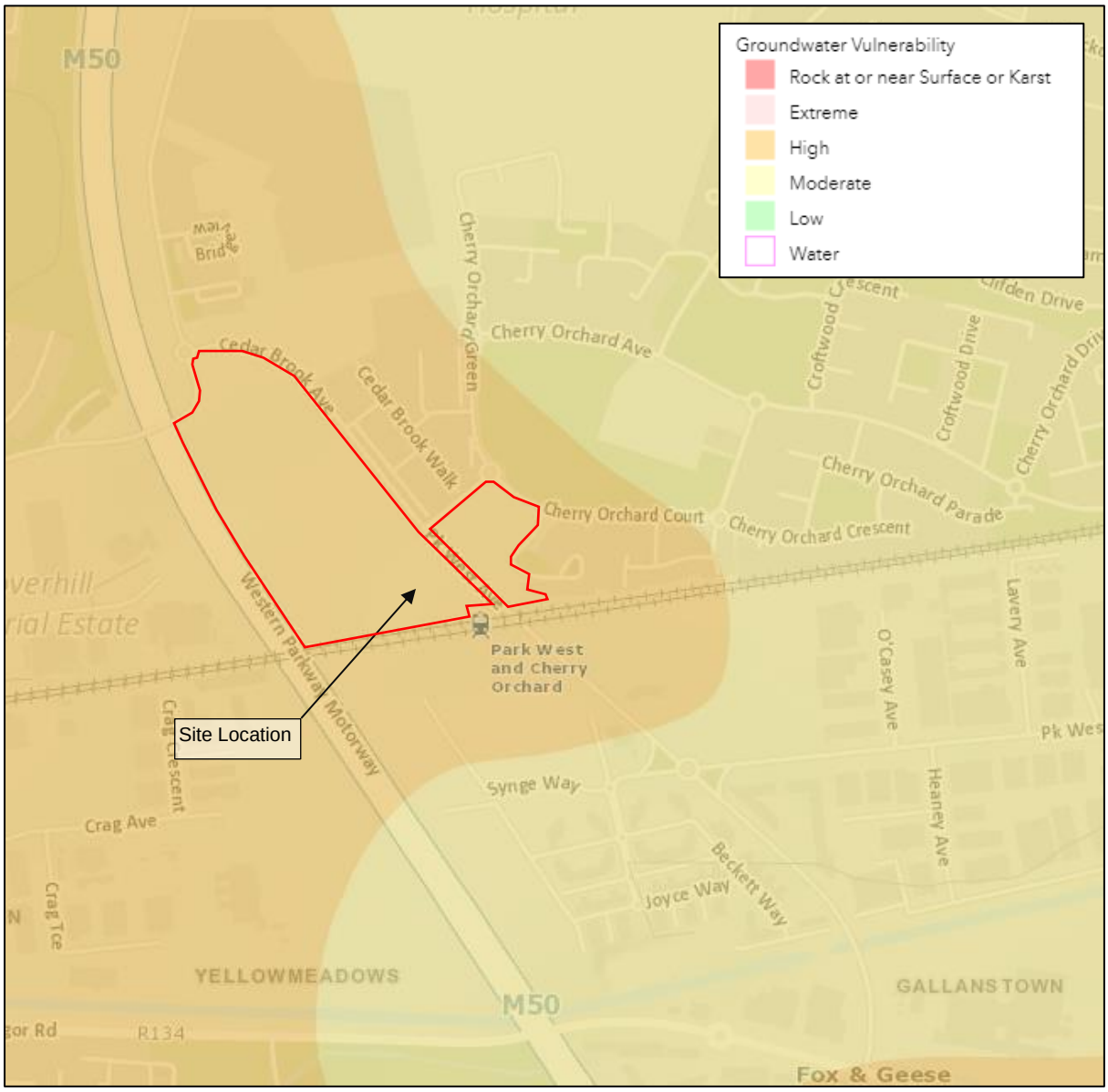


Figure 12.5 Extract from Groundwater Vulnerability Mapping

A Flood Risk Assessment has been prepared by Waterman Moylan Engineers and has been submitted under a separate cover. This Flood Risk Assessment has been carried out in accordance with the DEHLG/OPW Guidelines on the Planning Process and Flood Risk Management published in November 2009. The assessment identifies and sets out possible mitigation measures against potential risks of flooding from various sources. Sources of possible flooding include costal, fluvial (river), pluvial (direct heavy rain) and groundwater.

The Office of Public Works provides flood mapping on their website floodinfo.ie. An extract of the tidal flood mapping is shown overleaf in Figure 12.6 Extract from Tidal Flood Extent Mapping (Source: www.floodinfo.ie). The map extract indicates that the nearest extent of potential tidal flooding is located at Islandbridge on the River Liffey, c. 4.7km from the subject site.

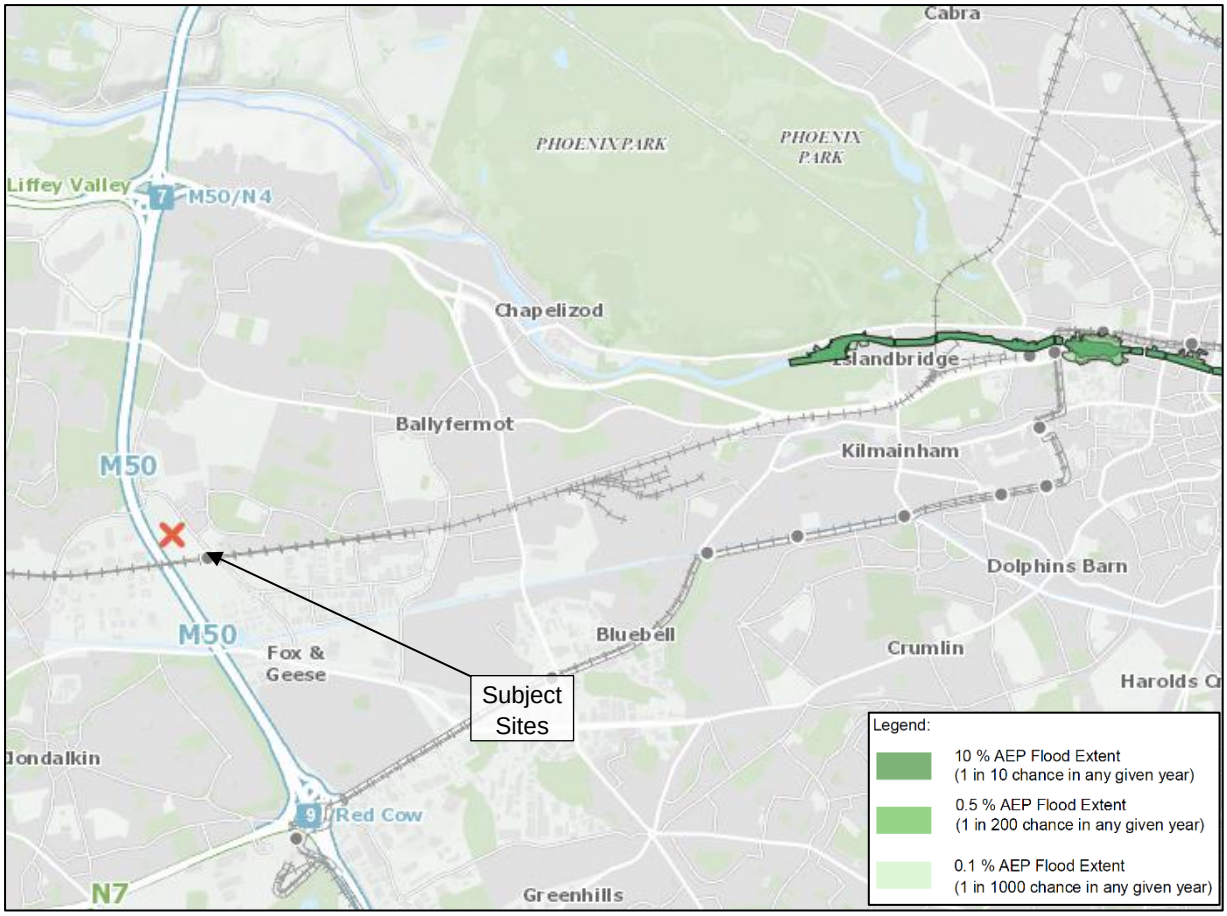


Figure 12.6 Extract from Tidal Flood Extent Mapping (Source: www.floodinfo.ie)

High probability flood events, as shown in the above map, are defined as having approximately a 1-in-10 chance of occurring or being exceeded in any given year (10% Annual Exceedance Probability), medium probability flood events are defined as having an AEP of 0.5% (1-in-200 year storm), while low probability events are defined having an AEP of 0.1% (1-in-1,000 year storm). The map indicates that the subject development is not at risk of flooding for the 1 in 1,000-year event.

Given that the site is located 13.1 kilometres inland from the Irish Sea, 4.7 kilometres from the nearest location at risk of tidal flooding, and that there is at least a 52.77m level difference between the lowest existing ground level (55.72m) and the record high tide event (2.95m), and given that the site is outside of the 1-in-1,000 year flood plain, it is evident that a pathway does not exist between the source and the receptor. The risk from tidal flooding is therefore extremely low and no flood mitigation measures need to be implemented.

The subject site is located within the Blackditch stream catchment. The Blackditch stream is a tributary of the Camac River which outfalls to the River Liffey at Heuston Station. There are no direct hydrological links (surface water drainage systems or natural watercourses) between the subject sites and the Blackditch stream. The site has an indirect hydrological link to the Blackditch Stream, whereby as discussed previously, overland flows from the site may enter the surface water drainage network serving the adjacent roads.

Figure 12.7 Extract from Fluvial Flood Extent Mapping (Source: www.floodinfo.ie). below, shows an extract of the extent of potential fluvial flooding in the vicinity of the site. This extract indicates that the site is not at risk of flooding for even the 1 in 1,000 year flood event. However, it is noted that a flood risk has been identified further downstream from the sites on the Camac River.

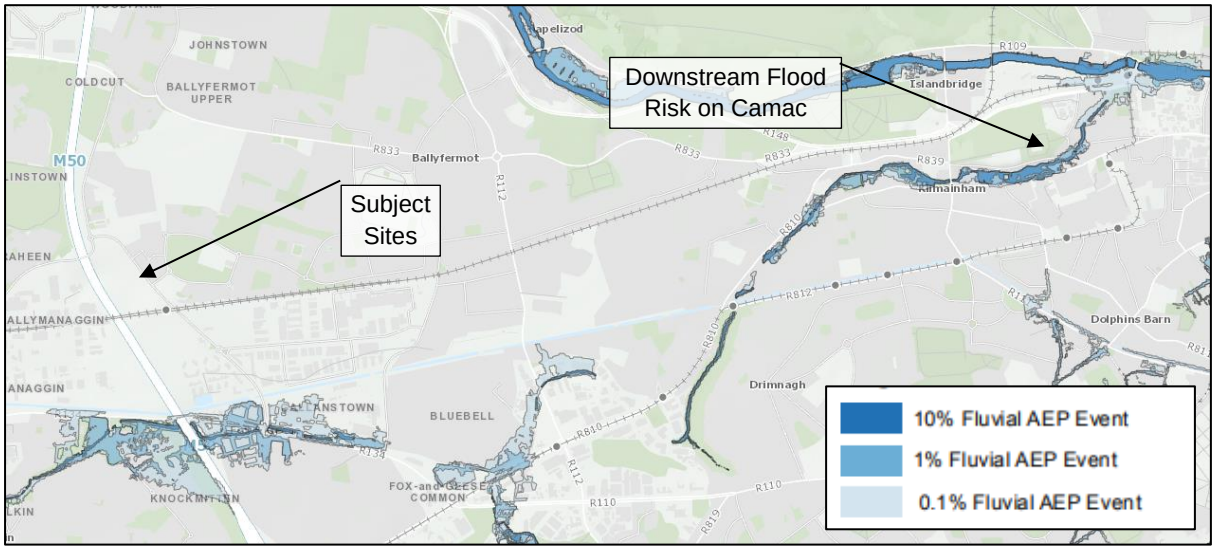


Figure 12.7 Extract from Fluvial Flood Extent Mapping (Source: www.floodinfo.ie)

As shown above, the potential for pluvial flooding is to the south of the site across the grand canal on the River Camac. A closer study of the fluvial flood map ref: e09cam_exfcd_f1_17, an extract of which is included as

overleaf, as downloaded from the OPW website, shows the relevant node points along the flood route of the Camac River. The nearest node point to the site is 09CAMM007501. The tabulated data for this node point informs that the water level of the 0.1% AEP (1 in 1,000 year storm), will be 51.08m OD. This is 4.64m below the lowest existing ground level of 55.72m OD on site.

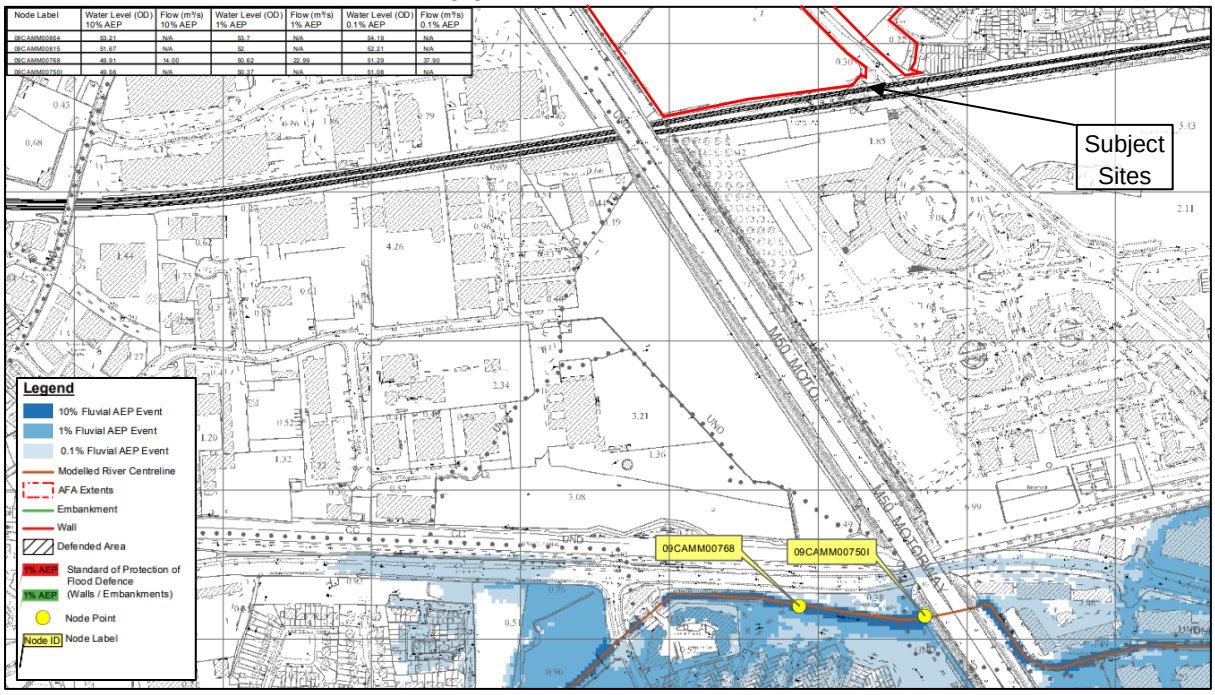


Figure 12.8 Extract from Flood Map e09cam_exfcd_f1_17

The OPW website further provide details of historic flood events Figure 12.9 Extract from Historic Flood Event Map (Source: www.floodinfo.ie) below, shows an extract of the historic flood events map for the

vicinity of the site. Recorded flood events in the vicinity of the site are in the location of the identified flood plains on the Camac River, south of the Grand Canal as noted earlier.

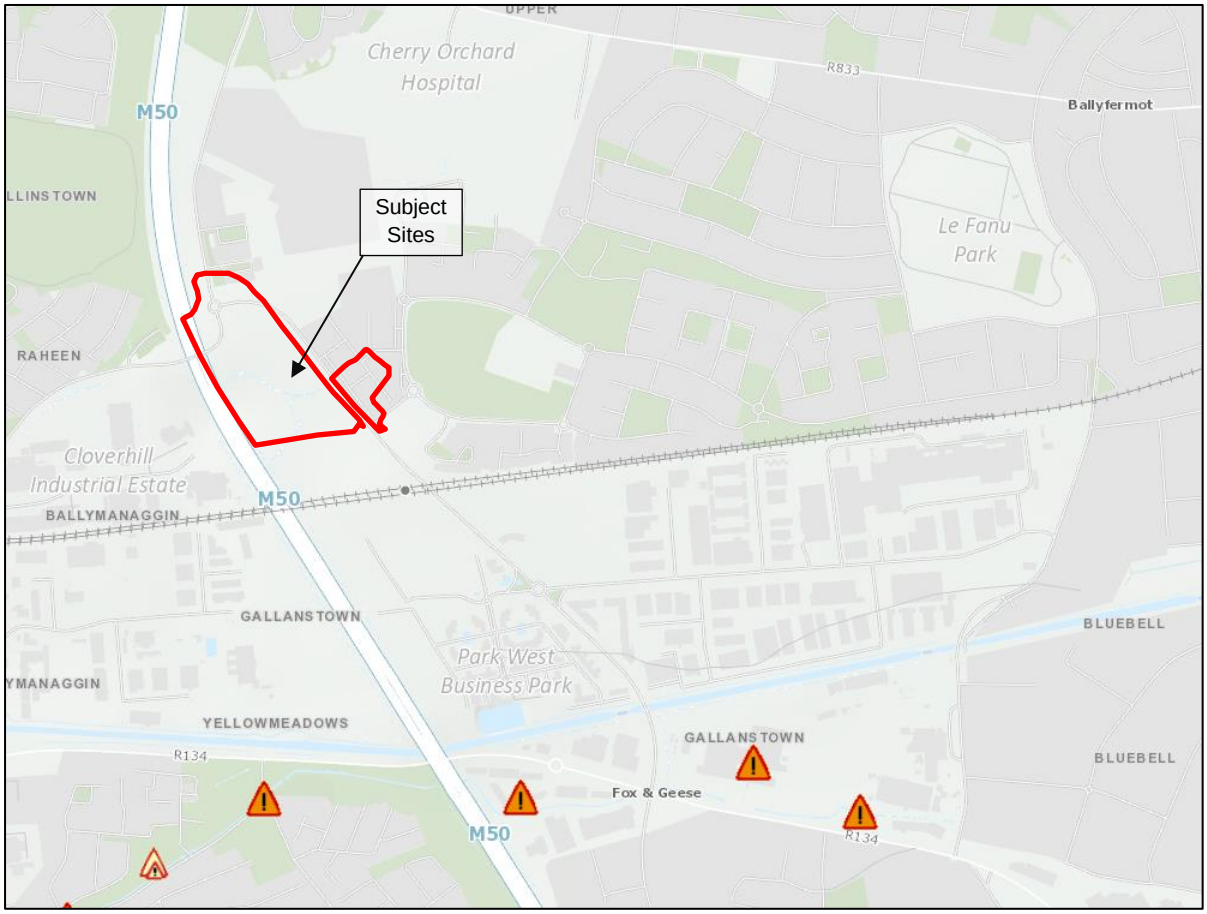


Figure 12.9 Extract from Historic Flood Event Map (Source: www.floodinfo.ie)

A summary of flood risks can be seen in Table 12.1 Summary of Flood Risks from Various Components below.

Table 12.1 Summary of Flood Risks from Various Components

Source	Pathway	Receptor	Likelihood	Consequence	Risk	Mitigation Measure	Residual Risk
Tidal	*Irish Sea (River Liffey)*	*Proposed development*	*Extremely low*	*None*	*Negligible*	*None*	Negligible
Fluvial	*Blackditch Stream & River Camac*	*Proposed development*	*Low*	*Low*	*Extremely Low*	*Setting of floor levels, overland flood routing*	Extremely Low
Pluvial	*Private & Public Drainage Network*	*Proposed development, downstream properties, and roads*	*Ranges from high to low*	*Moderate*	*Ranges from high to low*	*Appropriate drainage, SuDS, and attenuation design, setting of floor levels,*	Low

						overland flood routing	
Ground Water	*Ground*	*Underground services, basement and ground level of buildings, roads*	*High*	*Moderate*	*High*	*Appropriate setting of floor levels, flood routing, damp proof membranes*	Low
Human/ Mechanical Error	*Drainage network*	*Proposed development*	*High*	*Moderate*	*High*	*Setting of floor levels, overland flood routing, regular inspection of SW network*	Low

The site and surrounding lands have been assessed for the risk of flooding from tidal, pluvial, fluvial, groundwater, and mechanical sources. As detailed in the following chapters, the site and surrounding areas have determined as being located in Flood Zone C, as per the OPW'S Vulnerability Classifications. Zone C is and area at "low probability of flooding". Thus, the justification test (as required in the 2009 guidelines and SFRA DCC Development Plan) does not need to be applied.

Zone C is defined as: "low probability of flooding where the probability of flooding from rivers and sea is moderate (risk is less than 0.1% annually or 1 in 1,000 years for both river and coastal flooding).

The nearest location at risk of flooding as identified in the below flood maps as extracted to the following chapters is approx. 1.5km away from the site to the south. The site is c. 5m higher topographically than these areas at risk of flooding. Thus, the site as considered separated sufficiently, both in distance and height, from these identified flood zones.

The following Chapters have also identified potential flood risks from the various sources, incorporated mitigation measures to the design and assessed the residual risk as low to negligible in all cases.

12.3.4 Characteristics of the Proposed Development

12.3.4.1 Proposed Development

The subject application is for Phase 1 of a 4-phase masterplan development as per the figure overleaf.

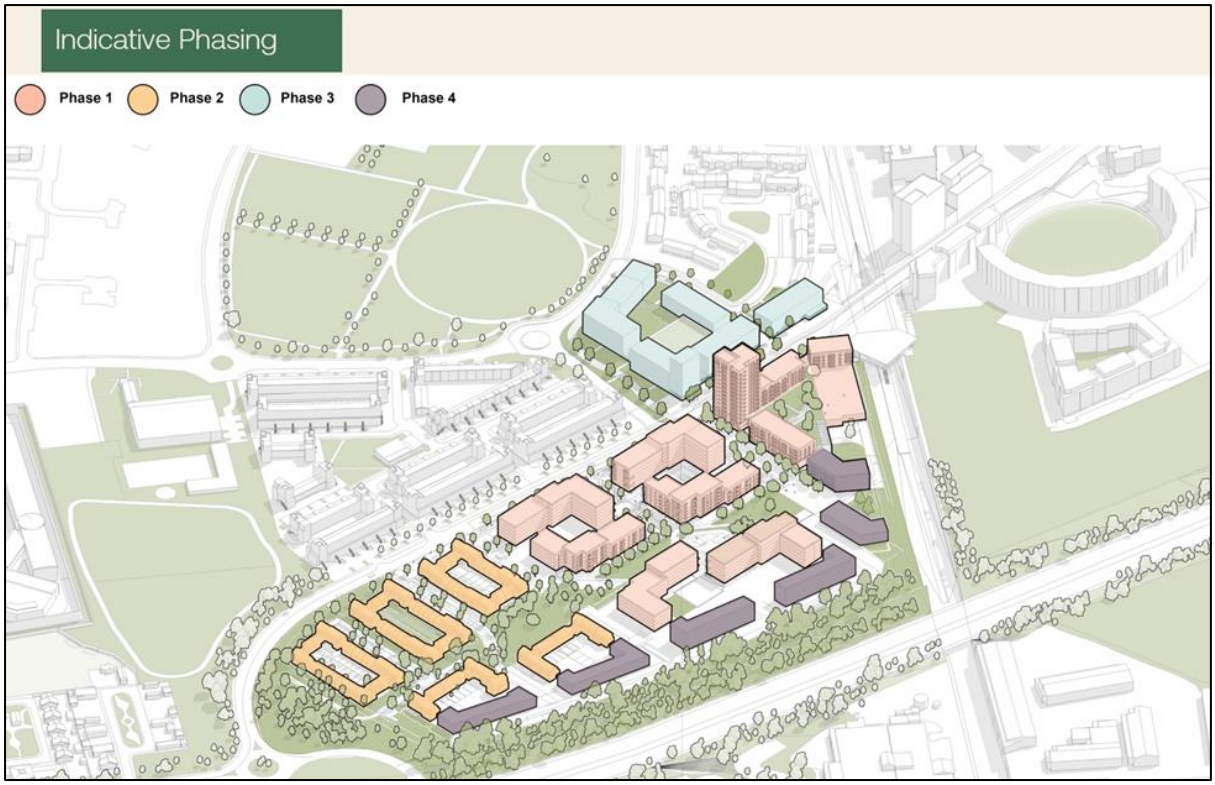


Figure 12.10 Phasing Layout

Phase 1 is the medium and high-density area and the subject application area, which will provide a total of 708 residential units ranging in size from studio to 3-bed apartments, a 2,523m² supermarket, a combined area of 373m² for retail over 7 units, a 672m² creche and 1,222m² of community spaces over 13 buildings. A breakdown of the schedule of accommodation for the subject application is provided in the table overleaf.

Table 12.2 Phase 1 Schedule of Accommodation

Block	Studio	1-bed Apt	2-bed Apt	3-bed Apt	Total	Total Area
1	-	13	-	11	24	-
2A	-	8	14	5	27	-
2B	1	43	66	-	110	-
3	-	12	23	-	35	-
5A	10	16	28	-	54	-
5B	-	10	14	5	29	-
6A	-	20	32	6	58	-
6B	-	8	12	4	24	-
7A	6	35	40	-	81	-
7B	-	5	25	-	30	-

8A	6	17	34	6	63	-
8B	5	13	10	5	33	-
9A	-	29	13	5	47	-
9B	-	8	10	4	22	-
10A	-	16	22	4	42	-
10B	-	10	14	5	29	-
Supermarket					1	2,523m²
Retail					7	373m²
Community					13	1,222m²
Creche					1	672m²

The development includes all associated site works, undergrounding of overhead lines, boundary treatments, drainage, and service connections.

The proposed development, with respect to water, includes the following characteristics:

- Excavation and trenches,
- Construction of foul and surface drainage and watermain networks,
- Reinstatement of lands above these networks.

The remainder of the phases will be subject to their own planning permission applications. However, their preliminary details are outlined below so that the subject development may be assessed as part of the full masterplan development in its full context. It should be noted that the trunk foul and surface water drainage, including attenuation storage, to serve phases 2, 3, & 4 are part-provided under the subject application for Phase 1.

Phase 2: This is the low-density housing area located to the north of Site 4 and contains 153 residential units comprising 100 apartment/ duplex units and 53 houses.

Phase 3: This will be the development of Site 5, and comprises 254 residential units, 1,200m² of retail space, with community facilities to be confirmed.

Phase 4: This will be the construction of commercial office space over 6 blocks with a total area of c. 16,310m².

12.3.4.2 Water Supply

The site is greenfield in nature and has no internal watermain networks. The road networks and footpaths immediately adjacent to the sites contain public watermain networks as per the Uisce Eireann network Map records extracted to Figure 12.11 Uisce Eireann Watermain Network Map Extract below.

Figure 12.11 Uisce Eireann Watermain Network Map Extract

A pre-connection enquiry was submitted to Uisce Eireann and received a reference number of: CDS22004824. The subsequent confirmation of feasibility letter from Uisce Eireann, advises that no upgrade works are required to facilitate the development. It further instructs of the connection points to the existing public infrastructure for both the sites. The confirmation of Feasibility Letter is included as an appendix to the Engineering Assessment Report, submitted under a separate cover.

12.3.4.3 Foul Water Network

The site is greenfield in nature and has no internal foul water networks. There are foul networks in the immediate vicinity of the sites as per the Uisce Eireann network Map records extracted to Figure 12.12 Uisce Eireann Foul Network Map Extract.

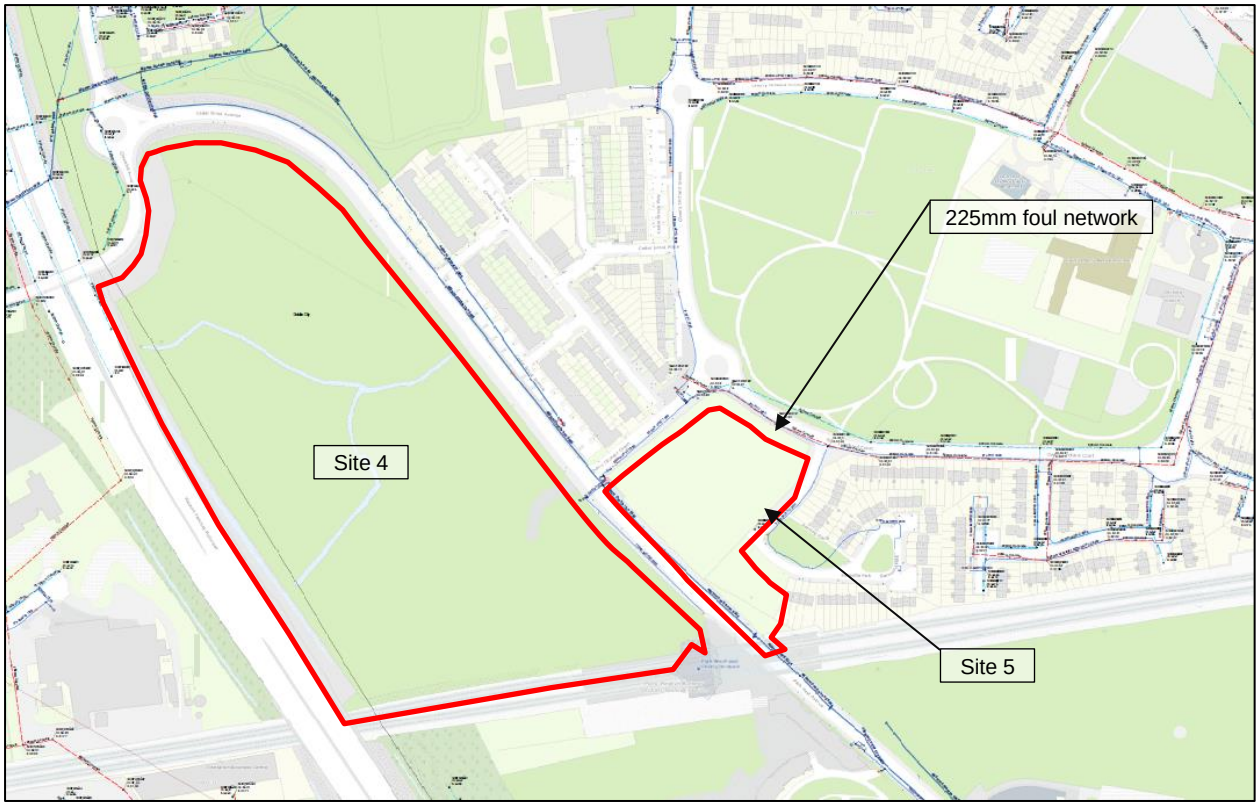


Figure 12.12 Uisce Eireann Foul Network Map Extract

The Confirmation of Feasibility Letter as discussed previously, also advises on the foul water strategy for the subject development. In respect to the foul water design, and as discussed in meetings with Uisce Eireann representatives, in order to meet Uisce Eireann infrastructural strategy objectives for the locality, both sites will need to connect to the existing foul water infrastructure on Cherry Orchard Green.

Uisce Éireann further advised it has a project underway which will provide the necessary upgrades and capacity. A part of this is to upsize the existing 225mm Ø on Barnville Park to a 1050mm Ø tank sewer, in order to act as a storage tank during peak flow periods. It is currently expected that the upgrade project will be completed by Q1 2026, and the proposed connection from the development can be completed as soon as practicably possible after this date. It is currently estimated that the subject proposed Phase 1 development will achieve completion towards the end of 2028. This existing network, instructed to be the connection point for the masterplan development, has an ultimate outfall to Dublin Bay post treatment at the Ringsend Wastewater Treatment Plant (WWTP).

The Ringsend WWTP is required to operate under an EPA License (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 WWTP will be able to treat wastewater for up to 2.4 million population equivalent (PE) while meeting the required standards. The current capacity of the WWTP is 1.65 million PE. Though the WWTP is currently over capacity, currently serving a PE of 1.9 million, water quality assessments undertaken in Dublin Bay (published by the EPA), confirm that Dublin Bay is classified as “unpolluted”, indicating that the capacity issues at the WWTP are not having any impacts on water quality in Dublin Bay.

Based on the WWTP upgrade works being scheduled for completion in 2025 and local foul network upgrade works scheduled for completion in 2026, capacity issues are expected to be resolved in advance of the expected completion date for the proposed development for the end of 2028,

Regardless of the foregoing, the loading from the proposed masterplan development is imperceptible in the context of the PE currently served by the WWTP. Therefore, there is adequate capacity in the public foul sewer network available to serve the proposed masterplan development.

12.3.4.4 Surface Water Network

The site is greenfield in nature and is not served by any surface water network**.**

Topographically, Site 4 slopes down to the centre of its eastern boundary from the north (Cloverhill Road roundabout), the west (M50) and the south (rail lines). There is no evidence that drainage networks from any of the roads or rail lines enters the site. The site itself contains a static ditch system which has no natural or constructed outfall, and percolates rain from heavy rainfall events locally. Drainage records show that drainage from the M50 does not enter the subject sites. The Ground Penetrating Radar (GPR) survey of the site further confirmed there are no surface water networks entering or exiting the site. Site 5 slopes outwards from a central high point. Similar to Site 4, there are no natural or artificial watercourses exiting the site. It is believed that in extreme rainfall events, where the volume of rainfall exceeds the infiltration capacity of the sites, that water flows off the surface of the sites to enter the existing surface water networks via the road gullies located on Park West Avenue, Barnville Walk, and Barnville Park Roads.

The aforementioned surface water gullies in the public roads connect to a 300mm Ø Surface Water (SW) network in Park West Avenue, with 300mm and 1,050mm Ø networks in Barnville Walk. These networks connect to a 900mm Ø SW network in Cherry Orchard Park, which has a detention basin.

The Site Investigation Report by GII, which is included as an appendix to this document, advises for ground conditions that:

"Infiltration rates of f = 7.303 x 10^{-6} *m/s, 6.95 x* 10^{-6} *m/s and 7.262 x* 10^{-6} *m/s respectively were calculated for the soakaway location ST06, ST10 and ST 11. At the locations of ST01, ST02, ST03, ST04, ST05, ST07, ST08 & ST09the water level dropped too slowly to allow calculation of "f" the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction."*

This is generally in line with the reports finding of predominantly clay-based subsoils.

Of the 14 No. Trial Pits undertaken with a maximum depth of 3.2m that Trial Pit (TP) 04 showed signed of slow seepage from groundwater a 2.6m BGL (Below Ground level).

Of the 11 No. Soakaway Tests undertaken, Soakaway Test (ST) 06 encountered groundwater at 1.8m BGL, which rose to a level of 1.6m BGL within 5 minutes.

These test locations are mapped in the Site Investigation Report.

12.3.4.5 Proposed Water Supply

Site 4 is proposed be served by 2 No. 200mm connection to the 300mm DI as instructed by Uisce Eireann. The proposed 200mm watermain will follow the main vehicular circulation route of the site and will be further supplemented by 150mm and 100mm loops and branches.

Site 5 is proposed to be connected via a 100mm watermain to the existing 200mm uPVC network as instructed by Uisce Eireann.

Meters will be installed at connection points for both sites in line with Uisce Eireann requirements.

The proposed watermain layouts are shown on drawing numbers: 22-010-P300–P303.

A Statement of Design Acceptance from Uisce Eireann is included as an Appendix to the Engineering Assessment Report submitted under a separate cover.

The calculated water demand at the subject development is set out in the table overleaf. The table has been sub-divided into sections to show the subject application (Phase1), and also the remainder of the masterplan development (Phases 2-4, inclusive). The water demand from the masterplan development is based on their current Schedules of Accommodation, these details will be finalised as part of their future planning application submissions.

The average domestic demand has been established based on an average occupancy ratio of 2.7 persons per dwelling with a daily domestic per capita consumption of 150 litres per head per day.

The supermarket has a floor area of 2,523m², with an expected staff rate of 1 person per 25m², for a total estimated staff number of 101 staff, with a consumption rate of 90 litres per head per day. This consumption rate is based on the rate of foul water expected to be generated as per the Uisce Eireann Wastewater Code of Practice Appendix C.

The retail areas, 373m^3 over 7 No. units, with an expected staff rate of 1 person per 50m², for a total estimated staff number of 8 staff, will have a consumption rate of 90 litres per head per day. This consumption rate is based on the rate of foul water expected to be generated as per the Uisce Eireann Wastewater Code of Practice Appendix C.

It is anticipated that the community buildings will be utilised by local residents and that for any community meetings or events it would be utilised by a maximum of 300 persons at any one time. As per Appendix C of the Wastewater Code of Practice it is considered that the most similar type of flow rate would be that of a Public House Patron with a specified rate of 12 litres per head. This output figure is further used as the projected consumption figure.

It is calculated that the creche (672m^2) will generate demand for 129 persons (25 staff and 104 children), with a water demand of 90 litres per head per day. This volume is based on the figure for the foul volume generated by the most similar type of usage: a non-residential school with canteen facilities, also as per Appendix C of the Code of Practice.

The Phase 3 retail areas, c, 1,200m², with an expected staff rate of 1 person per 50m², for a total estimated staff number of 24 staff, will have a water demand of 90 litres per head per day. This volume is based upon the generated foul flows as per Appendix C of Uisce Eireann's wastewater Code of Practice.

The Phase 4 office/commercial space has a total floor area of c. 16,310m², with an expected staff rate of 1 person per 15m², for a total estimated staff number of 1,087 staff. The foul flow rate of 100 litres per head per day, as per the Uisce Eireann Code of Practice, Appendix C, for an Office/Factory with Canteen, is presumed to be equal to the water consumption demand.

The residential, commercial, and creche water demands have also incorporated a 10% consumption allowance. The average day/peak week demand has been taken as 1.25 times the average daily domestic demand, while the peak demand has been taken as 5 times the average day/peak week demand, as per Section 3.7.2 of the Uisce Eireann Code of Practice for Water Infrastructure.

Table 12.3 Calculation of Total Water Demand

	Description	Total Population	Water demand	Average Demand	Average Peak Demand	Peak Demand
		No. People	*l/day*	*l/s*	*l/s*	*l/s*
Subject Application	708 Apartments	1,912	315,480	3.651	4.564	22.820
	Supermarket (2,523m²)	101	9,999	0.116	0.145	0.725

	Retail (373m²)	8	792	0.009	0.011	0.055
	Community space (1,222m²)	300	3,960	0.046	0.058	0.290
	Creche (672m²)	129	12,771	0.148	0.185	0.925
Phase 2*	153 units	413	68,145	0.789	0.986	4.930
Phase 3*	254 units	686	113,190	1.310	1.638	8.190
	Retail (1,200m²)	24	2,376	0.028	0.035	0.175
Phase 4*	Office/Commercial (c. 16,310m²)	1,087	119,570	1.384	1.730	8.650
	Total	**4,660**	**638,283**	**7.481**	**9.352**	**46.760**

** Denotes units as part of the masterplan development design, outside the area of the subject application*

The average demand for the development is 7.481 l/s, with a peak demand of 46.760 l/s.

12.3.4.6 Proposed Foul Network

As previously noted, Uisce Eireann have instructed that both Sites 4 & 5 must connect to the foul water infrastructure on Cherry Orchard Green. Uisce Eireann further advise it has a project underway which will provide the necessary upgrades and capacity and is scheduled for completion in Q1 2026. This is the upsizing of the existing 225mm Ø on Barnville Park to a 1050mm Ø pipe. The proposed connection can be completed as soon as practicably possible after this date.

In order to meet the above strategy, Uisce Eireann have confirmed that it is acceptable for Site 4 to be served by a 300mm Ø trunk sewer at a gradient of 1/300. This trunk sewer will reduce the depth that the existing site levels will have to be raised at the north of Site 4, to provide depth of coverage to the foul network. Existing ground levels will need to be raised by a maximum of c. 1m at the northernmost part of Site 4. The raising of these levels' ties-in well to the existing topography of the steep rise on Park West Avenue as it approaches the roundabout of the Cloverhill Road, Park West Avenue and M50 overpass immediately adjacent the north of Site 4.

It is proposed that Site 4 be drained via a series of 150mm and 225mm Ø sewers which will connect to the aforementioned 300mm Ø trunk sewer. This trunk sewer will leave Site 4 at the junction of Park West Avenue and Barnville Walk. It will proceed along Barnville Walk to connect to the existing foul network. The south of site 4 (high-density), will be served by a network of 225mm and 300mm Ø pipes. This network will exit Site 4 at the proposed southern access road and proceed north to connect to the 300mmØ trunk sewer. Site 5 will be drained via a network of 150mm and 225mm Ø pipes and will connect to the existing foul network at the connection point as specified by Uisce Eireann. All networks are proposed to drain by gravity and there is no requirement for pumping on the proposed foul networks.

The proposed internal foul drainage network has been designed and sized in accordance with the Uisce Eireann Code of Practice for Wastewater Infrastructure and Standard Details. Please refer to Drawing numbers: 22-010-P200-P203.

The calculated foul water flows at the subject and masterplan development are set out in the table overleaf. The table has been sub-divided into sections to show the subject application (Phase 1), and also the remainder of the masterplan development (Phases 2-4, inclusive). The foul water flows from

the masterplan development are based upon their current Schedule of Accommodation, these details will be finalised as part of their future planning application submission.

Domestic wastewater loads for all phases has been calculated based on 2.7 persons per unit with a per capita wastewater flow of 150 litres per head per day.

The supermarket has a floor area of 2,523m², with an expected staff rate of 1 person per 25m², for a total estimated staff number of 101 staff, will have a foul flow rate of 90 litres per head per day, as per Appendix C of the Code of Practice.

The retail areas, 373m² over 7 No. units, with an expected staff rate of 1 person per 50m², for a total estimated staff number of 8 staff, will have a foul flow rate of 90 litres per head per day, as per Appendix C of the Code of Practice.

It is anticipated that the community buildings will be utilised by local residents and that for any community meetings or events it would be utilised by a maximum of 300 persons at any one time. As per Appendix C of the Code of Practice it is considered that the most similar type of flow rate would be that of a Public House Patron with a specified rate of 12 litres per head.

It is calculated that the creche (672m²) will generate flow for 129 persons (25 staff and 104 children), with a wastewater volume of 90 litres per head per day, based on the figure for the most similar type of usage: a non-residential school with canteen facilities, as per Appendix C of the Code of Practice.

The Phase 3 retail areas, c, 1,200m², with an expected staff rate of 1 person per 50m², for a total estimated staff number of 24 staff, will have a foul flow rate of 90 litres per head per day, as per Appendix C of the Code of Practice.

The Phase 4 office/commercial space has a total floor area of c. 16,310m², with an expected staff rate of 1 person per 15m², for a total estimated staff number of 1,087 staff, will have a foul flow rate of 100 litres per head per day, as per the Uisce Eireann Code of Practice, Appendix C, for an Office/Factory with Canteen.

The residential, commercial, and creche flows have also incorporated a 10% unit allowance, in line with Section 3.6 of the Uisce Eireann Code of Practice for Wastewater Infrastructure.

Based on the total population of 4,361, a peak flow multiplier of 3 has been used, as per Section 2.2.5 of Appendix B of the Code of Practice.

Table 12.4 Calculation of Foul Water Flow

	Description	Total Population	Load per Capita	Daily Load	Total DWF	Peak Flow
		No. People	*l/day*	*l/day*	*l/s*	*l/s*
Subject Application	708 Apartments	1,912	150	315,480	3.651	10.953
	Supermarket (2,523m²)	101	90	9,999	0.116	0.348
	Retail (373m²)	8	90	792	0.009	0.027
	Community space (1,222m²)	300	12	3,960	0.046	0.138
	Creche (672m²)	129	90	12,771	0.148	0.444
Phase 2*	153 units	413	150	68,145	0.789	2.367

Phase 3*	254 units	686	150	113,190	1.310	3.930
	Retail (1,200m²)	24	90	2,376	0.028	0.084
Phase 4*	Office/Commercial (c. 16,310m²)	1,087	100	119,570	1.384	4.152
	Total	**4,660**		**646,283**	**7.481**	**22.443**

** Denotes units as part of the masterplan development design, outside the area of the subject application*

The total dry weather flow from the masterplan development has been calculated as: 7.481 l/s, with a peak flow of 22.443 l/s.

For the purpose of construction stage foul water discharge, the contractor will need to apply to Uisce Eireann for a temporary connection agreement at the appropriate time.

12.3.4.7 Proposed Surface Water Network

It is proposed to construct a surface water drainage network that will service and attenuate the development internally before discharging at the current greenfield (or allowable) rates to the local Surface Water network. It is proposed that Site 4 will connect to the existing 1,050mm Ø network in Cedar Brook Way, while Site 5 will outfall to the 900mm Ø Network in Barnville Park.

Based on the details presented by the Site Investigation Report, the sites have properties equivalent of a Type 5 soil, which has a runoff rate of 8.66 l/s/ha. However, in line with DCC requirements, the attenuation calculations undertaken, have limited the outflow rate to a maximum of 2.0 l/s/ha, by using a soil type 2 for progression of the calculations. The reason for this limitation, is that the Flood Risk Assessment submitted under a separate cover, has identified a downstream area of the Camac River of being at risk of flooding. The Council, already aware of this issue, confirmed in the preliminary surface water strategy meeting, discussed below, that our early-stage modelling of the attenuation volume requirements was correct in applying the max outfall rate of 2 l/s/ha to our calculations.

Meetings were held with Dublin City Council in 2022 & 2023 in order to agree the principles of the surface water and SuDS strategy. These meetings outlined the preliminary surface water strategy, SuDS strategy, and connection points. The overall preliminary proposal was deemed acceptable and suitable for further detailed design progression. It was agreed that the outflow rate be set at a maximum of 2 l/s/ha as per Dublin City Council requirements. This is in accordance with Dublin City Council's "SuDS Design and Evaluation Guide", which instructs in their Flow Control Discharge Limits Table (page 43), that the 1-in-100 year maximum outflow rate shall be limited to 2 l/s/The outflow limit of 2 l/s/ha is applicable to the subject development and future development of the masterplan site. The 2 l/s/ha outflow limit will reduce the outflow rate from its current greenfield runoff rate of 8.66 l/s/ha.

For storm water management purposes, it is proposed to divide the sites into four separate sub-catchments. Storm water from each catchment will be attenuated and discharge at a controlled rate, limited to a maximum of 2 l/s/ha (as per Dublin City Council requirements), to ultimately outfall to the existing surface water networks at Cedar Brook Way and Barnville Walk. The proposed development has been designed to incorporate best drainage practice.

It is proposed to incorporate a Storm Water Management Plan through the use of various SuDS techniques to treat and minimise surface water runoff from the site. The methodology involved in developing a Storm Water Management Plan for the subject site is based on recommendations set out in the Greater Dublin Strategic Drainage Study (GDSDS), Dublin City Council's SuDS Design and Evaluation Guide, and in the SuDS Manual. Based on four key elements – Water Quantity, Water Quality, Amenity and Biodiversity – the targets of the SuDS train concept have been implemented in the design, providing SuDS devices for each of the following:

- Source Control
- Site Control
- Regional Control

The proposed development incorporates a Storm Water Management Plan through the use of various SuDS techniques. Treatment and storage of surface water at source will intercept and slow down the rate of runoff from the site to the existing surface water sewer system.

The SuDS devices proposed around the site include permeable paving, filter drains, green/sedum roofing, bio-retention systems/raingardens, roadside trees, swales, attenuation tanks, flow control devices and petrol interceptors. These features will slow down and improve the quality of water flows discharging from the proposed development.

Attenuation storage is provided to limit the discharge rate from the site into the public network. As per the GDSDS, the required attenuation volume is calculated assuming 100% runoff from paved areas, and has been calculated for the 1-year, 30-year and 100-year return periods, identifying the critical storm for each.

Surface water runoff will be restricted via a hydro-brake or similar approved flow control device, limited to below the greenfield equivalent runoff rate for each catchment, as discussed earlier.

Full details of the SuDS features incorporated to the proposed surface water drainage design are included in the Storm Water Management Plan report, submitted as part of the planning package under a separate cover.

The proposed drainage and attenuation strategy can be seen on drawing numbers:

- 22-010 -P200-P203 and P205.
- Surface water catchments on 22-010-P210.
- The SuDS layout drawing is 22-010-P240.
- A cross section of the central attenuation corridor is provided on 22-010-P250.
- Ancillary details drawings for the Typical Surface Water Details are on 22-010-P230.
- The Typical SuDS Details are provided on 22-010-P241.

12.4 Predicted Impacts

12.4.1 Construction Stage

Significant amounts of site stripping and excavation will be required in order to construct the development. When the site has been stripped layers of sub-soil will be exposed to weathering and there will be potential for erosion due to rainfall and subsequent runoff. The erosion of soil can lead to sediments being washed into the receiving watercourses/sewers at higher rates of runoff. This has potential to cause a negative, slight (not significant) to moderate (significant) and short to medium-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.

There is also potential during the development's construction stage that contaminants from cement/concrete be washed into the receiving sewers. This has potential to cause a negative, slight (not significant) to moderate (significant) and short to medium-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.

There is a risk of pollution of groundwater/watercourses/soils by accidental spillage of oils/diesel from temporary storage areas or where maintaining construction equipment. This has potential to cause a negative, slight (not significant) to moderate (significant) and short to medium-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.

Foul water could be connected to the surface water drainage network resulting in the contamination of the receiving watercourses. Furthermore, if there is damage to any foul pipes, there is potential for contaminants to seep into the groundwater. This has potential to cause a negative, moderate (significant) and permanent impact on receiving watercourses/groundwater should no mitigation measures be implemented.

The construction of the proposed development in has potential to cause a significant negative and medium-term to permanent impact on receiving watercourses/groundwater should no mitigation measures be implemented.

12.4.2 Operational Stage

The proposed development will result in increased impermeable areas and there is potential for an increase in risk of higher rates of surface water runoff leading to increased downstream flooding. This has potential to cause a negative, slight (not significant) to moderate (significant) and short-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.

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. This has potential to cause a negative, slight (not significant) to moderate (significant) and short to medium-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.

There is potential for leaks in the foul network to result in contamination of the groundwater. This has potential to cause a negative, slight (not significant) to moderate (significant) and short-term to permanent impact on receiving watercourses/groundwater should no mitigation measures be implemented.

Accidental spills of fuels/hydrocarbons and washing down into the drainage pipe network has the potential to impact on the receiving hydrogeology. This has potential to cause a negative, slight (not significant) to moderate (significant) and short to medium-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.

There is a potential for Watermain leaks which would increase the volume of water permeating through the underground soil strata. This has potential to cause a negative, slight (not significant) and short-term to permanent impact on receiving watercourses/groundwater should no mitigation measures be implemented.

The operation of the proposed development has potential to cause a negative, slight (not significant) to moderate (significant), short-term to permanent impact on receiving watercourses/groundwater should no mitigation measure be implemented.

12.5 Mitigation Measures

12.5.1 Construction Stage

The sites have no direct hydrological connectivity to natural watercourses or surface water networks. There may be an indirect link from surface water runoff which may have the potential to run off the site boundary to the surface water gullies on the adjacent road networks. These networks outfall to the Blackditch Stream.

The following Mitigation Measures are to address potential impacts to water quality and are required to protect the Blackditch Stream, and the Camac River which has an ultimate outfall to the River Liffey at Heuston. All works will be undertaken with reference to the following guidelines:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams et al., 2001);
- CIRIA C692: Environmental Good Practice on Site, (Audus et al., 2010)
- BPGCS005: Oil Storage Guidelines;
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Technical Guidance (Murnane et al., 2006a)
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane et al., 2006a)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016)
- Guidelines for Planning Authorities – Architectural Heritage Protection – Guidance on Part IV of the Planning and Development Act 2000. (Part 2, Chapter 7) and ICOMOS Principles.
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.
- CIRIA 697, The SUDS Manual, 2007; and
- UK pollution Prevention Guidelines (PPG) UK Environment Agency, 2004

The schedule of mitigation presented within the following table summarises measures that will be undertaken in order to reduce impacts on ecological receptors within the zone of influence of the proposed development.

Table 12.5 Schedule of Surface Water Mitigation Measures

No.	Risk	Possible Impact	Mitigation	Result of Mitigation
1	Hydrocarbons from carparking area entering the drainage network.	Water quality impacts.	Petrol interceptor to be installed on drainage network prior to outfall to public surface water network.	Prevents hydrocarbons from entering the public surface water network.

No.	Risk	Possible Impact	Mitigation	Result of Mitigation
2	Pollutants from site compound areas entering the drainage network or contaminating soils.	Water quality impacts. Soil quality impacts. Groundwater impacts.	Materials to be stored appropriately in designated areas (discussed below). Temporary foul water connection to be obtained from Uisce Eireann to serve site compound welfare facilities.	Prevents contamination of public surface water network, soil, and groundwater.
3	Pollutants from material storage areas entering the watercourse or contaminating soils.	Water quality impacts. Soil quality impacts. Groundwater impacts.	Fuels, oils, greases, and other potentially polluting chemicals will be stored in roofed and bunded compounds at the Contractor's compound. Storage area to be located over 50m away to ensure no direct pathway to the surface water network. Bunds are to be provided with 110% capacity of storage container. Spill kits will be kept on site at all times and all staff trained in their appropriate use. Method statements for dealing with accidental spillages will be provided the Contractor for review by the Employer's Representative.	Prevents contamination of public surface water network, soil, and groundwater.
4	Concrete/ cementitious materials entering the drainage network.	Water quality impacts	A designated wash down area within the Contractor's compound will be used for cleaning of any equipment or plant, with the safe disposal of any contaminated water.	Prevents contamination of public surface water network. Ensures invasive species material is not transported off site as muck.
5	Leaching of contaminated soil into groundwater.	Groundwater quality impacts	Spill kits will contain 10 hr terrestrial oil booms (80mm diameter x 1000mm) and a plastic sheet, upon which contaminated soil can be placed to prevent leaching to ground water.	Prevents contamination of groundwater.
6	Pollutants from equipment storage/ refuelling area entering the drainage network.	Water quality impacts	Any refuelling and maintenance of equipment will be done at designated bunded areas with full attendance of plant operative(s) within contained areas. Discharge licence (where required) pollutant limits to be monitored and adhered to. The site is located at least 50m from any direct pathway to the surface water drainage network.	Prevents contamination of public surface water network.
7	Runoff from exposed work areas and excavated material storage areas entering the drainage network.	Water quality impacts due to silt entering the network.	Provision of silt entrapment facilities such as; straw bales, silt fencing, silt barriers, diversion drains, settlement tank(s), & settlement pond(s), as appropriate and as outlined below.	Prevents contamination of public surface water network.

As mentioned previously, there is no direct hydrological connectivity from the sites to natural watercourses or surface water networks. There is potential for an indirect hydrological connectivity to the local surface water drainage network, whereby during heavy rainfall events, surface water from the sites flows over the site boundary to the road gullies on the adjacent streets.

The most likely potential sources of contamination to the local surface water network are from silt and suspended particles, and from chemical compounds entering these networks as surface water runoff.

Silt and suspended particles may arise from surface runoff from stockpiled materials or from the pumping of water volumes in excavations.

Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area will pass through a sediment entrapment facility before it exits the site and flows downstream.

Site stripping will be minimised as far as practicable.

Straw Bales:

Straw bales can be placed at the base of a slope to act as a sediment barrier. These are not recommended for use within a swale or channel. Straw bales are temporary in nature and may perform for only a period of weeks or months. Proper installation and maintenance is necessary to ensure their performance.

Silt Fencing

A silt fence is made of a woven synthetic material, geotextile, and acts to filter run-off. Silt fencing can be placed as a temporary barrier along the contour at the base of a disturbed area but is not recommended for use in a channel or swale. The material is durable and will last for more than one season if properly installed and maintained. Silt fencing is not intended to be used as a perimeter fence or in area of concentrated flow. If concentrated flow conditions exist, a more robust filter should be considered.

Silt Barriers

Silt barriers can also be temporarily installed in any road gullies of partially constructed roads to prevent sediment movement into downstream drainage systems or SUDS components.

When the catchment area is greater than that allowed for straw bale barriers or silt fences, runoff should be collected in diversion drains and routed through temporary sediment basins.

Diversion Drains

Diversion drains are simple linear ditches, often with an earth bund, for channelling water to a desired location. If the drains are being eroded, they can be lined with geotextile fabric or large stones or boulders.

Settlement tank

Commercially available settlement tanks, also known as sediment tanks, have compartments that allow suspended solid contents such as sand and silts to precipitate and sink to the bottom, falling out of suspension. The settlement tank has an inlet for the runoff which enters a chamber where it is held before flowing to the next compartment or tank for further treatment, prior to outfall.

Spoil heap/stockpiles will not be located within 20m of the existing surface water networks. Spoil heaps/stockpiles will be considered for seeding if their storage is likely to be longer than a few seasons. Drainage diversion ditches will be constructed between the stockpile area and local surface water networks. This drainage ditch will flow to a sedimentation/settlement pond prior to outfalling to the surface water network. A Discharge Licence will need to be obtained from the local Authority by the Main Contractor. If topography doesn't allow for a gravity outfall from the sedimentation/settlement pond, a commercially available modular settlement tank will be utilised for the project, or outfall volumes may instead be pumped. Untreated surface water will not be permitted to flow to any natural or piped surface water network.

A site compound(s) including offices and welfare facilities will be set up by the main contractor in locations to be decided within the subject site. Sanitary connections will need to be arranged by the contractor with Uisce Eireann at the appropriate time via a Temporary Connection Application. The

main contractor will be required to schedule delivery of materials daily. The main contractor will be required to provide a site compound on the site for the secure storage of materials.

Chemical contamination can result due to fuel/chemical leaks and spills.

Spills and leaks may contaminate soil, groundwater, and surface water networks via surface run-off. Method statements and mitigation measures reduce the potential for leaks and spills and limit their impact should they occur.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and surrounding watercourses from oil and petrol leakages and significant siltation. Suitable bunded and roofed areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Spill kits will be provided by the Contractor to cater for any other spills.

Where possible, and subject to licence, the permanent connection to the public foul sewer will be used temporarily for construction phase. Vehicle wash down water will discharge directly, via suitable pollution control and attenuation, to the foul sewer system. If this connection is not permitted, then wastewater generated will be required to be stored for collection and treatment off-site at a suitable waste disposal facility.

On-site treatment measures will be installed to treat surface water run-off from the site prior to discharge to the receiving surface water sewer as noted above. This treatment will be achieved by the construction of settlement tanks/ponds, in conjunction with the installation of proprietary surface water treatment systems including class 1 full retention petrol interceptors, and spill protection control measures. Settlement tanks/ponds will be sized to deal with surface run-off and any groundwater encountered.

A sampling chamber with shut down valve will be installed downstream of the settlement pond/tank and water quality monitoring will be carried out here prior to discharge to the surface water sewer.

Regular testing of surface water discharges will be undertaken at the outfall from the subject lands in accordance with the requirements of the discharge licence to be obtained. The location(s) for testing and trigger levels for halting works will be agreed between the project ecologist and the site foreman or appointed, suitably qualified site staff member at the commencement of works.

Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.

It is likely that the surface water run-off from the site will be discharged to the existing public surface water network, post treatment. This will need to be confirmed between the Contractor and Local Authority, as well as any further conditions such as the permitted levels of contamination as well as frequency for testing, as part of the Contractor's application for a discharge licence.

All water pumped from the excavations will require to be treated for silt and deleterious matter. During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

In addition to daily visual inspections, a surface water monitoring programme, as outlined in the table below must be followed during construction in order to ensure maintenance of water quality protection. This is in line with Transport Infrastructure Ireland (TII)'s 'Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan'. It is considered that the parameter limit values (Guide/Mandatory) defined in the Fresh Water Quality Regulations (EU Directive 2006/44/EEC) should act as a trigger value for the monitoring of Surface Water.

Table 12.6 Monitoring Guidelines (Fresh Water Quality Regulations)

Parameter	Limit		Frequency and Manner of Samplings
	Limit Value	Guide/Mandatory	
Temperature	1.5°C	Mandatory Limit	Weekly, and at appropriate intervals where the works activities associated with the scheme have the potential to alter the temperature of the waters.
Dissolved oxygen	50% of Samples ≥ 9 (mg/l O2) 100% of Samples ≥ 7 (mg/l O2)	Guide Limit	Weekly, minimum one sample representative of flow oxygen conditions of the day of sampling
pH	6 to 9	Mandatory Limit	Weekly
Nitrites	≤0.01 (mg/l N02)	Guide Limit	Monthly
Suspended Solids	≤25 (mg/l)	Guide Limit	Monthly
BOD5	≤3 (mg/l)	Guide Limit	Monthly
Phenolic Compounds	-	-	Monthly where the presence of phenolic compounds is presumed (An examination by test)
Petroleum Hydrocarbons	5 (mg/l)	Guide Limit	Monthly (visual)
Non-Ionized Ammonia	≤ 0.005 (mg/l NH3)	Guide Limit	Monthly
Total Ammonium	≤ 0.004 (mg/l NH4)	Guide Limit	Monthly
Total Residual Chlorine	≤ 0.005 (mg/l HOCl)	Mandatory Limit	At appropriate intervals where works activities associated with the scheme have the potential to alter the Total residual Chlorine of the waters
Electrical Conductivity	-	-	Weekly

The Main Contractor will have overall responsibility for the implementation of the project Construction Surface Water Management Plan (CSWMP) during the construction phase. The appointed person from the Main Contractors team will be appropriately trained and assigned the authority to instruct all site personnel to comply with the specific provisions of the CSWMP. At the operational level, a designated person from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the CSWMP are performed on an on-going basis.

Copies of the Construction Surface Water Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the CSWMP and informed of the responsibilities which fall upon them because of its provisions.

The responsibilities of the appointed person will be as follows;

- Updating the CSWMP as necessary to reflect activities on site.
- Advise site management (including, but not limited to, the site Construction Manager) on environmental matters.
- Ensure pre-construction checks for protected species, are undertaken.

- Review method statement of the sub-contractors to ensure that it incorporates all aspects of CSWMP.
- Provide toolbox talks and other training, and ensure understanding by all involved of all mitigation measures.
- Assess effectiveness of mitigation, check weather forecast and site conditions where trigger levels are required.
- Ensure adherence to the specific measures listed in the Planning Conditions.
- Advise upon the production of written method statements and site environmental rules and on the arrangements to bring these to the attention of the workforce.
- Investigate incidents of significant, potential, or actual environmental damage, ensure corrective actions are carried out and recommend means to prevent recurrence.
- Be responsible for maintaining all environmental related documentation.
- Ensure plant suggested is environmentally suited to the task in hand.
- Co-ordinate environmental planning of the construction activities to comply with environmental authorities' requirements and with minimal risk to the environment. Give contractors precise instructions as to their responsibility to ensure correct working methods where risk of environmental damage exists.
- To minimise the adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the stripping back of the site.

Where possible, precast concrete units are to be used to avoid on-site "wet" mix concrete usage. In-situ concrete pours are to be managed in accordance with best practice to avoid overspills.

Wheel wash and wash down facilities are to be provided in designated areas. Discharge from these areas is to be directed into the settlement ponds/silt traps.

A method statement setting out in detail the procedure to be used when working in the vicinity of existing watermains will be produced by the contractor for any construction works within the vicinity of watermains and for roads and or services crossing watermains.

All watermains will be cleaned and tested in accordance with Uisce Eireann guidelines prior to connection to the public watermain.

All connections to the public watermain will be carried out and tested by or under the supervision of Uisce Eireann.

In order to reduce the risk of defective or leaking foul and surface sewers, the following measures will be implemented:

- All new foul sewers will be tested by means of an approved air test during the construction phase in accordance with Uisce Eireann's Code of Practice and Standard Details.
- All private drainage will be inspected and signed off by the Design Engineer in accordance with the Building Regulations Part H and BCAR requirements.
- Prior to connection, foul sewers will be surveyed by CCTV to identify possible physical defects.

- The connection of the new foul sewers to the public sewer will be carried out by or under the supervision of Uisce Eireann and will be checked prior to commissioning.

- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.

- Surface water networks will be constructed and tested in line with the Local Authority's requirements for Taking in Charge.

12.5.2 Operational Stage

The implementation of the following operation stage mitigation measures will minimise the impact on the hydrology and hydrogeology aspects of the development lands:

The surface water drainage network has been designed in accordance with the CIRIA SUDS Manual and the Greater Dublin Strategic Drainage Scheme. The appropriate interception mechanisms and treatment train process has been incorporated into the design.

Surface water outflow will be restricted to below the equivalent greenfield runoff rate from the proposed attenuation tanks and basins as per the catchment design, in accordance with Dublin City Council requirements.

Sustainable urban drainage measures, including green roofs, permeable paving, and filter strips/swales will be provided to improve water quality.

A petrol interceptor will be installed to prevent hydrocarbons entering the local drainage system at all outfalls.

A maintenance regime for the SuDS features will be incorporated to the Operation and Maintenance manual for the development. Surface SuDS features can typically be maintained as part of the regular maintenance of the landscape, incorporating litter picking, grass cutting, and inspections. The table overleaf is an extract from Section 12.3 of the SuDS Design & Evaluation Guide, and generally describes the regular maintenance aspect for the SuDS.

Table 12.7 Regular Maintenance Requirements for SuDS

Type	Activity	Normal site care (Site) or SuDS-specific maintenance (SuDS)	Suggested frequency
Regular Maintenance			
Litter	Pick up all litter in SUDS Landscape areas along with remainder of the site – remove from site	Site	1 visit monthly
Grass	Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. Leaving cuttings in situ	Site	As required or 1 visit monthly
Grass	Mow all dry swales, dry SUDS basins and margins to low flow channels and other SUDS features at 100mm with 150mm max. Cut wet swales or basins annually as wildflower areas – 1st and last cuts to be collected	Site	4-8 visits per year or as required
Grass	Wildflower areas strimmed to 100mm in Sept or at end of school holidays – all cuttings removed Or Wildflower areas strimmed to 100mm on 3 year rotation – 30% each year – all cuttings removed	Site	1 visit annually 1 visit annually
Inlets & outlets	Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	SuDS	1 visit monthly
Permeable paving	Sweep all paving regularly to keep surface tidy	Site	1 visit annually or as required

There will still be a remaining requirement for more intensive maintenance tasks to be undertaken however, the severity of these tasks can be reduced by regular inspections and proactive responses being incorporated as a part of the regular maintenance regime discussed above. A table showing the typical requirements for the occasional maintenance tasks and remedial works is extracted from the SuDS Design & Evaluation Guide to overleaf.

Table 12.8 Further Maintenance Requirements for SuDS

Occasional Tasks			
Permeable paving	Sweep and suction brush permeable paving when ponding occurs	SuDS	As required - estimate 10-15 year intervals
Flow controls	Annual inspection of control chambers - remove silt and check free flow	SuDS	1 visit annually
Wetland & pond	Wetland vegetation to be cut at 100mm on 3 – 5 year rotation or 30% each year. All cuttings to be removed to wildlife piles or from site.	Site	As required
Silt	Inspect swales, ponds, wetlands annually for silt accumulation	Site & SuDS	1 visit annually
Silt	Excavate silt, stack and dry within 10m of the SUDS feature, but outside the design profile where water flows. Spread, rake and overseed.	Site & SuDS	As required
Native planting	Remove lower branches where necessary to ensure good ground cover to protect soil profile from erosion.	SuDS	1 visit annually
Remedial Work			
General SuDS	Inspect SuDS system to check for damage or failure when carrying out other tasks. Undertake remedial work as required.	SuDS	Monthly As required

Surface water sewers will generally consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with Dublin City Council requirements for taking in charge. It is intended that all sewers within the public domain will be handed over to Dublin City Council for taking in charge.

All private outfall manholes will be built in accordance with the Greater Dublin Regional Code of Practice for Drainage Works. No private drainage will be located within public areas.

Drains will be laid in accordance with the requirements of the Building Regulations, Technical Guidance Document H.

All SuDS and surface water drainage networks proposed in the public domain will be constructed to the standards required for Taking in Charge.

Water metering via district meters will be installed to Uisce Eireann requirements. Monitoring of the telemetry data will indicate any excessive water usage which may indicate the potential for a leak in the watermain network. Early identification of potential leaks will lead a faster response in determining the exact location of leaks and completion of remedial works.

It is not envisaged that any further remedial or reductive measures will be necessary upon completion.

12.6 Residual Impacts

12.6.1 Construction Stage

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in water demand and foul water outflow during the period of construction. This increase in water demand and foul flows generated with be negative, slight (not significant), likely and short-term in nature.

12.6.2 Operational Stage

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development on surface water and groundwater quality.

Surface water discharge from the site will be restricted by means of attenuation to below the current greenfield runoff rate, therefore, no adverse impact in respect of flooding downstream will arise from the proposed development. The impact will be positive, slight (not significant), & permanent.

The installation of a Sustainable Urban Drainage System will ensure surface water runoff will be of high quality before discharge to the local surface water network and will not have an impact on the receiving waters downstream of the development. The impact will be positive, slight (not significant), & permanent.

There will be an increased water demand and an increased foul flow volume generated for the proposed development. Uisce Eireann have confirmed in their Confirmation of Feasibility Letter that the existing network has sufficient capacity to cater for the development. The impact will be negative, slight (not significant) and permanent.

12.7 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 on its water body status or prevent attainment or potential to achieve the WFD objectives.

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-term events that will not impact on the water status of the underlying aquifer long-term and as such will not impact on trends in water quality and over all status assessments.

12.8 Cumulative Impacts

12.8.1 Interactions

The main interactions relating to this EIAR Chapter are Land & Soils, Biodiversity, and Utilities.

During construction stage, the connection of wastewater services has the potential to impact groundwater and soils if wastewater were to leak from the network during the construction process. 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 Transport 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.

In respect of Land & Soils, interaction between surface and ground water and the bedrock geology is feasible. The implementation of the mitigation measures outlined in this chapter will reduce the potential of surface contaminants leaking into the underlying geology.

In respect of Biodiversity, there is interaction between hydrology and the downstream habitats present as the public surface water network outfalls volume and water quality to the natural watercourse. The mitigation measures ensure that surface water runoff is treated to the required standards so that downstream habitats are not negatively impacted.

12.8.2 Potential Cumulative Impacts

12.8.3 Construction Stage

There are no anticipated construction stage cumulative impacts arising from the proposed development, or any further development in the locality in relation to water, other than a neutral, imperceptible, and temporary increase in water supply demand and increase to foul flows generated.

12.8.4 Operational Stage

There are no anticipated cumulative impacts arising from the proposed development, or any further development in the locality in relation to water, other than a neutral, imperceptible, and permanent increased water supply demand and increase to foul flows generated. This is based on the current EIAR assessment of the masterplan lands as a whole rather than just the subject application site. Mitigation measures noted throughout this report apply to the full masterplan lands and their subsequent planning application and not just the subject application.

12.9 Risks to Human Health

There is a risk to Human Health should the ground water or the existing water supply become contaminated during the construction or operational stages, and the water is consumed. In order to mitigate these risks, the measures outlined previously will be adopted.

12.10 Monitoring

12.10.1 Construction Stage

Implementation of the Construction Management Plan is required to protect the hydrology and groundwater elements of the subject lands during construction stage. Maintenance of the mitigation measures and monitoring of the management processed is required to ensure best practice.

The monitoring measures to be implemented include:

- Monitoring of the management and storage of dangerous chemicals and fuel.
- Monitoring and maintenance of the wash and wheel wash facilities.
- Regular maintenance and monitoring of the sediment control measures.
- Monitoring and maintenance of the SUDS features, road gullies and, attenuation ponds and or sedimentation facilities during the construction phase of the development.

12.10.2 Operation Stage

Monitoring and maintenance of the water metering telemetry, SUDS features, road gullies, attenuation, and flow control devices are imperative during the operation phase of the development.

12.11 Difficulties Encountered

There were no particular difficulties encountered compiling the Water chapter of the EIAR.

12.12 Reinstatement

No reinstatement is anticipated on site with respect to the Water environment.

12.13 References

- Environmental Impact Assessment Reports – Guidelines, (2022), Environmental Protection Agency
- Environmental Protection Agency mapping available at http://gis.epa.ie/EPAMaps/
- Geological datasets available at www.gsi.ie
- Greater Dublin Strategic Drainage Study (GDSDS), (2015), Dublin Drainage
- OPW Eastern CFRAM study
- OPW Flood Hazard Mapping
- EIAR Chapter 10 for a Proposed Residential Development at Church Fields East, Mulhuddart, Dublin 15, Produced by Brady Shipman Martin.
- www.water.ie/projects/local-projects/ringsend/

13 Population and Human Health

13.1 Introduction

This section of the EIAR assess any potential impacts the proposed development may have on Population and Human Health in accordance with the requirements set out within the EIA legislation and guidance on preparation (detailed in Section 0 below) and content of EIAR. This chapter has been prepared by Alan Crawford, MRUP MIPI, Associate Director (Planning) at KPMG Future Analytics. Alan has 11 years' experience in planning of residential schemes including the preparation and project management of EIARs and the preparation of Population and Human Health assessments.

Population and Human Health is a broad ranging topic and addresses the potential likely significant direct and indirect effects of the proposed development on population and human health. The assessment considers the existence, activities, and wellbeing of people. It comprises an important aspect of the environment to be considered. This chapter describes the demographic and socio-economic profile of the receiving environment and potential impact of the proposed development on population, i.e., human beings, and human health. Any likely negative impacts will be addressed through mitigating factors and actions to be applied to minimise these effects.

Population

The impact on population has been assessed / evaluated through consideration of socio-economic and social factors. Specifically, the assessment seeks to capture the social effects of the proposed scheme, vis-à-vis, impact of construction workforce on local service, impacts on quality of life and well-being issues reflected through a range of indicators including (but not limited to): existing health status of population in the area, access to facilities and services etc., community health, participation etc. Economic impacts include any resulting employment and expenditure opportunities resulting from the scheme (at the different construction and operational stages).

Human Health

In addressing impacts on Population, it is but inevitable to consider the subsequent impacts of the proposed scheme on Human Health. This has been considered both separately and together to ensure the relationship between the two factors is considered in the assessment of impacts arising from the proposed scheme within the defined baseline.

Although there is no definition of Human Health within the EIA Directive, a commonly used (and widely accepted) definition of health is by The World Health Organisation (WHO), which defines health as *"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity".*

In the assessment of impact on Human Health arising from the proposed development, this Chapter first establishes the current status of health within the local study area catchment through relevant baseline information available in the local context. Where applicable (and inadequate information available at the local level) comparable data on Health, for a wider scale at Dublin Region level has also been set out. Subsequently the impact of the proposal during the different stages of construction and operation – on the welfare of the people, specifically the vulnerable groups (dependents) and quality of life, the impact on factors affecting human health, e.g., water supply, air, etc. and environment in general has been considered.

The baseline for both Population and Human Health has been set out in the Assessment Methodology, under Section 13.2.3 of this Chapter.

Please refer to Section 13.3 for details on the Development Sites and the Proposal; and the Planning Report / Statutory notices for full and complete description of the proposed development.

13.2 Assessment Methodology

The following Guidance documents have been reviewed by KPMG Future Analytics in setting out the methodology for the assessment of the impacts of the proposed development on the Population and Human Health, for the local area serving the subject site. It is also note that the approach within these documents is consistent with the approach as set out in the European Commission's Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).

- (EUPHA) Human Health: Ensuring a High Level of Protection. A reference paper on addressing Human Health in Environmental Impact Assessment
- Health Impact Assessment in Planning (IEMA 2020);
- Healthy Ireland - A Framework for Improved Health and Wellbeing 2013 – 2025 (the Healthy Ireland Framework) (Department of Health 2019);
- Environmental Noise Guidelines for the European Region (hereafter referred to as the WHO Noise Guidelines) (WHO 2018)
- Environmental Impact Assessment of Projects. Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017);

This section has been prepared in accordance with the EIA Directive, the European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017), the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (published in August 2018) and the Guidelines on the information to be contained in Environmental Impact Assessment Reports published by the EPA (2022).

Article 3 of the EIA Directive, on the assessment of effects of certain public and private projects on the environment, sets out the following:

> *"(1) 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 2014 Directive's title change to assess the impact on 'Population and Human Health' and the 2022 EIA Guidelines published by the EPA have been adhered to in this Chapter, including the requirement that the assessment of impacts on population and human health should refer to the assessment of those factors under which human health effects might occur, as addressed elsewhere in the EIAR, e.g., under the environmental factors of 'air, water, soil, etc.'

With regard to 'Human Health', the European Commission's (EC) 2017 publication, Environmental Impact Assessment of Projects: 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 the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."

EIA Directive Article 3(1) sets out the **environmental factors** that EIAs must consider. Human Health is specifically mentioned, as is its interaction with population, biodiversity, land, soil, water, air, climate, material assets, cultural heritage, the landscape, and the vulnerability of the project to risks of major accidents and / or disasters.

This Chapter will follow the EC guidelines and will examine the relevant health effects in the context of the proposed development as they relate to the defined study area. The effects of the proposal on the population and human health are analysed in compliance with the requirements of the EPA Guidelines.

13.2.1 Assessment of Significance

The EC guidelines sets out that the assessment of significance should be based on clear and unambiguous criteria, and that significance should be defined in a way that reflects what is valued in the environment by public and private stakeholders. A common approach to this would be the application of multi-criteria analysis. Common criteria used to evaluate significance include the magnitude of the predicted effect and the sensitivity of the receiving environment:

- *'Magnitude' considers the characteristics of the change (**timing**, **scale**, **size**, and **duration of the impact**) which would probably affect the target receptor as a result of the proposed Project;*
- *'Sensitivity' is understood as the sensitivity of the environmental receptor to change, including its capacity to accommodate the changes the Projects may bring about.*

The EC guidelines also notes that significance is always context-specific and hence, a tailored criteria should be developed for each Project and its settings.

13.2.2 Significance of Effects

The EC Guidelines on Scoping states that all assessment methods should define clear thresholds or criteria for determining whether an impact is significant, based on the characteristics of an impact, in a clear and unambiguous manner.

The assessment method for this Chapter, hence, follows the commonly used approach of the 'multi-criteria analysis' to evaluate significance – which includes consideration of the magnitude of the predicted effects and the sensitivity of the receiving environment (as described in Section 13.2.1 above).

Under **'Sensitivity of the receiving environment'**, the Chapter considers the following components of criteria:

- Existing legislation / guidelines / zoning for the Development and wider Study Area (as defined in Section 13.4);
- Value of the receptor to society – including (where applicable) but not limited to the economic values, social values, environmental values and / or the number of affected people, as a result of the proposed scheme; and
- Vulnerability to the changes – the ability of the receiving environment (as described in Section 13.5) to respond / adapt to the changes occurring from the scheme, for e.g., impact on air

quality, traffic, noise, pollution, employment, quality of life etc., within the area and potential sensitive targets.

Under **'Magnitude of the Impact'**, this Chapter considers the following components of criteria:

- Intensity and direction – the physical dimension (intensity) of the scheme and the direction of the impacts (positive or negative) arising from it. Depending on the type of impact, intensity has been measured in terms of physical units (where applicable), for e.g., the scheme would positively impact housing within the area through delivery of over 1,100 social / affordable and cost rental units;
- Spatial extent of the project – the geographical reach of an impact / range within which an effect is observable, for e.g., impact as a result of construction noise may affect those within the vicinity.
- Duration of impact – describing how long the effect from the scheme is expected to last and the frequency of occurrence (where applicable).

In order to scale and weigh the two criteria (on sensitivity and magnitude), a matrix similar to that set out in the EPA Guidelines (2022), has been adapted (Table 13.1) to evaluate the significant of effects:

Table 13.1 Matrix of Significance

Impact Magnitude	**Environmental Sensitivity**			
	High	**Medium**	**Low**	**Negligible**
High	Profound	Very Significant or Significant	Significant or Slight	Slight
Medium	Very Significant or Significant	Significant	Slight	Slight or Non-Significant
Low	Significant or Slight	Slight	Slight or Non-Significant	Non-Significant or Imperceptible
Negligible	Slight	Slight or Non-Significant	Non-Significant or Imperceptible	Imperceptible

Generalised definitions of the above scale of effects, as provided within the EPA Guidelines (2022), is represented below in Table 13.2.

Table 13.2 Description of Significance of Effects (as per the EPA Guidelines 2022)

Terminology Describing Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences
Non-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 Effects	An effect which, by its character, magnitude, duration, or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

In line with the above, the Section on Impact Assessment (13.6), has set out in detail the impacts resulting from the development and the extent of their significance on the receiving environment (as set out in Section 13.5). Each effect has been assessed on the basis of the sensitivity of the environment and the magnitude of change – with a focus on effects that are both likely and significant.

13.2.3 Description of Baseline

According to the World Health Organisation, *'well-being is a positive state experienced by individuals and societies*.' Both health and well-being are a resource for daily life and are determined by social, economic, and environmental conditions. Poor social and economic circumstances have a great impact

on the health and well-being of people and societies and therefore, better health encompasses improving quality of life by encouraging education, supporting employment, improving living / housing standards, and ensuring a safe and secure environment. Health is not only the physical disability, but also the state of mental health, social wellbeing, and economic conditions.

As per the Healthy Ireland: A Framework for Improved Health and Wellbeing 2013-2025 (Healthy Ireland Framework), *'a healthy population is essential to allow people to live their lives to their full potential, to create the right environment to sustain jobs, to help restore the economy and to look after the most vulnerable people in society.'*

The Healthy Ireland Framework was a landmark policy published by the Department of Health in 2013 with a focus on living healthier lifestyles and preventing chronic disease. A Healthy Ireland Outcomes Framework was published in 2018 to monitor and drive the achievement of Healthy Ireland's targets and performance indicators. The Outcomes Framework sets out four high-level outcomes that reflect the broad determinants of health and wellbeing across the life course:

- Responsibility is shared in addressing the social determinants of health and wellbeing;
- People of all ages and abilities participate in education, work, and leisure activities to their full potential;
- Children are active and healthy, with positive physical and mental wellbeing;
- We live longer healthier lives in safe, healthy environments in resilient communities.

These outcomes are supported by indicators grouped into three broad areas: Healthy Status, Health Outcomes, and Social Determinants to provide a holistic view of the impact of current policies. For each indicator an appropriate measure has been selected to allow progress and emerging trends to be tracked.

The Table 13.3 below provides an overview of some relevant indicators extracted from the Healthy Ireland Outcomes Framework's 'Indicators Set' for the three broad areas described above. This will further help determine some of the baseline data in the context of the proposed development. The indicators will also be subject to comparison with national data, where applicable / relevant.

Table 13.3 Healthy Ireland Outcomes Framework Indicator Set 2018.

Indicator Group	Indicator Set
Health Status	**Preventive Measures:** Breast Cancer Screening Rate, Cervical Cancer Screening Rate, Measles Mumps and Rubella (MMR) Immunisation Rate, Meningitis C Immunisation Rate **Lifestyle and Behaviour Risks:** Overweight and Obesity, Physical Activity Levels, Current Smoking Rate, Harmful Use of Alcohol, Breastfeeding Rates, Condom use (young people), Screen time (young people)
Health Outcomes	**Mortality and Morbidity:** Healthy Life Years, Premature Non-Communicable Disease Mortality, Cancer Incidence **Wellbeing Factors:** Self-Perceived Health, Positive Mental Health, Probable Mental Health Problem, Moderate and Severe Depression (age 50+), Social and Cultural Participation (age 50+), Safety and Security (age 50+), Feeling Safe (young people)
Social Determinants	**Environmental Factors:** Air Quality Index, Water Quality, Radon **Socio-economic Factors:** Long-term unemployment, Jobless Households, Education: Retention, Education: Attainment, Literacy and Numeracy, Consistent Poverty Rate, Inequality of Income

With regard to the above, the baseline data has been carefully considered and range of Socio-Economic, Environmental and Wellbeing Factors for the defined local area have been chosen, as set out below.

The assessment of potential impacts of the proposed development on Population and Human Health of residents in the Study Area are based on local population information sourced from the Central Statistics Office (CSO) Census data captured during the Census 2016 and 2022.

Datasets analysed include:

- Population and Household Data
- Economic, Education and Employment Data
- General Human Health Data

Population and Household data mainly seek to capture the change (growth / decline) in the overall size of the area surrounding the subject development, the demographic profile, specifically age and gender distribution and the household composition within the area. This will help identify specific / potentially vulnerable groups, establishing a baseline for assessing possible effects.

The Institute of Public Health's Guidance on Health Impact Assessment (2021) includes further details on who can be considered within the ambit of 'vulnerable / sensitive groups': young-age vulnerability (children and young people as potentially more vulnerable road users); old-age vulnerability (older people as potentially more vulnerable road users); low-income vulnerability (people living in deprivation, including those on low incomes for whom travel costs or alternatives may be limiting); poor health vulnerability (people with existing poor physical and mental health in relation to health trip journey times); and access and geographical vulnerability (people who experience existing access barriers or for whom close proximity to project change increases sensitivity)[3].

The economic and employment context draws on principle economic status data of persons in the Study Areas aged 15 years and older. The economic conditions of an area can have immense implications on the health of the population, for e.g., unemployment, income deprivation and social status can often have an impact on both physical and mental well-being of individuals. Negative impacts associated with unemployment include depression, anxiety, and self-esteem – this can in turn affect participation of such groups / individuals within the community and hence, often neglected. In addition, people living in deprivation also have reduced / limited access to financial resources, further restricting their access to healthcare, housing, travel, and other basic necessities. On that basis, this chapter sets out the existing economic condition within the Study Area and further evaluates the impact of the proposal on employment, and other economic activities.

The baseline also captures the educational status within the Study Area, which is also a key contributing factor to improved employment, security, and therefore good health.

Census data has also been used to reflect on the (self-evaluated) general health status of residents in the Study Area. Where applicable and available, relevant health data has been presented for the local area and where local level data was limited, data representing the Dublin Region has been detailed to provide an overview of the health status within the administrative area. Some environmental indicators such as air and water quality data available for the local Cherry Orchard area have also been included in the baseline to provide a complete representation of health for the area.

Built Environment is also a key factor impacting the health of population within an area. This includes (but is not limited to) access to green and blue spaces – which is considered to provide support for mental health by providing opportunities for play, recreation, activity, and social connection[3]. Therefore, an assessment of the current provision of community and social infrastructure was conducted through spatial analysis. The Chapter also sets out the details of the proposed mix of uses that the scheme has on offer in terms of non-residential uses. The scheme includes a wide range of uses catering to the diverse needs and age groups, including, community, arts and cultural spaces, a childcare facility with associated external playing space, high-quality landscaped public open space which will include a

[3] *Institute of Public Health: Health Impact Assessment Guidance (2021)*

public plaza, play space, outdoor fitness trail, communal amenity space, internal pedestrian, and cycle routes. The consequent impacts arising from the inclusion of these features as part of the proposal has been further discussed under Section 0 of this Chapter.

The Chapter also identifies relevant proposed / upcoming schemes within the Study Area, to assess the effects / impact these may have in combination with the proposed scheme. The current and prospective development and land use activity in the Study Area in relation to the proposed development has been set out in Section 13.7 ‘Cumulative Impacts’’.

Finally, to provide further context to the social and demographic assessment, a similar data analysis exercise, but at broader scale, was performed on the Dublin City administrative area, and the State were deemed necessary.

13.3 Subject Site

Development Sites

The subject lands comprise 2 no. sites known as Key Development Site 4 and Site 5 as identified in the Park West Cherry Orchard Local Area Plan 2019. The lands together are approximately 11.5 hectares in size, with plans for a mixed-use residential development. The lands are under the ownership of Dublin City Council and are being developed in partnership with the Land Development Agency. Figure 13.1 below demarcates the Development Sites in context of the surrounding area.

The sites are bound by Cloverhill Road to the north, Cedar Brook Avenue and Park West Avenue to the east, Park West Cherry Orchard Rail Station to the southeast, the rail line to the south, and the M50 motorway to the west. Two large industrial estates can be found to the south and southwest of the site as well as many green spaces and parks softening the area.

Figure 13.1 Development Sites in the context of surrounding area

The Development on Sites 4 and 5 of the Local Area Plan 2019 will be delivered across four Phases (see Figure 13.2).

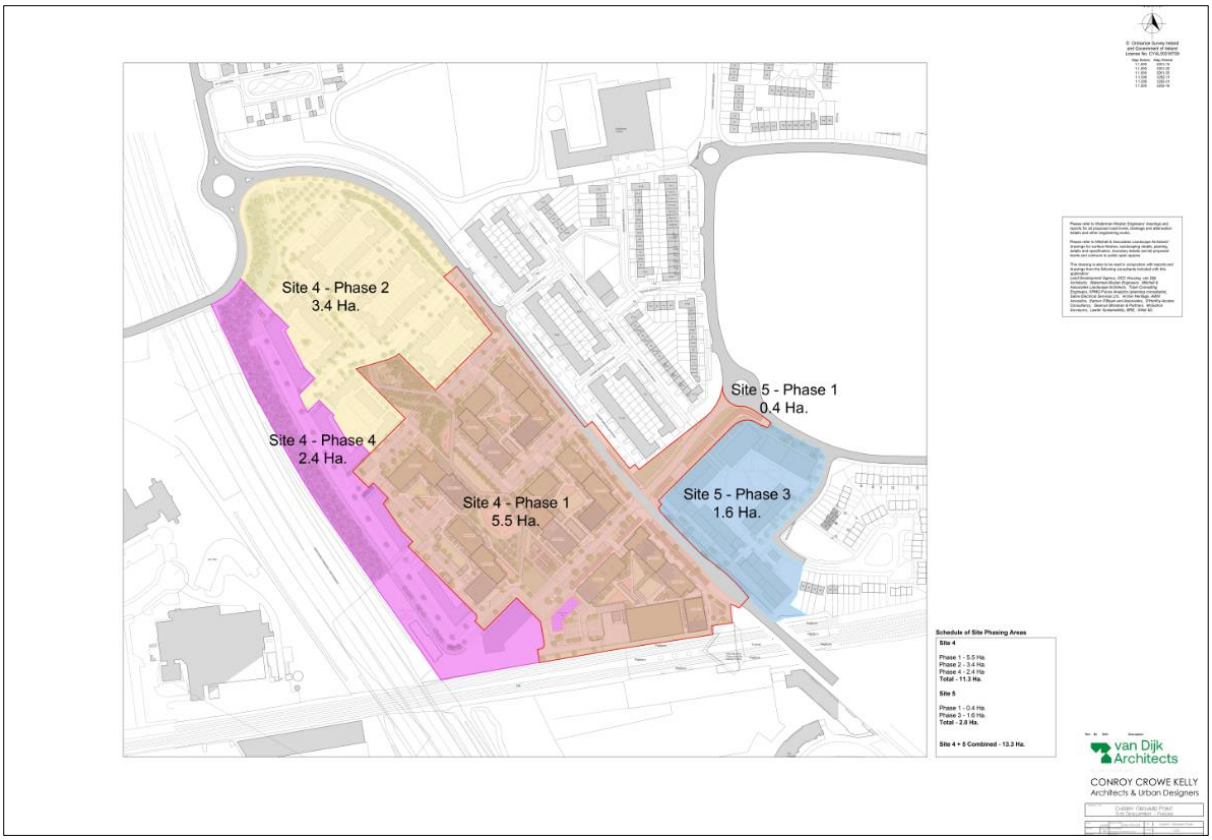


Figure 13.2 Phasing Plan for the delivery of the Proposed Development on Key Sites 4 and 5 under the Park West Cherry Orchard Local Area Plan 2019 (Source: Van Dijk Architects and Conroy Crowe Kelly Architects).

A breakdown of the total residential units under - cost rental, social and affordable units proposed for Phase 1-3 is provided in the below Table 13.4.

Table 13.4 Break down of typology of residential units proposed in Phases 1 to 3 of the Development

Phase	Cost Rental	Social and Affordable	Total Units
1	547	161	708
2	153		153
3	203	51	254
Total			**1,115**

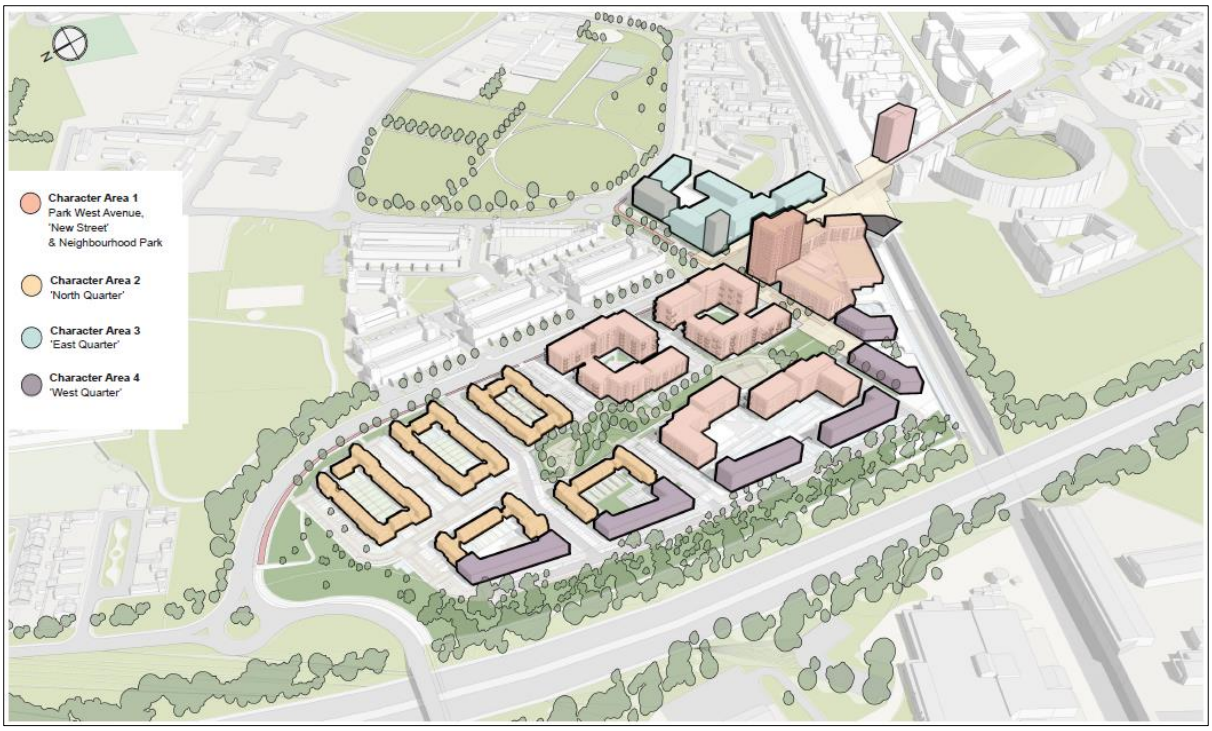


Figure 13.3 Proposed Development with the Character Areas illustrated (Source: Architectural Design Statement)

In total, the Development will provide approximately 1,115 homes, 4,790 sqm of retail uses on Park West Avenue, a creche, up to 16,310 sqm of commercial / enterprise uses adjacent to the M50 corridor and around 1,200 sqm of non-residential uses on Site 5.

Application Site

The Application Site (also known as 'Subject Site' hereon) is part of Site 4 at Cherry Orchard, Dublin 10 (known as Development Site 4 in the Cherry Orchard Local Area Plan 2019).

The proposed scheme represents Phase 1 of the overall planned development and has been proposed on part of Site 4, covering an area of c. 6.27 hectares (red line boundary in Figure 13.4). The application site consists of a mix of residential, retail, commercial and community uses (the details of which has been set out in Planning Report submitted along with this application).

Figure 13.4 Site Layout Plan (Source: van Dijk Architects and Conroy Crowe Kelly Architects and Urban Designers)

The proposed scheme involves construction of 16 blocks contained within 9 buildings ranging in height from 4 to 15 storeys comprising of 28no. studio units, 263no. on-bed units, 368no. two-bed units (52no. two-bed three-person and 316no. two-bed four-person) and 49no. three-bed units (59,022.8sq.m total GFA) together with a convenience retail supermarket (2,523sq.m GFA), 7no. retail / commercial units (totalling 373sq,m GFA), community, arts and cultural spaces delivered across 13no. community and arts / cultural units (totalling 1,222sq.m GFA), and associated external events space and community gardens (1,157sq.m), a childcare facility (672sq.m GFA) with associated external playing space (200sq.m) and all ancillary and sundry accommodation including sub stations, plant, refuse stores, cycle stores, and metre / comms rooms (2,586sq.m total GFA).

A summary of the proposed blocks and their subsequent uses has been provided in Table 13.5 below.

Table 13.5 Proposed Mix of Uses and Units within each Block (Source: Schedule of Accommodation)

Apartment Block	Stories	Units	Density Area	GFA (m^2)	Residential GIA (m^2)	Non-Residential (m^2)	Non-Residential Use
Apt Building 1	6	24	High	4,594	1,954	2,523	Retail
Apt Building 2A	6	27	High	3,084.8	2,577.8	222	Retail
Apt Building 2B	16	110	High	10,096	9,358	307	Retail (151 sqm)/Community (156sqm)
Apt Building 3	5	35	High	3,611	2,865	424	Community
Apt Building 5A	6	54	Medium	5,032	4,175.3	672	Creche
Apt Building 5B	5	29	Medium	2,628	2,571.7	0	NA
Apt Building 6A	6	58	Medium	5,019	4,901	0	NA

Apt Building 6B	5	24	Medium	2,584	2,130.5	289	Community
Apt Building 7A	7	81	Medium	6,363	6,193	0	NA
Apt Building 7B	6	30	Medium	3,208.8	2,763.6	353	Community
Apt Building 8A	6	63	Medium	5,424	5,239.1	0	NA
Apt Building 8B	5	33	Medium	2,640	2,556.8	0	NA
Apt Building 9A	5	47	Medium	3,791	3727.2	0	NA
Apt Building 9B	4	22	Medium	2,075.2	1,935.5	0	NA
Apt Building 10A	4	42	Medium	3,664	3,546.9	0	NA
Apt Building 10B	5	29	Medium	2,584	2,527.7	0	NA
		708		**66,398.8**	**59,023.1**	**4,790**	

The rationale for the proposed mix of uses is in line with the vision for the scheme as set out with the statutory Local Area Plan 2019 for the Park West Cherry Orchard local area as well as the requirements of the Dublin City Development Plan 2022-2028 (the "**DCC CDP**"), where relevant.

13.4 Study Boundary for the purpose of Environmental Impact Assessment

The study area for the purposes of this EIAR has been defined by a 1km buffer around the entire development / ownership boundaries of Sites 4 and 5 (see Figure 13.5). This consideration has been made on the basis that the development falls under a single ownership and hence, will be a single scheme, delivered in phases to align with the availability of essential infrastructure, services and amenities. Hence, the overall impacts of the entire development on the surrounding area, the associated risks and any subsequent mitigation measures will have to be set out and addressed at the outset.

Figure 13.5 illustrates the ownership boundary (in green), which also forms the basis for defining the EIAR Study Boundary, which extends from the outlined site boundaries.

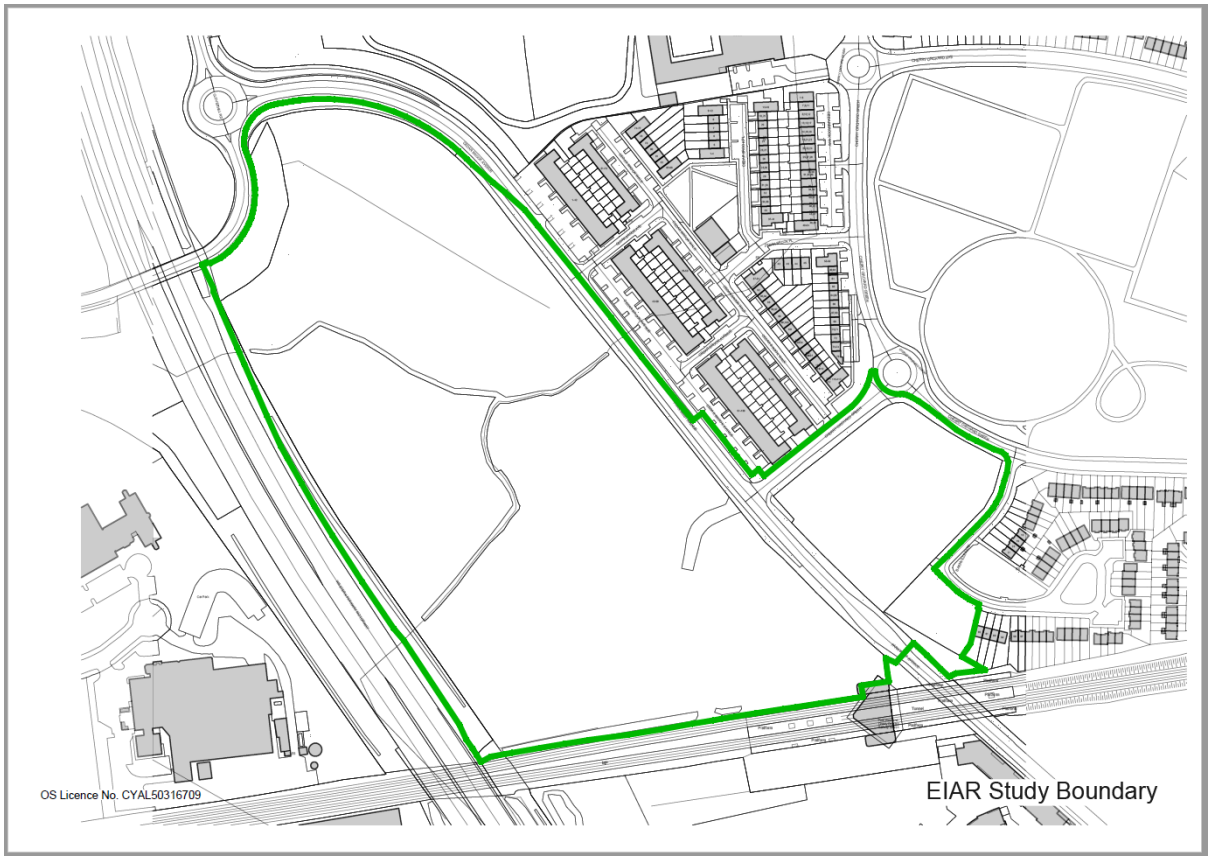


Figure 13.5 EIAR Boundary

The 1km study area catchment extending from the EIAR Boundary comprises 51 no. CSO Small Areas (SAs) which encompasses the entirety of the development sites (Figure 13.6). The demographic and socio-economic analysis is based on Census 2022 Small Area data in order to provide a consistent and accurate picture of the demographic profile of the study area.

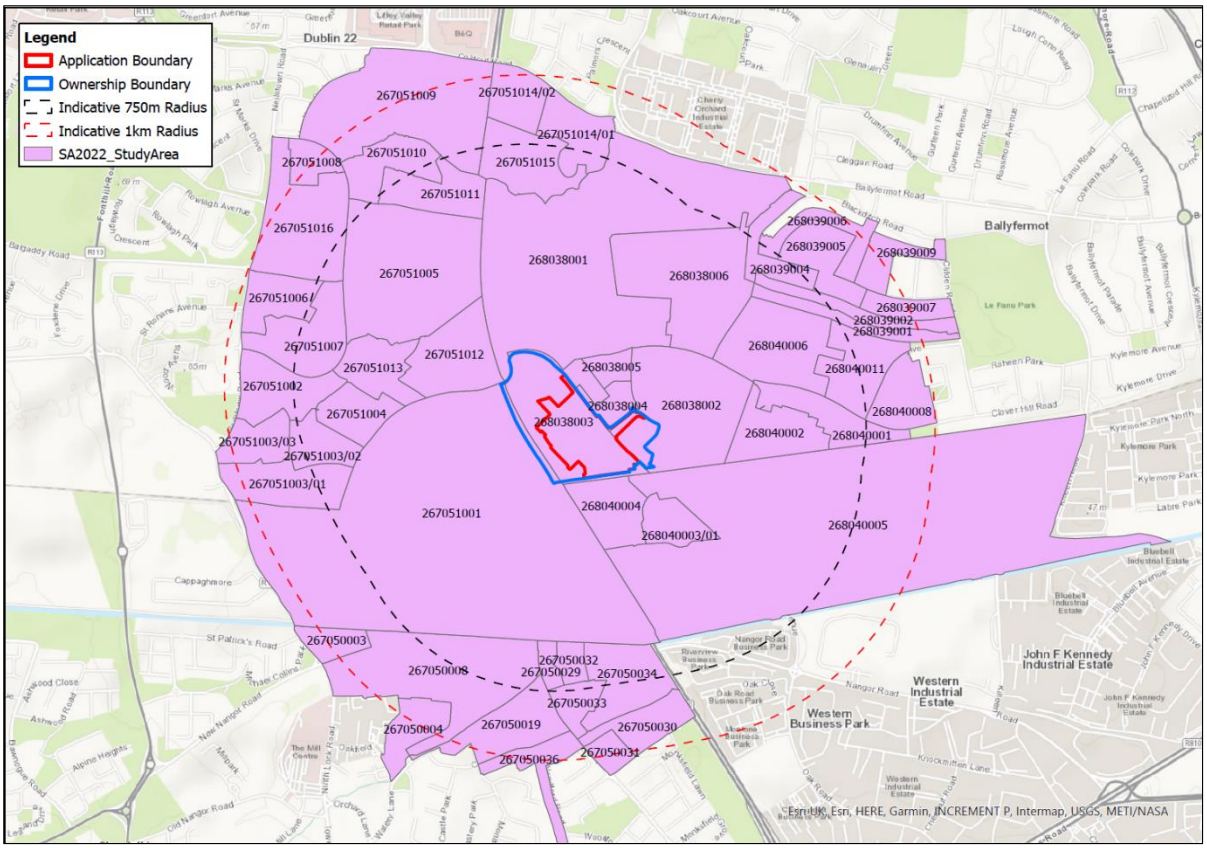


Figure 13.6 Extent of Demographic Study Area comprised of 51 no. SA Boundaries which covers a 1km radius from the application site (shown in red). The Ownership Boundary is shown in blue on the map. (Source: CSO 2022/KPMG-FA.)

The study area catchment also aligns with the principle of the 15-minute walking city concept introduced within the new DCC CDP – which seeks to ensure that people's daily requirements can be reached within 15-minute by foot, bike, or public transport.

It is considered that this study area provides a good representation of the socio-economic and demographic characteristics of the immediate populated area potentially impacted by the proposed development.

13.5 Receiving Environment

This section presents the findings of the baseline analysis of datasets relevant to population and human health. This analysis informs the professional conclusions reached as to duration and significance of impacts.

13.5.1 Overview: Census 2022

Some of the key highlights of the Census 2022 results at State Level has been set out in the context of the socio-economic profile for comparison at the local level where applicable.

The Census 2022 results indicate that, for the first time in 171 years, the population of Ireland has exceeded the five million thresholds (an increase of 8% since 2016). The average age of the State population has increased from 37.4 years in 2016 to 38 years in 2022. There was also an overall drop in the proportion of people who reported their health was good or very good since 2016, from 87% to 83%.

Around 22% of the population reported, as of April 2022, having experienced at least one long-lasting condition or difficulty. More than 34% of the population aged 15 years and older who experienced a

long-lasting condition or difficulty were at work. 72% of professional workers reported 'very good' health as against 41% of unskilled workers.

Close to 9% of the total population smoked daily and just over 4% smoked occasionally. A total of 6% of the population provide regular unpaid care. Some 57% of unpaid carers (aged 15 years and over) were at work in 2022, as compared to 51% in 2016.

The average number of families as per Census 2022 was 59% higher than in 1996, however, the average number of children per family fell by 26% - the average number of children per family was c. 1.34 per family down from 1.38 in 2011 and 2016. An approximate one in three children in the State were in some for of childcare, but just over 4 in 10 children were in a creche or similar facility.

From the Human Health perspective, it is also important to highlight the growing 'old age' vulnerabilities of the Country. The population of Ireland is ageing, with life expectancy increasing and older people continuing to be an active and vibrant part of communities. The population aged 65 years and over is projected to double to 1.6 million by 2051. Hence, as part of any new development, consideration will need to be had to all vulnerable groups and appropriate provisions made. The impact of the scheme on such groups has also been assessed under the Impact Assessment Section of this report.

The following sections focus on the key socio-economic and health characteristics for the local area surrounding the subject site.

13.5.2 Population and Household Characteristics

The Table 13.6 below, records the percentage change in population during the Census period 2016 and 2022 to highlight overall residential patterns and population profiles. Between 2016 and 2022, the population of the study area has experienced a drastic increase from the previous Census period, of 7.7%, which is close to the population increase observed at the Dublin Region and the State level, both of which experienced around 8% increase in the 6 years following Census 2016.

Table 13.6 Population Change during the Census Period 2011, 2016 and 2022

Area	2016	2022	2016-2022 Change #	2016-2022 Change %
Study Area	17,089	18,398	1,309	+7.7%
Dublin Region	1,347,359	1,458,154	110,795	+8.2%

Data analysis on the Study Area and the Dublin City administrative area show similar trends in the distribution of the population across various age cohorts, although the Dublin has experienced a comparatively higher growth in the population between Census 2016 and 2022. The population age group between 15 and 64 years consist of the c. 69.7% in the Study Area, which is slightly higher than that of Dublin and the State, which stand at 68% and 65% respectively (see Table 13.7).

Table 13.7 Study Area, Dublin Region, and State Population by Age Group (Summary)

Age Group	Study Area		Dublin Region		State 2022 %
	2022%	Change	2022%	Change	
0-14	20.3%	3.3%	18.4%	3.5%	19.7%
15-64	69.7%	6.4%	68.1%	7.7%	65.3%
65 years and over	10%	29.9%	13.4%	18.6%	15.1%
Total	100%	7.7%	100%	8.2%	100%

There is a visible increase in the population aged 65 years and over within the Study Area, which has experience almost 30% increase between 2016 and 2022. This increase is greater than that of Dublin, which has observed around 19% increase in the same age cohort. The highest increase in the Study Area population was recorded for the population in the age group 70-74 years (+68.3%) and 75-79 yeas (53.7%). This is indicative of the fact that there has been an influx of elderly population within the Study Area in the period between 2016 and 2022, as well as of – the growing old age vulnerabilities within the

area, which therefore calls for appropriate measures toward accommodating this age group. Although, the portion of population aged 65 years and over within the Study area consists about 10% and is comparatively lower than Dublin and the State which consists of 13% and 15% of people aged 65 years and over as of Census 2022.

According to Health in Ireland – Key Trends (2022), the proportion of working aged people to people over 65 will decrease from five to one, to three to one, in the next 20 years. A report prepared by the Institute of Public Health[4], in 2020 has also noted that the population in the State are *'getting older and the share of older people (65 years and over) is set to rise steeply over the coming decades… - to almost 1.6 million by 2051.'* This was further echoed in by the Central Statistics Office[5] in relation to ageing population, which notes that the number and the proportion of persons aged 65 years and over is increasing and is projected to continue an upward trend over the next three decades.

In terms of children population, the Study Area experienced around 13% decrease in the 0-4 years age cohort. However, there was c. 27% increase in the population aged 10-14 years of age. The decline in the level of 0-4 years within the Study Area is also somewhat reflective of the national drop in the children per family (c. - 26%).

While there was a 15% decline observed in the total number of persons aged 25-29, the majority of the households within the Study Area still consisted of 'Adult families', i.e., families where the eldest child was 20 years or over at 35% (Figure 13.7). While 'Adult families' were the most prevalent family cycle type in Dublin and the State over, the proportion was comparatively lower than the Study Area, at c. 26% in Dublin and c. 27% in the State.

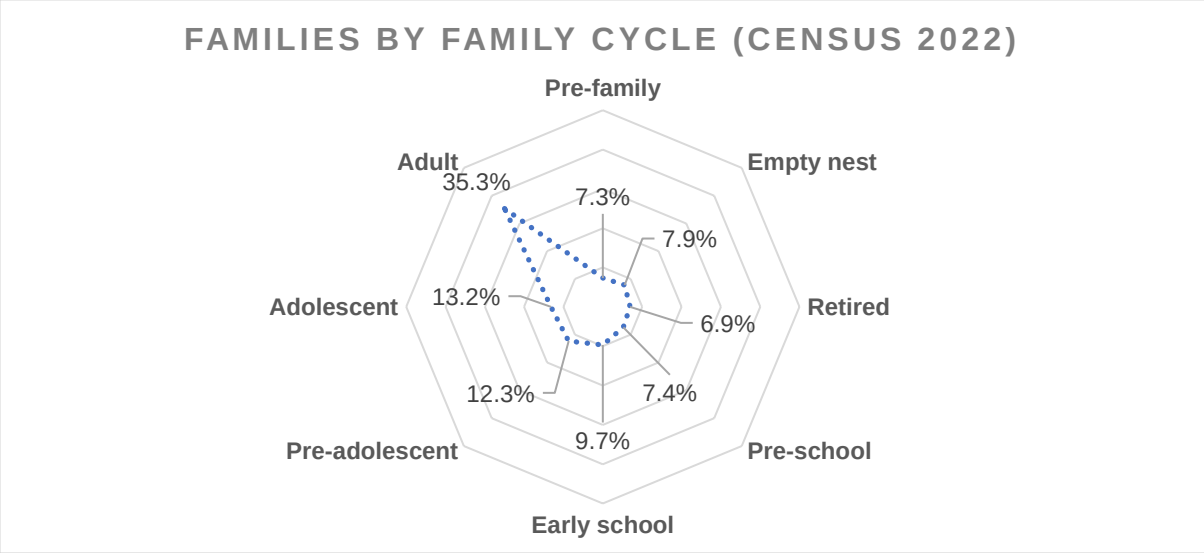


Figure 13.7 Families by Family Cycle as per Census 2022

There was an overall decline of 0.3% observed in the number of families, within the Study Area. Notwithstanding this, there was a significant increase of 48% in the number of retired families, within the Study Area between 2016 and 2022, which also reinstates the substantial increase in the total number of persons aged 65 years and over. This establishes the old age vulnerabilities within the area.

In terms of children population (who are considered as a vulnerable / dependent age group), it is noted that there has been an overall decline in the 'Pre-school' (-31%) and 'Early school' (-22.4%) families within the Study Area. The decline the 'Pre-school' families could also be attributed to a decline in the age profile of children between 0 and 6 years old, between 2016 and 2022, which has observed an

[4] *Ageing and Public Health – an overview of key statistics in Ireland and Norther Ireland:* 20200416-AGEING-PUBLIC-HEALTH-MAIN.pdf (publichealth.ie)
[5] Ageing Population - CSO - Central Statistics Office

overall decline of 14%, with the largest decline recorded in infants aged 1-year old (c. -30%) and 6-years old (c. -23%). The Study Area is reflective of the overall decline in 'Pre-school' and 'Early School' families in the State, which is down by c. 14% between since 2016.

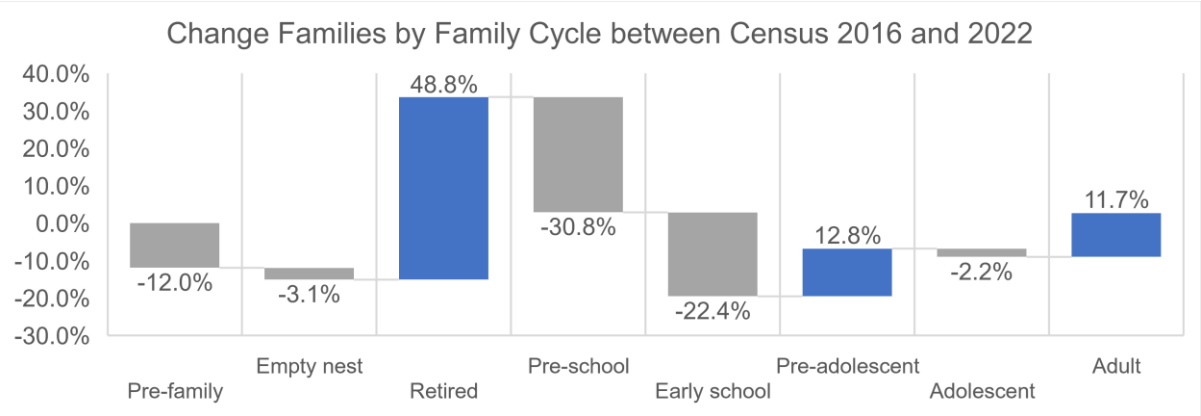


Figure 13.8 Changes in Families by Family Cycle - Census 2016, 2022

A decline in the number of children has been observed at the overall State Level, which as of Census 2022, recorded a decline of 26% in the average number of children per family (compared to 1996). This has been attributed to both demographic as well as economic factors, including (but not limited to) people starting families at a comparatively later stage as well as affordability constraints – resulting in higher costs of having children at a younger age. Section 13.5.3 below provides an overview of the current economic status of the Study Area in comparison to Dublin and the State.

It is noted that the Ballyfermot-Drimnagh Local Electoral Area has an average of 1.31 children per family and that of Dublin City Council administrative boundary has an average of 1.11 children per family.

13.5.3 Economic Activity and Employment

The principle economic status as captured by the CSO, provides a breakdown of the number of people aged 15 years and older in the labour force at work as well as those looking for their first job or are unemployed (short term and long term unemployed). Persons or groups over 15 years of age not participating in the labour force are typically students, home makers, retirees, and persons unable to work due to illness or disability and they are considered not economically active.

Table 13.8 Principle Economic Status (CSO 2022)

Principal Economic Status	Study Area 2022 #	% Total	Dublin 2022 #	% Total
At Work	7,865	53.7%	698,931	58.8%
Looking for First Regular Job	237	1.6%	10,330	0.9%
Short Term Unemployed	382	2.6%	21,889	1.8%
Long Term Unemployed	734	5.0%	30,176	2.5%
Student	1,452	9.9%	134,910	11.3%
Looking After Home/Family	1,044	7.1%	68,227	5.7%
Retired	1,491	10.2%	171,712	14.4%
Unable to Work due to permanent sickness or disability	1,069	7.3%	45,686	3.8%
Others not in labour force	383	2.6%	7,350	0.6%
Total	**14,657**	**100%**	**1,189,211**	**100%**

The economic profile of the study area has a similar distribution to the Dublin. The majority of the population for both the Study Area and the Dublin Region are 'At Work', with around 54% in the Study

Area and 58.5% in Dublin Region as of 2022 (see Table 13.8). This higher proportion of people working within the study area and Dublin Region is reflective of the age profile, given that nearly 70% of the Study Area population and c. 68% of Dublin population are in the age group 15-64 years. Albeit the proportion of people at work was comparatively lower within the study area than that in Dublin, there was a comparatively greater increase in the study area population categories as - 'At work' (c. +17%). There was also a c. 22% increase in the proportion of people 'Looking for First Regular Job' within the study area, which was much higher than in the Dublin Region, that recorded around 9% increase in the same population group. However, the composition of those looking for their first regular job in both study area and Dublin Region was only minor, at 1.6% and 0.9% respectively.

The proportion of 'Unemployed' population in the study area was c. 7.6%, which is closer to the State average of 8%. Census 2022 now also records the proportion of people that are in 'Short Term Unemployment' and those in 'Long Term Unemployment'. The proportion of the former was comparatively smaller at 2.6%, than the latter at 5%. There has, however, been an overall decline in the total population that are 'Unemployed' by around 32% since Census 2016. Dublin Region on the other hand recorded a total of 4.3% people that were 'Unemployed' as of 2022, with 1.8% in 'Short Term Unemployment' and around 2.5% in 'Long Term Unemployment'.

There was a significant increase proportion of people 'Retired' within the study area (c. +32%), in comparison to Dublin Region, which had around 18% increase in the total number of 'Retired' population. In relation to the proportion of 'Student' population, even though the study area has a comparatively lower portion of students (c. 10%) than in Dublin (11.3%), the increase in the number of student population within the study area was considerably higher (+9.8%) than the Dublin Region (6.4%).

13.5.4 Education

The largest portion of residents within the study area constituted those that had completed 'Secondary' Education (46.5%) as of 2022, and around 33% within the wider Dublin Region. A total of 20% of the study area population have completed 'Third Level' Education, which is lower compared to the Dublin Region which recorded around 33% of the population to have completed 'Third Level' Education.

There has been a notable increase of c. 64% in the population that were recorded as having 'No Formal Education', from 2.8% in 2016 to 4.3% in 2022 within the study area. There is a visible decline in the population with 'Primary Education' in both the study area and Dublin Region, by around 17% and 24% between 2016 and 2022. On the contrary, both the study area and Dublin Region demonstrated an increase in the number of people with 'Third Level Education' (by c. 23% and 17% respectively) and 'Postgraduate Education or Higher' (by c. 29% and 27% respectively) between 2016 and 2022.

Table 13.9 Population aged 15 years and over with highest level of education completed (Census 2016,2022)

Education Level	Study Area 2022	% Total	% Change 2016-2022	Dublin 2022	% Total	% Change 2016-2022
No Formal Education	493	4.3%	63.8%	18,836	2.0%	62.6%
Primary Education	1,387	12.0%	-17.4%	61,625	6.5%	-24.1%
Secondary Education	5,372	46.5%	4.2%	314,612	33.0%	-0.8%
Third Level Education	2,307	20.0%	22.8%	314,993	33.0%	17.2%
Postgraduate Education or Higher	1,048	4.5%	29.1%	164,586	17.2%	27.4%
Not Stated	1,474	12.8%	2.6%	79,921	8.4%	12.8%
Total	**11,557**	**100.0%**	**6.4%**	**954,573**	**100.0%**	**8.6%**

13.5.5 Pobal Deprivation Index

In order to better understand the socioeconomic status of the study area, the Pobal Deprivation Index for the small area population defining the study area boundary (in 2016) was derived. The Pobal HB Deprivation Index is Ireland's most widely used social gradient metric, which scores each small area (c. 100 households) in terms of affluence or disadvantage. The Index uses information from Ireland's census, such as employment, age profile and educational attainment to calculate this score.

Despite majority of the population being 'At work', the study area as per the 2016 Pobal Deprivation Index recorded a predominantly disadvantaged population. The area surrounding the subject site has population that are either 'disadvantaged' or 'very disadvantaged', with a portion to the south falling under the 'affluent' category (Figure 13.9). As per Pobal[6], the 2022 Index that in relative terms, the geographic distribution of disadvantaged and affluence remains largely the same, with persistently high levels of disadvantage in some areas.

Figure 13.9 Pobal Deprivation based on 2016 Small Area Data.

The higher proportion of disadvantaged population is indicative of the fact that most of the area is still experiencing higher levels of unemployment, low educational attainment and overcrowding.

In that regard, as recorded in the above sections, the study area has recorded an overall 'unemployment' level of 7.6% (closer to the State average), about 7.3% of those aged 15 years and over who are 'unable to work due to permanent sickness or disability', around 3% that are 'not in the labour force' and the 'retired' population consist of c. 10%. Majority (c. 47%) of the study area population consist of people with 'Secondary Education' as their highest level of education with a significant c. 64% increase in the population over the age of 15 years with 'no formal education'. However, it is also noteworthy that the study area has c. 20% of the population with a 'Third Level' education, an increase

[6] *Pobal | Pobal Programmes and Initiatives throughout Ireland*

of c. 23% since Census 2016. There was also an increase of around 29% in the population with a 'Postgraduate or Higher' education level, since 2016.

A study by Wang, J., & Geng, L. (2019)[7], on the *'Effects of Socioeconomic Status on Physical and Phycological Health…'*, examined the impact of socioeconomic status on health and focused on the mediating role of lifestyle. The main findings of this study indicated that, socioeconomic status was significantly associated with physical health, but not phycological health. The study also concluded that lifestyle had a significant positive effect on both physical and phycological health and that lifestyle mediated the relationship between socioeconomic status and health.

The study also found that the impact from socioeconomic status on health is reflected in three aspects of an individual's life: occupation, income, and education. People with higher professional status enjoy more work autonomy, engage in less manual labour, have fewer occasions of being exposed to health risks. Likewise, higher incomes are usually associated with better nutritional status, housing conditions, medical services, etc. Additionally, people with higher levels of education tend to have better health awareness, access, and health-related knowledge.

The following section details the status of health within the study area, where available, and that of the wider Ballyfermot-Drimnagh Local Electoral Area (LEA), to establish how the proposed development might impact (positive, negative, no impact etc.) the existing population, their socioeconomic status and health conditions.

13.5.6 Human Health

The Healthy Ireland – Framework for Improved Health and Wellbeing 2013-2025 described 'Health' as being *a personal, social, and economic good...'.* Further stating that *'a healthy population is a major asset for society…'*, the framework continues to emphasise that a healthy population is essential to enable people to live their lives to their full potential, create the right environment, sustain jobs, help restore the economy, and to finally look after the most vulnerable people in the society. One of the key goals of this framework is to *'…Increase the proportion of people who are healthy at all stages of life'.*

As discussed under Section 13.2.3 'Description of Baseline', health and wellbeing are determined by various factors including, social, economic, and environmental conditions. While the sections above have provided details on current social and economic conditions of the local area, it is also important to note the existing health status and environmental conditions that are likely to affect the health of the existing and future population for the area. This section captures some information on the level of disability, persons that smoke, total number of carers, mortality and its causes and healthy life years at birth and at 65 years. While some data was available at the local (Study Area Level), some of the data was only made available at Local Electoral Area (LEA) Level, City / County Level or National Level. Therefore, the context has been analysed on the basis of granularity of the data. With regard to environmental factors – data in relation to Air and Water Quality for the local area have been noted.

The Local Electoral Area within which the subject site falls, as per the Dublin City Council LEA Map (see Figure 13.10) is the 'Ballyfermot-Drimnagh' Local Electoral Area. Hence, to the extent where local area level data is unavailable, the data at LEA level has been considered in the baseline analysis.

[7] *Wang, J., & Geng, L. (2019). Effects of Socioeconomic Status on Physical and Psychological Health: Lifestyle as a Mediator. International journal of environmental research and public health, 16(2), 281. https://doi.org/10.3390/ijerph16020281*

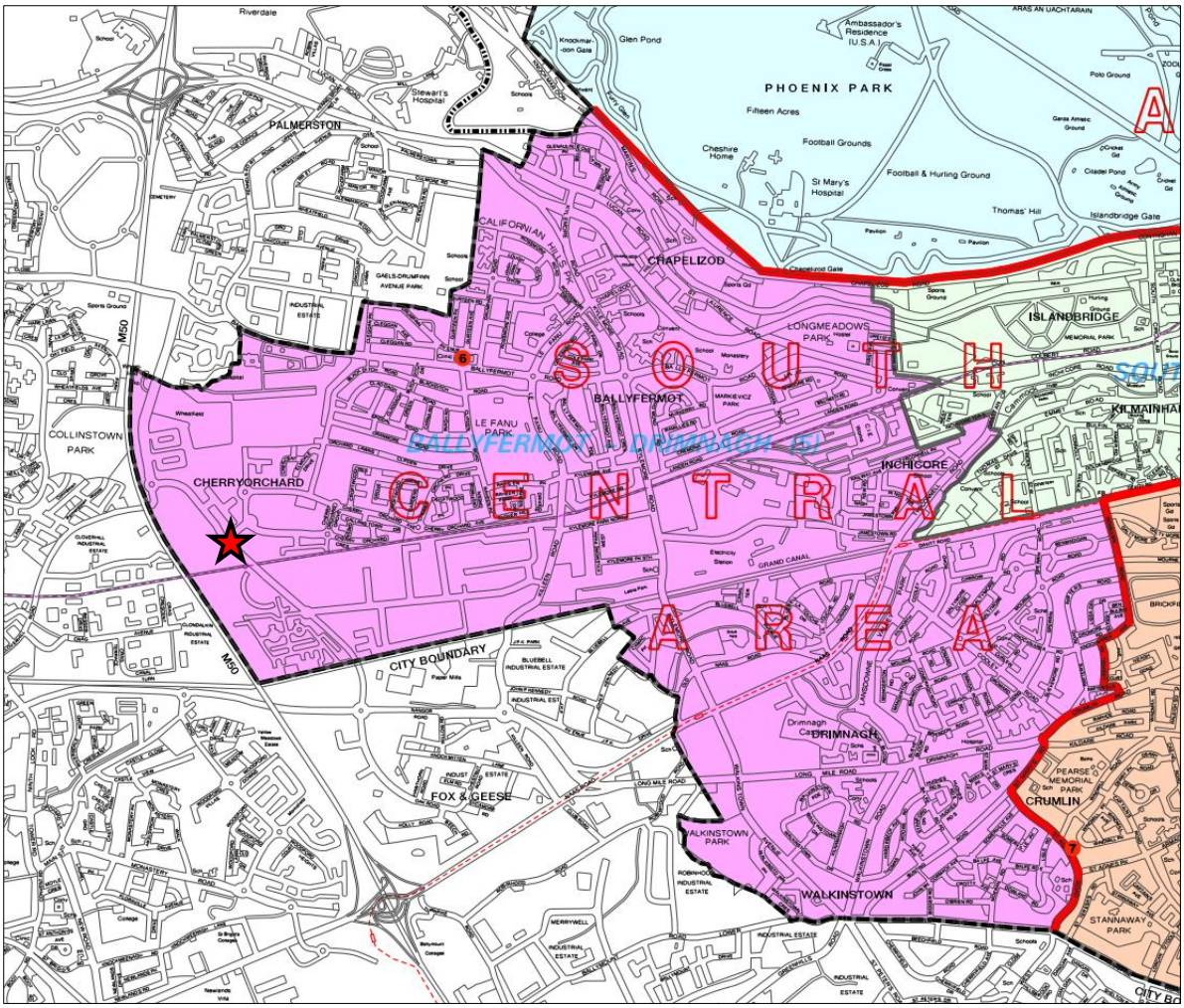


Figure 13.10 Ballyfermot-Drimnagh Local Electoral Area - 5 (Source: Dublin City Council Map 2022)

Self-Evaluated Health Status:

The Census records the self-evaluated general health status of respondents (as opposed to the health status confirmed by medical practitioners). In terms of general health and wellbeing, the Study Area recorded a total of 73.8% (drop from 81% in 2016) of the population as being in 'Good Health', on the basis of those that responded. Table 13.10, provides further breakdown of the spectrum. Overall, around 2.5% (slight increase from 2.3% in 2016) of the Study Area population stated that they were in 'Bad Health'.

Table 13.10 Study Area Population by General Health and Gender (CSO, 2011, 2016)

General Health	2022 Male (%)	2022 Female (%)	2022 Total (%)
Very good	43.4%	44.1%	43.7%
Good	28.6%	31.6%	30.1%
Fair	9.7%	11.1%	10.3%
Bad	2.2%	1.9%	2%
Very Bad	0.5%	0.5%	0.5%
Not Stated	15.7%	10.8%	13.3%
Total	**100%**	**100%**	**100%**

The self-evaluated health status as per Census 2022 has also recorded a comparatively higher portion of females as being in 'Very Good', 'Good' or 'Fair' health conditions than the male population within the Study Area.

Population with Disabilities:

Around 24.7% (up from 16% in 2016) of the Study Area population have some disability, and portion of people with disabilities seem to consist of an equal proportion of male and female at 12% and 12.7% respectively.

To further look at the prevalence of disabilities across age-groups, data for the Ballyfermot-Drimnagh LEA has been considered – as age wise information at the more local level was unavailable at the time of drafting this Chapter.

The total population for the Ballyfermot-Drimnagh LEA as of Census 2022 is c. 48,563, of which the total persons with a disability consisted of c. 26%. This is a similar proportion to the Study Area. Dublin City Council Administrative area on the other has a total proportion of around 22% people with a disability.

An age-wise proportion of persons any extent of disabilities for the Ballyfermot-Drimnagh LEA, has been set out in Figure 13.11. As would be expected, there is some direct co-relation between the proportion of population with a disability and their age. A comparatively higher portion of people in the age profile 55 to 85 years and over have a disability of some extent, as against those below 50 years.

The Ballyfermot-Drimnagh LEA, similar to the Study Area have an almost equal proportion of male and female with a disability. However, there is a slightly higher proportion of male children between the ages 5 and 14 years (c. 19%), compared to female children of the same age group (12.5%). On the other hand, there is a slightly higher proportion of female elderly persons with a disability (74%) as compared to male (c. 69%) in the age group 85 years and over.

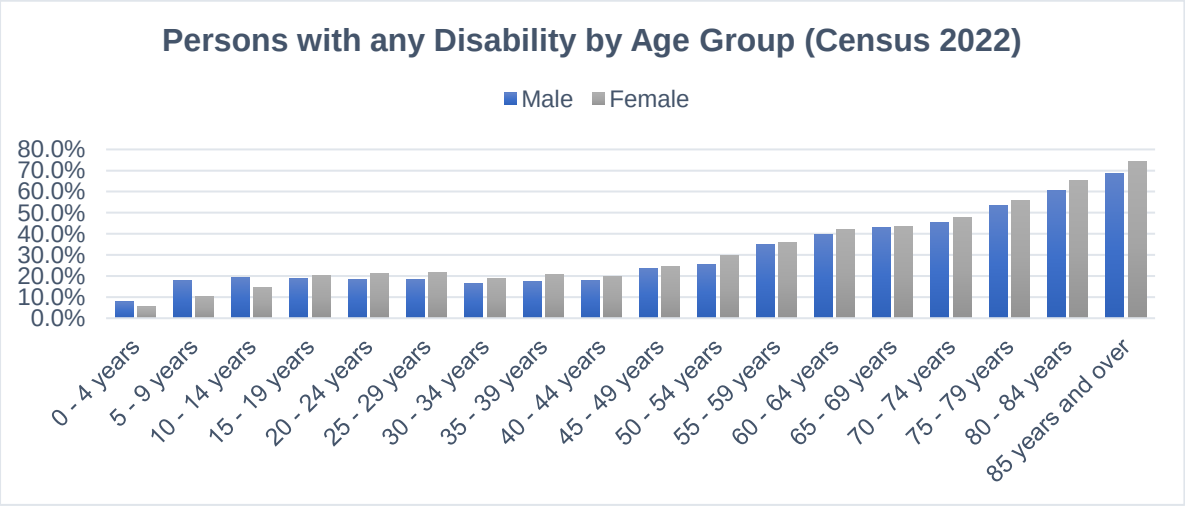


Figure 13.11 Persons with any Disability by Age-Group (Census 2022)

As per the WHO, persons with disabilities are generally more susceptible to poorer health, mortality, and experience increased limitations in everyday functioning than others. Poverty, exclusion from education and employment, and poor living conditions all add to the risk of poor health and unmet health care needs among persons with disabilities.

In that regard, as per Census 2022, the total number of carers for the Study Area was recorded at around 5% of the total population. This is an average of one carer for every 4-5 disabled persons within the Study Area.

Population that Smokes:

As per the Healthy Ireland Outcomes Framework, lifestyle factors such as smoking, drinking, inactivity and obesity have the potential to reverse many healthy gains. In that regard, the Framework notes that as per the 2021 Healthy Ireland Survey, smoking rates increased slightly between 2019 and 2021 despite there being a steady decline for a number of years prior to this.

The Study Area, as per Census 2022, has around 20% of the total population that smoke and about 65% that do not smoke (Table 13.11). Around 18.2% of the total population in the Ballyfermot-Drimnagh LEA consist of people that either smoke daily (13.5%) or occasionally (c. 5%). The Dublin City Council Administrative area has c. 15.5% people that either smoke daily or occasionally. Both the Study Area and Ballyfermot-Drimnagh LEA have a comparatively higher proportion of smokers than the administrative area of Dublin City Council.

Table 13.11 Persons that smoke and do not smoke within the Study Area as of Census 2022

Category	Persons	% of Total
Persons who smoke	3,694	20%
Persons who don't smoke	11,983	65%
Non stated	2,721	15%
Total persons	18,398	100%

A number of smoking related health issues have been noted in the Healthy Ireland Outcomes Framework (2022), which states that while much progress has been made in tackling smoking in Ireland, there is a continuing toll of smoking-related disease, especially for groups with higher past or present smoking rates.

Mortality Rate and Cause:

There is a visible increase in the Mortality Rate in Dublin in 2021, as compared to other years (Figure 13.12). One of the major reasons that can be attributed to this is the Covid19 pandemic. However, there is also a number of other reasons / causes for mortality.

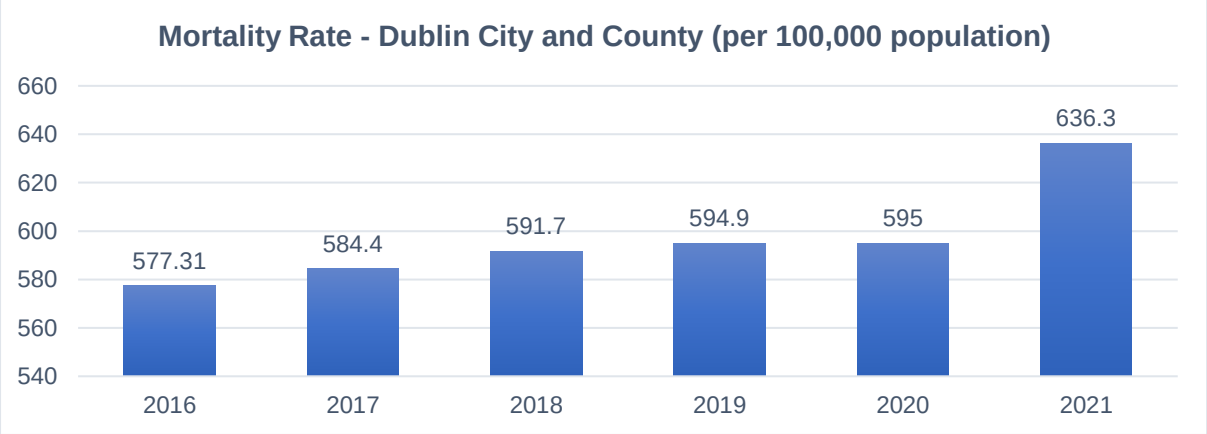


Figure 13.12 Mortality Rate per 100,000 Population in Dublin City and County

One of the key reasons for a higher mortality rate in Dublin is observed to be associated with 'Neoplasms' and 'Selected Smoking related causes' (Figure 13.13). This is closely followed by 'Malignant Neoplasms' and 'Diseases of the Circulatory System'.

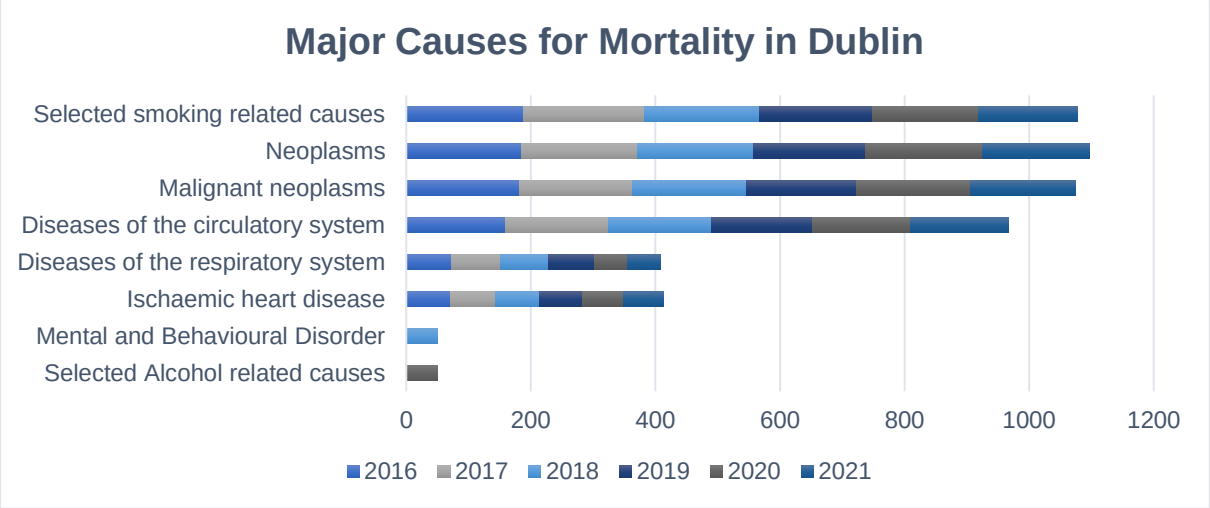


Figure 13.13 Major Causes for Mortality in Dublin City and County between 2016 and 2021(CSO)

Healthy Life Years:

It is noted that the national Healthy Life Years (HLY) at birth observed an overall increase (in both sexes), between 2016 and 2019 from 68.5 to 69.6 years. However, there is a visible decline during 2020, to 66.2 years (Table 13.12). This is a drop of around 3.4 years between 2019 and 2020. There is a generally higher number of healthy life years noticeable for female in the State than male.

Table 13.12 National Healthy Life Years (HYL) at Birth (CSO)

Healthy Life Years (HLY) at birth			
Year	**Both Sexes**	**Male**	**Female**
2016	68.5	67.2	69.8
2017	68.6	67.9	69.3
2018	69.4	68.3	70.4
2019	69.6	68.6	70.5
2020	66.2	65.3	67.1

Healthy Life Year at birth is a measure used across EU and is defined as the average number of years that a new-born child can expect to live in a healthy condition and free from disability (Healthy Ireland Outcomes Framework 2022). A major implication of the reduced healthy life years / falling life expectancy in Ireland can be associated with the Covid19 Pandemic, which was also observed for most countries throughout 2020.

Air Quality:

The PM2.5 ('Particulate Matter) levels city-wide average for Dublin City is recorded at 6.889µg/m^3, which is comparatively higher than the local area levels for Cherry Orchard, which falls within the 4-6 µg/m^3 range (Figure 13.14).

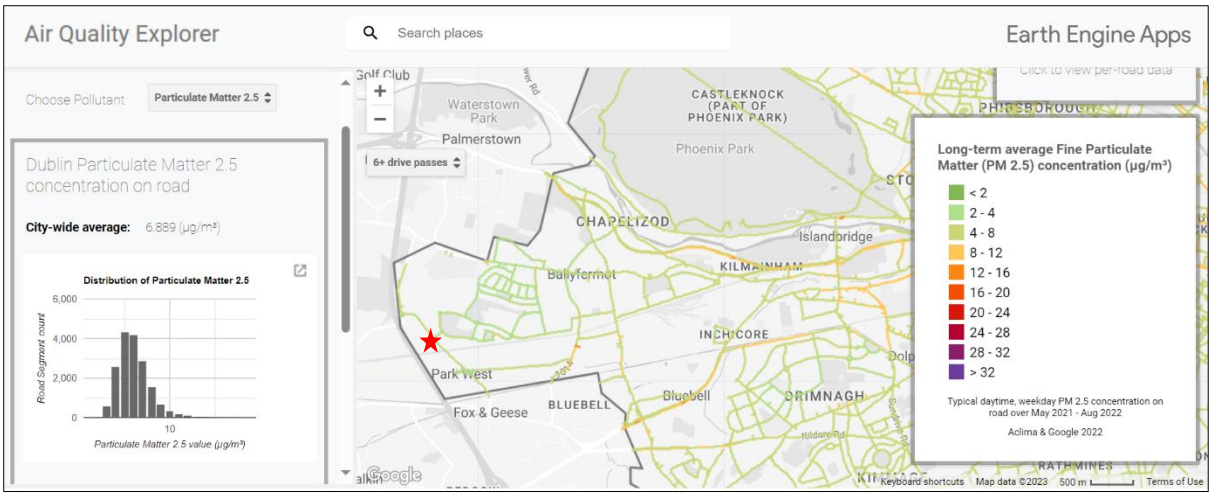


Figure 13.14 Air Quality for Cherry Orchard Local Area (Source: Labs - Google Environmental Insights Explorer - Make Informed Decisions (sustainability.google))

As per the EPA Air Quality Index[8] for Ballyfermot Local Area, the current index is rated as 'good' and with a 24-hour PM2.5 mean of 4.82 µg/m³ (Figure 13.15). The air quality monitor for this area is located in the public library in Ballyfermot and is operated by Dublin City Council – monitoring is done using continuous monitors for particulates (PM10 and PM2.5).

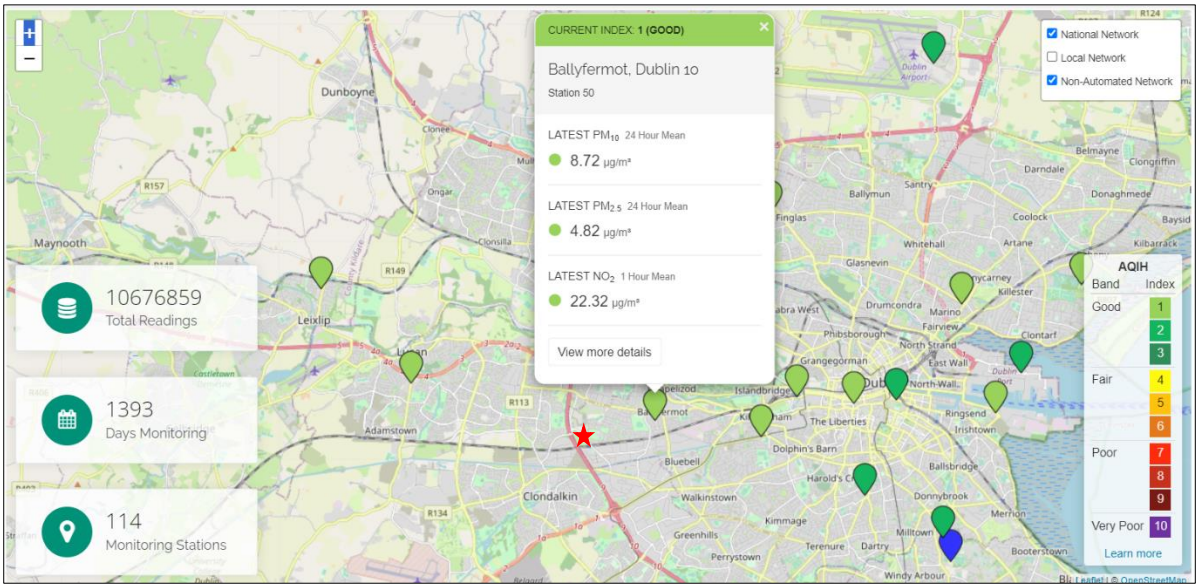


Figure 13.15 Air Quality Index for Health (AQIH) – Development Site demarcate in red. (Source: AirQuality.ie)

According to the WHO Global Air Quality Guidelines ('WHO 2021 Guidelines'), air pollution is now recognised as the single biggest environmental threat to human health and the burden of disease attributable to air pollution is now said to be on par with other major global health risks such as unhealthy diet and tobacco smoking.

The Healthy Ireland Outcomes Frameworks notes that one of the major causes of air pollution in Ireland are particulate matter from domestic burning of solid fuels and nitrogen dioxide gas from vehicle emissions in urban areas. Subsequently the Frameworks also provides solutions, which include moving towards cleaner ways of heating homes, improving the energy efficiency of our buildings, and implementing the transport options outlined in the Government's Climate Action Plan.

[8] Monitoring Stations | AirQuality.ie

Water Quality:

The Water Quality Zone for Cherry Orchard, Dublin is DCC Zone 1 Ballymore. As Uisce Éireann, when a water sample contains higher levels of a parameter than the regulations allow, it's called an exceedance. When this happens, Uisce Éireann carries out a risk assessment. If there is a risk to public health, the Health Service Executive (HSE) is consulted with, to agree on the next steps, which may include telling the public.

Parameter	Unit	Tests Undertaken	Exceedances	Pending Review	% of Tests within Exceedance Limit
Bacteria and Protozoa		947	1	0	99.89%
Chemicals		458	0	0	100%
Metals		583	0	0	100%
Other		1420	0	29	100%

Figure 13.16 Summary of the Water Quality for the DCC Zone 1 Ballymore generated for 2023. (Source: Water Quality & Drinking Safety Advice in Ireland | Uisce Éireann (formerly Irish Water))

As per the report generated for the Water Quality Zone within which the subject site is located in, the water quality seems to be mostly in 100% compliance with limits.

13.5.7 Social Infrastructure and Amenities

Social Infrastructure is defined by the European Association of Long-Term Investors[9] as a subcategory of infrastructure that are physical assets in the social sector that provide personal (individual/household) benefits and community benefits to increase social cohesion. An overview of the social infrastructure available within close proximity of the site is presented in the series of tables and maps (figures) set out below.

As detailed in Figure 13.17, a range of Social Infrastructure (SI) and Amenity facilities are available within the Study Area. This includes a variety of healthcare facilities, community and civic, schools, and childcare facilities, located within 1km of the Subject Site (see Table 13.13 for the complete list of facilities serving the subject site).

Table 13.13 Community and Social Infrastructure within 1km buffer of the Subject Site

Services / Facilities	Total Facilities within the 1km Study Area
Creches	7
Primary schools	4
Secondary schools	1
Art and Cultural	3
Community Centres / Services	6
Libraries	1
Youth Services / Residents / Family Centres	5
Civic Services (Post Office, Courthouse)	2
Health Centres, Doctors, and Speciality Clinic	9
Pharmacies	4
Hospitals	1

[9] *Fransen, L., del Bufalo, G., Reviglio, E. (2018). Boosting Investment in Social Infrastructure in Europe, Report of the High-Level Task Force on Investing in Social Infrastructure in Europe 2018. [PDF File]. Retrieved from:* https://economy-finance.ec.europa.eu/system/files/2018-01/dp074_en.pdf

Open Space, Sports, and Recreation	31
Religious Institutions	7
Total	**81**

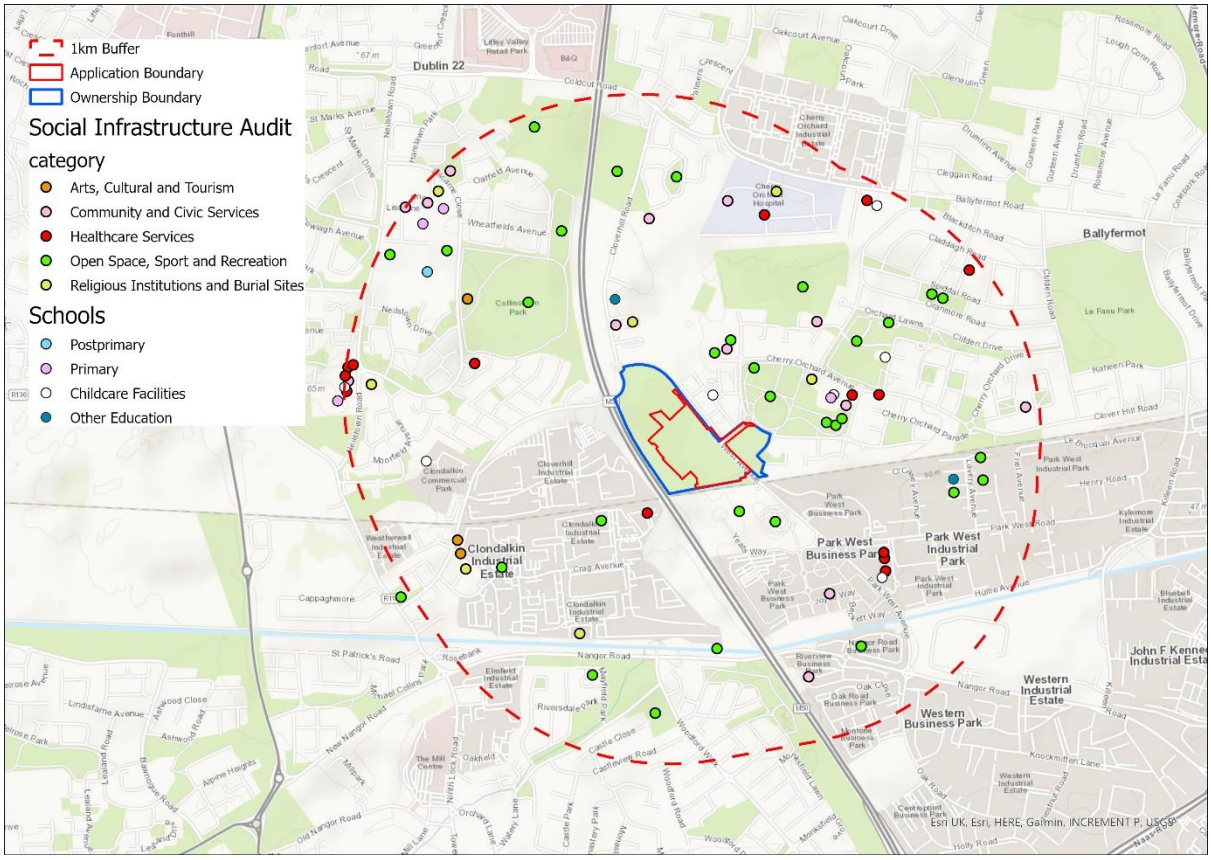


Figure 13.17 Extent of Social Infrastructure Facilities/Services available within the 1km Study Area

Childcare and Education Facilities

The baseline assessment undertaken for the 1km catchment area surrounding the subject site indicated a total of 15 education facilities. Of these, 7 creches are available to provide childcare for parents with small children. The Figure 13.18 below illustrates the total creche facilities serving the subject site within a 1km radius.

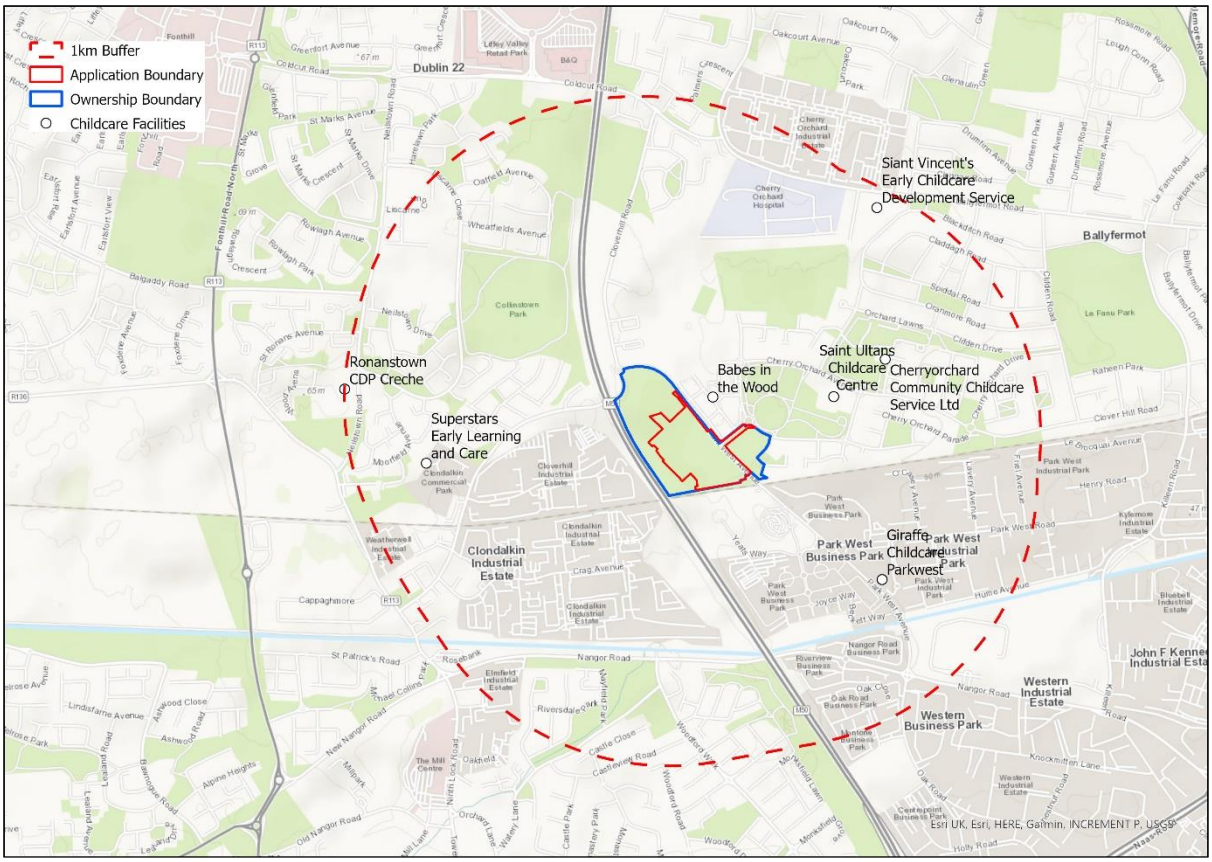


Figure 13.18 Childcare Facilities within the 1km buffer of the Subject Site

There are 4 primary and 1 post-primary schools located proximate to the subject site. Additionally, the subject site is also served by other education and training facilities. Figure 13.19 below illustrates the distance of each of these facilities from the subject site.

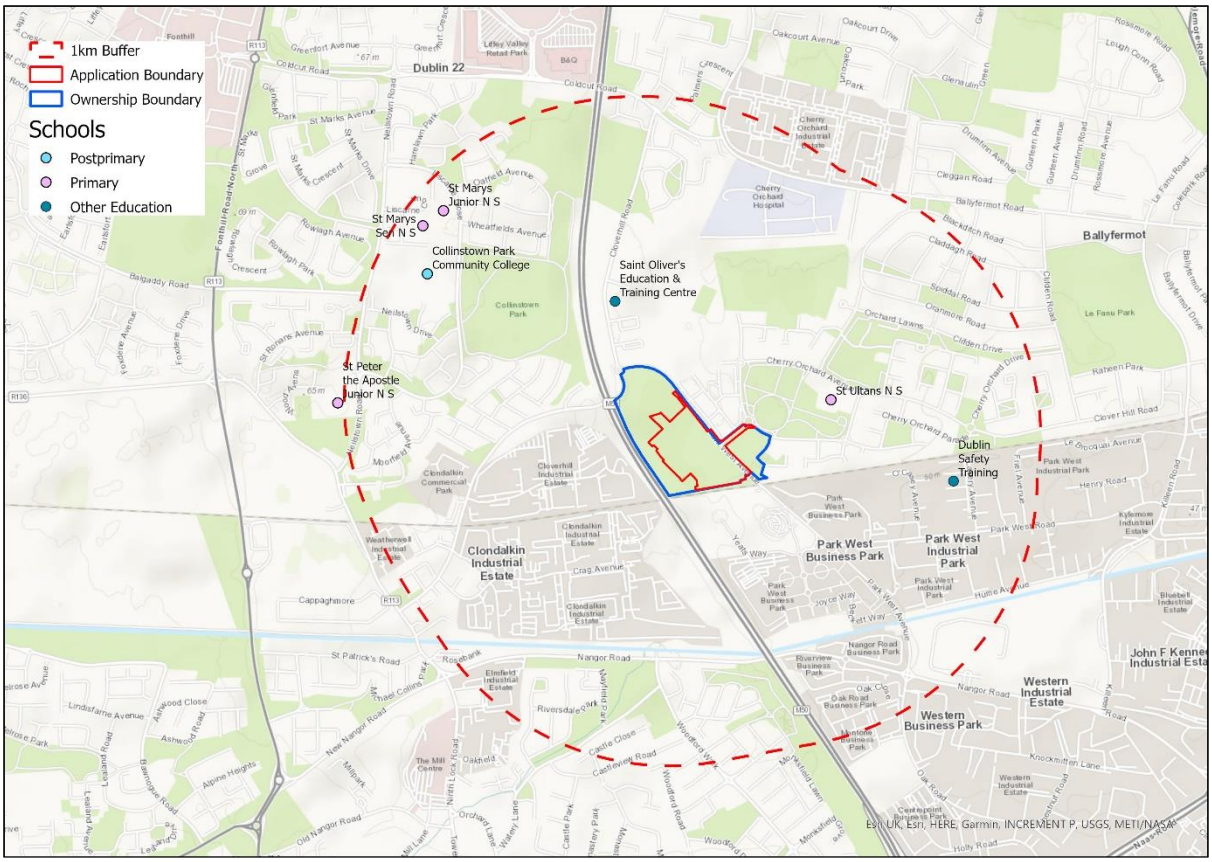


Figure 13.19 Schools and Other Education and Training Facilities within the 1km buffer of the Subject Site

Retail Services

The Retail Impact Statement provides a detailed overview of the designated shopping centres in the surrounding area that are most relevant to the consideration of retail development at the application site. The various designated centres serving the subject site within a 5-minute drivetime catchment have been illustrated in the below Figure 13.20.

Additionally, the subject site is also served by some local shops and retail facilities such as Spar, and a local grocers 'Tommy's shop' etc., within the 1km radius of the subject sites.

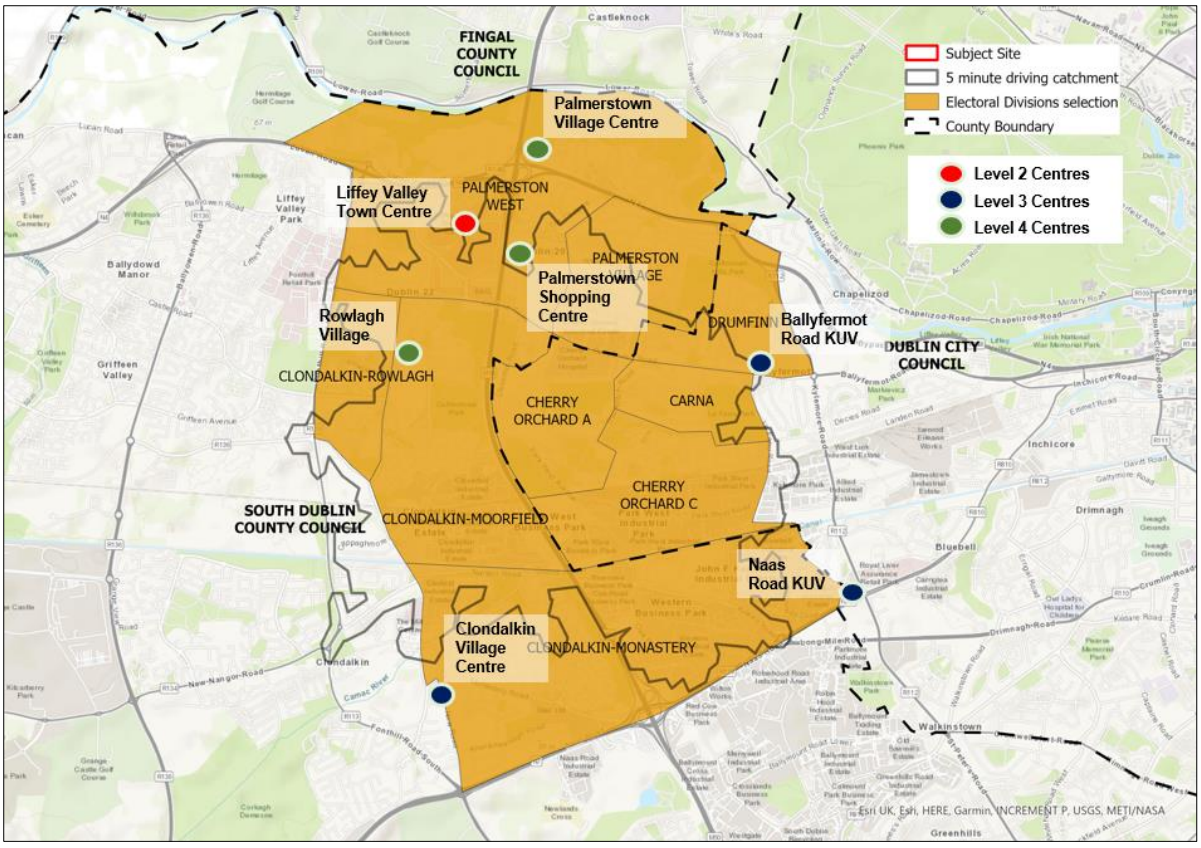


Figure 13.20 Shopping Facilities Serving the Subject Site within a 5-minute driving catchment.

The designated centres within or on the edge of the 5-minute drive time catchment area comprise:

- Liffey Valley Town Centre (Level 2) (SDCC)
- Naas Road Key Urban Village (Level 3) (DCC)
- Ballyfermot Key Urban Village (Level 3) (DCC)
- Clondalkin Town Centre (Level 3) (SDCC)
- Palmerstown Village (Level 4) (SDCC)
- Palmerstown Shopping Centre (Level 4) (SDCC)
- Rowlagh Village* (Level 4) (SDCC)

Access and Transport

The subject site is approximately 7km from the city centre and is located within equal distance from the M50 / N4 junction and the M50 / N7 junction. Only 2km away, the N4 connects Dublin to the northwest of Ireland while the N7 provides a direct connection to Limerick. The trainline runs regularly connecting the subject site to the city centre while also providing services to the midlands. The nearest stop to the light rail line (Luas Red Line) is approximately 4km to the south of the subject site.

Rail Services

The Park West train station is an intermediate station on the Kildare Commuter Line with regular commuter and inter-city services from Portlaoise and Newbridge to Heuston Station and from Hazlehatch and Celbridge to Grand Canal Dock.

Bus Services

The subject site is served by the Spine / Branch Route (G1) under the Bus Connects services, which provides further connections to the D1 / D3 spine and other local, orbital, and peak time routes including the Red Line Luas at Red Cow – these routes link the Subject Site to the west of Dublin city. The G1

spine and route 60 also provide links to G2 spine and other orbital and city bound routes – connecting the Subject Site to the east of the city, including the Docklands via the city centre.

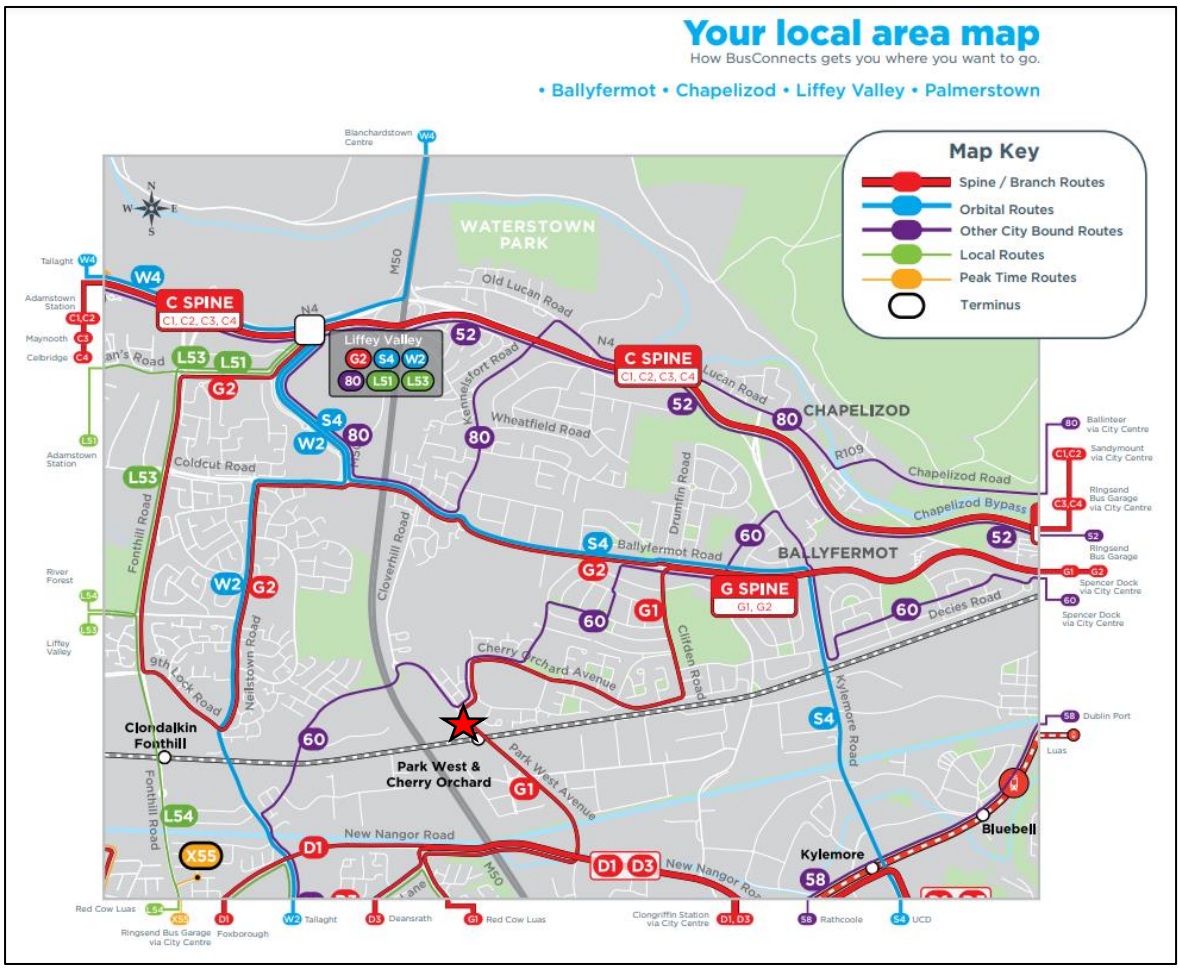


Figure 13.21 Bus Corridors under Bus Connects, serving the Subject Site which has been marked by a red star (Source: busconnects.ie)

Cycle Network

Under the Greater Dublin Area Cycle Network, a secondary (8C) cycle network passes along the west from across the M50 to intersect to the north of Site 4 and move further north (8C1) connecting into a primary route (7A). The secondary route (8C) also continues along the east of the Subject Site toward the south, to meet the primary route (7B/N10) and the Grand Canal Greenway (N10). Figure 13.22 below further illustrates the cycle network planned under the Greater Dublin Area Cycle Network Plan, for the area surrounding the Subject Site.

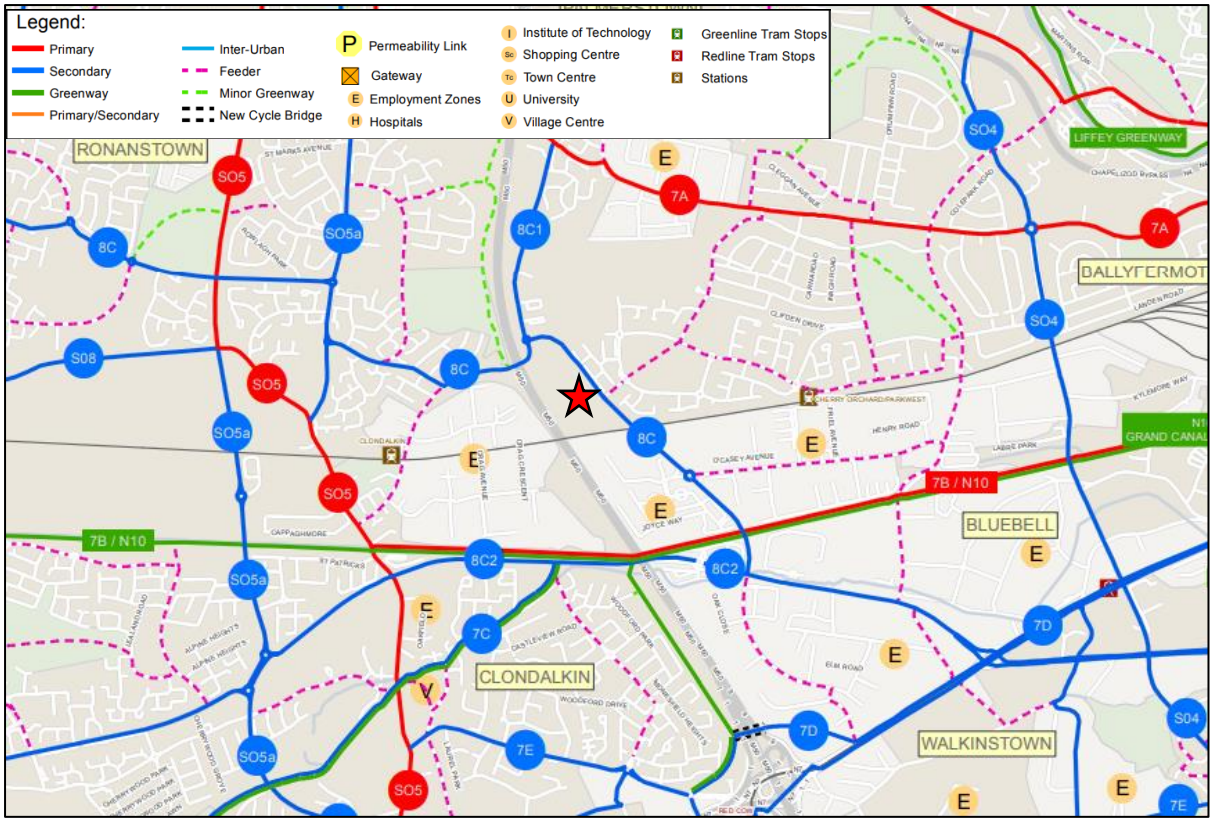


Figure 13.22 The Greater Dublin Area Cycle Network Plan 2013 (updated in 2021/22) and the subject site is marked by a red star. (Source: National Transport Authority – Proposed Cycle Network Dublin Area)

Existing mode of travel within the Study Area

As per the latest Census 2022 results, there is a visible portion of the Study Area population that is dependent on 'Green Transport' (Bus, Bike, Walk, Luas, DART…) and consists of an average of 35% of the total. Of those that use Green Transport, c. 47% consist of those that travel to 'School, College, or Childcare' and around 27% that travel to 'Work' (see Table 13.14).

Table 13.14 Population Aged 5 years and over by means of travel (Census 2022)

Green Transport		
Work	**School, College, or Childcare**	**Total**
1,831	1,836	3,667
27.4%	**46.5%**	**34.5%**
Car (or passenger)		
45%	**36%**	**42%**

Healthcare Services

The baseline survey identified around 14 healthcare services and facilities within the 1km buffer of the subject site (see Figure 13.23). This includes 1 Hospital, 4 Pharmacies, 9 Health Centre, GP, and Speciality Clinics. The location of each facility has been illustrated in Figure 13.23 below.

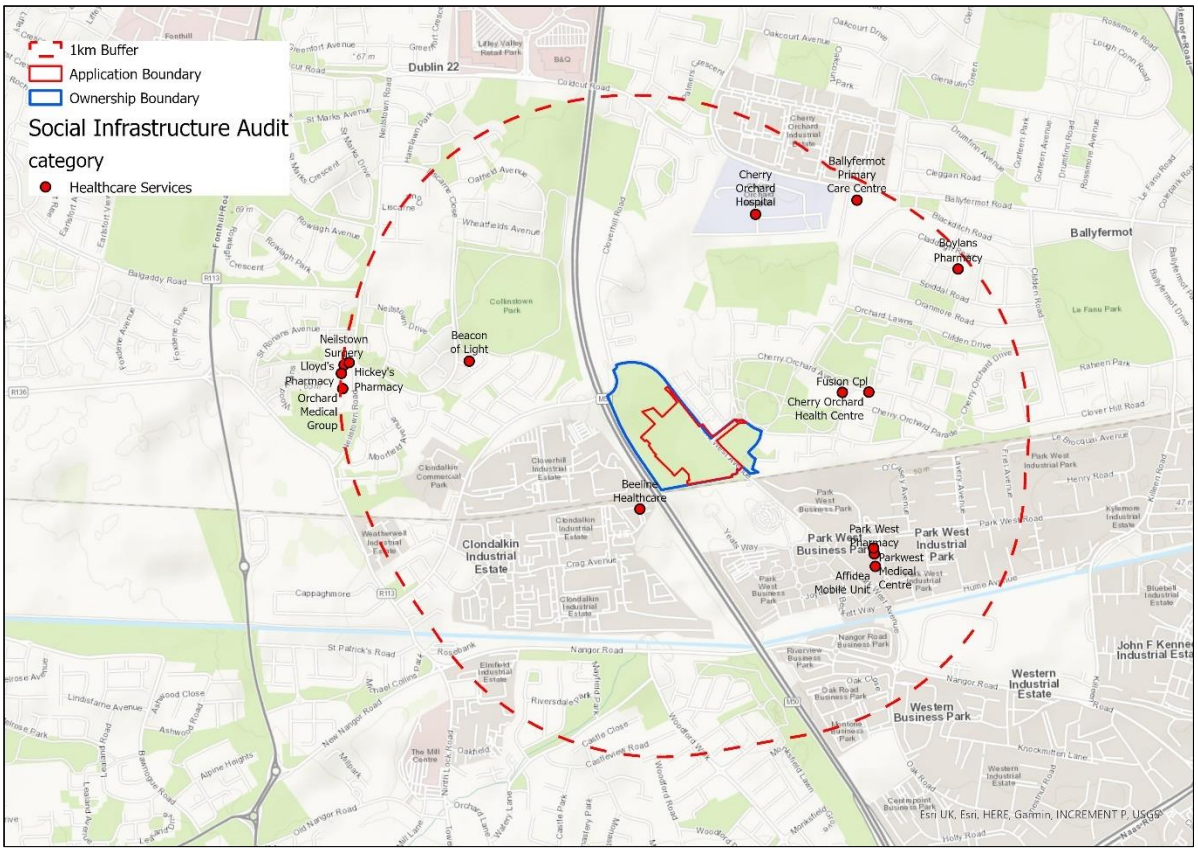


Figure 13.23 Healthcare Services within the 1km buffer of the Subject Site

Community and Civic Services

A total of 13 community and civic services are available within the 1km radius of the subject site. This comprises of 5 Community and Training Centres, 1 Library, 5 Youth / Residents / Family services and 2 Civic services. The Table 13.15 lists the total community and civic services and Figure 13.24 below identifies the location of these assets in the context of the subject site.

Table 13.15 List of Community and Civic Services

Type	Facilities
Community Facilities	The Community Café, Rowlagh Community Centre, Equine Education and Training Centre, Cherry Orchard Community Centre, and Saint Oliver's Traveller Centre
Libraries	North Clondalkin Library
Youth Service / Family Centres / Resident Associations	Ronanstown Youth Service, The National Youth Development Organisation, Clanmill Ireland Housing Association, Cherry Orchard Family Resource Centre, Child and Family Agency
Civic Services	Cloverhill Courthouse, An Post

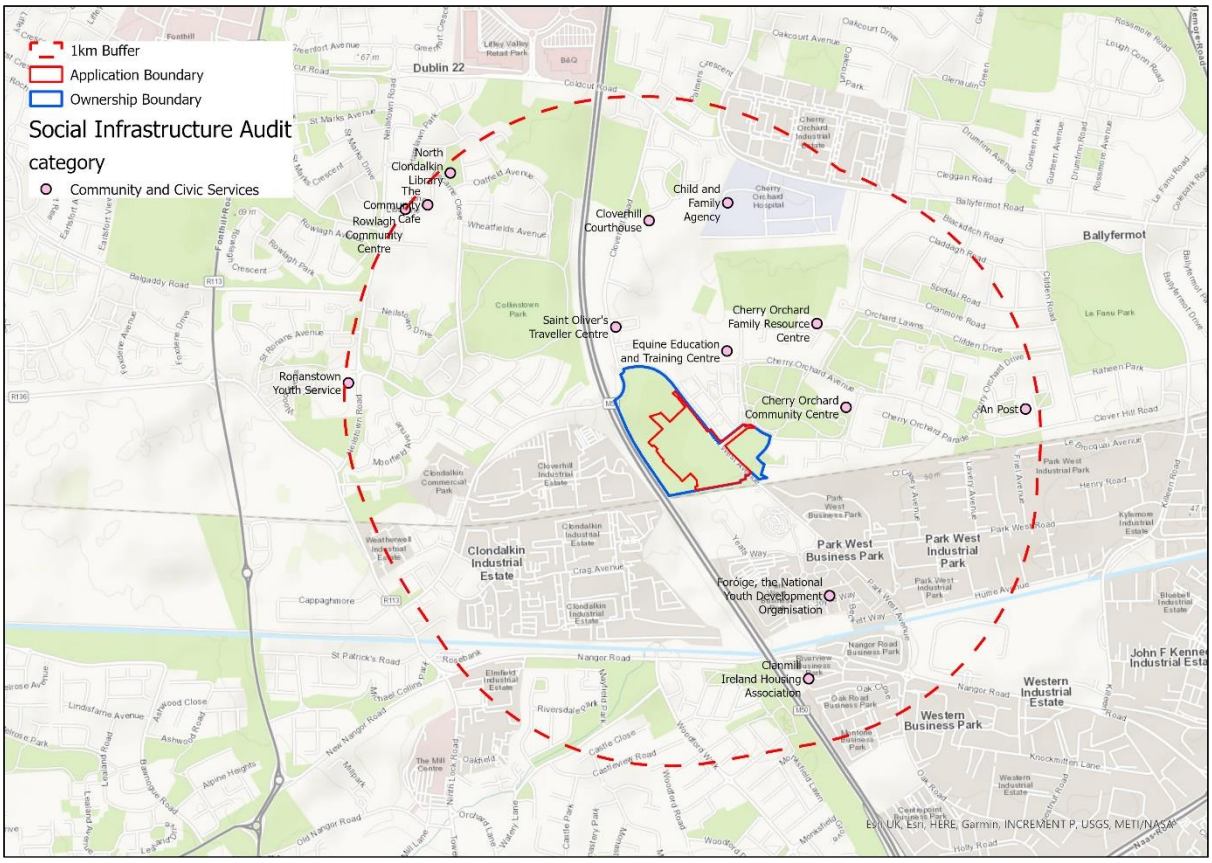


Figure 13.24 Community and Civic Services within a 1km buffer of the Subject Site

13.5.8 Surrounding Environment

The Proposed Development is current a greenfield site with no buildings or features of note existing on the Development Sites (4 and 5). Site 5, which lies to the east of Park West Avenue has a significant quantity of fill and a large ESB pylon on the corner of this site, which will need to be moved or dropped in the medium term to commence full development of the site. The Development Sites are currently vacant and overgrown in sections, particularly along the M50 boundary.

The wider / surrounding landscape is mixed, the land uses immediately adjacent to the Sites comprise of residential, and a mix of other key development sites designated for regeneration awaiting development, open spaces, and industrial lands. The housing within the area are all considerably low-density residential developments with some retail and community facilities.

A recent planning permission was granted under Ref. ABP-312290-21 (up to fifteen storeys) for a residential development (Key Development Site No. 6 of the Local Area Plan 2019) on Park West Avenue – southeast of the Proposed Development.

A number of strategic views and prospects have been identified as per the requirements under the DCC CDP, with no adverse impact on any of these vistas resulting from the Proposed Development of the Site (Chapter 10 Landscape and Visual).

13.6 Potential Impacts: Assessment

This section provides a description of the potential impacts that the proposed development may have on population and human health during both the construction and operational phases of the scheme. Potential impacts are assessed in terms of impact on socio-economic factors / conditions, impact on environmental factors such as air quality, noise and water quality and other physical factors such as traffic and transport and landscape and visual impact.

Mitigation measures required to alleviate any such effects are discussed further in Section 13.9.

For a more detailed assessment of potential impacts associated with other environmental factors, please refer to the specific chapters of the EIAR.

The analysis comprises a study of the key assessment themes as well as consideration of the construction and operational phase, with a conclusion reached in relation to the proposed development on the environment. The baseline characteristics are as described above. The characteristics of this impact assessment are defined below, as per the EPA Guidelines on the Information to be Contained in Environment Impact Assessment Reports (EPA 2022).

The Table 13.16 below provides an overview of the significance of effects arising from the Construction and Operational Phases of the Proposed Development and has been determined on the basis of their environmental sensitivity and the magnitude of change as set out in Section 13.2.2, Table 13.1.

Table 13.16 Assessment of Significance – Summary of Impacts on Population and Human Health

Characteristics	Significance of Effects / Impact Assessment
Construction Phase	
Human Health	Slight or Non-Significant Impact
Socio-Economic	Slight positive, short-term impact; Non-Significant Impact
Air Quality and Climate Factors	Imperceptible, negative, short-term, non-significant impacts
Noise and Vibration	Negative, slight to moderate and brief to short-term construction noise impact; Non-Significant Impact
Water Quality	Negative, slight (not significant), likely and short-term in nature
Traffic and Transport	No significant impact
Landscape and Visual	Slight and neutral to moderate and negative
Operational Phase	
Human Health	Slight positive, long-term impact; no significant negative impact
Population	Positive permanent significant impact
Socio-Economic	Slight positive significant impact
Air Quality and Climate Factors	Long-term, neutral, imperceptible, and non-significant
Noise and Vibration	No significant negative impact
Traffic and Transport	Slight positive permanent impact; no negative impact
Landscape and Visual	No significant negative impacts
Community and Social Amenities	Positive significant and long-term impacts

13.6.1 Construction Phase

Each of the impacts on human health, socio-economic conditions, air quality, noise, water quality, traffic and transport and landscape and visual impacts during the Construction Phase of the proposed development has been assessed under this Section.

Human Health

Chapter 11 on Land Soil and Geology note that there might be a potential risk to human health due to the associated works during construction is the direct contact, ingestion, or inhalation of receptors (i.e., construction workers) with any soils which may potentially contain low level hydrocarbon concentrations from site activities (potential minor leaks, oils, and paint). The chapter has also provided appropriate mitigation measures to minimise this risk.

The appointed contractor will adhere to the relevant HSE guidelines and any Government protocols that may be in place, if any, during the construction phase. If all health, hygiene, and safety measures are followed, then it is considered that there will be no health risks arising from the Proposed Development.

The likely effects of the construction phase on human health will be slight and short term. Therefore, the proposed development does not have any negative significant effects on human health.

Socio-Economic Conditions

Economic benefits and any uplift in the local employment opportunities will contribute positively to the local area. The availability of local job opportunities is positively correlated with health in terms of improvements made to quality of life, reduced commuter time, and an uplift in the local economy which contributes to the overall vitality and viability of the local area.

The development in the short term will provide for increased construction related employment. During the construction phase, businesses directly involved in the sector and those indirectly involved in the supply chain will generate economic benefits that will provide a positive net impact on the economy. The construction phase is expected to generate employment for a total of c. 100-150 workers. The construction phase will also provide for indirect positive impacts on ancillary support services such as local shops and businesses, which will be utilised by workers on the Site in the area, together with wider benefits in the construction sector; building materials supply services and professional; technical professionals; and drivers delivering the supplies. These beneficial impacts on economic activity will be largely temporary but will contribute to the overall future viability of the construction sector and related services and professions over the phased construction period. The proposed development will have a slight positive and short-term impact on the direct and indirect employment and the local socioeconomic conditions during the construction phase. There will be no likely significant effects from the construction phase of the Proposed Development will on the local economy.

Air Quality and Climate Factors

According to the European Environmental Agency (EEA), despite the decline in air pollution emissions in the last two decades, air pollution still remains the largest environmental health risk in Europe[10]. Air a major cause of adverse health effects: for instance, air pollution causes and aggravates respiratory and cardiovascular diseases. Heart disease and stroke are the most common causes of premature deaths attributable to air pollution, followed by lung diseases and lung cancer. Moreover, society's most vulnerable are more susceptible to air pollution impacts. Lower socioeconomic groups tend to be exposed to higher levels of air pollution, while older people, children and those with pre-existing health conditions are more susceptible.

During the construction stage the greatest potential for air quality impacts is from fugitive emissions impacting nearby sensitive receptors – this includes but is not limited to the residential dwellings adjacent to the Development Site and specifically people within the vulnerable groups such as people with underlying health conditions, elderly and children population.

Predicted impacts from air quality during the construction phase has been set out in Chapter 5 on Air Quality and Chapter 6 on Climate Factors, in line with the UK Institute of Air Quality Management

[10] *EEA, 2022, 'Health impacts of air pollution in Europe, 2022.*

(IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (2014). In terms of receptor sensitivity to dust soiling, there are sensitive receptors in proximity to the EIAR boundary including currently occupied residential properties. There are up to 10 sensitive residential receptors within 10 m of the EIAR boundary and 10-100 within 50m. The major dust generating activities identified in Chapter 5 and 6, are divided into four types within the IAQM (2014) guidance to reflect their different potential impacts.

These are:

- Demolition: No demolition is required for the proposed development; therefore, the assessment is scoped out.
- 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
- Construction: Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance
- Trackout (movement of heavy vehicles): Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement.

The Chapters notes that 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. The section on 'Sensitivity of the Receiving Environment' in both Chapters, notes that 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 5.17). Therefore, in the absence of mitigation, there is the potential for imperceptible, negative, short-term, non-significant impacts to human health as a result of the proposed development.

Noise and Vibration

The EEA notes that environmental noise pollution, and in particular road traffic noise, is a growing concern across Europe. Long-term exposure to noise from environmental sources such as road, rail, and air transport can cause a variety of health effects including annoyance, sleep disturbance, negative effects on cardiovascular and metabolic system, as well as cognitive impairment in children.

Chapter 7 of this EIAR identifies all activities associated to noise during the construction phase of the proposed development. The Chapter uses the *BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites* with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from Part One of the standard Noise. The British Standard refers to the need for protection against noise and vibration on, construction and open sites. It recommends procedures for noise and vibration control in respect of construction operations and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners.

Predictions in Chapter 7 indicate that moderate construction noise impacts are expected to occur when work is ongoing at boundary locations adjacent to noise sensitive locations. In that regard, the contractor will ensure that best practice control measures for noise and vibration from construction sites found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control Construction and Open Sites Parts 1 and 2, will be implemented during the construction of the proposed development.

Predicted Impacts from Noise:

Construction Noise

The Chapter notes that the largest noise and vibration impact of the proposed development will occur during the construction phase due to the operation of various plant machinery, HGV movement to and from the site, noise levels relating to site clearance, ground excavation and loading lorries.

The closest 'Category A' receptors noted, from the area of construction works are residential properties at R1 – St Oliver's Park at a distance of greater than 60m. The closest Category B receptors from the area of construction works are residential properties at R2 - Cedar Brooke Avenue at distances of greater than 40m. The construction noise predictions for both, indicate that noise levels from construction works will be below the CNT set out within BS5228 and above the baseline noise levels. Reference to Table 7.2 in the Chapter indicates a negative, slight to moderate and brief to short-term construction noise impact will be experienced at these locations. Given the calculated noise levels are below the CNT, the overall impact will is determined to be not significant.

Construction Traffic

In terms of additional construction traffic on local roads that will be generated as a result of this development, the Chapter notes, *"…in order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25% along the local road network. Additional traffic introduced onto the local road network due to the construction phase of the proposed development will not result in a significant noise impact."*

Landscape and Visual Impact

Changes to the landscape and visual amenities within an area can affect the emotional and physical health of the population. The potential impacts, as noted in Chapter 10 of this EIAR, during the construction phase are related to temporary works, site activity, and vehicular movement within and around the subject site. Vehicular movement may increase in the immediate area, and temporary vertical elements such as cranes, scaffolding, site fencing, gates, plant and machinery etc., will be required and put in place. Most of the construction impacts will be temporary, and may include the following:

- Site preparation works and operations (including tree protection measures as appropriate);
- Site excavations and earthworks;
- Site infrastructure and vehicular access;
- Materials storage, spoil heaps etc;
- Construction traffic, dust and other emissions;
- Temporary fencing/hoardings, site lighting and site buildings (including office accommodation);
- Cranes and scaffolding;

Where trees are to be felled, or hedgerows cleared, these impacts will be permanent, however any proposed new planting will offset such effects, increasingly so as the proposed development matures.

The landscape and visual effects of these changes are most likely to be experienced as adverse effects by adjacent residents and users of Park West Avenue and Cedarbrook Way.

The Chapter concludes that, generally, landscape and visual effects during the Construction Phase are likely to vary from slight and neutral to moderate and negative, depending on the stage of construction, and the intensity of site activity. The construction impacts will be of short-term duration.

Water

There is a potential for construction works to impact the quality of water which, if consumed, will have impact the health of the population in the area. Chapter 12 on Water notes the following impacts during construction stage, that has potential to impact population and human health:

- There is potential during the development's construction stage that contaminants from cement/concrete be washed into the receiving sewers. This has potential to cause a negative,

slight (not significant) to moderate (significant) and short to medium-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.

- There is a risk of pollution of groundwater/watercourses/soils by accidental spillage of oils/diesel from temporary storage areas or where maintaining construction equipment. This has potential to cause a negative, slight (not significant) to moderate (significant) and short to medium-term impact on receiving watercourses/groundwater should no mitigation measures be implemented.
- Foul water could be connected to the surface water drainage network resulting in the contamination of the receiving watercourses. Furthermore, if there is damage to any foul pipes, there is potential for contaminants to seep into the groundwater. This has potential to cause a negative, moderate (significant) and permanent impact on receiving watercourses/groundwater should no mitigation measures be implemented.

The Chapter notes that the construction of the proposed development in has potential to cause a significant negative and medium-term to permanent impact on receiving watercourses/groundwater should no mitigation measures be implemented.

The Chapter, however, concludes that due to the proposed remedial measures outlined no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in water demand and foul water outflow during the period of construction. This increase in water demand and foul flows generated with be negative, slight (not significant), likely and short-term in nature.

Traffic and Transport

There is an anticipated increase in the traffic volumes during the construction phase of the proposed development. Chapter 14 on Material Assets - Traffic and Transport has stated that during the construction stage 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.

The Chapter, in terms of predicted impacts notes that The traffic movements predicted to be generated during the construction stage represent some 3.0% of the existing traffic flow of 1,103 vehicles per hour on Park West Avenue during the AM Peak. This increase is less than the 10% threshold set out in the *Traffic and Transport Assessment Guidelines* published by TII in May 2014 and as a result, no further transportation assessment is required.

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 operational stage. 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 operational problems.

The Chapter concludes that no significant impact on roads and traffic will arise from the Construction Stage of the proposed development at Cherry Orchard Point.

13.6.2 Operation Phase

Human Health

The operation stage of the development is unlikely to cause any adverse impacts on the existing and future residents of the locality in terms of human health. The design of the Development has been formulated to provide for a safe environment for the future residents and visitors alike. The paths, roadways and public realm have been designed in accordance with the best practice and applicable guidelines. All open areas have been designed to be inviting, safe and conveniently located.

The appointed contractor will adhere to the relevant HSE guidelines and any Government protocols that may be in place, if any, during the construction phase. If all health, hygiene, and safety measures are followed, then it is considered that there will be no health risks arising from the Proposed Development.

The proposed development provides for a mix of social / affordable and cost rental housing with studio, one-, two- and three-bedroom units. Given the socioeconomic profile for the area, this will cater to the housing need within the locality, making it more affordable for people to live and work in the area. The baseline analysis further noted that there is a growing older population within the area, among others in need of care, including children and people with disabilities, that would need to be catered for going forward. With regard to a growing ageing population, the Housing Options for an Ageing Population Policy Statement 2019 requires that 50% of the apartments that are in excess of the minimum sizes should be designed in accordance with the guidance set out in Universal Design Guidelines for Homes in Ireland 2015 to ensure they are suitable for older people, mobility impaired people, people living with dementia and people with disabilities. As noted under the baseline analysis, such vulnerable groups of people (including the socioeconomically disadvantaged) are more susceptible to phycological and physical health concerns. Moreover, the provision of sufficient community and art and cultural spaces that is designed to cater to a diverse range of people in all age groups, including a neighbourhood park which has been designed as a semi-natural space that promotes a healthy lifestyle, a nature experience and sociability. In line with the above, the scheme under Phase 1 of the development provides for a total of 186 no. residential units (of the 708 no. units) which are designed to Universal Design Standards. These are assigned in proportional split between the cost rental and social and are well-distributed across the development site.

Therefore, it is reasonable to consider that positive impacts generated by the Proposed Development on the local economy will, in turn, give rise to improvements in vibrancy and vitality of the area contributing to a stronger sense of place which is positively related to health.

As a result of the above analysis, the scheme is considered to have a slight positive long-term impact on the health and wellbeing of the population within the scheme as well as the wider area. Subsequently the Proposed Development is not likely to have any significant negative impacts on human health.

Population

The operational phase of the entire development on Sites 4 and 5 of the Local Area Plan 2019 will result in the provision of c. 1,115 no. residential units, a creche facility, convenience retails (supermarket), other retail / commercial uses, community and art / cultural uses, and significant proportion of public open space. This will provide accommodation for approximately 3,122 persons, based upon an estimated occupancy of 2.8 persons per unit. The Phase 1 of the application site, which is the subject of the current planning application consists of c. 708 no. residential units and is hence, expected to accommodate approximately 1,982 persons, based on the same estimated occupancy of 2.8 persons per unit.

The uplift in the local population generated by the proposed development will contribute to the compact development targets set out in the National Planning Framework i.e., at least 50% of all new homes within or contiguous to existing built-up area in Dublin and 30% in other settlements. Furthermore, the RSES, through its Dublin Metropolitan Area Strategic Plan (MASP) identifies strategic residential, employment and regeneration development opportunities on strategic development corridors, which are aligned with key public transport projects. Sites within or close to these corridors are best placed to accommodate the 113,000 residential units identified by the MASP to be fully built out in 2040. The location of the subject side adjacent to the DART and future DART + South West Corridor places it in prime position to accommodate the sequential development of residential sites, to cater for the population growth envisaged.

The growth strategy contained in the RSES supports the continued sustainable growth of Dublin and its transition to a low carbon, climate resilient and environmentally sensitive region in accordance with the Dublin Metropolitan Area Strategic Plan (MASP). The RSES sets out specific population projections for Dublin City Council up to 2031, which predicts an increase of between 58,500 (low) and 70,500 (high) people by 2026 with further increase of between 84,000 (low) and 100,500 (high) people by the year 2031. The appropriate siting and distribution of housing to respond to this level of growth is among the most critical functions of the local planning system over the lifetime of the DCC CDP.

With the proposed upgrades to the DART South West corridor planned adjacent to the Development Sites, and the additional upgrades planned, to the existing local road network; open space; retail / commercial; community and art / cultural infrastructure; the proposed development will have a positive, indirect and significant benefit in terms of addressing and overcoming some of the infrastructural constraints that future development in the area will benefit from.

On consideration of the above, the proposed development will have a significant permanent positive impact on the population and households in the area.

Socio-Economic Conditions

The operational phase of the proposed development will provide accommodation for approximately 3,122 persons, based upon an estimated occupancy rate of 2.8 persons per unit. Considering the demographics of the area as of 2022, the population aged 15-64 years is c. 70%, therefore, the approximate number of people that could be in a position to work (within Phase 1 of the scheme), is c. 2185 persons. The total population over 15 years, that are 'At work' in the study area is c. 54%, on the basis of which it can be expected that around 1,180 persons may be in a position to be working when the scheme is fully delivered and occupied. This increase in occupancy in the area will enhance local spending power and will contribute to a critical mass of population to support a wide range of employment generating opportunities. In particular, the new residential community created by the proposed development and the subsequent commercial / retail offering within the scheme, will bring positive benefits in supporting and enhancing the local retail environment within Cherry Orchard local area, while also supporting other commercial developments in the locality.

The Proposed Development will allow for the creation of new employment. Jobs are expected to be created in the creche, retail / commercial units, and community and art / cultural management block. The provision of creche will provide an opportunity for childcare for future residents and will further encourage parents to consider part-time / full-time employment. The provision of new community and art / cultural space will also generate new co-working / studio / event spaces within the local area, encouraging local artists / creative workers / artisans / students to choose to work within the area.

Collectively, it is considered that the Development will have a slight positive significant impact on economic activity and employment.

Air Quality and Climate

The Chapter 5 and 6 on Air Quality and Climate Factors conclude that 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, imperceptible, and non-significant.

Noise and Vibration

The development lands in question are in proximity to the M50 Motorway which lies to the west of the site and a rail line to the south of the site. Noise from the road and rail has the potential to impact the residential development proposed for the site itself.

As per the Chapter on Noise and Vibration, in order to calculate noise levels across the site, an acoustic model was developed in order to initially calibrate against noise survey data recorded on site. Proprietary noise calculation software was used for the purposes of establishing the prevailing noise levels on the proposed site. The selected software, Brüel & Kjær Type 7810 Predictor, calculates noise levels in accordance with the selected source.

Road traffic noise levels calculated across the majority of the site during daytime periods are between 60 and 70 dB $L_{Aeq,16hr}$. Night-time noise levels are the order of 55 to 65 dB $L_{Aeq,8hr}$ across the site in this situation. Giving consideration to the measured and predicted noise levels presented in the Chapter, the initial site noise risk assessment has concluded that the level of risk across the site varies from medium to high noise risk. Additionally, the Stage 1 Noise Risk Assessment requires analyses of the L_{AFmax} noise levels. In the case of the AWN survey, the L_{Afmax} noise levels typically measured less than 80 dB during the night with sporadic events also recorded above this level. ProPG guidance considers 20 night events over 80 dB to be a high risk, therefore this site would be considered a low to medium risk in terms of maxima events.

The Predicted impacts section on the Chapter concluded that the development site may be categorised as Medium to High Risk and as such an Acoustic Design Strategy is 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.

External Noise Levels

The Chapter in relation to external noise levels note that typically at areas closer to the M50 noise levels will be higher than the recommended noise levels, however, mitigation in the form of screening around these areas will not be sufficient to reduce noise to recommended levels due to the elevation of the M50 above the site ground floor level. Future phases of the development indicate large commercial buildings will be located closer to the M50, these would drastically reduce noise levels across the site when built.

The ProPG document allows for the impact of higher than desirable external noise levels to be off-set through assessment of a hierarchy of measures including “a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)”.

For this site there is a substantially sized publicly accessible park (New Cherry Orchard Park) available within 150m of the development. Given the distance away from the M50, the park will meet the recommended noise levels for external amenity areas. Hence, given that a large area of space within the development will provide amenity space that meets the ProPG guidance, and an additional public park is accessible in a 2-minute walk from the development, it is considered that the ProPG objectives for external space have been satisfied.

Mechanical Plant and Services

The Chapter follows the BS 4142: 2014 +A1 2019: Methods for Rating and Assessing Industrial and Commercial Sound, which sets out a method for assessing the impact of a new continuous noise source to a residential environment such as plant items used to service the apartments and amenity areas.

Residential units are the most sensitive to this source, therefore, control of impacts at these units ensures control elsewhere.

On that basis, the Chapter states that it is recommended that cumulative plant noise from mechanical plant associated with the development does not exceed 45 dB $L_{Aeq,15min}$ at the closest existing noise sensitive locations and does not contain audible tones at any noise sensitive locations.

Plant items will be selected, designed, and located so that there is no negative impact on sensitive receivers within the development itself. Considering that sensitive receivers within the development are much closer than off-site sensitive receivers, then once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site.

On the basis of the above, there is likely no significant negative impact from noise on population and human health.

Landscape and Visual Impact

The Chapter on Landscape and Visual Impact Assessment notes, the landscape of the site currently has a rather degraded nature and appearance. The poor quality across the site represents a neglect through lack of impetus in developing the site dating since the most recent economic downturn. The proposed new buildings, infrastructure and its associated landscape provide an appropriate contemporary and designed solution for the area which fits with the longer-term aspiration as expressed in its development plan and the Local Area Plan. The resultant proposed scheme is not uncharacteristic within the context of this and similar parts of the city close to transport hubs. The design for the proposed development is a well-considered, high-quality scheme which is appropriate to the area and includes both design and specific mitigation measures that successfully address localised potential adverse landscape impacts. It also creates a number of landscapes, public realm and civic improvements with positive attributes and which, with the appropriate future maintenance and management will further improve as the scheme and its community mature over time.

The Chapter in terms of Landscape and Visual effects concluded that in general, the changes to the visual environment created by this proposed development will produce noticeable visual effects upon a range of receptors that are considered **moderate,** where visible, in the context of the LAP and the local developments that it is driving. The definition of moderate in the EPA Guidelines is *An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends*. The illustrated views are a representative selection of views from around the proposed development site, which are considered potentially the most sensitive. In accordance with the guidelines, they are also selected in order to provide sufficient landscape context to be able to properly assess the nature and scale of the effect.

Because the expected life of the proposed development is up to 60 years or beyond, the duration of predicted visual effects for all views is assessed as **long term or permanent** - as is the case for predicted landscape effects.

Subsequently there is no likely negative significant impacts as a result of changes in the landscape and visual impact on population and human health as a result of the proposed development.

Traffic and Transport

There is a constant emphasis on increase sustainable transport and need to move away from car reliance in order to support Ireland on the right path for the 2030 target in order to achieve the net zero 2050 target. Moreover, active, and sustainable modes of travel will also positively impact both the physical and phycological health of population.

The proposed scheme, in that regard provides dedicated cycle lane including c. 1618 no. bicycle parking, as well as pedestrian pathways, both providing access within the natural and semi-natural area, parks and playground as well as connects these lanes to the wider cherry orchard areas. The site is also adjacent to the current commuter rail corridor with plans for a future DART+ corridor along this train line, which has been envisaged to be delivered alongside the proposed development. The site is also well served by both existing and future BusConnects corridors.

In that regard, the operation phase impacts on public transport and access to sustainable travel, the Chapter on Material Assets – Traffic and Transport demonstrates that the proposed development will be consistent with the objectives for Transport and Mobility set out in the Dublin City Development Plan 2022 – 2028 and the Park West Cherry Orchard Local Area Plan 2019.

No significant impact on the existing and proposed traffic and transport in the surrounding area is predicted to arise from the Operational Stage of the proposed development at Cherry Orchard Point. The Chapter further concluded that no significant impact on roads and traffic will arise from the Operational Stage of the proposed development at Cherry Orchard Point.

As a result, the proposed development which has been design in line with the relevant Transport and Mobility objectives of the DCC CDP, will have a slight positive permanent impact on the health of the population. Consequently, there is no significant negative impacts anticipated from traffic and transport on human health.

Community and Social Amenities

Education and Childcare

The proposed development includes a ***creche facility*** that can accommodate more c. 135 child places across a floor space of c. 672 sq. m. GFA. 1,115 no. residential units are proposed as part of the Development across four Phases. The Planning Report and Schools and Childcare Demand Assessment accompanying this application establishes that this is an appropriate capacity given the mix of units and the level of demand expected to be generated across the four Phases of the Proposed Development.

A breakdown of the total residential units under - cost rental, social and affordable units proposed for Phase 1-3 is provided in the below Table 13.17.

Table 13.17 Break down of typology of residential units proposed in Phases 1 to 3 of the Development

Scheme	Studio	1 Bed	2 Bed	3 Bed	Total No. of Units
Phase 1	28	263	368	49	708
Phase 2	0	62	68	23	153
Phase 3	16	89	126	23	254
Total	**44**	**414**	**562**	**95**	**1,115**

In total, the Development will provide approximately 1,115 homes.

Given the total units mix within Phase 1 of the development, the number of units expected to generate children population has been derived as per Table 13.18. When this is applied to the average household size and the proportion of children in the 0–6-year age group (as per CSO 2022) within the Study Area, **the total demand generated for childcare spaces within Phase 1 of the scheme is c. 71 spaces.**

For Phase 2 and 3 of the development, it is noted that the unit mix break-down is not available at this stage of the development. Therefore, when the requirement under the Childcare guidelines of 20 spaces per 75 dwellings is applied – a combined total demand of 108 child spaces is generated for a total of 407 no. units across Phases 2 and 3. However, based on the requirements under the Apartment Guidelines 2023, in relation to discounting of units, a more conservative approach has been assumed. To allow for a certain level of flexibility in the estimation of demand generated for childcare from Phases

2 and 3[11], only the indicative proportion of studio, one bed units have been discounted. This would roughly produce a demand for around 55-56 child spaces from Phases 2 and 3

The applicant and Design Team have had regard to this requirement and incorporated a childcare facility designed to accommodate a total demand of c. 135 child spaces. This would be more than sufficient to cater to 71 no. child spaces generated in Phase 1, as well as c. 56 no. child spaces in Phases 2 and 3, with c. 8 additional spaces available to cater to any additional demand within the scheme or in the surrounding area.

In any event the proposed scheme's inclusion of a creche facility is considered to be of sufficient scale to satisfy the childcare requirements of the future occupied development. As such, the existing childcare services will not be impacted on. Conversely, the provision of a new creche facility, while predominantly catering for the new residential base generated by the proposed development, may also offer capacity to satisfy wider demand from the local community. In this regard, the proposed development will give rise to a slight positive permanent significant impact on population and human health.

In terms of ***schools***, the Census 2022 data for the study area sets out the share of population attending primary and post primary school years, as per Table 13.19 below. This percentage share was used to estimate the number of primary and post primary school children the proposed development would generate.

Based on an average household size of 2.8, the proposed development would comprise an estimated **3,122** no. persons living in the **1,115** no. residential units proposed. Of this, a total of 544 no. units are expected to accommodate families with children in the 0-18 age profile (see Table 13.18) of 2-and-3-bed units proposed. The total of 544 no. units is expected to accommodate a total of 1,523 people including children.

Table 13.18 Estimated Unit Mix Break-down for Phases 1 to 3 of the Proposed Development

	Phase 1	Phase 2	Phase 3	Total	Family Units*
Total Units Proposed	708	153	254	1,115	-
2-beds[12]	258[13]	68	126	452	452
3-beds	49	23	23	92	92
Total					**544**

**70% 2-beds and all 3-beds considered to accommodate family units as per the Apartment Guidelines 2022.*

As per Census 2022, the total 0–18-year age profile (4,755) within the study area comprises 26% of the study area population (18,398), and this, when applied to the proposed scheme, produces an indicative total of 396 children in the age group 0-18 years expected to reside within the proposed scheme.

Of the total 396 children, the Table 13.19 illustrates the estimated total number of Primary (5-12 years) and Secondary School (13-18 years) children expected to reside within the development. This has been estimated on the basis of the age-cohorts and their subsequent composition (as a percentage of 0-18 years old) within the Study Area.

Table 13.19 Estimated Primary and Post-primary School Children generated within the proposed scheme.

Age Group	2022 Census Population	% Of Total Cohort (CSO, 2016)	Indicative Children Population within scheme under 5-12 and 12-18 Age Cohort
Primary school children (5-12)	2,110	44%	174

[11] As the proposed schedule of units for Phases 2 and 3 are not the fully finalised version, at this stage of the Development.
[12] *Considering all of the two beds for the purpose of this calculation, assuming a more conservative approach and allowing for some flexibility in estimating demand generated.*
[13] *70% of two-beds have been assumed in the estimation of demand for Phase 1*

Post primary school children (13-18)	1,563	33%	131
Total			**305**

Therefore, an estimated total of 174 no. primary school children and 131 no. post primary school children are expected to reside within the development when it is fully delivered. However, the Proposed Development will not generate this level of demand within the short term given the development will be constructed in a phased manner.

Moreover, it should be noted that the Park West Cherry Orchard Local Area Plan 2019 has reserved a site (key development site 6) for the delivery of a school having regard to the planned and phased development of the LAP lands. The recently consented SHD application (Bord. Ref: ABP-312290-21) for the development of Site 6 of the LAP lands noted that the school identified in the LAP as catering for the existing and future development of the Park West area would be delivered under a future phase of development. The application documentation confirmed that discussions had commenced with the Department of Education and Skills, an approach which was deemed acceptable by the Board. The Proposed Development, in terms of layout and scale is hence, consistent with the vision of the LAP and has not been contingently phased on the delivery of a school in terms of construction or occupation.

Accordingly, the Proposed Development will have a **positive, indirect, significant** impact on population and human health with regard to primary and post primary school provision. Increase in schools and creche facilities would encourage more people to live within the local area, in turn improving the social and economic status and growth of the locality – given that education has an impact on the socio-economic status of the community (as described in the baseline analysis).

Therefore, there is no likely significant negative impact on population and human health as a result of community and social amenities.

Healthcare

The provision of healthcare within the study area is considered to be of a sufficient scale, with 14 healthcare services and facilities available within the 1km of the site, to serve the occupied development. The quality-of-life benefits for residents, and neighbouring communities arising from:

- the provision of a hierarchy of open spaces complemented by generous and high-quality landscaped treatments together with new green links and pedestrian and cycle paths – promoting green space, reduced parking, and encouraging active travel and ensuring long term high quality public environment;
- inclusion community and art / cultural spaces;
- the provision of retail use in close proximity to the residential units thus reducing the need for private vehicle trips to services located further afield;
- play areas and multi-use games area; and
- the sufficient communal and residential amenities within the scheme,

All of the above will have a positive knock-on effect in terms of public health. As such, the proposed scheme is anticipated to have a positive, slight effect on social infrastructure and its impact on population and human health.

Access and Transport

The proposed development will result in significant improvements in terms of access and facilities for pedestrian and cycle movement. This will include an upgrading of the cycle facilities on Park West Avenue and Barnville Walk together with new phases at the existing signalised junction between Park West Avenue and Barnville Walk.

The proposed development will generate additional passenger numbers on both rail and bus services. As the capacity provided on both rail and bus services will exceed the predicted demand, the predicted impact of the proposed development on the public transport services in the surrounding area is likely to be imperceptible. The delivery of new housing in an area with access to high quality public transport access, in particular rail services, will have a positive impact on the health of the future residential population and ensure a higher proportion of journeys are made by public transport versus private modes.

As set out in Chapter 14 of this EIAR, the proposed development includes development of Sites 3 and 4 together with reordering of the existing junctions and the provision of additional access junctions on Park West Avenue. These proposals are likely to lead to increased traffic flow and reduced traffic speed on Park West Avenue. However, it is important to note the subject site is located within an area where a modal shift from vehicular traffic to sustainable modes of travel is considered a key objective for the sustainable development of the area.

Overall, the proposed development is likely to have a positive long term significant impact on the transportation environment during the Operational Stage.

Community and Art / Cultural Infrastructure

The proposed scheme as per the requirement of Policy CUO25 of the DCC CDP, has considered the provision of 5% community and arts / cultural spaces in the context of the current application site (Phase 1 of the Development). The proposal, therefore, provides for a total of 13 no. dedicated community and arts / cultural units at ground floor level, with internal floor space of c. 1,222sq.m total GFA, spread across Blocks 2B, 3, 6 and 7 and an external community and cultural space (Central Park) of c. 1157sq.m. The external area (Central Park) is strategically linked to connect the different internal community and art / cultural units, creating a synergy of spaces in turn enhancing the cultural vibrancy of the public realm within the development.

The multipurpose use considered for the community and art / culture proposal will create a safe and accessible space, encouraging people from all age groups to engage and participate; and the combined internal and external space will further create a focal point for people to gather, in turn inspiring a sense of ownership, security, and belonging within the residents / users of the space.

In addition, the inclusion of a hierarchy of open spaces complemented by generous and high-quality landscaped treatments together with new green links and pedestrian and cycle paths, further promotes green space, reduced parking, and encourages active travel – ensuring a long-term high quality public environment for the proposed development as well as the wider area. The scheme also provides for addition play areas and multi-use games areas to cater for children of all age-groups.

The Proposed Development has provided for a number of notable local amenity gain to the existing community assets within the Cherry Orchard local area. By enhancing the amenity value of the existing facilities, providing additional cultural assets to cater to the local population and opening up access for the wider community, the proposed scheme is making a significant contribution to the local area as well as delivering on the objectives of the City Development and Local Area Plan.

Access to local community services, open space and play areas will have a long-term positive impact on population and human health within the area. Accordingly, positive, significant impacts on recreational, community and cultural amenity and provision is identified. There will be no negative impacts on population and human health as a result of the community and cultural amenities.

13.6.3 Risk of Major Accidents or Disasters

Construction Phase

It is considered that the proposed development will not give rise to any impacts related to a major accident or disasters during the construction phase. Throughout the construction phase standard and regulated construction practices will be employed. The accompanying Construction and Environment Management Plan prepared by Waterman Moylan Consulting Engineers outlines measures that will ensure construction practices will limit the risk of accidents during the construction phase. It will also detail the storage measures for hazardous materials used during construction ensuring they do not give rise to a risk of pollution.

The works proposed in proximity to public roadways and footpaths will be governed by best practice and appropriate safety procedures, thus reducing any risk of a major accidents in public areas.

Operational Phase

The proposed development is not considered to be vulnerable to major accidents or disasters, and therefore the anticipated impacts are considered to be negligible. The site access, surrounding the M50 motorway and pedestrian network of the proposed development has been designed to ensure risk of a major accident is avoided.

13.7 Cumulative Impacts

This EIAR has been prepared to reflect the overall impact of the proposed development of 11.5 hectares of lands, which have been identified as Key Development Site 4 and Site 5 in the Park West Cherry Orchard Local Plan 2019. The surrounding context of the site consists of a mix of commercial, industrial, residential, and related land uses. The lands are bound by Cloverhill Road to the north, Cedar Brook Avenue and Park West Avenue to the east, Park West Cherry Orchard Rail Station to the southeast, the rail line to the south, and the M50 motorway to the west. Two large industrial estates can be found to the south and southwest of the site as well as many green spaces and parks softening the area. There are established residential communities located to the east of the site within Cederbrook and Barnville, north of the site in St. Oliver's Park and Bridgeview, and south of the site opposite the train station within the Crescent complex.

The EPA Guidelines (2022) states that while a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in cumulative impact that is collectively significant. The EC *'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions'* define 'cumulative impacts' as *"Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project"*. It is, therefore, prudent to consider the cumulative effects arising from other permitted or planned developments in combination with the proposed development.

In that regard a review of the planning and development pipeline was undertaken, to consider the extant list of consented projects within the defined EIAR study boundary, and their potential cumulative impacts in combination with the proposed development on the wider area. As predicted impacts on human health can also extend beyond the boundary of the development, the following list of projects within 1km study boundary of the site were identified to consider their potential impacts on human health resulting from air quality, noise, landscape and visual and traffic, in combination with the impacts from the proposed development.

This section will only consider, in detail, the cumulative impacts associated with Population and Human Health, whereas, the subsequent cumulative impacts associated with air quality, noise, landscape and visual and traffic are covered in the respective Chapters – 5. 7, 10, and 14 of this EIAR.

Chapter 5 concludes that there will be no significant cumulative impact as a result of air quality and therefore, no significant cumulative impact on human health.

Chapter 7 concludes that the majority of the sites are located at distances greater than 200m from the proposed development and consequently there is likely to be no significant cumulative impacts associated with these developments. Application 3403/21 is noted to be approximately 50m from the proposed development, however, given that other sensitive receptors with the potential to be impacted by the cumulative noise are located approximately 85m from the proposed development it can be concluded that cumulative construction noise will not be significant at these locations. As such there is no significant cumulative impact on human health anticipated.

Chapter 10 conclude that the cumulative effects are generated by schemes listed and in the in the context of the Park West Cherry Orchard Local Area Plan. It is clear from the assessment that the gap sites are causing urban dereliction and antisocial behaviour, with a notable effect on the quality of the public realm. The granting of schemes and the completion of permitted development will further consolidate the ambitions of the LAP and SDRA4 of the Dublin City Development Plan. Increasing the population and amenity in proximity to public transport and connecting it through green infrastructure to the local area, should be a positive way to make new, integrated communities. The cumulative effects are therefore seen as **moderate** and **positive.** Subsequently, there is no potential adverse significant cumulative impact on human health.

Chapter 14 concludes that in addition to the trips that will be generated by the future development of Sites 4 and 5, the trips that would be generated by the approved Park West SHD development on Site 6 should be included in the traffic assessment for the subject site. The Traffic and Transport Assessment prepared by Waterman Moylan further provides a detailed assessment of the cumulative traffic impact. No other significant construction projects have been identified in the area of the subject site which would result in a significant cumulative impact on Traffic and Transport either during the construction or operational stages. However, measures currently being considered by NTA, TII and Dublin City Council for the intensification of public transport services and cycle facilities in the surrounding area are likely to have a cumulative long term significant impact.

The main cumulative impacts associated with Population and Human Health are potential pollution and nuisance resulting from the construction phase, vis-à-vis, air quality, dust, construction noise and traffic etc. In the operational phase, there are 3 major residential planning applications, delivering a total of 1,008 units, resulting in population increase within the area, when considered in combination with the proposed development. There are also 3 planning applications for commercial development, delivering and additional circa 2,8000 sqm of commercial floorspace, which are considered to have cumulative impacts, including a major discount food retail development.

However, it should be considered that the proposed development, alongside the relevant residential and commercial planning applications cited in Table 13.20 and Table 13.21, form part of a key growth area as identified in Local Area Plan and DCC CDP. The cumulative impact of the development of adjacent lands within Study Area will be the resulting rise in population, in line with national, regional, and local planning policy for Park West and Cherry Orchard. This impact will be long term and positive in the context of the development zoning objectives for the subject site, and wider local, regional, and national planning policy. This is further supported by the strategic location of lands within the Study Area and their proximity to high-quality public transport services, and social and community services. The cumulative impact of the full development of lands in line with the objectives of the Local Area Plan will enhance the social and economic viability of the area.

13.7.1 Residential Projects

There is a total of 4 no. residential planning applications, of which 3 are within the Dublin City administrative boundary and 1 within the South Dublin administrative boundary. The residential

planning pipeline includes the planned delivery of a total of 1,052 no. residential units within the local area.

Table 13.20 List of Residential Development within the 1km buffer of the Subject Site

Reference	Location	Development Description	Status	Decision Date
4313/22 (Part 8 Application)	Cherry Orchard Green, Dublin 10	Proposed construction of a residential development comprising **172 no. dwellings** (141 no. 3-bedroom two-storey terraced houses and 31 no. 2-bedroom two-storey terraced houses), 2 public open spaces approx. 0.83 ha /14% of site area, associated site infrastructure works/ supporting infrastructure, landscaping, public lighting, access roads/pavements, boundary treatments and provision for a link road/ pavements and cycleways to Ballyfermot	City Council – Approved	03.10.2022
312290	Park West Avenue and Park West Road, Park West, Dublin 12	**750 no. apartments**, creche and associated site works.	Granted	16.06.2022
3403/21	Site (1.26 ha) at Blocks 70 and 72 Park West Avenue and Park West Road, Park West, Dublin 12	Planning permission for the proposed development will consist of modifications to the permitted residential development of **86 no. residential units** over retail/restaurant uses (reg. ref. 3798/18, 3941/20, 2517/21) within blocks 70 and 72.	Granted	21.10.2021
SD188/0006 (Part 8 Application)	New Nangor Road, Clondalkin, Dublin 22.	Social Housing Development comprising of two and three storey housing and apartment units (**44 units in total**) on a site located at New Nangor Road, bounded by Riversdale Estate & Mayfield Park, Clondalkin, Dublin 22. The proposed development shall consist of: 19no. 3-bed, two storey houses, 1no. two storey specially adapted unit and 24no. 2-bed apartments in 3 storey building.	Part 8 Approved by Council	08.10.2018

Note: The applications outlined above relate to planning permissions granted within the last 5 years for developments above 10no. residential units on the basis that such schemes are considered more likely to give rise to potential environmental impacts when considered in combination with the proposed development.

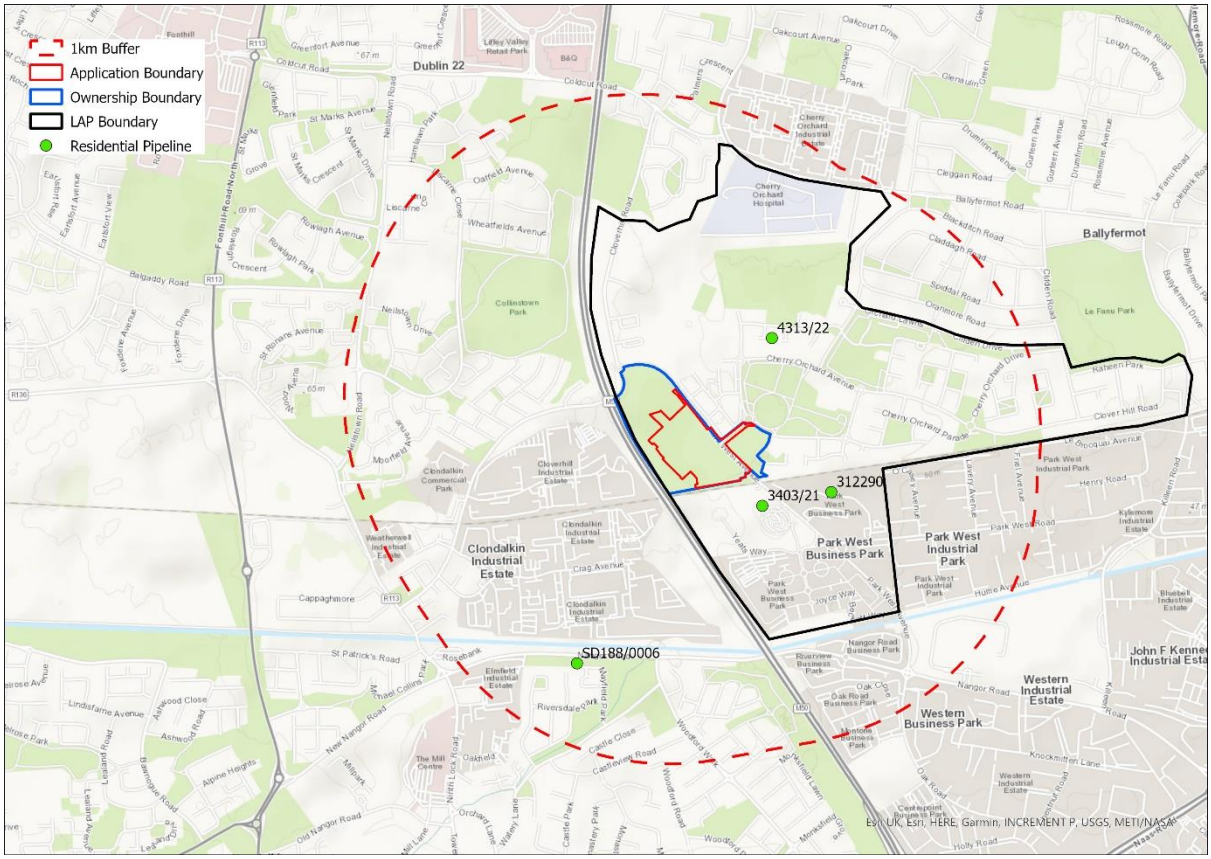


Figure 13.25 Residential Development - Planning Pipeline within the 1km buffer of the Subject Site

1. **Reg. Ref. 4313/22 Part 8 Application in Cherry Orchard Green, Dublin 10.**

This development was approved by the Dublin City Council as of October 2022, on Site 1 under the Park West Cherry Orchard LAP, Cherry Orchard Green, Dublin 10. Due to the size and nature of the development, an EIAR was not considered necessary. There is no likelihood of significant effects on the environment during the construction period on population or human health arising from this scheme in combination with the proposed development. The operational phase will observe an additional increase in the population within the Study Boundary, with no additional pressures perceived on the existing community and social infrastructure in combination with the proposed development. This scheme in combination with the proposed development will positively impact on the area, which is zoned for regeneration under both the DCC CDP and Park West Cherry Orchard LAP and hence, the delivery of both will be in line with the statutory zoning requirement for the area.

2. **Key Development Site 2 under Park West Cherry Orchard Local Area Plan 2019**

It should also be noted that Dublin City Council are intending progressing proposals for the redevelopment of Development Site 2 as identified in the LAP under Part 8 procedures in Q1-Q2 2024. As this scheme has not progressed through the planning process at the time of writing (23 October 2023) and is still therefore liable to material adjustments, both in scale and scope, prior to lodgement, it was not considered appropriate to assess its potential cumulative impacts with the subject development.

3. **ABP 312290 Park West Avenue and Park West Road, Park West, Dublin 12.**

The scheme granted permission by the Board in 2022 includes the construction of c. 750 no. residential units, 522 no. car parking, 1,676 bicycle parking, community, and café facilities. The scheme has further provided for a creche facility of c. 410 sq.m with a capacity to accommodate c. 84 no. children. The

social infrastructure audit submitted along with the scheme concludes that the social infrastructure provision within proximity to the subject site is capable of serving the population; however, the Councils in association with inter alia the DES must continually ensure the quality of social infrastructure is maintained at a high level.

The Subject Development also provides for a creche facility with a capacity to accommodate c. 135 no. children, in addition to convenience retail, commercial / retail and community and art / cultural facilities. This is considered sufficient community, social and cultural facilities to meet the demand arising from the proposed development as well as uplifting and well-integrating with the local community.

An EIAR was submitted as part of the Application for the scheme, which has assessed in detail the potential environmental impacts for the scheme. Following the mitigation measures proposed within the EIAR, will result in no significant negative impacts as a result of the development within the area.

The potential cumulative impact of the scheme in combination with the proposed scheme at Cherry Orchard Point will likely have a significant impact on the total population with the area, resulting in a substantial increase in the population. There is no significant negative cumulative impact on human health as a result of proposed scheme when considered in combination with the Park West scheme. Moreover, the inclusion and subsequent promotion sustainable infrastructure within the area, will further increase the vibrancy and vitality of the area.

Moreover, this scheme in combination with the proposed development will positively impact on the area, which is zoned for regeneration under both the DCC CDP and Park West Cherry Orchard LAP and hence, the delivery of both will be in line with the statutory zoning requirement for the area.

4. **Reg. Ref. 3403/21 Blocks 70 and 72 Park West Avenue and Park West Road, Park West, Dublin 12**

This proposal is for the development of 86 no. residential units, which will positively contribute to the population influx within the area, creating further opportunities for infrastructure development. The Planner's Report for this application noted that the scheme has been screened for AA and found that significant effects are not likely to arise, either alone or in combination with other plans and projects that will result in significant effects to any Natura 2000 area. As such there is likely no adverse significant cumulative impact generated by the scheme in combination with the proposed development on population or human health.

5. **Reg. Ref. SD188/0006 New Nangor Road, Clondalkin, Dublin 22.**

Due to the size and nature of the scheme, there was no requirement for an EIAR to be submitted along with this Application. However, the development will result in a population uplift within the area, delivering social housing scheme. As such there is no likely significant negative cumulative impact on human health. The scheme in combination with the proposed development will cater to the social housing requirement within the area.

13.7.2 Commercial Projects

There is a total of 9 no. commercial planning applications, of which 3 are within the Dublin City administrative boundary and 6 within the South Dublin administrative boundary. This includes applications for commercial uses within parts of the study area which have established industrial or business and enterprises land uses.

Table 13.21 List of Commercial Developments within 1km of the Subject Site

Reference	Location	Development Description	Status	Grant Date
5311/22	Block 7, Parkwest Business Campus, Parkwest, Dublin 12	The development will consist of the change of use of the ground, first and second floors from class 3 office use to class 8 for use as a health centre / clinic along with all associated works.	Granted	05.04.2023
312290	Park West Avenue and Park West Road, Park West, Dublin 12	Residential Development with a mix of other uses: **Retail Unit – 156 sqm** Block A Crèche – 410 sqm 84 child spaces **Café/bar – 91 sqm** Block G	Granted	16.06.2022
3999/21	Unit 55, Park West Road, Park West Industrial Park, Dublin 12, D12 X9F9	The development will consist of **extension of the existing office space at second floor level resulting in an overall office floorspace increase of 125 sqm approximately, construction of a new mezzanine level in the warehouse area (circa 257 sqm)** and a new stairwell. Creation of 2no. openings to the south elevation and 1no. opening to the west elevation and associated site development works. The development will also include the retention of **the existing office space at ground and first floor level of 250 sqm approximately**.	Granted Permission and Retention Permission	22.03.2022
SD21A/0100	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Construction of a revised two storey mono-pitched Discount Foodstore (with ancillary off-licence use), with an increased **total gross floor space of 2,415sq.m** and an **increased net retail sales area of 1,650sq.m (2,144sq.m and 1,400sq.m respectively permitted under SD19A/0286);** Associated reconfiguration of site layout and all other associated and ancillary modifications to SD19A/0286 above and below ground level, including modifications to pedestrian access and a new electricity substation and switch room building.	Granted	22.07.2021
SD20A/0309	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22	Provision of 4 new information and communications technology (ICT) Facility buildings and associated development at the subject site, **superseding elements of the extant planning permissions on site (Reg. Ref.: SD18A/0068 and Reg, Ref.: SD19A/0185).** The proposed development will comprise the following: The construction **of 4 ICT Facility buildings (ICT Facilities 1, 2, 3, and 4) with a combined total gross floor area {GFA) of c. 47,564.5 sq. m.**	Granted	04.05.2021

SD19A/0185	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22.	Alterations to approved plans (Grant of Permission ref PL06S.243151 and PA Reg Ref SD13A/0271 and SD18A/0068) to the previously granted planning permission for the construction of an ESB 110kV Gas Insulated Substation for the use by Crag Digital Limited in support of the development and to incorporate an ESB Network Substation to improve and upgrade power supply to Clondalkin and adjoining areas; **the proposed ESB 110kV Gas Insulated Substation is a two storey building of gross floor area of 1,586sq.m and Client Control Room building of an area of 116sq.m**	Granted	09.09.2019
SD19A/0098	Unit E20, Cloverhill Industrial Estate, Ballymanaggin, Clondalkin, Dublin 22	(1) Demolition of front single storey entrance building and rear storage area; removal of trees to facilitate vehicular entrance, road and associated site preparation work; (2) **630sq.m. two storey front entrance building including café and office space** with flat roof and building signage; 206sq.m. single storey dispatch fridge with flat roof, level loading dock and canopy complete with associated plant; (3) roller shutter door and canopy and pedestrian doors to existing building; (4) enclosed bin store; (5) reorganisation of parking to provide 49 total parking spaces; (6) enlargement of the existing side plant enclosure; (7) all associated site, civil, drainage and landscaping works required for the construction and usage of the proposed building.	Granted	16.09.2019
SD19A/0100	Unit 1, Elmfield Court, Ninth Lock Road, Clondalkin, Dublin 22	Change of use for part of existing retail unit to Off-Licence sales area (**Site area 0.025 ha**)	Granted	01.07.2019
SD19A/0286	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Demolition of existing single storey discount food store (with ancillary off-licence use) measuring 1758sq.m gross floor space with a net retail sales area of 1286sq.m; **two storey mono-pitch discount food store (with ancillary off-licence use) measuring 2144sq.m gross floor space with a net retail sales area of 1400sq.m**	Granted	16.12.2019

Note: The applications outlined above relate to planning permissions granted within the last 5 years for commercial developments above 100sq.m and relevant change of use applications where such schemes are considered more likely to give rise to potential environmental impacts when considered in combination with the proposed development. Further details are outlined in Section 13.7 of this EIAR.

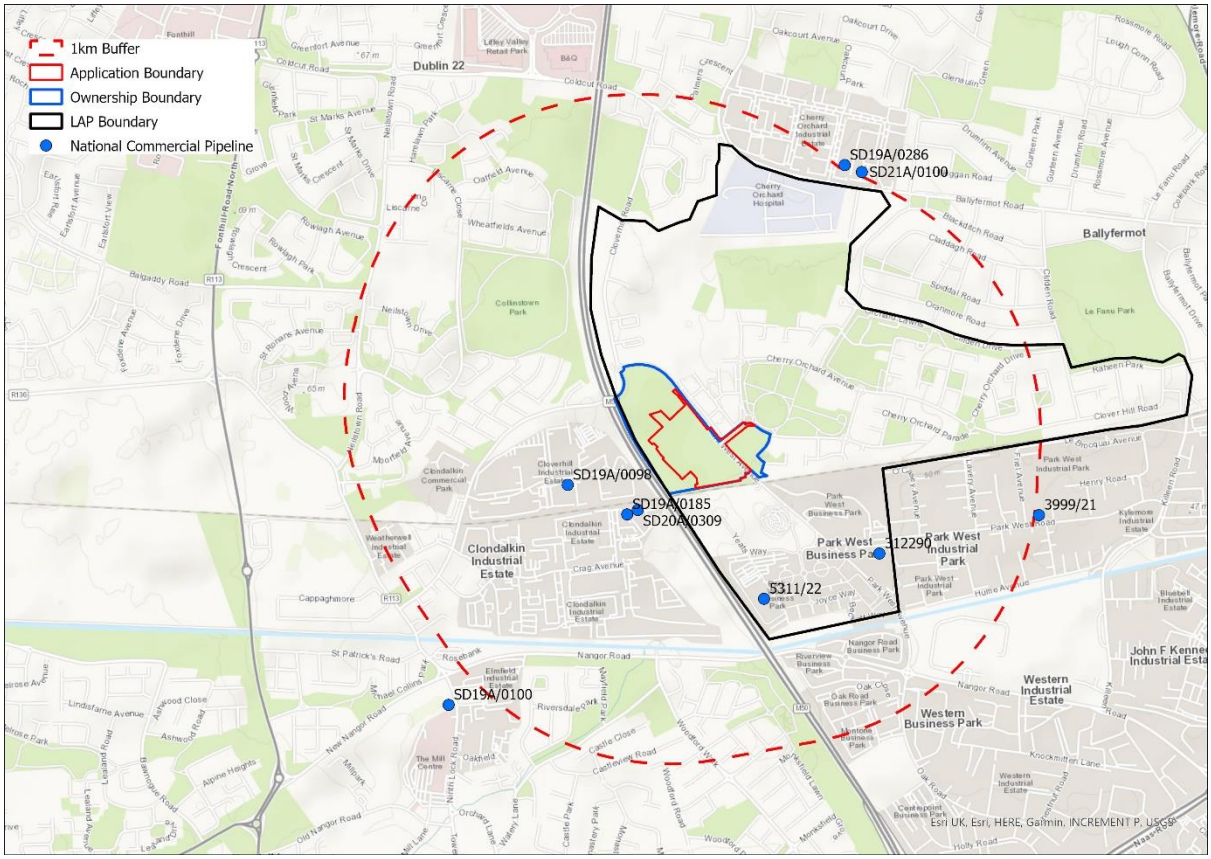


Figure 13.26 Commercial Development - Planning Pipeline within the 1km buffer of the Subject Site.

There are no potential adverse significant cumulative impacts expected to arise as a result of the retail / commercial development within the area. The schemes within the study boundary in combination with the proposed development, would help provide employment opportunities for the people within the area, as well as access to a variety of facilities vis-à-vis retail supermarkets, cafes, etc.,

Moreover, the proposed development further provides for a mix of uses, including a retail supermarket, retail / commercial uses and community and art cultural uses, integrating well with the wider catchment, and creating a positive impact for the current and future population within the area.

13.7.3 Proposed DART + South West Project

The DART + South West is the second of the infrastructural projects of the DART+ Programme expected to be delivered. The Rail Order Application for this has been submitted for statutory approval for its design, as of March 2023.

It is expected that once this project is delivered, it will increase the train capacity to double the current (12) trains per hour per direction and increase passenger capacity from the current peak capacity of approximately 5,000 passengers per hour to around 20,000 passengers per hour per direction.

Table 13.22 DART + South West Rail Order

ABP Reference	Development Description	Status	Date
316119	DART+ South West Electrified Heavy Railway Order - Hazelhatch & Celbridge Station to Heuston Station, and Hesuton Station to Glasnevin	Lodged	Case Due by 18.09.2023

Córas Iompair Éireann (CIÉ) has applied planning permission to An Bord Pleanála for a Rail Order in relation to the DART+ South West project. The subsequent approval of the Rail Order will authorise CIÉ to carry out all associated railway works necessary to enable construction, operation, maintenance, and improvements to the railway line between Hazelhatch and Celbridge Station, County Kildare to Heuston Station County Dublin (extending c. 16km) on the Cork Mainline, and Heuston Station to Glasnevin via the Phoenix Park Tunnel Branch line.

CIÉ / Iarnód Éireann are proposing a new substation and compound, a temporary access road, a temporary works compound and a track access point, all to be located on the subject lands. Utility diversions on the east side of Park West Avenue, within 'Site 5', are also required.

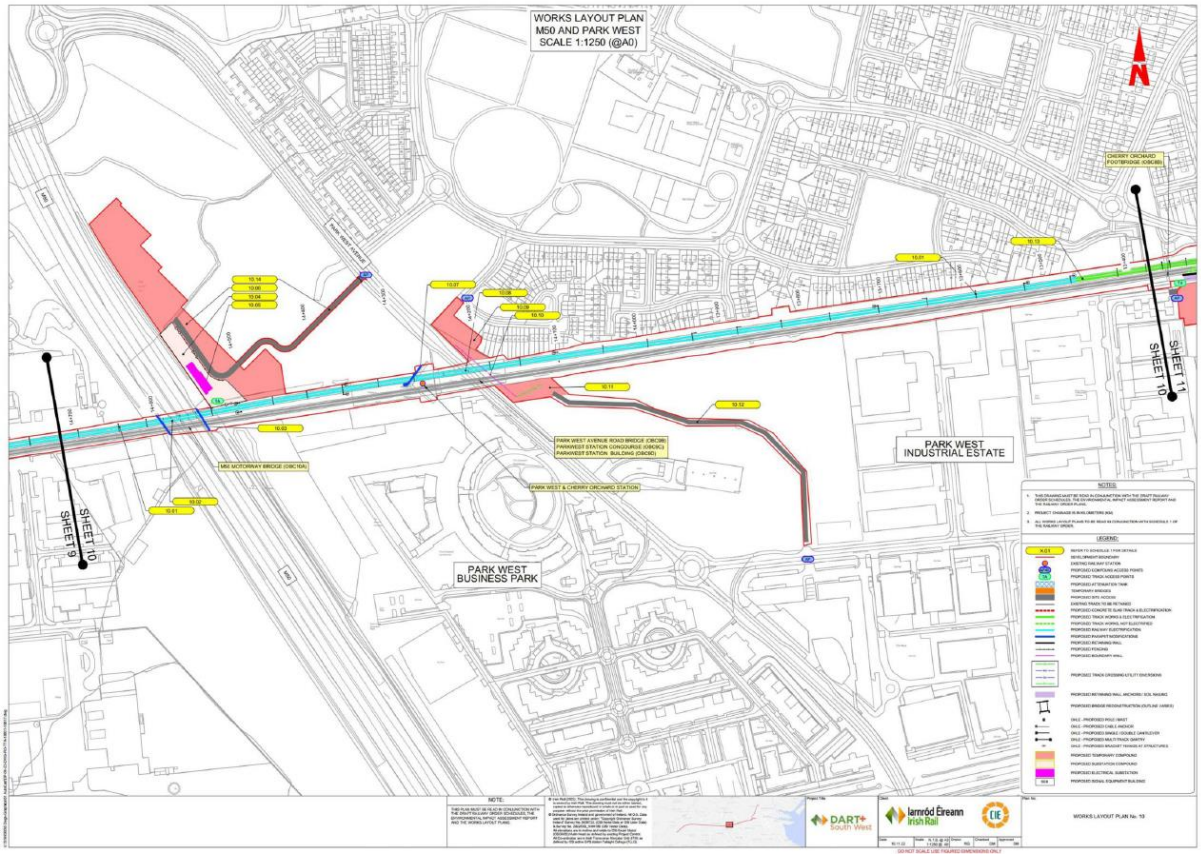


Figure 13.27 Works Layout Plan No. 10 (extract from the DART+ South West Railway Order)

The planned infrastructure improvements include:

- 20 km of electrification and re-signalling of the Hazelhatch and Celbridge Line to Heuston and the south city via Phoenix Park Tunnel
- Construction of a new station at Heuston West to serve the community of Clancy Quay and Island Bridge
- Four-tracking of the rail line from Park West and Cherry Orchard Station to Heuston to enhance capacity
- Civil, bridge and ancillary works as necessary to accommodate the project
- Upgrading of the Phoenix Park Tunnel
- New electric DART carriages for the DART+ Programme will be deployed on Hazelhatch and Celbridge services.

The proposed development is not materially impacted on by provision of the proposed new substation and track access point in the southwest corner of the development lands, and the temporary access road can be accommodated within the proposed internal road network for the development lands. The electrification of the railway line will be of a huge benefit to existing and future residents, providing a faster, cleaner mode of public transport to the city centre.

The temporary works compound is outside the planning redline for Phase 1 of the Cherry Orchard Point development and an 'interim' boundary treatment between the compound and new residential development has been detailed by the Landscape Architect.

The DART + works are anticipated to be completed by 2030 and will most likely run in parallel with the construction phase of the proposed residential development.

13.8 'Do Nothing' Impact

This section considers the potential impacts should the proposed development not take place. In a 'Do Nothing Scenario', the subject site would remain an undeveloped greenfield grazing field. The environmental receptors discussed throughout this EIAR would in all likelihood remain unchanged while the potential for any likely significant adverse environmental impacts arising from the proposed development would not arise.

Consequently, in a 'Do Nothing Scenario', the potential for any significant positive impacts from the construction and operation of the proposed development would also not arise.

Moreover, a 'Do Nothing Scenario' would involve the Development Sites, which are zoned Strategic Development and Regeneration Areas (Z14), remaining in their current predominantly greenfield state, and remaining underutilised and not fulfilling local, regional, and nation planning policy objectives.

13.9 Mitigation Measures

Construction Phase

A range of construction related remedial and mitigation measures are proposed throughout this EIAR with reference to the various environmental topics examined, and the inter-relationships between each topic. Through the provision of these remedial and mitigation measures, any negative impacts on population and human health during the construction phase shall be appropriately mitigated. Readers are directed to Chapter 18 'Summary of Mitigation Measures and Residual Impacts', of this EIAR for a summary of mitigation measures proposed as a result of this EIAR.

Operational Phase

The Proposed Development has been designed to avoid negative impacts on population and human health through the design and provision of physical and social infrastructure as described in Chapter 2

of this EIAR. Compliance with the proposed design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Furthermore, measures outlined in the Chapters of this EIAR which address other environmental matters such as Water, Air Quality, Climate Factors, Landscape and Visual Impact and Noise sufficiently address monitoring requirements. Readers are directed to Chapter 18 of this EIAR for a summary of mitigation measures proposed as a result of this EIAR.

13.10 Residual Impacts of the Proposed Development

Residual impacts are those which remain following the implementation of the proposed mitigation measures; however, no significant adverse residual impacts have been identified. The character and condition of the land will change from disused, green field site to a residential land use. This change is in line with the specific zoning (Z14) of the site and the impacts is considered acceptable when balanced with the other positive impacts in terms of building a critical mass of population, compact urban development, provision of housing on strategic, edge of centre site, provision of new local services and amenities (créche facility, retail and commercial units, community arts and cultural space, new public open space) and the indirect benefits arising for employment.

13.11 Interactions

There are numerous inter-related environmental topics described in detail throughout this EIAR which are of relevance to population and human health. The main high-level interactions between Population and Human Health and other environmental factors include Air Quality and Climate Factors, Noise and Vibration, Landscape and Visual Impact, Water, Waste Management, and Traffic and Transportation. Although these have been covered in detail in the respective Chapters of this EIAR, it was considered prudent to provide a robust description of the same within this section.

Air Quality and Climate Factors

The interactions of population and human health with air quality and climate can occur during both the construction and operational phases of the proposed development. The Chapter 5 on Air Quality notes that during the construction stage the greatest potential for air quality impacts is from fugitive emissions impacting nearby sensitive receptors. Construction phase traffic can also impact air quality, particularly due to the number of HGVs accessing the site. Construction phase traffic levels were reviewed, and it was found that the change in traffic was not of the magnitude to require a detailed assessment, therefore the impact is considered short-term and neutral. In terms of the operational stage air quality and climate impacts will predominantly occur as a result of the change in traffic flows on the local roads associated with the proposed development.

However, the Chapter concluded that the local area is considered of low sensitivity to human health impacts from dust emissions. 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.

Noise and Vibration

The interaction with Noise and Vibration can have an impact on Population and Human Health, mainly during the construction phase. Chapter 7 on Noise and Vibration notes that the largest noise and vibration impact will occur during the construction stage due to the operation of various plant machinery and HGV to, from and around the site, noise levels relating to site clearance, ground excavation and loading lorries etc. The Chapter also notes that the additional traffic introduced into the local road network due to the construction phase of the proposed development will not result in a significant noise impact. The predicted impact assessment in Chapter 7 has concluded that, provided the proposed

mitigation measures are implemented, there is no long-term significant impact from owing to noise and vibration from the proposed development. As a result, there is no significant impact perceived from the same on population and human health.

Landscape and Visual Impact

The proposed development will potentially visually impact the appearance of the Development Sites. The sites are currently vacant and underutilized, with no previous uses or development identified. It is considered that the proposed development, by virtue of its visual appearance, will positively impact the visual amenity of the site in its current form. There will be no significant direct impact of the changes to visual appearance on human health. It is however considered that the proposed landscaping and green infrastructure will have a long-term positive impact on the population within the local area. The proposed development includes dedicated cycle lanes connecting the development and its public open space to the rest of the local area, pedestrian paths providing internal access / links, a park and MUGA pitch in combination with the community, art, and cultural spaces. This will increase the aesthetic and amenity value of the local area, positively contributing to the community, creating a sense of belonging and hence, improving social health within the area.

Water

The proposed development can impact the water quality within the local area as a result of contamination during any given phase of the development. Chapter 12 on Water identifies that there is a risk to Human Health should the ground water become contaminated during the construction or operational stages, and water is consumed. In order to mitigate the risk of 'leaching of contaminated soil into groundwater, Chapter 12, Table 12.5 notes that "spill kits will contain 10 hr terrestrial oil booms (80mm diameter x 1000mm) and a plastic sheet, upon which contaminated soil can be placed to prevent leaching to ground water", this will prevent contamination of aquatic zone by petrochemicals.

Material Assets – Traffic and Transportation

As per Chapter 14 on 'Material Assets – Traffic and Transport', during the construction stage, some of the construction traffic movements will be undertaken by heavy goods vehicles (HGVs), including vehicles movements associated with appointed contractors and staff. The Chapter notes that the expected increase in the day-to-day traffic movements associated with construction activities is less than the benchmark of 10% set out in the TTA Guidelines published by TII. The Chapter concluded as such no significant impact on roads and traffic will arise from the Construction Stage of the proposed development.

In the operational stage however, the proposed development is expected to increase in terms of population and consequently experience an increase in the number of vehicles generated from the scheme. This might result in an impact on human health arising from the capacity and operation of the surrounding road network. The Chapter notes that the traffic impact from the proposed development during the operational stage is predicted to be 10% or higher at all junctions included in the traffic modelling undertaken for the project. This is generally in exceedance of the benchmark set out in the TTA guidelines. The results of the traffic modelling assessments indicate that all assessed junctions except Junction 4 Signalised Crossing (Park West Avenue / Barnville Walk) and Junction 7 (Park West Avenue / Park West Road), will operate within capacity with the proposed development in place in the Opening Year 2027 through the Design Year in 2032 to the Future Year 2042.

With regard to the overall impact of the development on traffic and transport, the Chapter concludes that no significant impact on the existing and proposed traffic and transport in the surrounding area is predicted to arise from the Construction or Operational Stages of the proposed development at Cherry Orchard Point. It is further noted that there will also be no significant impact on population and human health resulting from traffic and transport.

Material Assets – Waste Management

The inappropriate management of waste during the construction phase, including storage, handling and the use of insufficient segregation techniques has the potential to negatively impact the health of the construction workers. Likewise, during the operational phase the potential impacts on the environment and subsequently human health, from the proposed development would be caused by improper or the lack thereof of waste management. According to Chapter 15 on Material Assets – Waste Management, a carefully planned approach to waste management and adherence to the site-specific Resource and Waste Management Plan during the construction phase, will ensure that the effect on the environment will be ***short-term, neutral*** and ***imperceptible.*** With regard to the operational phase, the Chapter concludes – provided the mitigation measures in the development OWMP (Appendix 15.2) and in Chapter 15 are implemented, and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be ***long-term, neutral*** and ***imperceptible***.

As a result, it is considered that there is no subsequent significant impact on population and human health from the proposed development during the construction or operational phases.

Please refer to Chapter 17 Interactions for more information from each Chapter.

13.12 Difficulties Encountered

There were no significant difficulties encountered in compiling the information contained in the Population and Human Health Chapter.

13.13 References

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- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, Draft August 2017).
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- Ageing and Public Health: An overview of the key statistics in Ireland and Northern Ireland, published by The Institute of Public Health 2020.
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- Pobal Deprivation Index Mapping, available at: Pobal | Pobal Programmes and Initiatives throughout Ireland
- Dublin City Development Plan 2022-2028, available at: Development Plan 2022 - 2028 | Dublin City Council
- Tusla Data, available at: Tusla - Child and Family Agency
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- An Bord Pleanála, available at: Welcome to An Bord Pleanála | An Bord Pleanála (pleanala.ie)
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- Water Quality for the DCC Zone 1 Ballymore generated for 2023, available at: Water Quality & Drinking Safety Advice in Ireland | Uisce Éireann (formerly Irish Water)
- Environmental Protection Agency's Air Quality Index for Health (AQIH), available at: Monitoring Stations | AirQuality.ie
- Air Quality Explorer, available at: Labs - Google Environmental Insights Explorer - Make Informed Decisions (sustainability.google)

14 Material Assets – Traffic and Transport

14.1 Introduction

14.1.1 Background

This chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the impact that the proposed development at Cherry Orchard Point, Park West Avenue, Dublin 10 will have on traffic and transportation infrastructure and network in the surrounding area.

This chapter was completed by Brian McCann, BE, MSc (Eng), DIC, CEng, FIEI, MIStructE, MConsEI with input from the other members of the design team. Brian has in excess of 30 years' experience of transportation planning and assessment.

This chapter sets out the existing receiving environment in terms of roads conditions, traffic activity and transportation accessibility. It also describes the proposed development in terms of construction and operational traffic impact on the receiving environment and any appropriate mitigation measures.

A full description of the proposed development can be found in Chapter 2 Background to the Proposed Scheme in this EIAR.

A detailed Traffic & Transport Assessment was also prepared by Waterman Moylan in September 2023 in compliance with Section 2.3 of Appendix 5: *Transportation and Mobility Technical Requirements* of the Dublin City Development Plan 2022 – 2028.

The TTA presents survey data for the existing traffic conditions and a detailed estimation of the transport demand that will be generated by the development. The TTA also addresses the existing capacity on the public transport network. The traffic generated during both the morning and evening peak times is assessed as well as an estimation of the construction stage traffic. An assessment of the percentage impact of traffic on local junctions, and accessibility of the site by sustainable modes including walking, cycling and public transport is also included.

14.2 Methodology

The methodology for the preparation of this chapter of the EIAR included: -

(a) Desktop review of the planning stage documentation provided by the project design team.

(b) Visits to the site and surrounding area including survey of existing transportation facilities and observation of traffic movements.

(c) Review of public transport services, routes, and timetables.

(d) Review of proposals for transportation improvements by Transport Infrastructure Ireland (TII), National Transport Authority (NTA) and Dublin City Council (DCC).

(e) Review of the Traffic & Transport Assessment was also prepared by Waterman Moylan in September 2023

(f) Review of future trips to and from the proposed development.

(g) Review of trips from future contiguous developments.

(h) Review of public transport, both existing and proposed.

(i) Assessment of the transportation impacts of the development.

14.3 Receiving Environment

14.3.1 Site Location and Zoning

The site for the proposed development (part of the overall the Park West – Cherry Orchard Local Area Plan) is located in the administrative area of Dublin City Council (DCC) within the area bounded by the M50 Motorway to the west, Ballyfermot Road to the north, Le Fanu Road to the east and the Grand Canal to the south. See Figure 14.1.

The LAP extends to an area of 267.5 ha of which Sites 4 M50-Cedarbrook Avenue and Site 5 Barnville extend to a total of 14.0 ha.

At the time of writing in September 2023, the site comprised undeveloped greenfield sites. Both sites were unoccupied with no traffic movements in or out.

In the Dublin City Development Plan 2022 – 2028, the subject site is zoned Z14 *Strategic Development and Regeneration Area* (SDRA).

SDRA 4 Park West / Cherry Orchard guided the preparation of a new Local Area Plan for Park West / Cherry Orchard, which came into effect in November 2019. The objective of the Plan is to deliver private, council and affordable housing, schools, sports and recreational facilities, retail facilities and employment opportunities in consultation with local community and youth services.

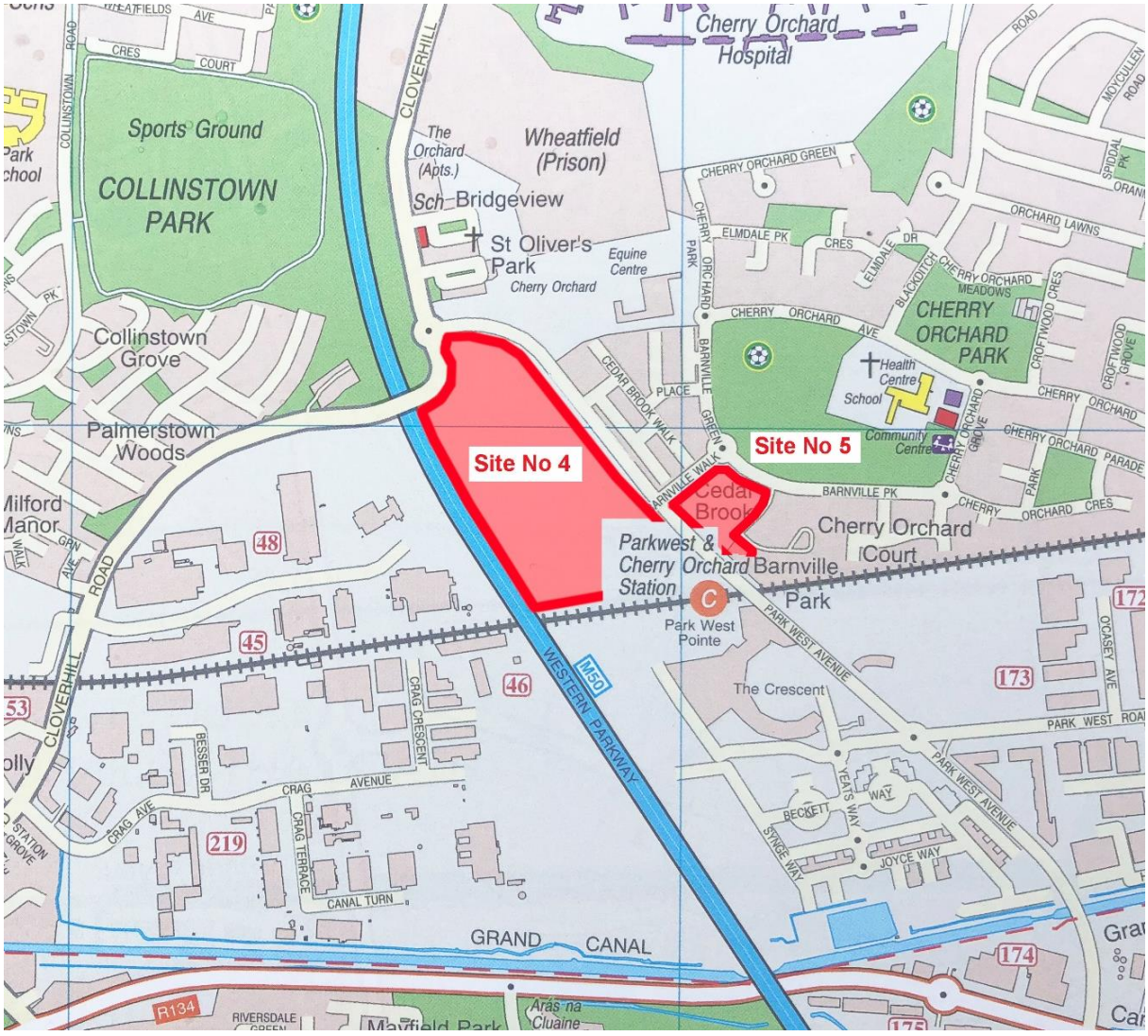

Figure 14.1 Location Map

14.3.2 Phasing

It is proposed that Sites 4 and 5 be developed in four phases as shown on Figure 14.2.

Figure 14.2 Project Phasing

14.3.3 Project Timescale

For the purpose of this EIAR, the Base Year has been taken as 2022, the Opening Year as 2027, the Design Year as 2032 (Opening Year + 5) and the future Year as 2042 (Opening Year + 15).

14.3.4 Local Road Network

The proposed development is located on either side of Park West Avenue between the R134 Nangor Road and Ballyfermot Road / Coldcut Road.

Park West Avenue is a wide single carriageway road with a north – south alignment and a posted speed limit of 50 kph. It is linked to Cloverhill Road via a roundabout junction at its northern end and to the R134 Nangor Road via a signalised crossroads at its southern end.

Park West Avenue has a 9.0-metre-wide carriageway with footpaths and cycle tracks on both sides. Speed ramps are provided for traffic calming. There are no parking restrictions. See Figure 14.3.

Figure 14.3 Park West Avenue looking north from the bridge over the railway.

14.3.5 Existing Traffic Conditions

A classified traffic survey on the roads in the area of the proposed development was carried out by IDASO on Tuesday 8th November 2022 over a period of 24 hours at the locations shown in Figure 14.4.

In addition to motorised traffic, the survey recorded pedestrians and pedal cycle movements. The survey confirmed the AM and PM Peak Hours to be 08:00 – 09:00 and 17:00 – 18:00.

From the results of the survey, the 24-hour traffic flow recorded on Park West Avenue was some 11,004 vehicles per day. The two-way traffic flow on Park West Avenue was some 1,103 vehicles per hour (vph) during the AM peak hour 8 – 9 reducing slightly to 1,046 vph during the PM peak hour 5 - 6. See Table 1.

Similarly, the 24-hour traffic flow recorded on Barnville Walk was some 4,092 vehicles per day. The two-way traffic flow on Barnville Walk was some 329 vehicles per hour (vph) during the AM peak hour 8 – 9 increasing to 422 vph during the PM peak hour 5 - 6.

The pedestrian movements recorded on Park Avenue varied from 200 persons per hour at the railway station to 40 persons per hour at Junction 4. The corresponding cycle movements varied from 6 – 18 cyclists per hour. Pedestrian and cycle movements recorded at the other junctions were significantly lower.

Section 4.5.2 of the Park West - Cherry Orchard Local Area Plan 2019 advised that

'*The road network serving Park West – Cherry Orchard experiences some traffic congestion during peak hours in areas such as Cloverhill Road, Park West Avenue and Le Fanu Road with the highest delays occurring where these roads connect to regional roads such as Ballyfermot Road and the New Nangor Road.'*

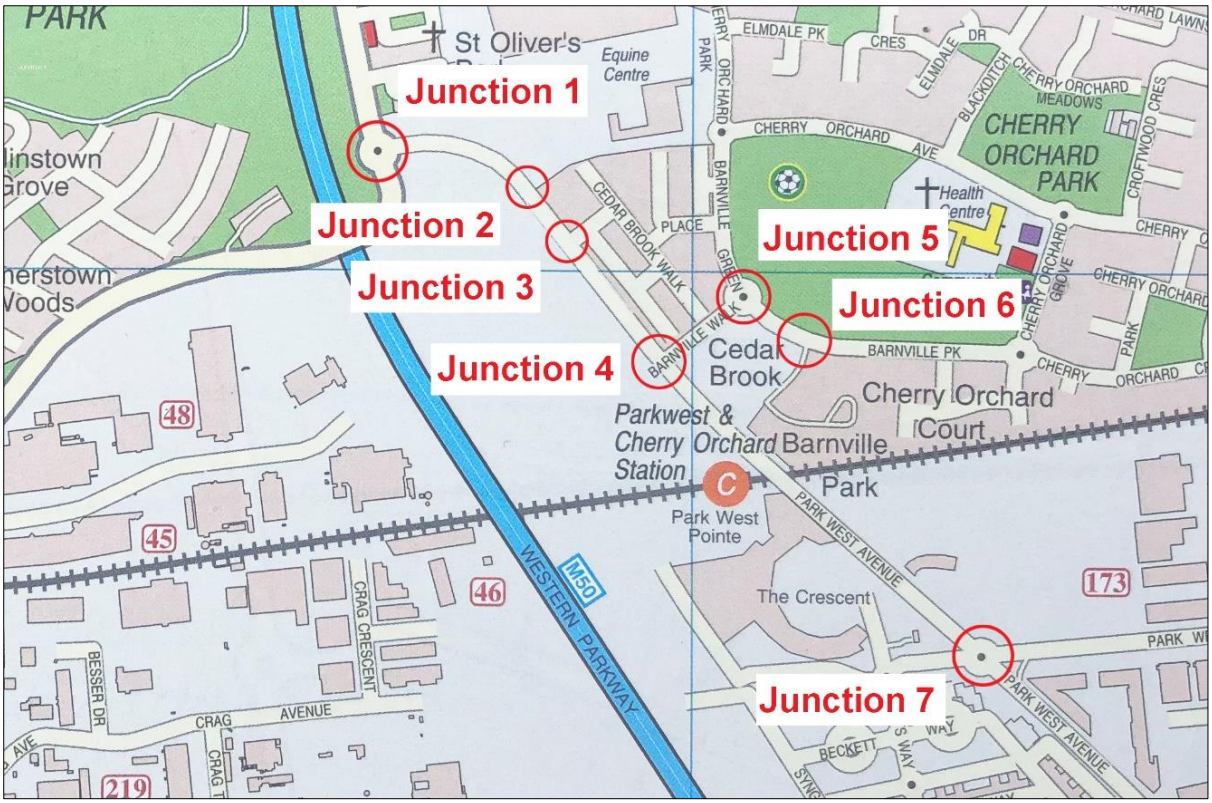

Figure 14.4 Locations of Traffic Surveys

14.3.6 Existing Bus Service

Park West Avenue

Bus services in the area of the proposed development are a combination of historic services operated by Dublin Bus and new services provided under the auspices of Bus Connects. See Figure 14.5.

Dublin Bus Routes 79 and 79a which formerly served Park West Avenue, and the Park West & Cherry Orchard Station were replaced by Bus Connects Routes G1 and 60 in October 2022. See Figure 8. Timetables for Routes G1, 60 and 151 are included in Appendix B of this TTA.

Route G1 is a 24-hour service which is part of the G spine. It links the site for the proposed development to New Wapping Street in the City Centre via Inchicore and to the Luas Red Line at the Red Cow. Services operate at 15-minute intervals in both directions Monday – Saturday reducing to 20-minute intervals on Sundays. A reduced frequency operates during the early morning and at night.

Route 60 links the site to Sir John Rogerson's Quay in the City Centre via Heuston Station and to the Luas Red Line at the Red Cow via Clondalkin. Services operate at 60-minute intervals in both directions.

Bus stops for these services are located on Park West Avenue, Barnville Walk and Cedar Brook Way.

Passenger Capacity

Based on a review of the fleet of double deck buses operated by Dublin Bus in the area of the proposed development, the average capacity of each bus including standing passengers was found to be 87 passengers per bus.

Current timetables for Routes G1 and 60 provide for 5 buses per hour in each direction with a total capacity of 435 passengers per hour in each direction (5 buses x 87 passengers per bus).

For an assessment of future capacity to cater for future demand post development, See Section 14.6.4of this TTA.

Nangor Road

Other contiguous services continue to be provided by Dublin Bus Route 151 along Nangor Road at a walking time of 16 minutes (1.3km) from the proposed development. Services operate at 20-minute intervals in both directions Monday – Saturday reducing to 30 minute intervals on Sundays. A reduced frequency operates during the early morning and at night.

Future Changes

Route 151 is due to be replaced by Routes D1 and D3 in April 2024.

14.3.7 Existing Car-Sharing Service

An existing car sharing base operated by GoCar Ireland is located at The Crescent Building in the Park West Business Park. This base is located in the Information Centre car park off Yeats Way at a walk time of 8 minutes (600 metres) from the subject site.

14.3.8 Existing Cycle Facilities

The existing cycle facilities in the area of the subject site comprise cycle tracks on both sides of Park West Road, partly on-road and partly off-road. See Figure 14.3.

14.3.9 Existing Pedestrian Facilities

Existing pedestrian facilities in the area of the subject site comprise footpaths on both sides of Park West Road, Barnville Walk, Barnville Place, Cedar Brook Walk and Cedar Brook Way.

There are no footpaths on Cedar Brook Avenue which is primarily a residential parking area.

Pedestrian crossing facilities are provided at the following locations:

- Junction 1: Uncontrolled Crossing (Cloverhill Road / Park West Avenue)
- Junction 4: Signalised Crossing (Park West Avenue / Barnville Walk).

14.3.10 Existing Rail Services

Existing Station

Park West & Cherry Orchard which opened in 2008, is an intermediate station on the Kildare Commuter Line with regular commuter and inter-city services including stopping services from Portlaoise and Newbridge to Heuston Station and from Hazelhatch & Celbridge to Grand Canal Dock. See Figure 9.

Services

In common with established practice and other transportation studies and reports, this TTA assesses the impact of the proposed development on the rail service during the AM peak.

The journey time to Heuston is some 9 - 11 minutes and the journey time to Grand Canal Dock is some 40 – 45 minutes. There are 5 existing services from Park West and Cherry Orchard to the City Centre during the AM Peak Hour 8 – 9.

At other periods outside the AM Peak, rail services at Cherry Orchard & Park West are provided between Hazelhatch and Grand Canal Street at hourly intervals.

Rail Mode Share

Section 2.9.1 of the Park West - Cherry Orchard Local Area Plan 2019 advised that

'In examining the Census data and the breakdown of sustainable modes of transport, rail represent a very low) 2%. This is despite its central location and despite 2,550 people having access to the station within a 15-minute walk.

Passenger Capacity – AM Peak

Commuter services in both directions from at Park West & Cherry Orchard are provided by four / eight car 29000 class railcar sets each with capacity of 640 / 1,280 passengers per set or a 6-car High Capacity Inter City railcar set with a capacity of 406 passengers.

For an assessment of future capacity to cater for future demand post development, See Section 14.6.3.

14.3.11 Access to Services and Amenities

Overall, walking and cycling access to the various services and amenities in the area of the subject site is good for some facilities but not so good for others.

Access is good to the rail based public transport serving an east -west corridor. Access is moderate to the bus based north-south corridor.

Access also is good to local amenities and community services.

However, access is not good to retail or other commercial services with the nearest retail provision located to the northeast in the Ballyfermot area at a walking distance of 20 – 40 minutes or a cycling distance of up to 10 minutes.

The proposed supermarket at Cherry Orchard Point is expected to make good this deficit.

14.3.12 Road Collision Statistics

Road traffic statistics for the area around the subject site are normally available on the Road Safety Authority (RSA) website www.rsa.ie.

However at the time of writing in September 2023, the RSA were in the process of reviewing their road traffic collision (RTC) data sharing policies and procedures. As a result, the RSA were unable to share record-level RTC data pending completion of this review.

14.4 Planned Future Receiving Environment

14.4.1 BusConnects

Service improvements arising from the network redesign by Bus Connects in the Ballyfermot / Clondalkin area had only been partly implemented at the time of writing in September 2023.

Services G1 and 60 illustrated on Figure 14.5 are currently operational. In the near future, both are expected to be operated by the electric buses ordered by the NTA in June 2022.

In April 2024, services D1 and D3 on Spine Route D are expected to replace Dublin Bus Route 151 along the Nangor Road.

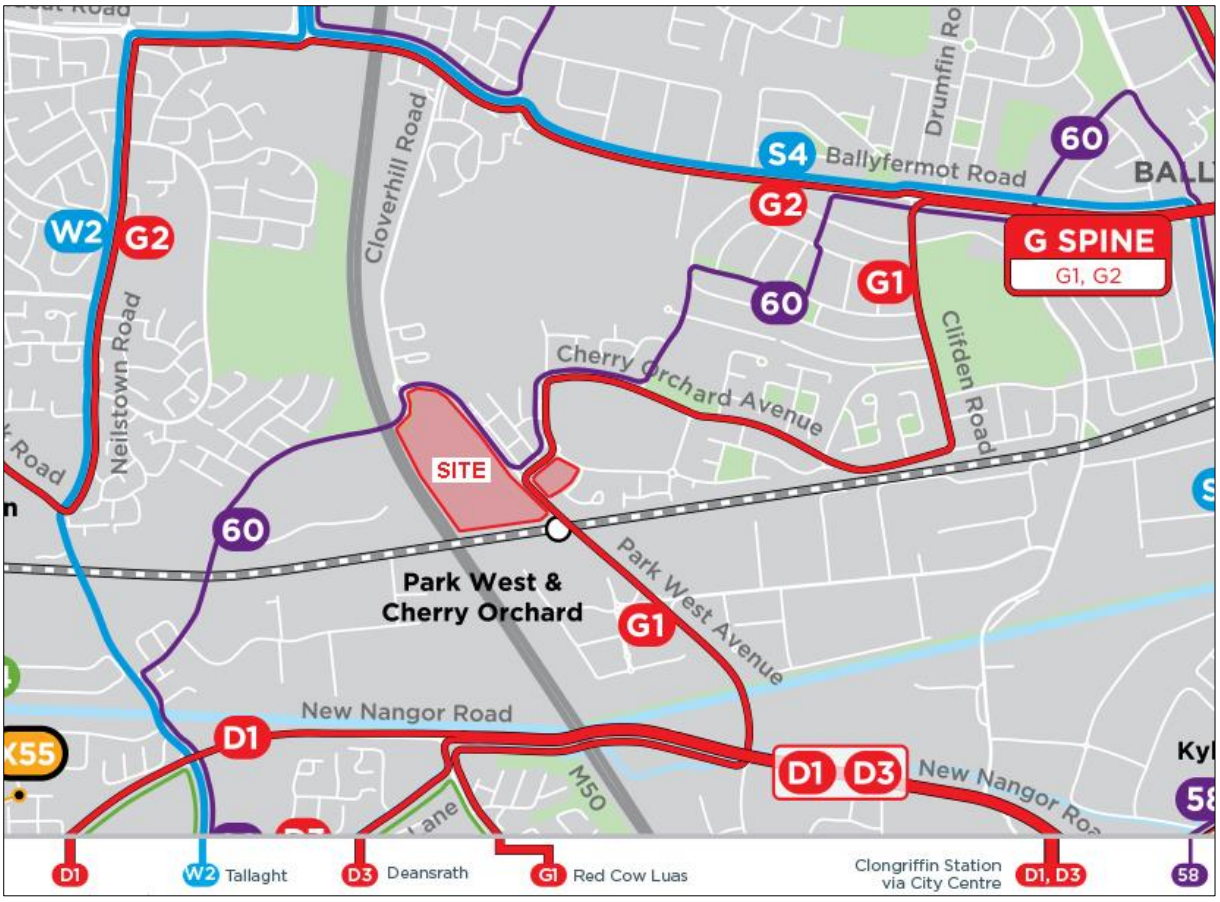

Figure 14.5 Extract from Bus Connects Map for the Ballyfermot/Clondalkin Area

14.4.2 Pedestrian and Cycling Facilities

There are a number of new pedestrian or cycling facilities proposed in the area of the subject site including: -

- New / improved off road pedestrian and cycle facilities along Ballyfermot Road as part of the Bus Connects Liffey Valley to City Centre Core Bus Corridor works.
- New / improved pedestrian and cycle facilities within the adjacent City Edge development area immediately to the east and south of the subject site
- New cycle facilities as part of the Grand Canal Greenway.

New and improved pedestrian and cycle facilities within the curtilage of the subject site are described later in this chapter.

14.4.3 Rail Improvements

The DART Expansion Project proposed by Irish Rail will deliver new electrified rail services between the existing DART network in the City Centre City Centre and Hazelhatch. The service through Park West & Cherry Orchard will provide an increased service frequency and enhanced passenger capacity.

The DART + SouthWest project illustrated in Figure 14.6 will provide:

- An increase in train frequency from the current 12 trains per hour per direction to 23 trains per hour per direction on this corridor.

- A quadrupling of passenger capacity from 5,000 passengers per hour per direction to 20,000 per hour per direction.

An application for a Railway Order for the DART+ South West project was submitted to An Bord Pleanala in March 2023.

The works proposed in the Railway Order application include

- 20km of electrification and re-signalling of the Hazelhatch and Celbridge Line to Heuston and the south city via Phoenix Park Tunnel
- Construction of a new station at Heuston West to serve the community of Clancy Quay and Island Bridge
- Four-tracking of the rail line from Park West and Cherry Orchard Station to Heuston to enhance capacity
- Civil, bridge and ancillary works as necessary to accommodate the project
- Upgrading of the Phoenix Park Tunnel
- New electric DART carriages for the DART+ Programme will be deployed on Hazelhatch and Celbridge services.

Works at Park West and Cherry Orchard will include the erection of infrastructure to support the electrification of the commuter rail services through the station.

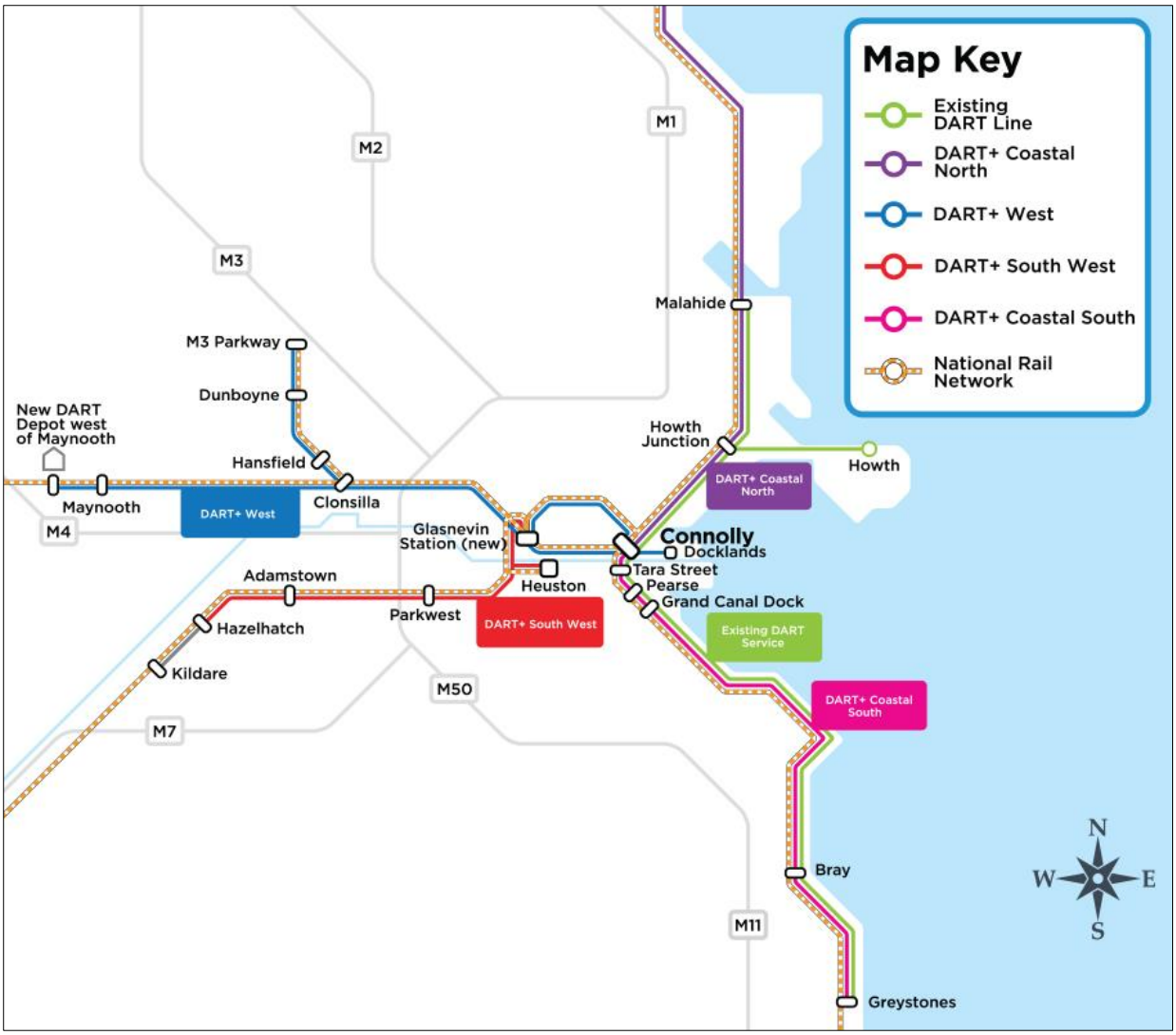

Figure 14.6 Extract from Irish Rail DART + Map.

14.4.4 Car Sharing

A total of 14 No. new car sharing facilities are proposed in the area of the subject site as part of the adjacent Park West SHD in addition to the 11 new spaces proposed on the subject site.

14.4.5 Bleeper Bike

As part of the development of Site 4, it is proposed that the operating zone for the Bleeper Bike service be extended to include Cherry Orchard Point.

14.4.6 Roads and Junctions

Proposals for new or improved roads in the area of the subject site comprise the Cherry Orchard Link Roads shown as a line of black dots on Map D of the Dublin City Development Plan 2022 – 2028. This proposal does not affect or impact on the subject site.

The applicants are not aware of any new other road or junction works proposed in the area of the subject site other than the improvements on the Clondalkin to Drimnagh Core Bus Corridor being promoted by

Bus Connects along the Nangor Road. This Corridor is located at a walking distance of some 16 minutes (1.3km) from the subject site.

14.5 Characteristics of Proposed Development

14.5.1 Description

The proposed development of Phase 1 on Site 4 at Cherry Orchard Point will comprise: -

- A total of 708 residential apartments in 9 blocks.
- A total of 4,790 sqm non-residential development comprising
  - Supermarket (2,523 sqm).
  - Retail Units (373 sqm)
  - Creche with accommodation for 25 staff and 104 children (672 sqm)
  - Community Facilities (1,222 sqm)
- A total of 444 number car parking spaces comprising
  - 159 number privately managed at surface spaces for residents.
  - 117 number spaces at lower ground / podium level (high density area) for residents
  - 92 number spaces at lower ground level for retail.
  - 34 number on street surface spaces for residents and general use on New Street
  - 18 number on street surface spaces for residents and general use on Park West Avenue
  - 7 number retail spaces on Park West Avenue (including a loading bay).
  - 6 number spaces for the Creche.
  - 11 number on street spaces for car sharing (GoCar).
- The total of 444 spaces numbers includes 22 spaces for disabled parking (5%).
- A total of 222 number spaces will be equipped with fully functional EV Charging Point(s) and the remaining 222 spaces are designed to facilitate the relevant infrastructure to accommodate future EV charging.
- Motorcycle parking (22 spaces).
- A total of 1,618 number bicycle parking spaces with 1,552 spaces for residents / visitors and 66 number spaces for customers and visitors to the supermarket, retail, creche and community.

The layout of the proposed development (Phase 1 of the overall development) is illustrated on Figure 14.7 and on the drawings included with the planning application.

Figure 14.7 Site Development Layout

14.5.2 Future Development – Phase 2

Future development of Phase 2 on Site 4 at Cherry Orchard Point is expected to comprise: -

- 53 residential houses.
- A total of 100 residential apartments in 6 blocks.
- A total of 105 number car parking spaces comprising
    - 53 spaces for houses (based on 1 space per house).
    - 50 number spaces for apartments (based on 0.5 spaces per apartment).
    - 2 number spaces for car sharing (GoCar)
- A total of 210 cycle parking spaces with 160 spaces for residents and 50 spaces for visitors.

The preliminary Phase 2 site layout can be seen in Figure 14.7.

14.5.3 Future Development – Phase 3

The future development of Phase 3 on Site 5 at Cherry Orchard Point is expected to comprise: -

- A total of 254 residential apartments in 6 blocks.
- A total of 1,200 sqm non-residential development comprising
  - Retail (800 sqm).
  - Community (400 sqm)
- A total of 142 number car parking spaces comprising
  - 127 number spaces for apartments.
  - 3 number spaces for retail.
  - 2 number spaces for car sharing (GoCar).
- A total of 544 cycle parking spaces with 533 spaces for residents / visitors and 11 spaces for customers at the retail.

The preliminary Phase 3 site layout can also be seen in Figure 14.7.

14.5.4 Future Development – Phase 4

The future development of Phase 4 on Site 4 at Cherry Orchard Point is expected to comprise: -

- Commercial units in 4 blocks (16,310 sqm).
- A total of 82 number car parking spaces.
- A total of 300 cycle parking spaces with 218 spaces for staff and 82 spaces for visitors.

The preliminary Phase 4 site layout can be seen in Figure 14.7 and on the drawings included with the planning application.

14.5.5 Overall Development

The overall development of Phases 1, 2, 3 and 4 on Sites 4 and 5 at Cherry Orchard Point is expected to comprise: -

- 1,115 residential units comprising: -
  - 53 number Houses.
  - 1,062 number Apartments (708 + 100 + 254).
- Total non-residential development of 22,300 sqm comprising:
  - 1 number Supermarket (2,523 sqm).
  - 3 number Retail (222 sqm + 151 sqm + 800 sqm).
  - 1 number Creche (672 sqm).
  - 4 number Commercial (16,310 sqm).
  - 2 number Community (1,222 sqm + 400 sqm).
- 763 number car parking spaces (444 + 105 + 132 + 82).
- 2,537 number cycle parking spaces (1,618 + 210 + 409 + 300).
- 22 number motorcycle parking spaces.

The overall site layout can be seen in Figure 14.7 and on the drawings included with the planning application.

14.5.6 Design Population

The proposed development will comprise a total of 708 apartments with 1,174 bedrooms and a design population of 2,247 persons.

14.5.7 Access Points

Access to the proposed development on Site 4 Phase 1 is proposed from four junctions on Park West Avenue as shown on Figures 14.7 and 14.8.

Three of the four junctions on Park West Avenue will be at-grade with priority control. Sightlines at these junctions will comply with the requirements of DMURS.

The fourth junction will from an at-grade signalised crossroads with Barnville Park. The signals at this junction will incorporate cycle and pedestrian phases.

Access to Site 5 will be from an at-grade priority junction to be located on Barnville Park.

Access to the cycle parking provided is shown on the architectural and engineering drawings included in the planning application.

14.5.8 Internal Layout

The proposed internal layout on Site 4 Phase 1 including roads, cycle facilities and pedestrian facilities.is shown reproduced in Figure 14.8.

The pedestrian and cycle access to the proposed development have been integrated with the proposals for the surrounding road network.

This development provides for upgraded footpaths and cycle tracks on the Park West Avenue together with pedestrian and cycle phases in the signalised junction at Barnville Walk.

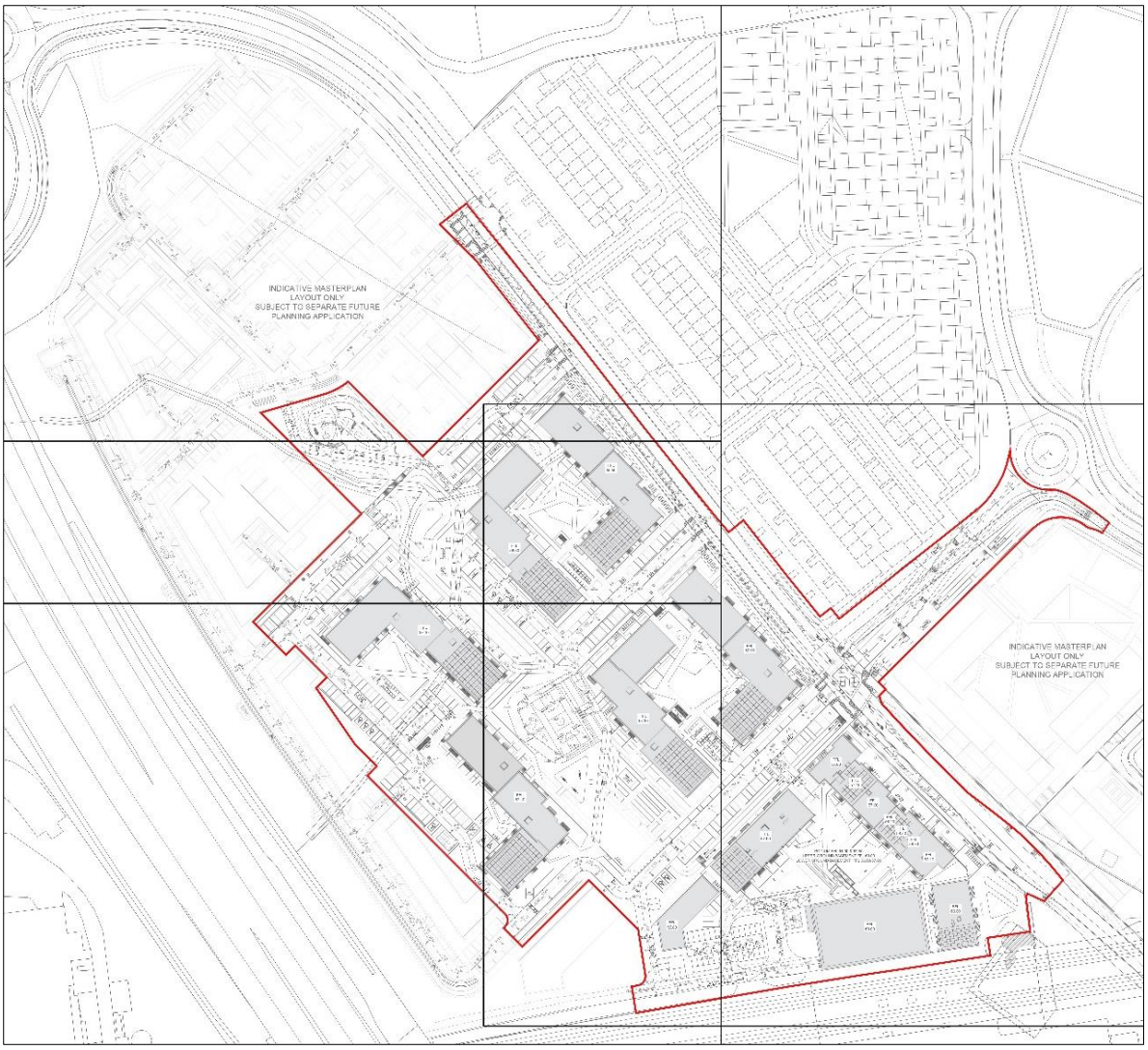

Figure 14.8 Proposed Road Layout

14.5.9 Proposed Car Parking

A total of 444 number car parking spaces will be provided in Phase 1 comprising: -

- 159 number privately managed at surface spaces for residents (including 8 number spaces for disabled).
- 117 number spaces at lower ground / podium level (high density area) for residents (including 6 number spaces for disabled).
- 92 number spaces at lower ground level for retail (including 5 number spaces for the disabled).
- 34 number on street surface spaces for residents and general use on New Street (including 2 number spaces for disabled).
- 18 number on street surface spaces for residents and general use on Park West Avenue / New Street (including 1 number space for disabled).
- 7 number retail spaces on Park West Avenue (including a loading bay).
- 6 number spaces for the Creche with 3 spaces at the rear allocated to staff and 3 spaces at the front designated for drop-off / collection.
- 11 number on street spaces for car sharing (GoCar).

The locations of the car parking spaces are shown on Figure 14.8 and on the architectural and engineering drawings included with the planning application.

14.5.10 Car Park Management

Permits for access by residents to the 276 private spaces will be issued by the Management Company on a first come first served basis with not more than one permit per unit.

Operation of the 109 spaces for the supermarket (92 spaces), creche (6 spaces) and car sharing will be controlled by the Management Company.

For residents who require occasional car use without the need to own a vehicle, 11 spaces will be permanently allocated for car sharing with vehicles supplied by GoCar or similar company.

Operation of the 59 on-street spaces including Pay & Display and permits will be managed by Dublin City Council.

14.5.11 Proposed Cycle Parking

In compliance with Section 3.0 of Appendix 5 of the Dublin City Development Plan 2022 – 2028, it is proposed that a total of 1,618 cycle parking spaces be provided within the proposed development.

A total of 1,601 spaces are required to meet the standards of the City Development Plan and a total of 1,618 spaces are provided.

The locations of the spaces are shown on the architectural and engineering drawings included in the planning application.

Shower / changing facilities for staff will be provided in accordance with Section 3.2 of Appendix 5 of the City Development Plan.

14.5.12 Proposed Motorcycle Parking

The parking provision for motorcycles within the proposed development will be 22 spaces (5% of the car parking provision) at various locations around the development.

These locations are shown on the architectural and engineering drawings included with the planning application.

14.5.13 Servicing and Deliveries

Deliveries to and waste collection from the supermarket in Site 4 will take place at the dedicated service yard located at the supermarket.

Deliveries to the retail units in Site 4 will take place from the loading bay on Park West Avenue.The operational hours proposed for the loading bays are 07h00 – 19h00 Monday – Saturday.

The following short stay transport related activities by residents will be facilitated off the internal road network:

- Drop Off / Collection by car or taxi.
- Moving In / Moving Out including furniture delivery and removal.
- Courier / Parcel Collections and deliveries.
- Accessible spaces for disabled parking (22 spaces).

Tracking for refuse freighter and fire tender is shown on the engineering drawings included with the planning application.

14.6 Predicted Impacts

14.6.1 Predicted Traffic Impact - Construction Stage

Construction Traffic Access Routes

Construction traffic routes to the proposed development are facilitated by the high standard of the existing road network in the surrounding area.

The primary construction access route is expected to be from the R134 Nangor Road via Park West Avenue. The secondary construction access would be from Ballyfermot Road / Coldcut Road via Cloverhill Road and Park West Avenue. See Figure 14.9.

At the time of writing in September 2023, both of the proposed construction access routes are fully operational and open to traffic including road markings and traffic signals.

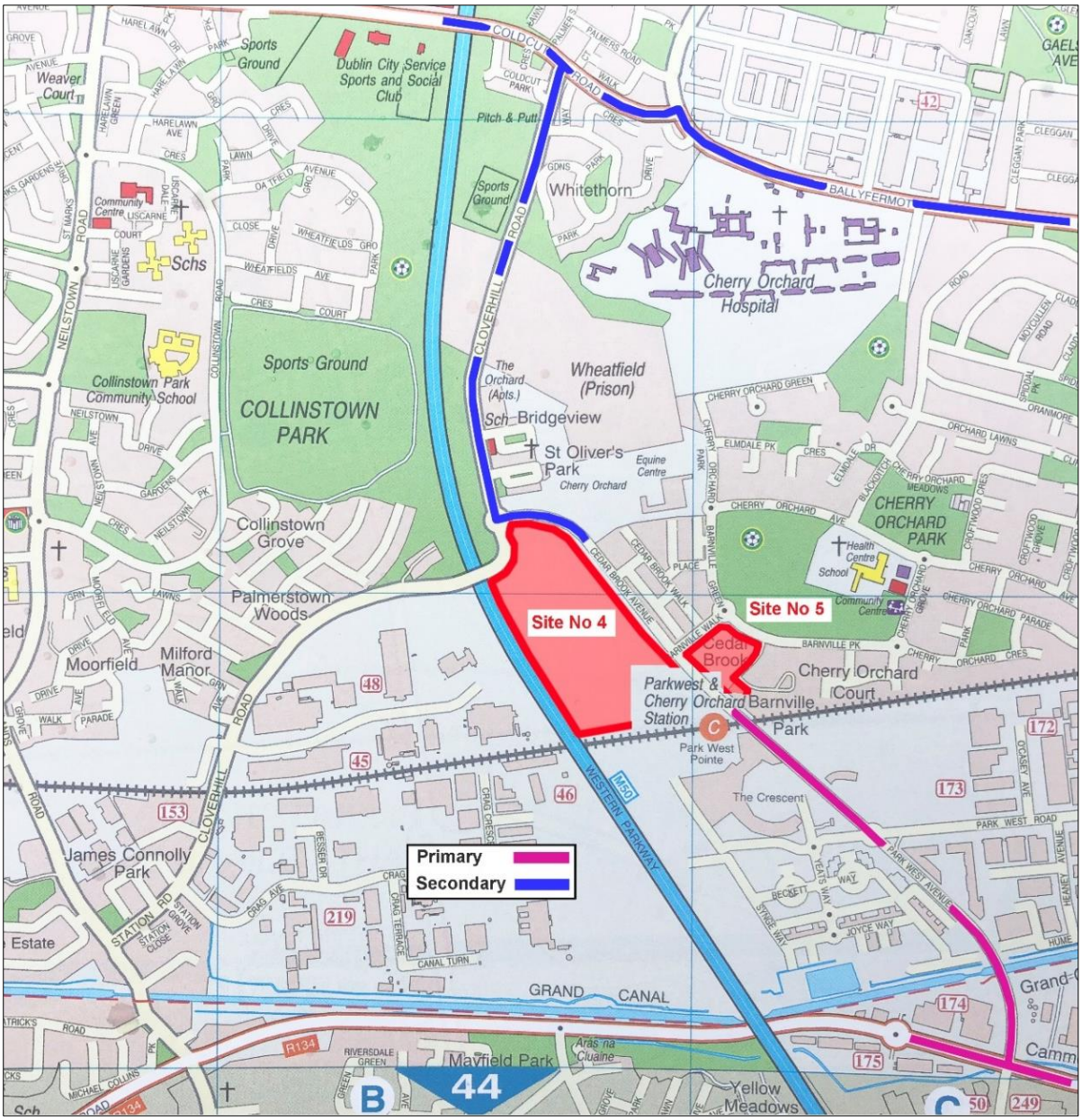

Figure 14.9 Construction Traffic Access Routes

14.7 Construction Traffic Volumes

During the construction stage 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 construction related heavy goods vehicle movements to and from the application site will be no more than 3 arrivals/departures per hour, with the majority of the trips undertaken outside the network AM and PM peak hours. In addition, traffic movements generated during the earthworks phase of the development are predicted to generate an average of 24 arrivals and 24 departures per working day equivalent to 3 arrivals and 3 departures per hour.

Allowing for other concurrent on-site activities during the same period particularly completion and fit-out to Phase 1, the construction related truck movements are expected to peak at 5 arrivals and 5 departures per hour during a 10-hour day between 08.00 and 18.00.

The general workforce is likely to be c. 100 in number, reaching up to 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 is expected to attract/generate 40-60 number of cars / vans per day, with up to 50% the trips being undertaken outside the AM and PM peak hours.

Based on the above, it is estimated that the daily construction traffic movements during the AM Peak Hour 08.00 – 09.00 is predicted to be:

- Car / Van 20 arrivals and 3 departures per hour
- HGV: 5 arrivals and 5 departures per hour
- Total 33 movements per hour.

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 operational phase and most of the trips will occur outside of the traditional peak hours.

Parking During Construction

Off-street parking for construction staff will be provided on the Phase 2 site where a construction carpark will be created at the start of works by the laying of a temporary surface for vehicles. Parking will not be provided for construction staff on public roads. Construction staff will be encouraged to reduce the use of the car for the journey to work by car sharing and / or travelling by public transport. Workers will be encouraged to keep themselves informed about the public transport options and active mode facilities provided in the surrounding area.

14.7.1 Predicted Traffic Impact - Construction Stage

The traffic movements predicted to be generated during the construction stage represent some 3.0% of the existing traffic flow of 1,103 vehicles per hour on Park West Avenue during the AM Peak. This increase is less than the 10% threshold set out in the *Traffic and Transport Assessment Guidelines* published by TII in May 2014 and as a result, no further transportation assessment is required.

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 operational stage. 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 operational problems.

Summary of Traffic Impacts – Construction Stage

Having regard to the predicted impacts described above, it can be concluded that no significant impact on roads and traffic will arise from the Construction Stage of the proposed development at Cherry Orchard Point.

14.8 Predicted Traffic Impact – Operational Stage – Roads and Junctions

The traffic impact of the Cherry Orchard Point on the surrounding road network was assessed by modelling the projected traffic movements in future years on the surrounding road network including the junctions.

14.8.1 Future Base Traffic Flows

The methodology adopted for the determination of base flows for future years is described below.

Firstly, the AM and PM peak traffic hours were extracted from the traffic survey carried out by IDASO in November 2022.

Secondly and in line with the '*Transport Assessment Guidelines (May 2014)*', the years to be assessed were selected to be:

- 2022 Base Year:
- 2027 Opening Year:
- 2032 Design Year (Opening Year + 5)
- 2042 Future Year (Opening Year + 15)

Thirdly, the base traffic flows for the selected future years were obtained by factoring up the 2022 baseline traffic flows using factors from the TII Publication – *Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections* (May 2021).

The Central Growth Rate factors extracted from Table 6.1 of that publication are set out below.

- 2022 – 2027: 1.084
- 2022 – 2032: 1.149
- 2022 - 2042: 1.201

For the purpose of cumulative impact, the base flows for the seven selected junctions for 2027, 2032 and 2042 included traffic forecast to be generated by the contiguous Park West development 3.

14.8.2 Trip Generation

Trip generation for Site 4 and Site 5 has been estimated based on latest version of the Trip Rate Information Computer System (TRICS). As the proposed development includes a number of different land use, trip rates were obtained for the AM and Pm peaks for each of the proposed land use categories. Trip generation for the Commercial units has been calculated based on the 82 car parking spaces proposed to serve them.

The proposed site layout for Phases 1, 2 and 4 on Site 4 incorporates four access points onto Park West Avenue. Based on a total of 862 residential units, 16,310 sqm Commercial and supporting development, the total number of peak hour trips generated by the development of Site 4 is expected to be 413 in the AM and 459 in the PM Peak.

The proposed site layout for Phase 3 on Site 5 incorporates one access point onto Barnville Park. Based on a total of 254 residential units and supporting development, the total number of peak hour trips generated by the development of Site 5 is expected to be 108 in the AM and 130 in the PM Peak.

14.8.3 Trip Distribution

The trip distribution assumed for Site 4 the AM and PM Peaks was based on the assumption that: -

- 35% would travel in a northerly direction travel north to/from the proposed development.
- 25% would travel in an easterly direction to/from the proposed development.
- 40% will travel in a southerly direction to/from the proposed development.

The trip distribution assumed for Site 5 the AM and PM Peaks was based on the assumption that: -

- 25% would travel in a northerly direction travel north to/from the proposed development.
- 240% would travel in an easterly direction to/from the proposed development.
- 35% will travel in a southerly direction to/from the proposed development.

14.8.4 Development Generated Traffic

The predicted number of trips in the AM Peak Hour is 194 inbound and 219 outbound from Site 4 and 43 inbound and 65 outbound from Site 5.

The predicted number of trips in the PM Peak Hour is 216 inbound and 243 outbound from Site 4 and 72 inbound and 58 outbound from Site 5.

14.8.5 Post Development Traffic Flows

The post development traffic flows for 2027, 2032 and 2042 were obtained by adding the distributed trips generated by the proposed development to the Base Flows. These post development traffic flows were then used in the assessment of the sr4urrioundung junctions.

Modelling Software

There are various modelling software packages available to assess every type of junction. Waterman Moylan uses ARCADY, TRANSYT and PICADY to analyse roundabouts, signalised and priority junctions, respectively.

ARCADY is a software for modelling roundabouts. This programme utilises roundabouts geometry and traffic flows input by the user to determine Ratio of Flow to Capacity (RFC) and queue length for each link on the roundabout.

TRANSYT (Traffic Network Study Tool) software is a widely accepted software for modelling signalled controlled junctions. This programme utilises the phases input by the user and optimises their timings over a cycle time. The outputs of a TRANSYT assessment include a Degree of Saturation percentage (DOS%) figure and queue length for each link on the road network.

PICADY is a software for modelling priority-controlled junctions. This programme utilises junction's geometry and traffic flows input by the user to determine Ratio of Flow to Capacity (RFC) and queue length for each link on the junction.

Future Traffic

The future traffic used in the assessment of the surrounding road network during the Operational Stage has been based on the trips generated by the following developments: -

- The proposed development of Phases 1, 2 and 4 on Site 4.

- The future development Phase 3 on Site 5.
- The contiguous development at Park West SHD on Site 6.

The traffic from these development was not included in the traffic survey as they were all still at the pre-construction stage.

Junctions Assessed

The following junctions on the surrounding road network were assessed for the Operational Stage:

- Junction 1: Cloverhill Road / Park West Avenue / Station Road.
  Junction 1 is an existing Three-arm Roundabout.
- Junction 2: Park West Avenue / Cedar Brook.
  Junction 2 is an existing Priority T-junction proposed to be upgraded to a Signalised Crossroads.
- Junction 3: Park West Avenue / Cedar Brook Walk.
  Junction 3 is an existing Priority T-junction proposed to be upgraded to a Priority Staggered Junction.
- Junction 4: Park West Avenue / Cedar Brook Way.
  Junction 4 is an existing Signalised T-junction proposed to be upgraded to a Signalised Crossroads.
- Junction 5: Unnamed Road / Cedar Brook Way.
  Junction 5 is an existing Three-arm Roundabout.
- Junction 6: Barnville Park / Unnamed Road.
  Junction 6 is an existing Priority T-junction.
- Junction 7: Park West Avenue / Park West Road.
  Junction 7 is an existing Four-arm Roundabout.
- Junction 8: Park West Avenue / Site Access.
  Junction 8 is a proposed Priority T-junction.

Locations of Junctions

The locations of the assessed junctions are shown in Figure 14.10.

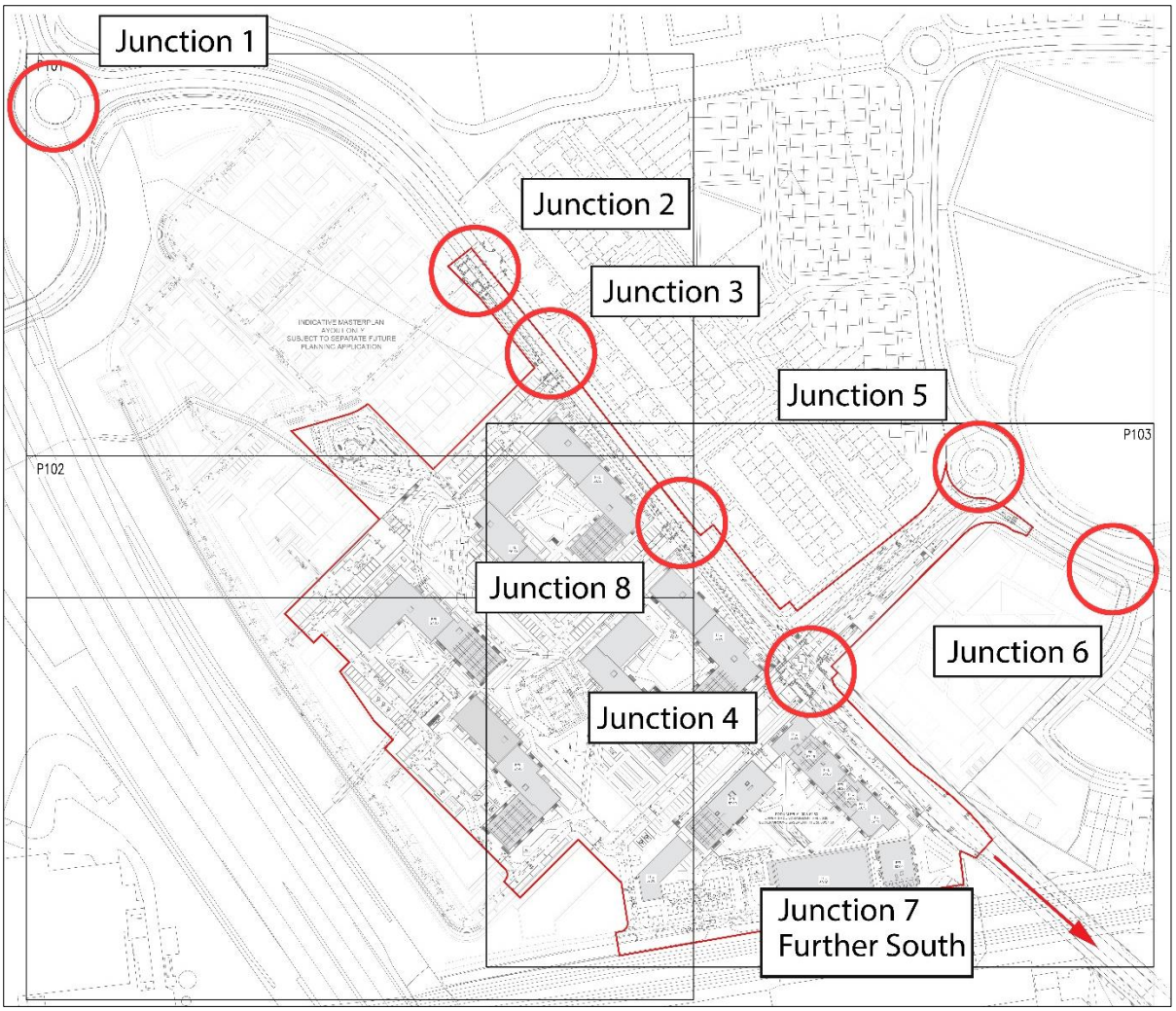

Figure 14.10 Locations of Junctions Assessed

Percentage Traffic Impact

The extent of the traffic impact from the proposed development was determined by initially checking where generated traffic would exceed 10% of the 2022 baseline traffic flow on the adjoining road or 5% on the road where congestion exists, or the location is sensitive. This is in line with the *Traffic and Transport Assessment Guidelines* published by TII in May 2014. The predicted increase in traffic increase at all of the assessed junctions is greater than 10% as shown in Table 14.1. Therefore, further assessment was required.

The proposed / upgraded junctions have been modelled for the DO-SOMETHING scenarios, whilst the existing junctions were modelled for the BASELINE and DO-NOTHING scenarios.

Table 14.1 Increase in Traffic Flows at Junctions

Junction	AM Baseline	PM Baseline	Proposed Development AM	Proposed Development PM	% Increase AM	% Increase PM
Junction 1	1,404	1,204	177	200	13%	17%
Junction 2	1,040	991	260	291	25%	29%
Junction 3	1,059	1,003	260	291	25%	29%
Junction 4	1,164	1,153	401	452	34%	39%
Junction 5	355	457	184	212	52%	46%
Junction 6	109	137	129	153	118%	112%
Junction 7	1,964	1,707	203	229	10%	13%
Junction 8	893	834	280	314	31%	38%

Results of Junction Modelling

Notwithstanding that he traffic impact from the proposed development is predicted to be 10% or greater at all of the seven road junctions included in the traffic modelling undertaken for this project, the results of the traffic modelling predict that all of assessed junctions, except Junctions 4 and 7, will operate within capacity in the AM and PM peaks hours with the proposed development in place in the Opening Year 2027 through the Design Year in 2032 to the Future Year 2042.

For the DO-NOTHING scenario 2027, Junction 7 is indicated to operate marginally above capacity in the PM Peak Hour even without the inclusion of the proposed development trips. It is likely that Junction 7 will require upgrading, most likely to a signalised crossroads, by Dublin City Council about 2027 with or without development at Cherry Orchard Point.

For the DO-NOTHING scenario, Junction 4 is predicted to operate within capacity and will continue to do so for during 2027, 2032 and 2042, should the proposed development not take place.

For the DO-SOMETHING scenarios, Junction 4 is predicted to operate above capacity during 2027, 2032 and 2042 in both peak hours with the inclusion of the proposed development trips.

Junction 4 has been designed in compliance with current national and local policies which prioritise cycle and pedestrian movements over road traffic. The restricted capacity proposed at Junction 4 is largely due to the application of these policies when an alternative design for traffic movements albeit with longer crossing times for pedestrian and cyclists could bring the junction within capacity for 2027, 2032 and 2042.

Summary of Predicted Impacts – Operational Stage – Roads and Junctions

Having regard to the predicted impacts described above, it can be concluded that no significant impact on roads and traffic will arise from the Operational Stage of the proposed development at Cherry Orchard Point.

14.8.6 Predicted Traffic Impact – Operational Stage - Rail Services

The traffic impact of the Cherry Orchard Point on the surrounding public transport network and services was assessed by modelling the projected traffic movements in future years on the surrounding road network including the junctions and by reviewing the future passenger loadings in relation to capacity for public transport, both rail and bus.

Passenger Demand

Based on a design population of 2,247 persons (Table 4 of the Traffic & Transport Assessment) and a modal spilt of 20 – 30% (Table 16 of the Transport & Traffic Assessment), and peak demand from the proposed development for travel by rail is expected to be 449 – 674 passengers during the AM Peak Hour.

(2,247 persons x 20 – 30% split = 449–674 passengers per hour)

Based on the location of Park West, it is expected that 75% of these passengers can be expected to travel eastbound towards the City Centre with 50% travelling during the AM Peak Hour giving a projected demand of 168 –253 passengers per hour eastbound during the AM Peak Hour

(449–674 passengers per hour x 50% AM Peak x 75% eastbound = 168–253 passengers per hour).

Train Capacity

There are five existing rail services departing Park West & Cherry Orchard during the AM Peak Hour 08.00 – 09.00 (Table 2 of the Traffic and Transport Assessment). Commuter services in both directions at Park West & Cherry Orchard are provided by four / eight car 29000 class railcar sets each with capacity of 640 / 1,280 passengers per set or a 6-car High Capacity Inter City railcar set with a capacity of 406 passengers.

The use of the 29000-class railcar sets in lieu of the Inter City railcar sets on one of more of the five services to the City Centre between 08.00 and 09.00 would significantly increase the overall passenger capacity for commuters.

Demand v Capacity

The demand of 168 –253 passengers per hour during the AM Peak Hour is well below the minimum capacity of 2,030 persons per hour provided between 08.00 and 09.00 towards the City Centre by five 6-car High Capacity Inter City railcar sets each with a capacity of 406 passengers.

(449 - 674 per day x 50% AM Peak Hour x 75% eastbound = 168 – 253 passengers per hour).

The conclusion of this assessment is that the future capacity of the rail service at Park West and Cherry Orchard will be more than sufficient to cater for future passenger demand from Cherry Orchard Point even without the additional capacity that can readily be provided by the rostering of 29000 class railcar sets in lieu of the Inter City sets prior to commissioning of the high-capacity DART+ South West services.

Summary of Predicted Impact – Operational Stage – Rail Services

Having regard to the predicted impacts described above, it can be concluded that no significant impact on rail based public transport services will arise from the Operational Stage of the proposed development at Cherry Orchard Point.

14.8.7 Predicted Traffic Impact – Operational Stage –Bus Services

Passenger Demand

Based on a design population of 2,247 persons (Table 4 of the Traffic & Transport Assessment) and a modal spilt of 20 – 30% (Table 16 of the Traffic and Transport Assessment), the peak demand from the proposed development for travel by bus is expected to be 449 – 674 passengers during the AM Peak.

(2,247 persons x 20 – 30% split = 449–674 passengers per hour)

Based on the location of Park West, it is expected that 50% of these passengers can be expected to travel towards the City Centre with 50% travelling during the AM Peak Hour.

(449 – 674 per day x 50% AM Peak Hour x 50% northbound = 112 – 168 passengers per hour)

Bus Capacity

Based on a review of the fleet of double deck buses operated by Dublin Bus in the area of the proposed development, the average capacity of each bus including standing passengers was found to be 87 passengers per bus.

Current timetables for Routes G1 and 60 provide for 5 buses per hour in each direction with a total capacity of 435 passengers per hour in each direction (5 buses x 87 passengers per bus).

Demand v Capacity

The demand of 112 – 168 passengers per hour during the AM Peak Hour is well within the existing capacity of 435 passengers per hour provided by the current timetable (5 buses x 87 passengers per bus).

The capacity of the bus services used in this review is the existing startup schedule on the new Bus Connects routes. These schedules are expected to be increased by Dublin Bus through timetable changes as demand increases.

The capacity used in this TTA is for buses passing Park West & Cherry Orchard Station only and does not include contiguous services on Nangor Road or Ballyfermot Road a relatively short walk from the proposed development.

The conclusion of this assessment is that the future capacity of the bus service at Park West and Cherry Orchard will be more than sufficient to cater for future passenger demand from Cherry Orchard Point even without the benefit of the additional services which can be provided by increased frequency as passenger demand builds up.

Summary of Predicted Impact – Operational Stage – Bus Services

Having regard to the predicted impacts described above, it can be concluded that no significant impact on bus based public transport services will arise from the Operational Stage of the proposed development at Cherry Orchard Point.

14.9 Do Nothing Scenario

Sites 4 and 5

As set out in Section 13 of the Dublin City Development plan 2022 – 2028, Dublin City Council have zoned the subject site Z14 *Strategic Development and Regeneration Area* (SDRA).

SDRA 4 Park West / Cherry Orchard guided the preparation of a new Local Area Plan (LAP) for Park West / Cherry Orchard, which came into effect in November 2019. The objective of the LAP is to deliver private, council and affordable housing, schools, sports and recreational facilities, retail facilities and employment opportunities in consultation with local community and youth services.

Should the proposed development not take place, the subject site will continue to comprise undeveloped unoccupied greenfield lands with no traffic movements in or out and a key objective of the Development Plan will not be achieved. Background traffic will however continue to increase in line with the TII Travel Demand Predictions for the Dublin area.

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, is likely to be established on this site at some stage in the future.

The benefits from the proposed development at Cherry Orchard Point including junction upgrade works, pedestrian routes, cycle paths, etc. would improve the current setting. The Do-Nothing scenario would result in no improvement measures or provision of residential accommodation.

General Traffic

Should the proposed development not take place, background traffic on the road network in the surrounding area will r continue to increase in line with the TII Travel Demand Predictions for the Dublin area.

Junction 7

Junction 7 is an existing four-arm roundabout located at the junction of Park West Avenue and Park West Road south of the railway bridge. There are no proposals to upgrade this junction.

For the DO-NOTHING scenario, even without the inclusion of the proposed development trips, the results of the junction assessment predicted that Junction 7 will continue to operate within capacity in the AM Peak Hour up to 2042 but not so in the PM Peak Hour. During the PM Peak Hour, Junction 7 is predicted to reach capacity in 2027 and exceed capacity in 2042 on Park West Road (W) during the PM Peak Hour departures.

In summary, Junction 7 is likely to require upgrading by Dublin City Council, most likely to a signalised crossroads, about 2027 with or without development at Cherry Orchard Point.

14.10 Potential Cumulative Impacts

For the purpose of cumulative impact, the Traffic and Transport Assessment Guidelines, issued by TII in May 2014 require that *'Traffic and Transport Assessment should consider all committed developments within the vicinity of the site. This includes sites which have previously been granted planning permission, but which are yet to become operational as well as any planning applications that have been submitted but have yet to be determined.'*

Cumulative traffic impacts may arise where there are a number of existing or proposed developments, which may affect the traffic at this development and the traffic flows in the surrounding area.

Scoping for TTA

The Scoping for TTA prepared by Waterman Moylan in September 2022 identified that, in addition to the trips that will be generated by the future development of Sites 4 and 5, the trips that would be generated by the approved Park West SHD development on Site 6 should be included in the traffic assessment for the subject site.

Approved Development on Site 6

Planning permission for a residential development of 750 units and 552 car parking spaces (Including 14 spaces for car sharing) on a 9.4 ha site at Park West, Dublin 12 was granted by An Bord Pleanala to Greenseed Ltd in June 2022 subject to 29 conditions (ABP Reg Ref 312290-21). The site included the Aspect Hotel which is located some 5 minutes' walk from Site 4 (400m).

Other Projects

No other significant construction projects have been identified in the area of the subject site which would result in a significant cumulative impact on Traffic and Transport either during the construction or operational stages.

However, measures currently being considered by NTA, TII and Dublin City Council for the intensification of public transport services and cycle facilities in the surrounding area are likely to have a cumulative long term significant impact.

Future Increase in Traffic Flow

The traffic growth factors described in Section 14.6.2 above are derived by the Transport Infrastructure Ireland (TII) II and make an allowance for traffic growth due to future This is in line with industry standards and best practice. The traffic modelling undertaken for the subject development includes the growth factors from the TII publication – *Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections* and therefore the potential cumulative impacts have been considered as part of this proposal.

Other Future Developments – Park West and Cherry Orchard LAP.

Any future development in the area around Cherry Orchard Point is likely to increase the traffic volumes on the surrounding road and therefore a full Traffic and Transport Assessment will be prepared and appropriate mitigation measures implemented for any such future developments.

14.11 Mitigation Measures

14.11.1 Construction Stage

The primary mitigation and monitoring measures during the Construction Stage will be the implementation by the selected Contractor of the *Construction Management Plan* and the *Construction Traffic Management Plan*.

The assessment of predicted impacts concluded that the construction stage of the proposed development is not anticipated to impact on the operational performance of the local road network. However, good practice requires the preparation of a Construction Management Plan (CMP) and a Construction Traffic Management Plan (CTMP), both of which set out measures to manage construction traffic.

Due to the proximity of the subject site to bus and rail services together with existing cycle lanes, it is intended to limit parking for construction staff and to encourage the use of car sharing and public transport.

The main Contractor as part of their site set up arrangements, will appoint a Coordinator responsible for the implementation of the Construction Stage Mobility Management and Travel Plan and shall carry out the following tasks as part of their role:

- Provide an extensive information service for public transport options and routes at a public location(s) within the development for construction workers.
- Update the public transport information adjacent to the development on an ongoing basis; and
- Advise company staff of tax incentives for public transport and bicycles.

For those wishing to cycle to and from the development, dedicated cycle parking will be provided for the duration of the works within the site. Shower facilities and lockers will also be provided.

Adequate signposting will be located on-site to ensure the safety of all road users and construction workers.

Dedicated construction haul routes will be identified and agreed upon with Dublin City Council before the commencement of construction activities on site.

A dedicated “construction site”’ access/egress system will be implemented during the construction phases. Hoarding will be set up around the perimeter to prevent pedestrian access.

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

A detailed Construction and Traffic Management Plan (CTMP) will be prepared by the contractor and agreed with Dublin City Council before commencing works on site.

The contractor will be obliged to ensure that any sub-contractors engaged on the site are made fully aware of the required mitigation measures and that they are properly implemented as part of any works that they undertake.

14.11.2 Operational Stage

The primary mitigation and monitoring measure during the Operational Stage will be the implementation of the *Mobility Management and Travel Plan.*

To reduce traffic impact, mitigate against possible overspill car parking and to promote more sustainable modes of transport, a Mobility Management and Travel Plan has been prepared for the development and will be updated on an ongoing basis.

The proposed development will include car parking for residents at less than the maximum rate set out in the Dublin City Development plan 2022 – 2028. The level of car parking proposed has been informed by national standards for transport strategy and car parking for new apartments. The implementation of the measures set out in the Mobility Management and Travel Plan are designed inter alia to promote non-car modes of travel thereby discouraging high levels of car ownership and demand for car parking from residents.

A management company will be appointed by the developer to manage the development. A senior member of staff from the management company who supports the philosophy of the Plan will be appointed as the Coordinator. The Coordinator will be responsible for:

- Implementation and maintenance of the Plan.
- Monitoring progress of the Plan
- Liaison with public transport operators and officers of the Planning and Roads Authority.
- Production of information reports for the developer, the occupier(s) and the Planning and Road Authorities; and
- Ongoing assessment of the objectives of the Plan.

Up to date, local bus and rail timetables will be maintained within the resident amenity areas and other fixed points within the buildings on the site. Residents will be advised of their location. In addition, internet access to travel information will be provided. The developer will provide all new residents with a travel pack showing alternative modes of travel to the development. Where possible, the developer will advise visitors to the site of alternative modes of travel to that of the car.

Adequate and secure bicycle parking facilities with a total of 1,618 spaces will be provided within the development for residents, visitors, Creche users and staff. Local cycle route information will also be provided in the resident amenity areas and at other fixed points within the development. Residents will be advised of these locations.

The Mobility Management and Travel Plan Co-ordinator will be responsible for the management of inappropriate parking within the development. This parking management will ensure that spaces are reserved for those who have been allocated the space and will be accessible only to those users.

14.12 Residual Impacts

14.12.1 Construction Stage

Development traffic during the construction stage is predicted to have a low-level impact on surrounding road network in comparison to the existing baseline traffic flows. The preparation and implementation of a detailed Construction Traffic Management Plan (CTMP) to manage construction traffic will further mitigate any residual impacts.

In line with their experience working on projects of this scale in similar locations, the developer will build a construction car park on the Phase 2 site at the start of works by laying a temporary surface for vehicles. Staff are likely to arrive to site before 8am, before the morning peak hour of 8am -9am. However staff are likely to leave during the peak PM hour of 5-6pm. As the number of construction staff on site will be less than the number of people on site post development, the number of additional vehicles can be accommodated.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, which will be addressed by the Contractor as part of the Construction Traffic Management Plan (CTMP) and which will be approved by Dublin City Council (DCC). On this basis, construction will likely have a negligible impact on pedestrian and cyclists.

Due to the proposed mitigation measures outlined above, the residual impact of the proposed development will be temporary, slight (not significant), negative and short term for the duration of the construction stage of Cherry Orchard Point.

14.12.2 Operational Stage

During the Operational Stage, there will be an increase in the use of the surrounding road network by private vehicles. However, the Mobility Management and Travel Plan will promote more sustainable forms of transport to help reduce the use of private cars by the residents of the proposed development.

There is likely to be an increase in the number of pedestrians and cyclists in the surroundings of the development particularly on the approaches to the railway station. However, the existing footpaths and cycle paths, both internally and externally along the site frontage, will be upgraded as part of development, thus, the impact should be minimal.

The traffic modelling undertaken includes growth in background traffic flows which accounts for other developments in the area.

The increase in traffic volumes as a result of the proposed development will impact the adjacent existing developments as the traffic flows through access and egress from the site will increase. The transport assessment carried out indicates that six of the eight assessed junctions, operating with the improved junction layouts proposed as part of the subject development, would operate within the capacity of the junctions and the impact arising from the proposed development at these junctions would be considered negligible.

The existing roundabout at the intersection of Park West Avenue and Park West Road to the south of the railway (Junction 7) is likely to reach capacity about 2027 and exceed capacity by 2042 with or without the proposed development. It is expected that this junction which is remote from the subject site will be upgraded, probably to a signalised crossroads by Dublin City Council before 2042.

Due to the proposed mitigation measures outlined above, the residual impact of the proposed development during the operational stage will be slight (not significant) to moderate (significant), negative and long term for the duration of the operation of Cherry Orchard Point.

14.13 Monitoring

14.13.1 Construction Stage

Traffic management and deliveries will be carefully monitored by the project team and the selected contractor during the Construction Stage as part of the Construction Management Plan (CMP) and Construction Traffic management Plan (CTMP).

Monitoring will include construction traffic routes and measures to minimise nuisance.

The appointed contractor will monitor their mobility management plan to ensure that is operating effectively. Staff will be encouraged to car share or use public transport.

14.13.2 Operational Stage

During the Operational Stage, the Mobility Management and Travel Plan will be monitored by the Travel Plan Co-ordinator. The travel survey will establish the initial modal split of travel by residents.

The Co-ordinator, in consultation with the management company, the occupiers, and Dublin City Council, will agree on annual targets, following completion and analysis of the travel survey, for increasing the percentage of residents travelling by non-car modes.

The Travel Plan Co-ordinator will:

- Meet with officers of Dublin City Council within 6 months following the occupation of the building(s) and thereafter every 12 months to assess and review the progress of the Plan and agree on objectives for the next 12 months, and
- Prepare and submit an Annual Monitoring Report to senior management of the developer, the occupier(s) and Dublin City Council.

The management team will monitor the operation of the Mobility Management and Travel Plan including public transport demand. Any issues arising will be advised to Dublin City Council and the public transport operators.

The management team will also monitor the operation of the access from Park West Avenue and advise Dublin City Council in relation to any operational or safety issues noted.

14.14 Difficulties Encountered

No particular difficulties were encountered during the preparation of this chapter of the EIAR.

14.15 Interactions

The main high-level interactions between Material Assets – Traffic & Transport and other environmental factors include Noise & Vibration, Air & Climate and Population & Human Health. Please refer to Chapter 16 Interactions for further information on interactions.

14.16 References

The following documents were reviewed by Waterman Moylan during the preparation of this chapter of the EIAR: -

- Park West – Cherry Orchard Local Area Plan (LAP), Dublin City Council, November 2019
- Dublin City Development Plan 2022 – 2028.
- Park and Ride Report, NTA, August 2015.
- National Rail Census Report 2019, NTA, July 2020.
- National Rail Census Report 2021, NTA, October 2022.
- Park & Ride Strategy; Greater Dublin Area, NTA Park and Ride Development Office, 2021.
- Preliminary Car Parking Review, Waterman Moylan, May 2022.
- SHD Planning Applications, An Bord Pleanala, 2019 – 2022.
- Greater Dublin Area Transport Strategy 2022 – 2042, NTA.
- Technical Note on Park and Ride, Waterman Moylan, June 2022.
- Design Manual for Urban Roads and Streets (DMURS).
- Traffic and Transport Assessment Guidelines, TII, May 2014
- Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, TII, May 2021.
- Traffic and Transport Assessment (TTA), Park West SHD, CS Consulting Group, November 2021.
- Traffic and Transport Assessment (TTA), Cherry Orchard Point – Proposed development at Sites 4 and 5, Park West Avenue, Dublin 10, Waterman Moylan, September 2023.
- Mobility Management and Travel Plan, Cherry Orchard Point – Proposed development at Sites 4 and 5, Park West Avenue, Dublin 10, Waterman Moylan, September 2023

15 Material Assets – Waste Management

15.1 Introduction

This chapter evaluates the likely significant effects, if any, which the proposed development may have on Material Assets (related to waste management) as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports 2022 .

This chapter has also been prepared to address the issues associated with material assets (waste management) during the construction and operational phases of the proposed development as described in Chapter 2 (Background to the Scheme).

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the excavation and construction phases of the proposed development and has been included as Appendix 15.1. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021).

A separate Operational Waste Management Plan (OWMP) has been prepared for the operational phase of the proposed Development and is included as Appendix 15.2 of this Chapter.

The Chapter has been prepared in accordance with European Commissions Guidelines, *Guidance on the preparation of the Environmental Impact Assessment Report* (2017) and the EPA *Guidelines on the Information to be contained in EIAR* (2022).

These documents will ensure the management of wastes arising at the development site in accordance with legislative requirements and best practice standards.

15.2 Assessment Methodology

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed development, as described in Chapter 2 (Background to the Scheme) and considers the following aspects:

- Legislative context;
- Construction phase (including site excavations); 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 15.4 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.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 15.6 of this EIAR Chapter.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 11 of this EIAR (Land, Soils & Geology).

15.2.1 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) 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 15.1).

Figure 15.1 Waste Hierarchy (Source: European Commission).

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 15.2).

Figure 15.2 Circular Economy (Source: Repak).

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, A Resource Opportunity, in 2012.

One of the first actions to be taken from the WAPCE was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The Circular Economy and Miscellaneous Provisions Act 2022 was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will work to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021). The guidance documents, 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 national Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021, draft National Waste Management Plan for a Circular

Economy (NWMPCE) 2023, BS 5906:2005 Waste Management in Buildings – Code of Practice, the Dublin City Council (DCC) Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018, the EPA National Waste Database Reports 1998 – 2020 and the EPA National Waste Statistics Web Resource.

15.2.2 Terminology

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
b) the adverse impacts of the generated waste on the environment and human health; or
c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

15.3 Baseline Environment

In terms of waste management, the receiving environment is largely defined by DCC 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 draft NWMPCE (2023) which will supersede the three current regional waste management plans in Ireland.

The waste management plans set out the following targets for waste management in the region:

- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The EMR plan sets out the strategic targets for waste management in the region and sets a specific target for 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.

The Regional Waste Management Planning Offices have issued a new Draft National Waste Management Plan for a Circular Economy (NWMPCE) in June 2023, which is set to replace the EMR and the two other regional waste management plans. The Draft NWMPCE does not however dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The National Waste Statistics update published by the EPA in December 2022 identifies that Ireland's current against "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 51% however they are currently not in line with the 2025 target (55%).

The Dublin City Development Plan 2022 – 2028 (2022) set out the policies and objectives for the DCC area which reflect those sets out in the regional waste management plan.

In terms of physical waste infrastructure, DCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which 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.

15.4 Characteristics of the proposed development

A full description of the proposed development can be found in Chapter 2 (Background to the Scheme). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

15.4.1 Demolition Phase

There will be no demolition associated with this application.

15.4.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be 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, made ground and clay excavated to facilitate construction of new foundations, and installation of underground services. The project Engineers (Waterman Moylan Consulting Engineers) have estimated c. 31,300 m^3 of material will need to be excavated to facilitate the proposed development. It is currently envisaged that up to 20,000 m^3 of excavated material will be removed off

site for appropriate offsite reuse, recovery, recycling and / or disposal. It is envisaged that the remainder of the excavated material will be reused on site.

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 of the European Communities (Waste Directive) Regulations 2011, as amended. For more information in relation to the envisaged management of by-products, refer to the RWMP (Appendix 15.1).

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). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. Any surplus excavated material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (Appendix 15.1). 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 15.1.

Table 15.1 Predicted on and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Total Waste	Reuse		Recycle/Recovery		Disposal	
	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	1288.0	10	128.8	80	1030.4	10	128.8
Timber	1092.8	40	437.1	55	601.0	5	54.6
Plasterboard	390.3	30	117.1	60	234.2	10	39.0
Metals	312.2	5	15.6	90	281.0	5	15.6
Concrete	234.2	30	70.3	65	152.2	5	11.7
Other	585.4	20	117.1	60	351.3	20	117.1
Total	3902.9		886.0		2650.1		366.8

15.4.3 Operational Phase

As noted in Section 15.1, an OWMP has been prepared for the proposed development and is included as Appendix 15.2. 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), cardboard, plastic as well as providing a strategy for management of waste glass, batteries, WEEE, printer / toner cartridges, chemicals, textiles, confidential paper, 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 15.2, below, and is based on the uses and areas as advised by the Project Architects, along the EPA National Waste Database Reports 1998 – 2020 and the EPA National Waste Statistics Web Resource. Further unit breakdowns can be found in Appendix 15.2.

Table 15.2 Estimated Waste Generation for the Proposed Development for the Operational Phase

Waste Type	Waste Volume (m^3/week)	
	Residential Waste (Combined)	Commercial Waste (Combined)
Organic	10.19	1.29
DMR	72.20	26.71
MNR	1.97	0.68
Glass	37.97	11.21
Total	122.33	39.89

The residents and commercial tenants will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the residents and commercial tenants. As required, the residents and commercial tenants will need to bring these segregated wastes from their units to their allocated Waste Storage Areas (WSAs). The locations of all WSAs can be viewed on the plans submitted with the planning 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,* draft *NWMPCE (2023). Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland* and the *DCC Waste Bye-Laws.*

15.5 Predicted Impacts

15.5.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction as outlined in section 15.4 (see Appendix.15.1 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 in the construction site compound or adjacent to it, on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect from waste material not

being managed and stored correctly on the local and regional environment is likely to be ***indirect, 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 from the use of non-permitted waste contractors or unauthorised waste facilities on the local and regional environment is likely to be ***indirect, 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 from not taking material to suitably registered / permitted / licenced waste facilities on the local and regional environment is likely to be ***indirect, 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 11. It is anticipated that up to 20,000 m^3 of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect from not correctly classifying and segregating excavated material on the local and regional environment is likely to be ***indirect, short-term, significant*** and ***negative***.

15.5.2 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 which is not suitable for recycling can be sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion into 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, short-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 15.2. 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 ***indirect, long-term, significant*** and ***negative***.

15.6 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.

15.6.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development:

As previously stated, 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 15.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site and are listed in summary below. 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.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 15.1) in agreement with DCC and in compliance with any planning conditions, or submit an addendum to the RWMP to DCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases.

A quantity of topsoil, made ground and clay will need to be excavated to facilitate the proposed development. The Project engineers have estimated up to 20,000 m^3 of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out 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.

- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, where possible. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 of the EC (Waste Directive) Regulations (2011-2020). EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, the EMR Waste Management Plan 2015 – 2021 and the draft NWMPCE 2023. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

15.6.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 15.2 and are listed in summary below. The mitigation measures outlined in the OWMP will be implemented in full and form part of 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, draft NWMPCE (2023), Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland and the DCC waste bye-laws.

- The operator of the proposed development 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.
- The operator of the proposed development will regularly audit the onsite waste storage facilities and infrastructure, and maintain a full paper trail of waste documentation for all waste movements from the site.

The following mitigation measures will be implemented:

- The residents / commercial tenants / operator of the proposed development will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):

- Organic waste;
- Dry Mixed Recyclables;
- Mixed Non-Recyclable Waste;
- Glass;
- Cardboard;
- Plastic;
- Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
- Waste Electrical and Electronic Equipment
- Cooking oil;
- Cleaning chemicals (paints, adhesives, resins, detergents, etc.);
- Furniture (and from time-to-time other bulky waste); and
- Abandoned bicycles

- The residents / commercial tenants / operator of the proposed development 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 of the proposed development 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 of the proposed development 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, draft NWMPCE (2023) and the DCC Waste Bye-Laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

15.7 Residual Impacts

It is predicted with the implementation of the mitigation measures outlined in section 15.6 and adherence to the RWMP (Appendix 15.1) and OWMP (Appendix 15.2) there will be no significant residual impact in relation to material assets- waste management. The implementation of the mitigation measures outlined in Section 15.6 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the Proposed Development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

15.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 15.6.1 and adherence to the RWMP (which includes mitigation) (Appendix 15.1) during the construction phase will ensure that the predicted effect on the environment will be ***short-term***, ***imperceptible*** and ***neutral***.

15.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 15.6.2 and adherence to the OWMP (Appendix 15.2) 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.***

15.8 Cumulative Impacts

It is predicted with the implementation of the mitigation measures outlined in section 15.6 and adherence to the RWMP (Appendix 15.1) and OWMP (Appendix 15.2) there will be no significant cumulative residual impact in the receiving environment section, which includes cumulative developments that are already built and in operation in relation to material assets- waste management.

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.

A review of the permitted and proposed developments, as set out in Chapter 18 of this EIA Report, has been undertaken to identify any substantial projects that are concurrent with the construction phase of the proposed development that may result in cumulative effects in respect of land soils geology and hydrogeology.

This review identified the permitted developments outlined in Section 15.8.1, below, which are capable of combining with the proposed development and have the potential to result in significant cumulative effects due to their scale and close proximity to the proposed development site.

15.8.1 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, including the following:

Table 15.3 Development Planning permissions that can potentially overlap with the development

Reference	Location	Development Description	Status	Decision Date
4313/22 (Part 8 Application)	Cherry Orchard Green, Dublin 10	Proposed construction of a residential development comprising **172 no. dwellings** (141 no. 3-bedroom two-storey terraced houses and 31 no. 2-bedroom two-storey terraced houses), 2 public open spaces approx. 0.83 ha /14% of site area, associated site infrastructure works/ supporting infrastructure, landscaping, public lighting, access roads/pavements, boundary treatments and provision for a link road/ pavements and cycleways to Ballyfermot	City Council – Approved	03.10.2022
312290	Park West Avenue and Park West Road, Park West, Dublin 12	**750 no. apartments**, creche and associated site works.	Granted	16.06.2022

3403/21	Site (1.26 ha) at Blocks 70 and 72 Park West Avenue and Park West Road, Park West, Dublin 12	Planning permission for the proposed development will consist of modifications to the permitted residential development of **86 no. residential units** over retail/restaurant uses (reg. ref. 3798/18, 3941/20, 2517/21) within blocks 70 and 72.	Granted	21.10.2021
SD188/0006 (Part 8 Application)	New Nangor Road, Clondalkin, Dublin 22.	Social Housing Development comprising of two and three storey housing and apartment units (**44 units in total**) on a site located at New Nangor Road, bounded by Riversdale Estate & Mayfield Park, Clondalkin, Dublin 22. The proposed development shall consist of: 19no. 3-bed, two storey houses, 1no. two storey specially adapted unit and 24no. 2-bed apartments in 3 storey building.	Part 8 Approved by Council	08.10.2018
5311/22	Block 7, Parkwest Business Campus, Parkwest, Dublin 12	The development will consist of the change of use of the ground, first and second floors from class 3 office use to class 8 for use as a health centre / clinic along with all associated works.	Granted	05.04.2023
312290	Park West Avenue and Park West Road, Park West, Dublin 12	Residential Development with a mix of other uses: **Retail Unit – 156 sqm** Block A Crèche – 410 sqm 84 child spaces **Café/bar – 91 sqm** Block G	Granted	16.06.2022
3999/21	Unit 55, Park West Road, Park West Industrial Park, Dublin 12, D12 X9F9	The development will consist of **extension of the existing office space at second floor level resulting in an overall office floorspace increase of 125 sqm approximately, construction of a new mezzanine level in the warehouse area (circa 257 sqm)** and a new stairwell. Creation of 2no. openings to the south elevation and 1no. opening to the west elevation and associated site development works. The development will also include the retention of **the existing office space at ground and first floor level of 250 sqm approximately**.	Granted Permission and Retention Permission	22.03.2022
SD21A/0100	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Construction of a revised two storey mono-pitched Discount Foodstore (with ancillary off-licence use), with an increased **total gross floor space of 2,415sq.m** and an **increased net**	Granted	22.07.2021

		retail sales area of 1,650sq.m (2,144sq.m and 1,400sq.m respectively permitted under SD19A/0286); Associated reconfiguration of site layout and all other associated and ancillary modifications to SD19A/0286 above and below ground level, including modifications to pedestrian access and a new electricity substation and switch room building.		
SD20A/0309	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22	Provision of 4 new information and communications technology (ICT) Facility buildings and associated development at the subject site, **superseding elements of the extant planning permissions on site (Reg. Ref.: SD18A/0068 and Reg, Ref.: SD19A/0185).** The proposed development will comprise the following: The construction **of 4 ICT Facility buildings (ICT Facilities 1, 2, 3, and 4) with a combined total gross floor area {GFA) of c. 47,564.5 sq. m.**	Granted	04.05.2021
SD19A/0185	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22.	Alterations to approved plans (Grant of Permission ref PL06S.243151 and PA Reg Ref SD13A/0271 and SD18A/0068) to the previously granted planning permission for the construction of an ESB 110kV Gas Insulated Substation for the use by Crag Digital Limited in support of the development and to incorporate an ESB Network Substation to improve and upgrade power supply to Clondalkin and adjoining areas; **the proposed ESB 110kV Gas Insulated Substation is a two storey building of gross floor area of 1,586sq.m and Client Control Room building of an area of 116sq.m**	Granted	09.09.2019
SD19A/0098	Unit E20, Cloverhill Industrial Estate, Ballymanaggin, Clondalkin, Dublin 22	(1) Demolition of front single storey entrance building and rear storage area; removal of trees to facilitate vehicular entrance, road and associated site preparation work; (2) **630sq.m. two storey front entrance building including café and office space** with flat roof and building signage; 206sq.m. single storey dispatch fridge with flat roof,	Granted	16.09.2019

		level loading dock and canopy complete with associated plant; (3) roller shutter door and canopy and pedestrian doors to existing building; (4) enclosed bin store; (5) reorganisation of parking to provide 49 total parking spaces; (6) enlargement of the existing side plant enclosure; (7) all associated site, civil, drainage and landscaping works required for the construction and usage of the proposed building.		
SD19A/0100	Unit 1, Elmfield Court, Ninth Lock Road, Clondalkin, Dublin 22	Change of use for part of existing retail unit to Off-Licence sales area (**Site area 0.025 ha**)	Granted	01.07.2019
SD19A/0286	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Demolition of existing single storey discount food store (with ancillary off-licence use) measuring 1758sq.m gross floor space with a net retail sales area of 1286sq.m; **two storey mono-pitch discount food store (with ancillary off-licence use) measuring 2144sq.m gross floor space with a net retail sales area of 1400sq.m**	Granted	16.12.2019
316119	DART+ South West Electrified Heavy Railway Order - Hazelhatch & Celbridge Station to Heuston Station, and Hesuton Station to Glasnevin		Lodged	Case Due by 18.09.2023

Additionally, to the above Table 15.3 there are additionally Local Area Plan sites that have been advised by Dublin City Council (DCC)l that could potentially overlap with proposed development during the construction phase, these are as follow:

Site 1 - DCC Affordable Purchase scheme delivering 172 new homes, targeting a construction completion date of Q1 2026.

Site 2 - Currently at design stage. A Part 8 is to be brought to council in Q1 2024 by DCC PPP section. Current iteration outlines 126 social and 47 affordable homes. There will be 3-4 shops. One 250sqm and the others in the region of 120sqm as per the LAP requirements.

Due to the high number of waste contractors in the Dublin region as provided from the National Waste Collection Permit Office and the Environmental Protection Agency there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, imperceptible*** and ***neutral.***

15.8.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area, and the indicative future masterplan development, will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a ***long-term, imperceptible*** and ***neutral***.

15.9 Monitoring or Reinstatement

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 of the proposed development to ensure effective implementation of the mitigation measures outlined in Section 15.6, Appendix 15.1 and 15.2 internally and by the nominated waste contractor(s).

Table 15.4 Monitoring Proposals

Likely Significant Effect	Monitoring Proposals
Litter Pollution	The Contractor will review and maintain waste records and site audits
Unlicensed Waste Collection (Illegal Dumping)	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of waste Classification	An appointed Resource Manager will monitor all on-site waste segregation and classification
Unlicensed Waste Collection (Illegal Dumping)	The operator/ facilities management company will maintain waste receipts on-site for a period of 7 years and make available to DCC as requested.
Poor Waste Segregation	Waste generation volumes will be monitored by the waste contractor / operator / facilities management company
Litter Pollution	Waste storage areas will be monitored by the waste contractor / operator / facilities management company

15.9.1 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 RWMP specifies the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual

waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

15.9.2 Operational Phase

During the operational phase, waste generation volumes should be monitored by the waste contractor and or the operator of the proposed development. 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 contactor costs.

15.10 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.

While it is possible to initially select a licensed waste facility for soil disposal, there is potential to encounter contaminated material or material with naturally occurring variations in minerals and chemicals that necessitates sending it to a different suitably licensed facility. The sampling and testing carried out in the Site Investigation (SI) process provides spot samples, and further testing is required during the excavation process, as the true condition of all excavated materials cannot be ascertained with certainty until this is undertaken.

There is a number of licensed, permitted and registered waste facilities in the Dublin and EMR regions and across Ireland and Northern Ireland. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

Licensed waste facilities have annual limitations on material that they can important as part of their license agreements. Because of this it would not make it possible to commit to a singular specific receiving facility as it is not available throughout the excavation phase. It would not be viable to cease a development and wait until a receiving facilities annual receiving quotas are reset. In a normal development waste facilities would switch between facilities with available capacity.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability. The waste facilities selected will ultimately be selected to minimise the environmental impacts on the surrounding environment.

15.11 Interactions

It is predicted with the implementation of the mitigation measures outlined in section 15.6 and adherence to the RWMP (Appendix 15.1) and OWMP (Appendix 15.2) there will be no significant residual impact caused by the below interactions in relation to material assets- waste management.

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR.

15.11.1 Land & Soils

During the construction phase, excavated topsoil, made ground and clay (c. 31,300 m^3) will be generated from the excavations required to facilitate site levelling, construction of new foundations and

installations of site services. It is currently envisaged that up to 20,000 m^3 of excavated material will be removed off site for appropriate offsite reuse, recovery, recycling and / or disposal. It is envisaged that the remainder of the excavated material will be reused on site.

If material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 11, Chapter 15 and the requirements of the RWMP (Appendix 15.1), will ensure the effect is ***long-term, imperceptible*** and ***neutral***.

15.11.2 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 14 (Traffic and Transportation). Provided the mitigation measures detailed in Chapter 14 and Chapter 15 are adhered to, the predicted effects are ***short to long-term, imperceptible*** and ***neutral***.

15.11.3 Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and mitigation measures in Chapter 13 and Chapter 15, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be ***long-term, imperceptible*** and ***neutral***.

15.12 Conclusion

It is predicted with the implementation of the mitigation measures outlined in section 15.6 and adherence to the RWMP (Appendix 15.1) and OWMP (Appendix 15.2) there will be no significant residual impact in the receiving environment section in relation to material assets- waste management.

This chapter has reviewed and analysed the potential and the predicted impacts of the Proposed Development, cumulative developments and interactions with regards to material assets - waste management. These potential impacts have been considered for both the construction and operational phases of the Proposed Development. The cumulative impact of the Proposed Development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter (section 15.6) and the attached RWMP (appendix 15.1) and the OWMP (appendix 15.2), the overall predicted impact of the proposed development is long-term, imperceptible and neutral.

15.13 References

1. Waste Management Act 1996 - 2021 (No. 10 of 1996) as amended.
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
4. The Circular Economy and Miscellaneous Provisions Act 2022
5. Eastern Midlands Region Waste Management Plan 2015 – 2021 (2015).
6. Regional Waste Management Planning Offices, draft National Waste Management Plan (2023).
7. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).

8. European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).
9. Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022)
10. Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
11. Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
12. DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)
13. Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)
14. Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).
15. FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
16. Dublin City Council (DCC), *Dublin City Development Plan* (2022-2028)
17. DCC, Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018).
18. BS 5906:2005 Waste Management in Buildings – Code of Practice
19. Planning and Development Act 2000 (No. 30 of 2000) as amended
20. Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2018)
21. 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.
22. EPA, National Waste Database Reports 1998 – 2022.
23. US EPA, Characterisation of Building Uses (1998);
24. 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)

16 Material Assets – Utilities

16.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) has been prepared by Waterman Moylan Consulting Engineers and examines the material assets serving the subject land for the proposed development of Cherry Orchard Point at Sites 4 and 5, Park West Avenue, Dublin 10, relating to surface water drainage, water supply, foul sewerage, electricity, gas, and telecommunications.

16.2 Assessment Methodology

The assessment follows a phased approach as outlined in the EPA and IGI guidelines.

The first phases of this assessments determined the type, scale, and location of the proposed development as well as establishing the baseline conditions via a Desktop study to classify the utility networks related to the site was undertaken. The following information sources were used in the assessment of the existing networks in the vicinity of the proposed development site:

- A desktop review of Uisce Eireann Utility Plans, ESB Networks Utility Plans, Gas Networks Ireland Service Plans, Eir E-Maps and Virgin Media Maps;
- Consultation with Uisce Eireann and Dublin County Council;
- Submission of a Pre-Connection Enquiry Application to Uisce Eireann;
- Submission of a Statement of Design Acceptance application to Uisce Eireann;
- Review of ESB Network Utility Plans
- Review of Gas Networks Ireland existing network maps;
- Review of EIR and Virgin Telecommunications existing network maps;
- Site Inspection / Walkover;

The second phase of this assessment was the incorporation of direct and indirect investigations and studies. This information was primarily provided by a GPR Survey (Ground Penetrating Radar) and a basic hydrological monitoring undertaken as part of geotechnical site investigations carried out by Ground Investigations Ireland in November 2022 for both sites, Site 4 to the west of Park West Avenue and Site 5 to the east. A further report, Waste Analysis Classification Report, which would help determine the properties of any potential leachate to groundwater tables, was also produced by GII and referred to in this Chapter. These are both included as appendices to this document.

Phase 2(a) of the assessment was the refinement of the design layout to mitigate by elimination and replacement, any items that would have the potential to negatively impact the environment by their design, material components, or method of construction/installation. It should be noted that in certain circumstances, alternative designs may have been available however, in order to meet the requirements of the Local Authority or Responsible Bodies, these alternatives were not accepted. An example of this would be the preliminary design of the foul drainage for Site 4 which had 2 potential outfall locations. However, Uisce Eireann have precisely instructed the location for the foul water outfall from Sites 4 & 5, so as to align the drainage design for the proposed development with their strategic infrastructural plans for the locality.

Phase 2(b) of the assessment was a detailed review of the proposed design and a study to determine the potential risks and impacts of the design and strategies.

Phase 2(c) is a continuation of the Phase 2(b) works whereby the identified risks and impacts where then further assessed against mitigation measures which provided a residual risk. Where a residual risk

was determined to be high, the item was isolated and returned to Phase 2(a) to repeat the process of identifying alternatives methods and measures to reduce the risk further.

Phase 3 was the completion of this EIAR chapter based on a full understanding of the baseline, proposed development design layout, and construction strategies, incorporation of the mitigation measures, identified risks.

As part of the above phases the following items were also undertaken:

- Consultations with Uisce Eireann to agree the foul drainage strategy.
- Uisce Eireann confirmation of feasibility letter.
- Uisce Eireann Statement of Design Acceptance.
- Calculation of 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);
    - IS EN752, “Drain and Sewer Systems Outside Buildings”;
    - Uisce Eireann’s Code of Practice (water demand and foul water loading);

16.3 Baseline Environment

The subject masterplan development is comprised of 2 No. sites. Site 4 & Site 5 are bisected by Park West Avenue and lie to the west and east of this roadway respectively, as per the blue boundary lines indicated on the figure overleaf.

The Site Investigation Report undertaken by Ground Investigations Ireland (GII), determined that Site 4 is combination of Greenfield and Brownfield, with evidence of fill material in the area of the site previously used as a construction compound. Site 5 is predominantly a brownfield site, with fill material found for the same reason.

Site 4 is bound to the west by the M50, to the south by the Dublin-Kildare rail line and the Park West & Cherry Orchard station, and to the east and north by Park West Avenue. Site 5 is bound to the west by Park West Avenue, the northwest by Cedar Brook Way, the northeast and east by Barnville Park, and to the south by the Dublin-Kildare rail line and the residential unit of 62 Barnville Park.

Site 4 is currently access via a secured gate from Park West Avenue. Site 5 is accessed via a similar arrangement from Cedar Brook Way.

The area of the subject application is indicated by the red boundary line, also on Figure 16.1 overleaf. A letter of consent has been obtained for the area of public works required from the Local Authority.

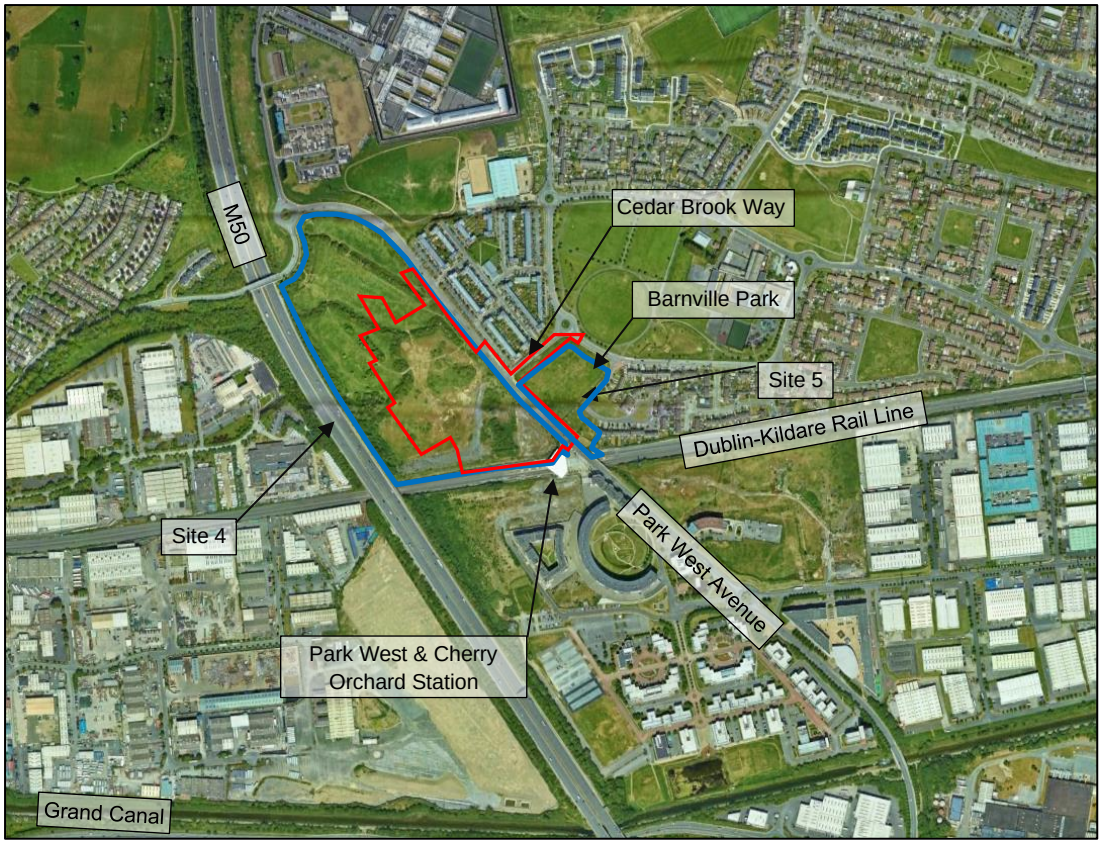

Figure 16.1 Site Location (Source: Google Earth)

The overall masterplan development area as per the blue line boundaries is c. 13.02ha, with Site 4 being c. 11.41 ha and Site 5 being c. 1.61ha. The area of the subject application indicated by the redline boundary, including for works in the public domain, is 6.16ha (61,648m²).

For Site 4, the topographic survey of the area indicates that the low point of the site has a level of 55.72m OD. This is located on the eastern site boundary approximately 140m north of the junction of Park West Avenue and Cedar Brook Way. The remainder of the site generally slopes to this location owing to the embankments and subsequent site grading from the Dublin-Kildare Rail line to the south, M50 to the west, and approach road to the overpass on the M50 to the north.

Site 5 has a central high point with a level of 58.05m OD, and slopes outwards to all boundaries. The boundaries of Site 5 typically have levels between 54.80m and 56.00m, with the higher of these levels being located to the south of the site, adjacent to the retaining wall of the Park West Avenue Bridge over the rail lines.

Ordnance survey and topographic survey mapping indicates that Site 4 contains static ditches with no outfall. These ditches previously had hydrological connectivity and flow, which has been cut-off by the construction of the M50 to the west and the Cedar Brook housing development to the east, as discussed later in this Chapter. These ditches normally remain dry except in heavy rainfall events where water that is not percolated via the site's naturally grassed landscaping, would collect locally in these static ditches for infiltration to the groundwater table. Site 5 does not have any form of surface drainage network and conveys rainfall directly to the soils via its grassed landscape. There is potential during heavy rainfall events, that the ground may become saturated and unable to further infiltrate rainfall, which would then run from the surface, over the boundary and to the adjacent road networks to outfall to the storm drainage networks serving these roads. The sites are located in the catchment of the Blackditch stream, a tributary of the Camac River which has an ultimate outfall to the River Liffey at Heuston Station.

EPA mapping advises that the River Waterbody WFD status 2016-2021 for the Camac_040 (River Camac), European Code: IE-EA_09C020500 has a status of “poor”, and a risk status of “at-risk”. The status of the Camac River is based on monitoring stations, with the nearest of these stations, downstream of the Blackditch Stream discharging to the River Camac, being National Water Monitoring Station Ref: RS09G080100.

16.3.1 Water Supply

The site is greenfield in nature and has no internal watermain networks. The road networks and footpaths immediately adjacent to the sites contain public watermain networks as per Figure 16.2 Existing Water Supply Network. There is an existing 450mm Ductile Iron (DI) pipe located on the western side of Park West Avenue. A 300mm DI spur crosses to the east side of Park West Avenue at its junction with Cedar Brook Walk. There is a 200mm uPVC network on Cedar brook Walk, and an 8” (200mm) network located on Barnville Park,

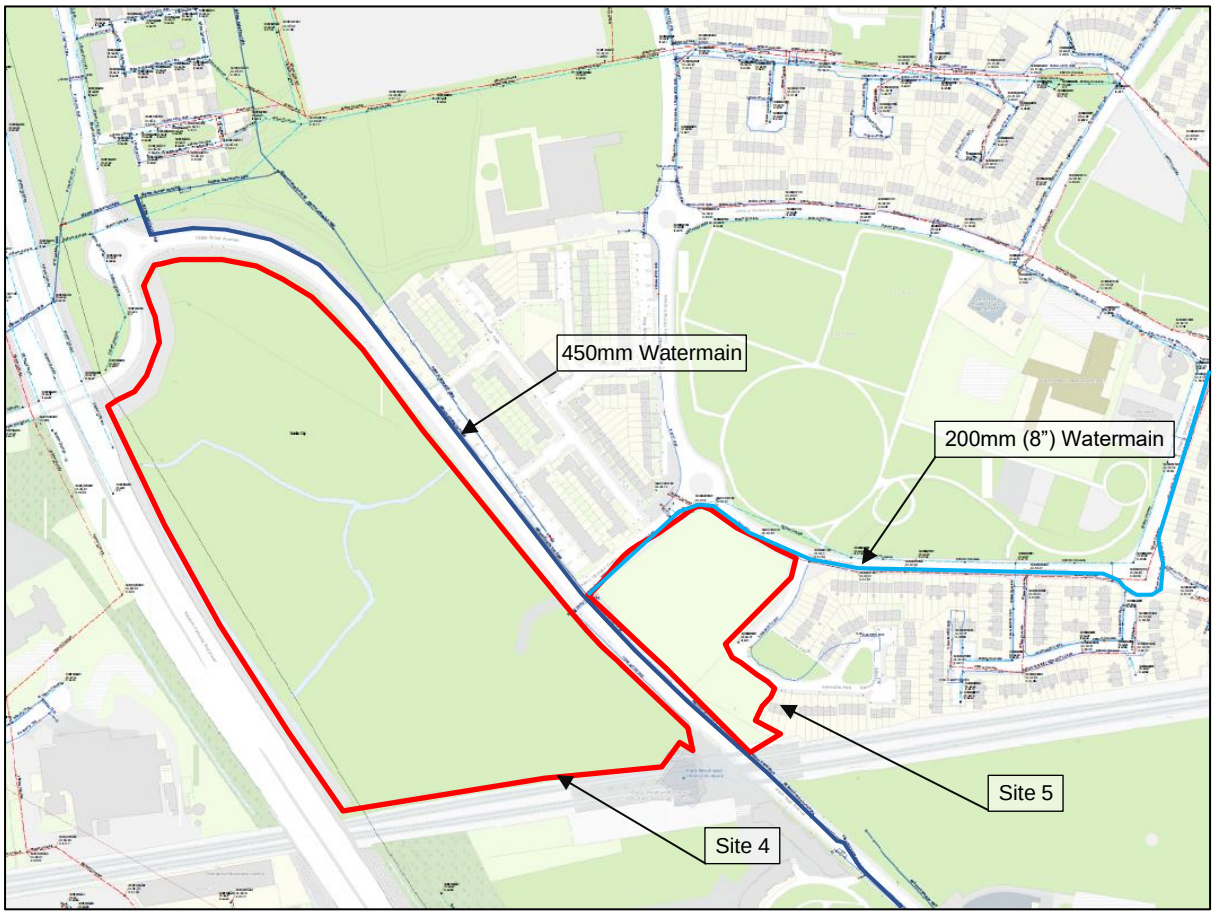

Figure 16.2 Existing Water Supply Network

A pre-connection enquiry was submitted to Uisce Eireann and received a reference number of: CDS22004824. The subsequent confirmation of feasibility letter from Uisce Eireann, advises that no upgrade works are required to facilitate the development. It further instructs of the connection points to the existing public infrastructure for both the sites. The confirmation of Feasibility Letter is included as an appendix to the Engineering Assessment Report, submitted under a separate cover.

16.3.2 Foul Sewerage

The site is greenfield in nature and has no internal foul water networks. There are foul networks in the immediate vicinity of the sites. There is existing 225mm diameter foul water sewers to the north of Site 4 and adjacent Site 5 as per Figure 16.3 Existing Foul Drainage Network, overleaf.

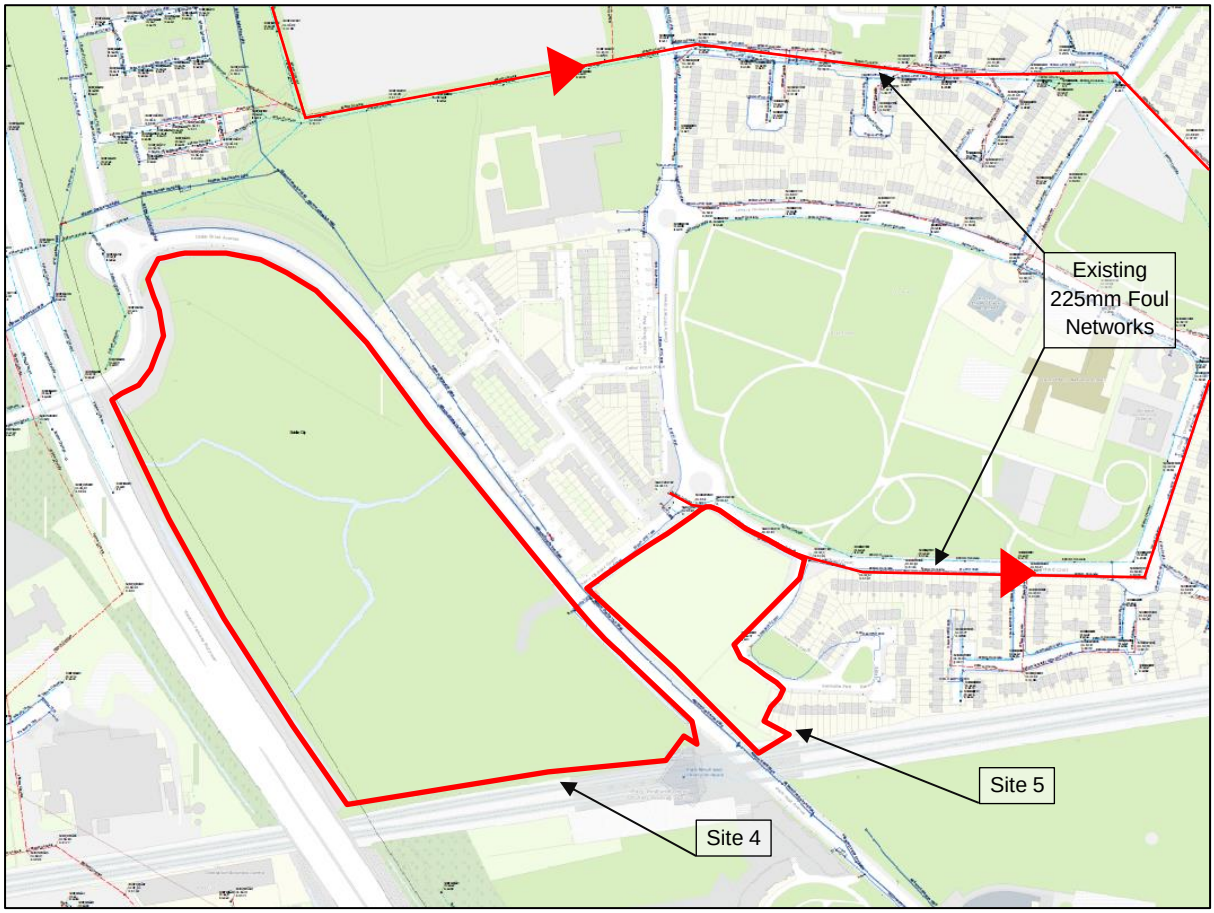

Figure 16.3 Existing Foul Drainage Network

The Confirmation of Feasibility Letter as discussed previously, also advises on the foul water strategy for the subject development. In respect to the foul water design, and as discussed in meetings with Uisce Eireann representatives, in order to meet Uisce Eireann infrastructural strategy objectives for the locality, both sites will need to connect to the existing foul water infrastructure on Cherry Orchard Green.

Uisce Éireann further advised it has a project underway which will provide the necessary upgrades and capacity. A part of this is to upsize the existing 225mm Ø on Barnville Park to a 1050mm Ø tank sewer, in order to act as a storage tank during peak flow periods. It is currently expected that the upgrade project will be completed by Q1 2026, and the proposed connection from the development can be completed as soon as practicably possible after this date. It is currently estimated that the subject proposed Phase 1 development will achieve completion towards the end of 2028. This existing network, instructed to be the connection point for the masterplan development, has an ultimate outfall to Dublin Bay post treatment at the Ringsend Wastewater Treatment Plant (WWTP).

The Ringsend WWTP is required to operate under an EPA License (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 WWTP will be able to treat wastewater for up to 2.4 million population equivalent (PE) while meeting the required standards. The current capacity of the WWTP is 1.65 million PE. Though the WWTP is currently over capacity, currently serving a PE of 1.9 million, water quality assessments undertaken in Dublin Bay (published by the EPA), confirm that Dublin Bay is classified as "unpolluted", indicating that the capacity issues at the WWTP are not having any impacts on water quality in Dublin Bay.

Based on the WWTP upgrade works being scheduled for completion in 2025 and local foul network upgrade works scheduled for completion in 2026, capacity issues are expected to be resolved in advance of the expected completion date for the proposed development for the end of 2028,

Regardless of the foregoing, the loading from the proposed masterplan development is imperceptible in the context of the PE currently served by the WWTP. Therefore, there is adequate capacity in the public foul sewer network available to serve the proposed masterplan development.

16.3.3 Surface Water

The site is greenfield in nature and is not served by any surface water network**.** The subject sites are in the catchment of the Blackditch Stream which discharges to the Camac River with an ultimate outfall to the River Liffey at Heuston Station.

Topographically, Site 4 slopes down to the centre of its eastern boundary from the north (Cloverhill Road roundabout), the west (M50) and the south (rail lines). There is no evidence that drainage networks from any of the roads or rail lines enters the site. The site itself contains a static ditch system which has no natural or constructed outfall, and percolates rain from heavy rainfall events locally. Drainage records show that drainage from the M50 does not enter the subject sites. The Ground Penetrating Radar (GPR) survey of the site further confirmed there are no surface water networks entering or exiting the site. Site 5 slopes outwards from a central high point. Similar to Site 4, there are no natural or artificial watercourses exiting the site. It is believed that in extreme rainfall events, where the volume of rainfall exceeds the infiltration capacity of the sites, that water flows off the surface of the sites to enter the existing surface water networks via the road gullies located on Park West Avenue, Barnville Walk, and Barnville Park Roads.

The Site Investigation Report by GII, which is included as an appendix to this document, advises for ground conditions that:

"Infiltration rates of f = 7.303 x 10^{-6} *m/s, 6.95 x* 10^{-6} *m/s and 7.262 x* 10^{-6} *m/s respectively were calculated for the soakaway location ST06, ST10 and ST 11. At the locations of ST01, ST02, ST03, ST04, ST05, ST07, ST08 & ST09the water level dropped too slowly to allow calculation of "f" the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction."*

This is generally in line with the reports finding of predominantly clay-based subsoils.

Of the 14 No. Trial Pits undertaken with a maximum depth of 3.2m that Trial Pit (TP) 04 showed signed of slow seepage from groundwater a 2.6m BGL (Below Ground level).

Of the 11 No. Soakaway Tests undertaken, Soakaway Test (ST) 06 encountered groundwater at 1.8m BGL, which rose to a level of 1.6m BGL within 5 minutes.

These test locations are mapped in the Site Investigation Report.

As noted above in respect to the static ditch system, a detailed review of historic maps for the locality, from the national historic maps dashboard produced by Ordnance Survey Ireland (OSI), indicates that

the ditch system noted as present in Site 4, previously had hydrological connectivity from the east, merging on the site and flowing to the west. It is clear that this hydrologically connectivity has been cut-off on the west by development of the M50, and to the east by residential development. Refer to Figure 16.4 Site Location (Source: OSI Historic Map Viewer) for an extract of this historic map.

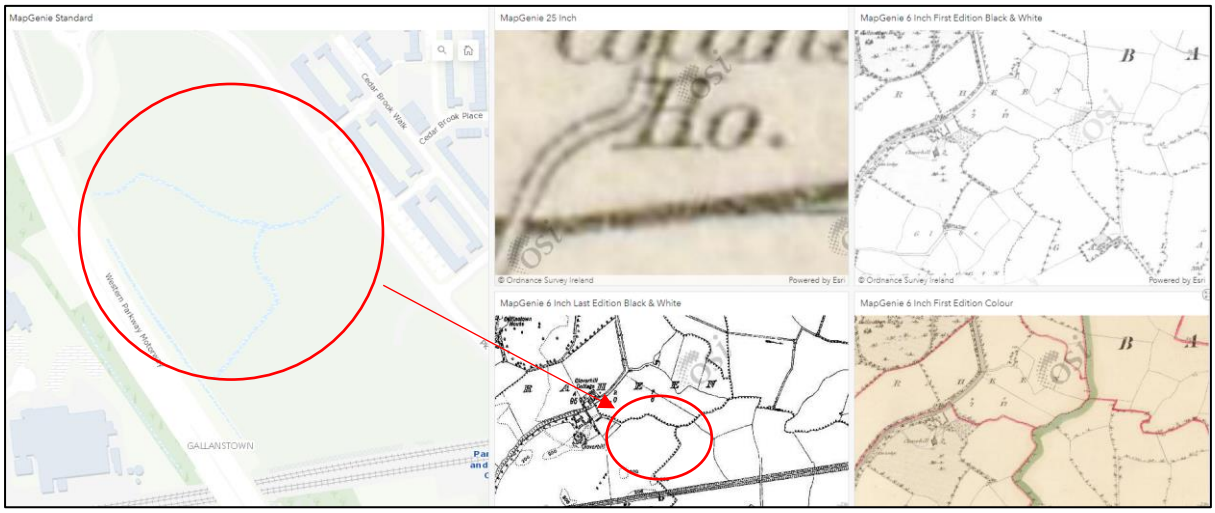

Figure 16.4 Site Location (Source: OSI Historic Map Viewer)

Existing surface water drainage within the locality consists of the following:-

A trunk surface water sewers exist in the vicinity of the site. To the north there is a network ranging in diameter from 525mm to 1,350mm. Immediately to the east of site, a strategic sewer exists ranging in diameter from 600mm to 900mm, which connects to the trunk sewer on Cherry orchard Avenue. Both of these networks are indicated in Figure 16.5 Existing Surface Water Network, below.

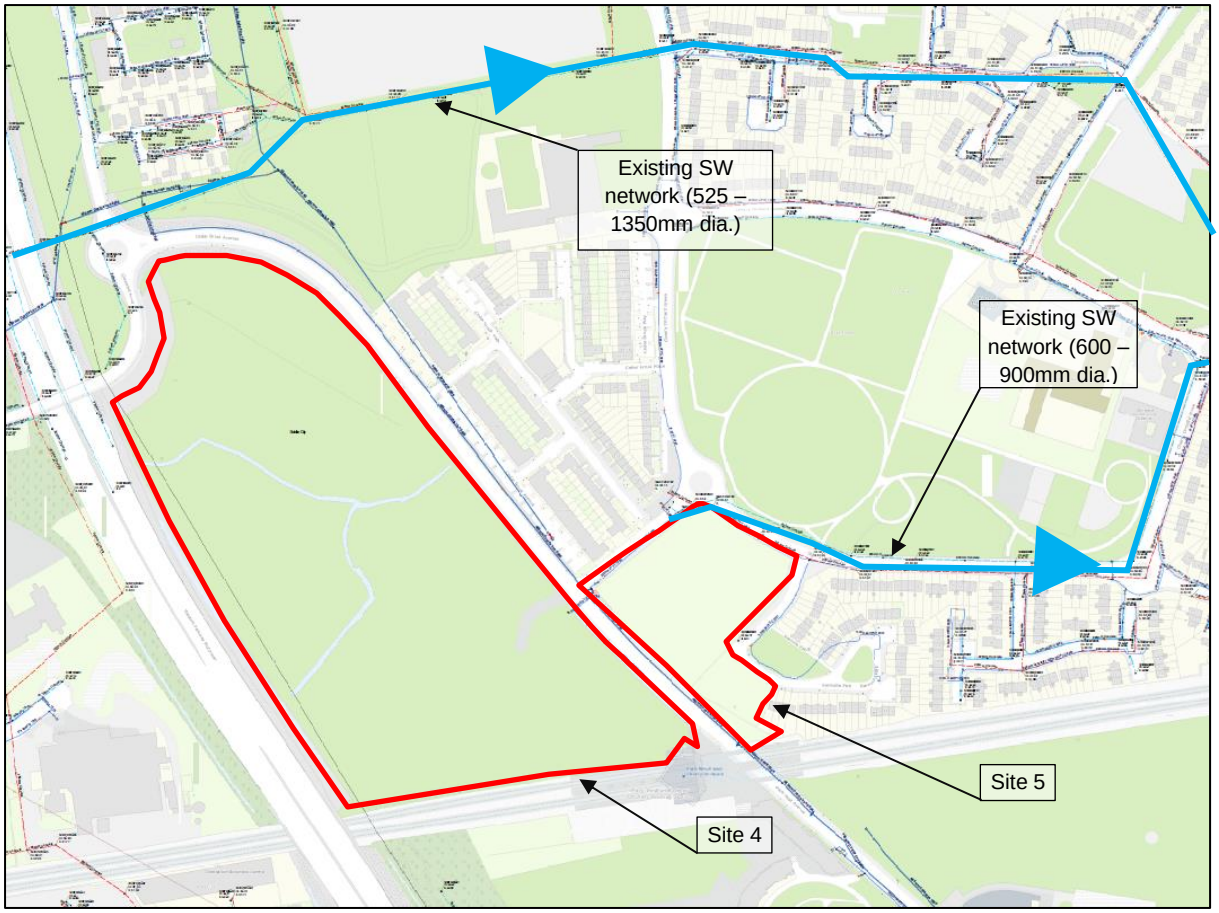

Figure 16.5 Existing Surface Water Network

The existing surface water drainage sewers are indicated in the Park West - Cherry Orchard Local Area Plan (LAP) 2019, an extract of which is shown as Figure 16.6 Existing Surface Water Network and Strategy from the LAP, below. This shows that surface water from the sites will eventually outfall to the piped Blackditch Stream and exit the LAP lands at Outfall point A.

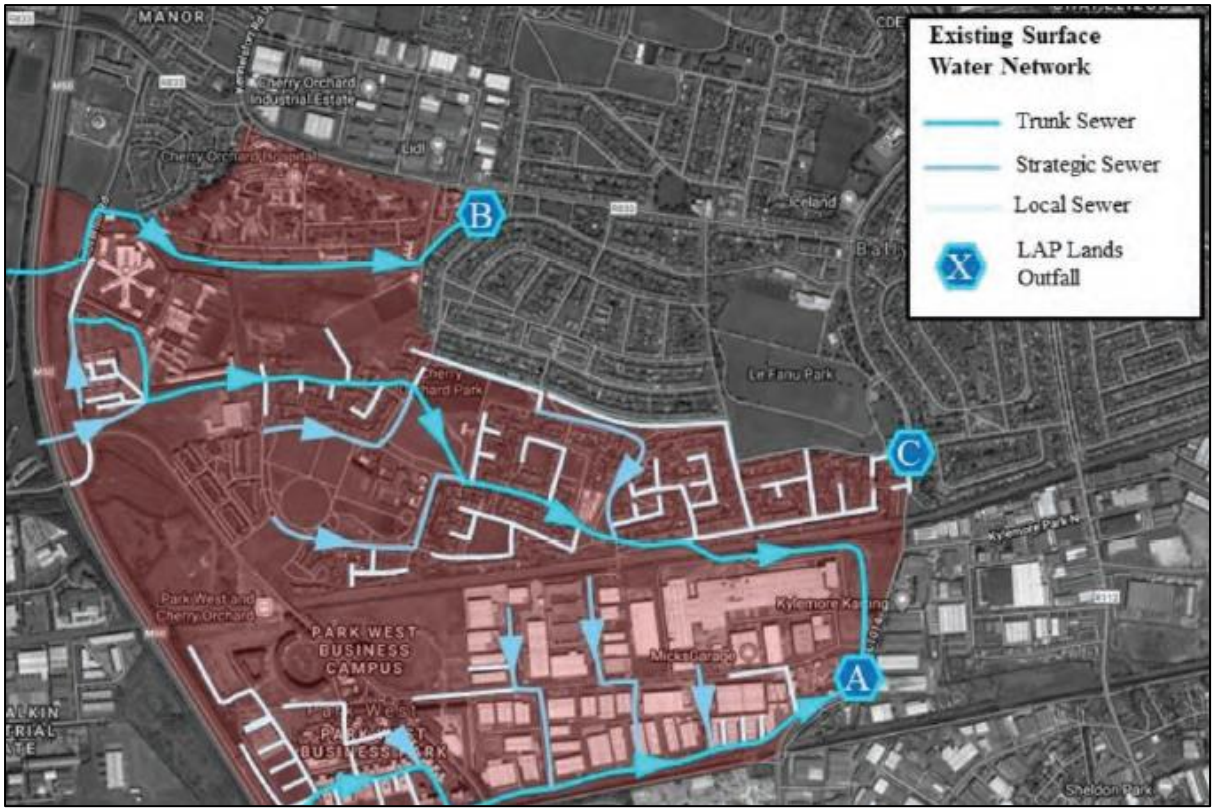

Figure 16.6 Existing Surface Water Network and Strategy from the LAP

Discussions were held with the Surface Water Department of Dublin City Council on the preliminary design strategy. They confirmed that the surface drainage strategy presented, which sees both sites draining to the existing surface water network to the north of Site 5 on Cedar Brook Way was their preference for the locality. They further confirmed that the internal drainage and SuDS Strategy were acceptable in principal and suitable for more detailed progression. It was also noted that the outflow rate is limited to 2 l/s/ha as per Dublin City Council policy, which is lower than the current greenfield runoff rate for the site, thus when the site becomes developed, the runoff rate for the site will actually be reduced from its current rate.

16.3.4 Electricity

ESB Networks have been contacted and an existing ESB network map for the area surrounding the proposed development has been obtained, refer to , overleaf. ESB infrastructure, both under and overground, exists on and in the immediate vicinity of both sites. It is intended that the existing overground infrastructure internal to the sites be undergrounded, and furthermore, existing underground networks may also need to be rerouted. Detailed design of such will be undertaken at the appropriate stage as ESB networks will only engage in this regard on projects that have received a grant of planning permission.

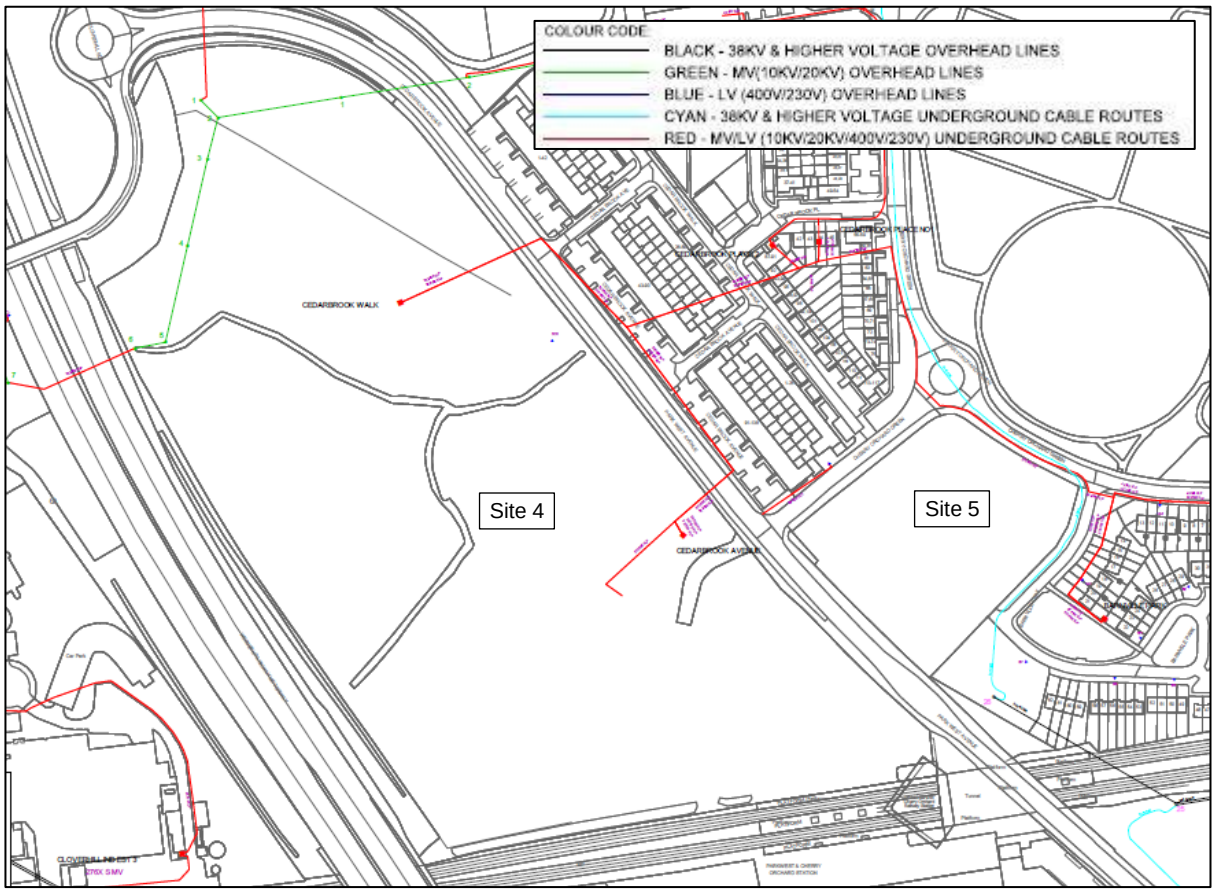

Figure 16.7 ESB Network Map

16.3.5 Gas

Gas Networks Ireland have been contacted and an existing gas network map for the area surrounding the proposed development has been obtained, refer to , overleaf. There are existing gas pipes adjacent Site 5 on Barnville Park. A medium pressure distribution Main is also indicated as partially being located inside the northern part of Site 4. No development is planned at this location in Site 4, and the relevant body will be contacted by the main contractor upon appointment to discuss and agree the measures required to be implemented during construction to ensure the area remains undisturbed.

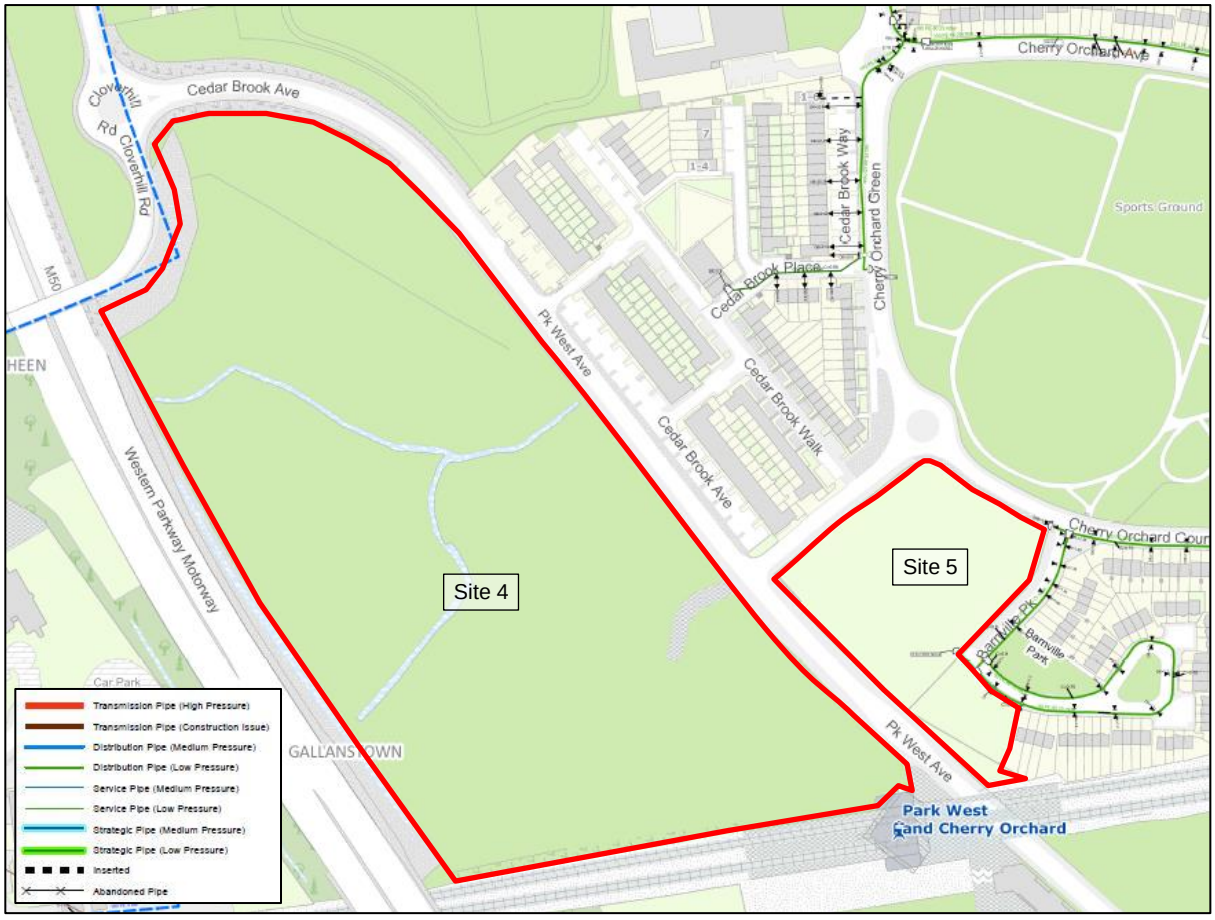

Figure 16.8 Gas Network Map

16.3.6 Telecommunications

Eir & Virgin have been contacted and their existing network maps for the area surrounding the proposed development has been obtained. Figure 16.9 Eir Network Maps below & Figure 16.10 Virgin Network Map below show these networks respectively. There are existing Eir and virgin services adjacent to the subject sites.

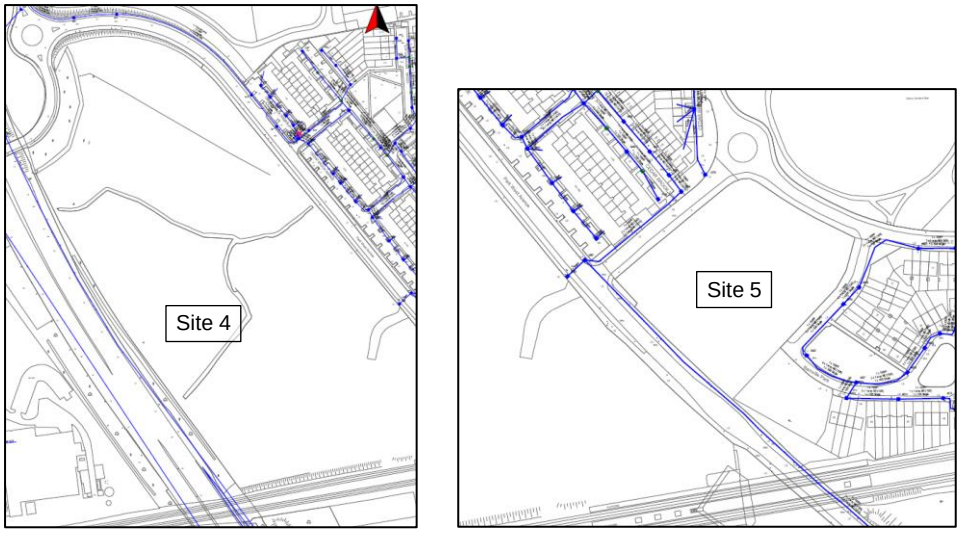

Figure 16.9 Eir Network Maps

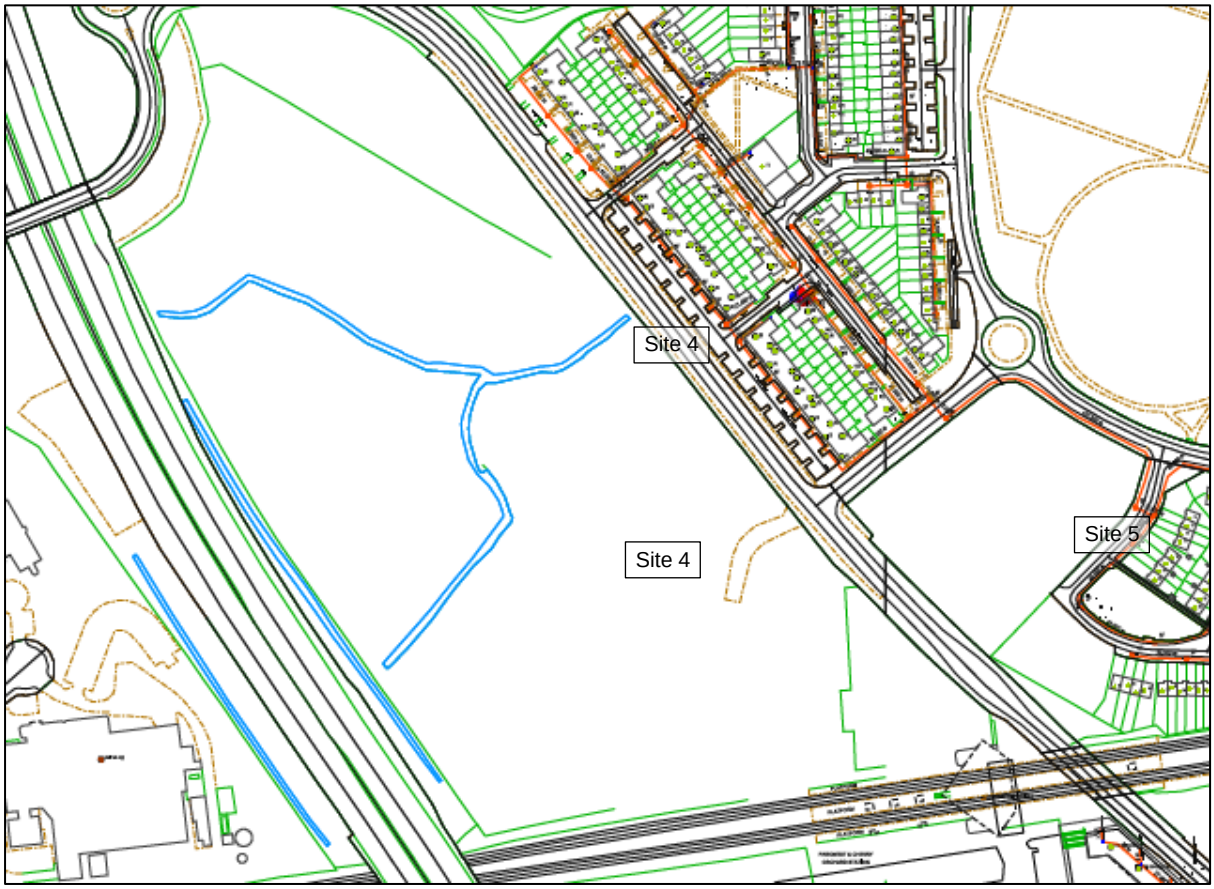

Figure 16.10 Virgin Network Map

16.4 Predicted Impacts

The subject application is for Phase 1 of a 4-phase masterplan development as per the figure below.

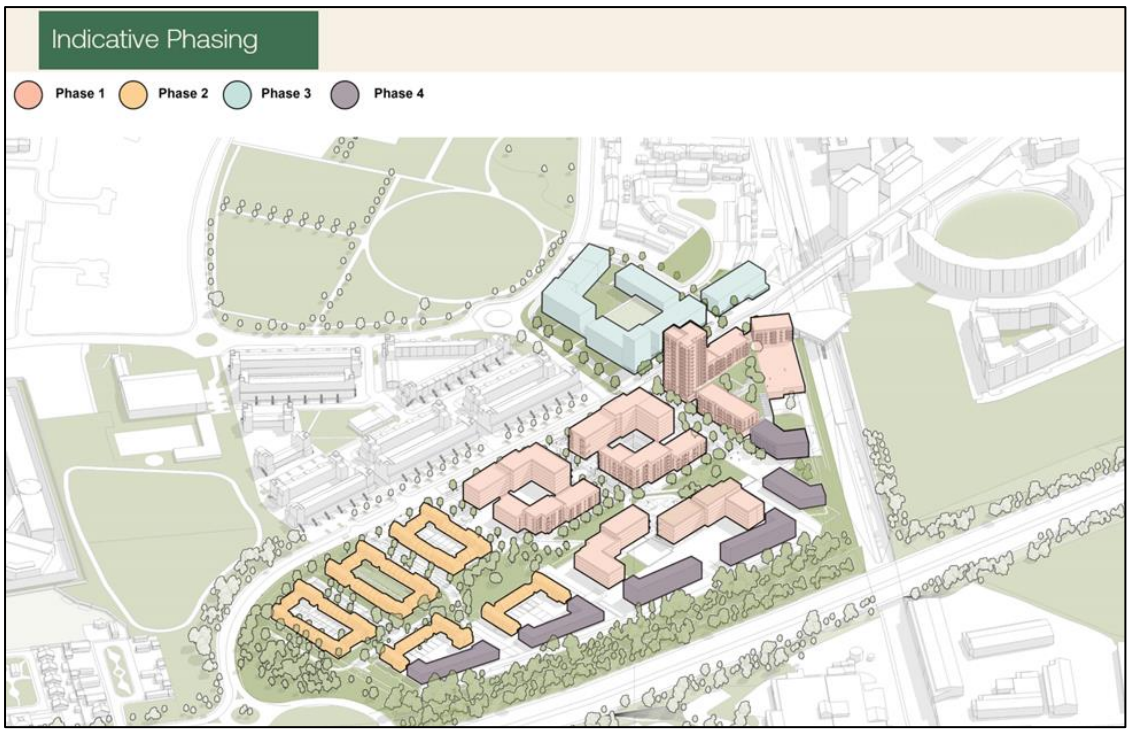

Figure 16.11 Phasing Layout

Phase 1 is the medium and high-density area and the subject application area, which will provide a total of 708 residential units ranging in size from studio to 3-bed apartments, a 2,523m² supermarket, a combined area of 373m² for retail over 7 units, a 672m² creche and 1,222m² of community spaces over 13 buildings. A breakdown of the schedule of accommodation for the subject application is provided in the table below.

Table 16.1 Phase 1 Schedule of Accommodation

Block	Studio	1-bed Apt	2-bed Apt	3-bed Apt	Total	Total Area
1	-	13	-	11	24	-
2A	-	8	14	5	27	-
2B	1	43	66	-	110	-
3	-	12	23	-	35	-
5A	10	16	28	-	54	-
5B	-	10	14	5	29	-
6A	-	20	32	6	58	-
6B	-	8	12	4	24	-
7A	6	35	40	-	81	-
7B	-	5	25	-	30	-
8A	6	17	34	6	63	-

8B	5	13	10	5	33	-
9A	-	29	13	5	47	-
9B	-	8	10	4	22	-
10A	-	16	22	4	42	-
10B	-	10	14	5	29	-
Supermarket					1	2,523m²
Retail					7	373m²
Community					13	1,222m²
Creche					1	672m²

The development includes all associated site works, undergrounding of overhead lines, boundary treatments, drainage, and service connections.

The proposed development, with respect to utilities, includes the following characteristics:

- Excavation of service trenches for the:
- Construction of the proposed utilities, and
- Reinstatement of lands above these utilities.

The remainder of the phases will be subject to their own planning permission applications, however their preliminary details are outlined below so that the subject development may be assessed as part of the full masterplan development in its full context. It should be noted that the trunk foul and surface water drainage, including attenuation storage, to serve phases 2, 3, & 4 are part-provided under the subject application for Phase 1.

Phase 2: This is the low-density housing area located to the north of Site 4 and contains 153 residential units comprising 100 apartment/ duplex units and 53 houses.

Phase 3: This will be the development of Site 5, and comprises 254 residential units, 1,200m² of retail space, with community facilities to be confirmed.

Phase 4: This will be the construction of commercial office space over 6 blocks with a total area of c. 16,310m².

16.4.1 Water Supply

A Pre-Connection Enquiry was submitted to Uisce Eireann. The subsequent Confirmation of Feasibility Letter, included as Appendix A to the Engineering Assessment Report, advises that no upgrade works are required to the public watermain networks. The letter further advises that Site 4 is to be served by a connection to the existing 300mm DI spur crossing Park West Avenue, and Site 5 is to be served by a connection to the 200mm uPVC network at Cherry Orchard Park (Cedar brook Way). Metering/telemetry facilities are to be installed at both connection points.

Site 4 is proposed be served by 2 No. 200mm connection to the 300mm DI as instructed by Uisce Eireann. The proposed 200mm watermain will follow the main vehicular circulation route of the site and will be further supplemented by 150mm and 100mm loops and branches.

Site 5 is proposed to be connected via a 100mm watermain to the existing 200mm uPVC network as instructed by Uisce Eireann.

Meters will be installed at connection points for both sites in line with Uisce Eireann requirements.

The proposed watermain layouts are shown on drawing numbers: 22-010-P300–P303.

A Statement of Design Acceptance from Uisce Eireann is included as an Appendix to the Engineering Assessment Report submitted under a separate cover.

The calculated water demand at the subject development is set out in the table overleaf. The table has been sub-divided into sections to show the subject application (Phase1), and also the remainder of the masterplan development (Phases 2-4, inclusive). The water demand from the masterplan development is based on their current Schedules of Accommodation, these details will be finalised as part of their future planning application submissions.

The average domestic demand has been established based on an average occupancy ratio of 2.7 persons per dwelling with a daily domestic per capita consumption of 150 litres per head per day.

The supermarket has a floor area of 2,523m², with an expected staff rate of 1 person per 25m², for a total estimated staff number of 101 staff, with a consumption rate of 90 litres per head per day. This consumption rate is based on the rate of foul water expected to be generated as per the Uisce Eireann Wastewater Code of Practice Appendix C.

The retail areas, 373m^3 over 7 No. units, with an expected staff rate of 1 person per 50m², for a total estimated staff number of 8 staff, will have a consumption rate of 90 litres per head per day. This consumption rate is based on the rate of foul water expected to be generated as per the Uisce Eireann Wastewater Code of Practice Appendix C.

It is anticipated that the community buildings will be utilised by local residents and that for any community meetings or events it would be utilised by a maximum of 300 persons at any one time. As per Appendix C of the Wastewater Code of Practice it is considered that the most similar type of flow rate would be that of a Public House Patron with a specified rate of 12 litres per head. This output figure is further used as the projected consumption figure.

It is calculated that the creche (672m^2) will generate demand for 129 persons (25 staff and 104 children), with a water demand of 90 litres per head per day. This volume is based on the figure for the foul volume generated by the most similar type of usage: a non-residential school with canteen facilities, also as per Appendix C of the Code of Practice.

The Phase 3 retail areas, c, 1,200m², with an expected staff rate of 1 person per 50m², for a total estimated staff number of 24 staff, will have a water demand of 90 litres per head per day> this volume is based upon the generated foul flows as per Appendix C of Uisce Eireann's wastewater Code of Practice.

The Phase 4 office/commercial space has a total floor area of c. 16,310m², with an expected staff rate of 1 person per 15m², for a total estimated staff number of 1,087 staff. The foul flow rate of 100 litres per head per day, as per the Uisce Eireann Code of Practice, Appendix C, for an Office/Factory with Canteen, is presumed to be equal to the water consumption demand.

The residential, commercial, and creche water demands have also incorporated a 10% consumption allowance. The average day/peak week demand has been taken as 1.25 times the average daily domestic demand, while the peak demand has been taken as 5 times the average day/peak week demand, as per Section 3.7.2 of the Uisce Eireann Code of Practice for Water Infrastructure.

Table 16.2 Calculation of Water Demand for the Development

	Description	Total Population	Water demand	Average Demand	Average Peak Demand	Peak Demand
		No. People	*l/day*	*l/s*	*l/s*	*l/s*
Subject Application	708 Apartments	1,912	315,480	3.651	4.564	22.820
	Supermarket (2,523m²)	101	9,999	0.116	0.145	0.725
	Retail (373m²)	8	792	0.009	0.011	0.055
	Community space (1,222m²)	300	3,960	0.046	0.058	0.290
	Creche (672m²)	129	12,771	0.148	0.185	0.925
Phase 2*	153 units	413	68,145	0.789	0.986	4.930
Phase 3*	254 units	686	113,190	1.310	1.638	8.190
	Retail (1,200m²)	24	2,376	0.028	0.035	0.175
Phase 4*	Office/Commercial (c. 16,310m²)	1,087	119,570	1.384	1.730	8.650
	Total	**4,660**	**638,283**	**7.481**	**9.352**	**46.760**

** Denotes units as part of the masterplan development design, outside the area of the subject application*

The average demand for the development is 7.481 l/s, with a peak demand of 46.760 l/s.

Construction Phase

- There is a risk of contamination of the existing water supply during construction of the development when connection of the proposed development 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 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 may be temporary interruptions to the local water supply during the connection works to the public network. Local residents that may be affected will be notified in advance of the works taking place.
- There will be some minor water demand for site offices. There is a risk of contamination to the existing water supply during connection of the development's watermains to the public water supply.

The construction of the proposed development will not give rise to any significant long term adverse impact. Negative impacts during the construction phase will be slight (not significant) and short term only.

Operational Phase

There is a potential for Watermain leaks which would increase the volume of water permeating through the underground soil strata. This has potential to cause a negative, moderate (significant) and permanent impact on the water supply network should no mitigation measures be implemented.

During the operational phase of the development, there will be an increase in demand for water from the public water supply, and increased loading to the foul water network. This has potential to cause a negative, moderate (significant) and permanent impact on the water supply network should no mitigation measures be implemented.

16.4.2 Foul Sewerage

As previously noted, Uisce Eireann have instructed that both Sites 4 & 5 must connect to the foul water infrastructure on Cherry Orchard Green. Uisce Eireann further advise it has a project underway which will provide the necessary upgrades and capacity and is scheduled for completion in Q1 2026. This is the upsizing of the existing 225mm Ø on Barnville Park to a 1050mm Ø pipe. The proposed connection can be completed as soon as practicably possible after this date.

In order to meet the above strategy, Uisce Eireann have confirmed that it is acceptable for Site 4 to be served by a 300mm Ø trunk sewer at a gradient of 1/300. This trunk sewer will reduce the depth that the existing site levels will have to be raised at the north of Site 4, to provide depth of coverage to the foul network. Existing ground levels will need to be raised by a maximum of c. 1m at the northernmost part of Site 4. The raising of these levels' ties-in well to the existing topography of the steep rise on Park West Avenue as it approaches the roundabout of the Cloverhill Road, Park West Avenue and M50 overpass immediately adjacent the north of Site 4.

It is proposed that Site 4 be drained via a series of 150mm and 225mm Ø sewers which will connect to the aforementioned 300mm Ø trunk sewer. This trunk sewer will leave Site 4 at the junction of Park West Avenue and Barnville Walk. It will proceed along Barnville Walk to connect to the existing foul network. The south of site 4 (high-density), will be served by a network of 225mm and 300mm Ø pipes. This network will exit Site 4 at the proposed southern access road and proceed north to connect to the 300mmØ trunk sewer. Site 5 will be drained via a network of 150mm and 225mm Ø pipes and will connect to the existing foul network at the connection point as specified by Uisce Eireann. All networks are proposed to drain by gravity and there is no requirement for pumping on the proposed foul networks.

The proposed internal foul drainage network has been designed and sized in accordance with the Uisce Eireann Code of Practice for Wastewater Infrastructure and Standard Details. Please refer to Drawing numbers: 22-010-P200-P203.

A Statement of Design Acceptance has also been issued by Uisce Eireann and is provided as an Appendix to the Engineering Assessment Report.

The calculated foul water flows at the subject and masterplan development are set out in the table overleaf. The table has been sub-divided into sections to show the subject application (Phase1), and also the remainder of the masterplan development (Phases 2-4, inclusive). The foul water flows from the masterplan development are based upon their current Schedule of Accommodation, these details will be finalised as part of their future planning application submission.

Domestic wastewater loads for all phases has been calculated based on 2.7 persons per unit with a per capita wastewater flow of 150 litres per head per day.

The supermarket has a floor area of 2,523m², with an expected staff rate of 1 person per 25m², for a total estimated staff number of 101 staff, will have a foul flow rate of 90 litres per head per day, as per Appendix C of the Code of Practice.

The retail areas, 373m² over 7 No. units, with an expected staff rate of 1 person per 50m², for a total estimated staff number of 8 staff, will have a foul flow rate of 90 litres per head per day, as per Appendix C of the Code of Practice.

It is anticipated that the community buildings will be utilised by local residents and that for any community meetings or events it would be utilised by a maximum of 300 persons at any one time. As per Appendix C of the Code of Practice it is considered that the most similar type of flow rate would be that of a Public House Patron with a specified rate of 12 litres per head.

It is calculated that the creche (672m²) will generate flow for 129 persons (25 staff and 104 children), with a wastewater volume of 90 litres per head per day, based on the figure for the most similar type of usage: a non-residential school with canteen facilities, as per Appendix C of the Code of Practice.

The Phase 3 retail areas, c, 1,200m², with an expected staff rate of 1 person per 50m², for a total estimated staff number of 24 staff, will have a foul flow rate of 90 litres per head per day, as per Appendix C of the Code of Practice.

The Phase 4 office/commercial space has a total floor area of c. 16,310m², with an expected staff rate of 1 person per 15m², for a total estimated staff number of 1,087 staff, will have a foul flow rate of 100 litres per head per day, as per the Uisce Eireann Code of Practice, Appendix C, for an Office/Factory with Canteen.

The residential, commercial, and creche flows have also incorporated a 10% unit allowance, in line with Section 3.6 of the Uisce Eireann Code of Practice for Wastewater Infrastructure.

Based on the total population of 4,361, a peak flow multiplier of 3 has been used, as per Section 2.2.5 of Appendix B of the Code of Practice.

Table 16.3 Calculation of Foul Water Flows

	Description	Total Population	Load per Capita	Daily Load	Total DWF	Peak Flow
		No. People	*l/day*	*l/day*	*l/s*	*l/s*
Subject Application	708 Apartments	1,912	150	315,480	3.651	10.953
	Supermarket (2,523m²)	101	90	9,999	0.116	0.348
	Retail (373m²)	8	90	792	0.009	0.027
	Community space (1,222m²)	300	12	3,960	0.046	0.138
	Creche (672m²)	129	90	12,771	0.148	0.444
Phase 2*	153 units	413	150	68,145	0.789	2.367
Phase 3*	254 units	686	150	113,190	1.310	3.930
	Retail (1,200m²)	24	90	2,376	0.028	0.084
Phase 4*	Office/Commercial (c. 16,310m²)	1,087	100	119,570	1.384	4.152
	Total	**4,660**		**646,283**	**7.481**	**22.443**

** Denotes units as part of the masterplan development design, outside the area of the subject application*

The total dry weather flow from the masterplan development has been calculated as: 7.481 l/s, with a peak flow of 22.443 l/s.

Foul water sewers will be constructed strictly in accordance with Uisce Eireann requirements. No private drainage will be located within public areas.

Drains will be laid to comply with the requirements of the latest Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Document H.

Construction Phase

For the purpose of construction stage foul water discharge, the contractor will need to apply to Uisce Eireann for a temporary connection agreement at the appropriate time.

- 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.
- Cross connection between foul and surface water pipes.
- There will be a temporary increase in the volume of foul water generated on-site by construction staff.

This has potential to cause a negative, moderate (significant) and permanent impact on the foul sewer network should no mitigation measures be implemented.

Operational Phase

- Blockages may occur within the pipe network and the wastewater could become septic.
- Foul water could be connected to the surface water drainage network.
- In the absence of mitigation measures these potential impacts are considered to be negative, significant and permanent.
- There is potential for leaks in the foul network to result in contamination of the groundwater.
- Accidental spills of fuels/hydrocarbons and washing down into the drainage pipe network has the potential to impact on the receiving hydrogeology.
- During the operational phase of the development, there will be an increase in demand for water from the public water supply, and increased loading to the foul water network.

This has potential to cause a negative, moderate (significant) and permanent impact on the foul sewer network should no mitigation measures be implemented.

16.4.3 Surface Water

It is proposed to construct a surface water drainage network that will service and attenuate the development internally before discharging at the current greenfield (or allowable) rates to the local Surface Water network. It is proposed that Site 4 will connect to the existing 1,050mm Ø network in Cedar Brook Way, while Site 5 will outfall to the 900mm Ø Network in Barnville Park.

Based on the details presented by the Site Investigation Report, the sites have properties equivalent of a Type 5 soil, which has a runoff rate of 8.66 l/s/ha. However, in line with DCC requirements, the attenuation calculations undertaken, have limited the outflow rate to a maximum of 2.0 l/s/ha, by using

a soil type 2 for progression of the calculations. The reason for this limitation, is that the Flood Risk Assessment submitted under a separate cover, has identified a downstream area of the Camac River of being at risk of flooding. The Council, already aware of this issue, confirmed in the preliminary surface water strategy meeting, discussed below, that our early-stage modelling of the attenuation volume requirements was correct in applying the max outfall rate of 2 l/s/ha to our calculations.

Meetings were held with Dublin City Council in 2022 & 2023 in order to agree the principles of the surface water and SuDS strategy. These meetings outlined the preliminary surface water strategy, SuDS strategy, and connection points. The overall preliminary proposal was deemed acceptable and suitable for further detailed design progression. It was agreed that the outflow rate be set at a maximum of 2 l/s/ha as per Dublin City Council requirements. This is in accordance with Dublin City Council's "SuDS Design and Evaluation Guide", which instructs in their Flow Control Discharge Limits Table (page 43), that the 1-in-100 year maximum outflow rate shall be limited to 2 l/s/The outflow limit of 2 l/s/ha is applicable to the subject development and future development of the masterplan site. The 2 l/s/ha outflow limit will reduce the outflow rate from its current greenfield runoff rate of 8.66 l/s/ha.

For storm water management purposes, it is proposed to divide the sites into four separate sub-catchments. Storm water from each catchment will be attenuated and discharge at a controlled rate, limited to a maximum of 2 l/s/ha (as per Dublin City Council requirements), to ultimately outfall to the existing surface water networks at Cedar Brook Way and Barnville Walk. The proposed development has been designed to incorporate best drainage practice.

It is proposed to incorporate a Storm Water Management Plan through the use of various SuDS techniques to treat and minimise surface water runoff from the site. The methodology involved in developing a Storm Water Management Plan for the subject site is based on recommendations set out in the Greater Dublin Strategic Drainage Study (GDSDS), Dublin City Council's SuDS Design and Evaluation Guide, and in the SuDS Manual. Based on four key elements – Water Quantity, Water Quality, Amenity and Biodiversity – the targets of the SuDS train concept have been implemented in the design, providing SuDS devices for each of the following:

- Source Control
- Site Control
- Regional Control

The proposed development incorporates a Storm Water Management Plan through the use of various SuDS techniques. Treatment and storage of surface water at source will intercept and slow down the rate of runoff from the site to the existing surface water sewer system.

The SuDS devices proposed around the site include permeable paving, filter drains, green/sedum roofing, bio-retention systems/raingardens, roadside trees, swales, attenuation tanks, flow control devices and petrol interceptors. These features will slow down and improve the quality of water flows discharging from the proposed development.

Attenuation storage is provided to limit the discharge rate from the site into the public network. As per the GDSDS, the required attenuation volume is calculated assuming 100% runoff from paved areas, and has been calculated for the 1-year, 30-year and 100-year return periods, identifying the critical storm for each.

Surface water runoff will be restricted via a hydro-brake or similar approved flow control device, limited to below the greenfield equivalent runoff rate for each catchment, as discussed earlier.

Full details of the SuDS features incorporated to the proposed surface water drainage design are included in the Storm Water Management Plan report, submitted as part of the planning package under a separate cover.

The proposed drainage and attenuation strategy can be seen on drawing numbers:

- 22-010 -P200-P203 and P205.
- Surface water catchments on 22-010-P210.
- The SuDS layout drawing is 22-010-P240.
- A cross section of the central attenuation corridor is provided on 22-010-P250.
- Ancillary details drawings for the Typical Surface Water Details are on 22-010-P230.
- The Typical SuDS Details are provided on 22-010-P241.

Surface water sewers will generally consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with Fingal County Council requirements for taking in charge. It is intended that all sewers within the public domain will be handed over to Dublin City Council for taking in charge.

All private outfall manholes will be built in accordance with the Greater Dublin Regional Code of Practice for Drainage Works. No private drainage will be located within public areas.

Drains will be laid in accordance with the requirements of the Building Regulations, Technical Guidance Document H.

A site-specific Flood Risk Assessment has been carried out for the proposed development and accompanies this submission under separate cover.

Construction Phase

- 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 surface water networks on the adjacent roads in the runoff.
- There is a risk of pollution of groundwater / surface water networks / soils by accidental spillage of oils / diesel from temporary storage areas or where 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.
- Cross Connection between surface water and foul pipes.

This has potential to cause a negative, moderate (significant) and permanent impact on the surface water sewer network / groundwater should no mitigation measures be implemented.

Operational Phase

- 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.
- DCC policy restricts the designed outflow rate to a maximum of 2 l/s/ha. This is below the current greenfield runoff rate of 8.646 l/s/ha. This limitation reduces the flow rate of surface water

entering the surface water network that may contribute to downstream flooding when compared to the current, undeveloped site conditions.

This has potential to cause a negative, moderate (significant) and permanent impact on the surface water sewer network / groundwater should no mitigation measures be implemented.

16.4.4 Electricity, Gas and Telecommunications

Construction Phase

ESB Network

The installation of the ESB 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.

The relocation or diversions of the existing overhead and underground ESB lines may lead to loss of connectivity to and / or interruption of the supply from the electrical grid to the surrounding areas. Any loss of supply will be managed by ESB Networks to minimise impact on neighbouring properties.

The site compound will require a power connection. This likely negative impact will be temporary and negligible.

Gas

The installation of the gas 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 Gas Networks Ireland infrastructure while carrying out works to provide service connections. This likely adverse impact may be characterised as a temporary, regionally short term, moderate (significant) impact.

Telecommunications – Eir & Virgin

The installation of the telecommunications 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 negative impact may be characterised as a temporary, regionally short term, moderate (significant) impact.

The site compound will require a telecommunications connection. This likely negative impact will be temporary and negligible.

Operational Phase

ESB Network

There will be an increased demand for power once the development is occupied however this will have no impact on existing consumers.

Gas

There will be an increased demand for gas once the development is occupied however this will have no impact on existing consumers.

Telecommunications – Eir & Virgin

The impact of the operational phase of the proposed development on the telecommunications network would be to increase the demand on the existing network however this will have no impact on existing consumers.

16.5 Mitigation Measures

16.5.1 Water Supply

Construction Phase

A site compound(s) including offices and welfare facilities will be set up by the main contractor in locations to be decided within the subject site. Sanitary connections will need to be arranged by the contractor with Uisce Eireann at the appropriate time via a Temporary Connection Application.

- 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 Eireann/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 Eireann/Local Authority.

Operational Phase

- Water metering via district meters will be installed to Uisce Eireann requirements. Monitoring of the telemetry data will indicate any excessive water usage which may indicate the potential for a leak in the watermain network. Early identification of potential leaks will lead a faster response in determining the exact location of leaks and completion of remedial works.

16.5.2 Foul Sewerage

Construction Phase

A site compound(s) including offices and welfare facilities will be set up by the main contractor in locations to be decided within the subject site. Sanitary connections will need to be arranged by the contractor with Uisce Eireann at the appropriate time via a Temporary Connection Application.

Where possible, and subject to licence, the permanent connection to the public foul sewer will be used temporarily for construction phase. Vehicle wash down water will discharge directly, via suitable pollution control and attenuation, to the foul sewer system. If this connection is not permitted, then wastewater generated will be required to be stored for collection and treatment off-site at a suitable waste disposal facility.

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.

In order to reduce the risk of defective or leaking foul sewers, the following measures will be implemented:

- All new foul sewers will be tested by means of an approved air test during the construction phase in accordance with Uisce Eireann's Code of Practice and Standard Details.
- All private drainage will be inspected and signed off by the Design Engineer in accordance with the Building Regulations Part H and BCAR requirements.

- Prior to connection, foul sewers will be surveyed by CCTV to identify possible physical defects.
- The connection of the new foul sewers to the public sewer will be carried out by or under the supervision of Uisce Eireann and will be checked prior to commissioning.
- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.
- Surface water networks will be constructed and tested in line with the Local Authority's requirements for Taking in Charge.
- Public networks are proposed to be taken in charge by Uisce Eireann, and as such will be subject to post construction review and inspection as part of this process.

Operational Phase

It is not envisaged that any further remedial or reductive measures will be necessary upon completion.

16.5.3 Surface Water

Construction Phase

The sites have no direct hydrological connectivity to natural watercourses or surface water networks. There may be an indirect link from surface water runoff which may have the potential to run off the site boundary to the surface water gullies on the adjacent road networks. These networks outfall to the Blackditch Stream.

The following Mitigation Measures are to address potential impacts to water quality and are required to protect the Blackditch Stream, and the Camac River which has an ultimate outfall to the River Liffey at Heuston. All works will be undertaken with reference to the following guidelines:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams et al., 2001);
- CIRIA C692: Environmental Good Practice on Site, (Audus et al., 2010)
- BPGCS005: Oil Storage Guidelines;
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Technical Guidance (Murnane et al., 2006a)
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane et al., 2006a)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016)
- Guidelines for Planning Authorities – Architectural Heritage Protection – Guidance on Part IV of the Planning and Development Act 2000. (Part 2, Chapter 7) and ICOMOS Principles.
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.

- CIRIA 697, The SUDS Manual, 2007; and
- UK pollution Prevention Guidelines (PPG) UK Environment Agency, 2004

The schedule of mitigation presented within the following table summarises measures that will be undertaken in order to reduce impacts on ecological receptors within the zone of influence of the proposed development.

Table 16.4 Schedule of Surface Water Mitigation Measures

No.	Risk	Possible Impact	Mitigation	Result of Mitigation
1	Hydrocarbons from carparking area entering the drainage network.	Water quality impacts.	Petrol interceptor to be installed on drainage network prior to outfall to public surface water network.	Prevents hydrocarbons from entering the public surface water network.
2	Pollutants from site compound areas entering the drainage network or contaminating soils.	Water quality impacts. Soil quality impacts. Groundwater impacts.	Materials to be stored appropriately in designated areas (discussed below). Temporary foul water connection to be obtained from Uisce Eireann to serve site compound welfare facilities.	Prevents contamination of public surface water network, soil, and groundwater.
3	Pollutants from material storage areas entering the watercourse or contaminating soils.	Water quality impacts. Soil quality impacts. Groundwater impacts.	Fuels, oils, greases, and other potentially polluting chemicals will be stored in roofed and bunded compounds at the Contractor's compound. Storage area to be located over 50m away to ensure no direct pathway to the surface water network. Bunds are to be provided with 110% capacity of storage container. Spill kits will be kept on site at all times and all staff trained in their appropriate use. Method statements for dealing with accidental spillages will be provided the Contractor for review by the Employer's Representative.	Prevents contamination of public surface water network, soil, and groundwater.
4	Concrete/ cementitious materials entering the drainage network.	Water quality impacts	A designated wash down area within the Contractor's compound will be used for cleaning of any equipment or plant, with the safe disposal of any contaminated water.	Prevents contamination of public surface water network. Ensures invasive species material is not transported off site as muck.
5	Leaching of contaminated soil into groundwater.	Groundwater quality impacts	Spill kits will contain 10 hr terrestrial oil booms (80mm diameter x 1000mm) and a plastic sheet, upon which contaminated soil can be placed to prevent leaching to ground water.	Prevents contamination of groundwater.
6	Pollutants from equipment storage/ refuelling area entering the drainage network.	Water quality impacts	Any refuelling and maintenance of equipment will be done at designated bunded areas with full attendance of plant operative(s) within contained areas. Discharge licence (where required) pollutant limits to be monitored and adhered to. The site is located at least 50m from any direct pathway to the surface water drainage network.	Prevents contamination of public surface water network.

No.	Risk	Possible Impact	Mitigation	Result of Mitigation
7	Runoff from exposed work areas and excavated material storage areas entering the drainage network.	Water quality impacts due to silt entering the network.	Provision of silt entrapment facilities such as; straw bales, silt fencing, silt barriers, diversion drains, settlement tank(s), & settlement pond(s), as appropriate and as outlined below.	Prevents contamination of public surface water network.

As mentioned previously, there is no direct hydrological connectivity from the sites to natural watercourses or surface water networks. There is potential for an indirect hydrological connectivity to the local surface water drainage network, whereby during heavy rainfall events, surface water from the sites flows over the site boundary to the road gullies on the adjacent streets.

The most likely potential sources of contamination to the local surface water network are from silt and suspended particles, and from chemical compounds entering these networks as surface water runoff.

Silt and suspended particles may arise from surface runoff from stockpiled materials or from the pumping of water volumes in excavations.

Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area will pass through a sediment entrapment facility before it exits the site and flows downstream.

Site stripping will be minimised as far as practicable.

Straw Bales:

Straw bales can be placed at the base of a slope to act as a sediment barrier. These are not recommended for use within a swale or channel. Straw bales are temporary in nature and may perform for only a period of weeks or months. Proper installation and maintenance is necessary to ensure their performance.

Silt Fencing

A silt fence is made of a woven synthetic material, geotextile, and acts to filter run-off. Silt fencing can be placed as a temporary barrier along the contour at the base of a disturbed area but is not recommended for use in a channel or swale. The material is durable and will last for more than one season if properly installed and maintained. Silt fencing is not intended to be used as a perimeter fence or in area of concentrated flow. If concentrated flow conditions exist, a more robust filter should be considered.

Silt Barriers

Silt barriers can also be temporarily installed in any road gullies of partially constructed roads to prevent sediment movement into downstream drainage systems or SUDS components.

When the catchment area is greater than that allowed for straw bale barriers or silt fences, runoff should be collected in diversion drains and routed through temporary sediment basins.

Diversion Drains

Diversion drains are simple linear ditches, often with an earth bund, for channelling water to a desired location. If the drains are being eroded, they can be lined with geotextile fabric or large stones or boulders.

Settlement tank

Commercially available settlement tanks, also known as sediment tanks, have compartments that allow suspended solid contents such as sand and silts to precipitate and sink to the bottom, falling out of

suspension. The settlement tank has an inlet for the runoff which enters a chamber where it is held before flowing to the next compartment or tank for further treatment, prior to outfall.

Spoil heap/stockpiles will not be located within 20m of the existing surface water networks. Spoil heaps/stockpiles will be considered for seeding if their storage is likely to be longer than a few seasons. Drainage diversion ditches will be constructed between the stockpile area and local surface water networks. This drainage ditch will flow to a sedimentation/settlement pond prior to outfalling to the surface water network. A Discharge Licence will need to be obtained from the local Authority by the Main Contractor. If topography doesn't allow for a gravity outfall from the sedimentation/settlement pond, a commercially available modular settlement tank will be utilised for the project, or outfall volumes may instead be pumped. Untreated surface water will not be permitted to flow to any natural or piped surface water network.

A site compound(s) including offices and welfare facilities will be set up by the main contractor in locations to be decided within the subject site. A discharge Licence for surface water will need to be arranged by the contractor with the Local Authority at the appropriate time. The main contractor will be required to schedule delivery of materials daily. The main contractor will be required to provide a site compound on the site for the secure storage of materials.

Chemical contamination can result due to fuel/chemical leaks and spills.

Spills and leaks may contaminate soil, groundwater, and surface water networks via surface run-off. Method statements and mitigation measures reduce the potential for leaks and spills and limit their impact should they occur.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and surrounding watercourses from oil and petrol leakages and significant siltation. Suitable bunded and roofed areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Spill kits will be provided by the Contractor to cater for any other spills.

On-site treatment measures will be installed to treat surface water run-off from the site prior to discharge to the receiving surface water sewer as noted above. This treatment will be achieved by the construction of settlement tanks/ponds, in conjunction with the installation of proprietary surface water treatment systems including class 1 full retention petrol interceptors, and spill protection control measures. Settlement tanks/ponds will be sized to deal with surface run-off and any groundwater encountered.

A sampling chamber with shut down valve will be installed downstream of the settlement pond/tank and water quality monitoring will be carried out here prior to discharge to the surface water sewer.

Regular testing of surface water discharges will be undertaken at the outfall from the subject lands in accordance with the requirements of the discharge licence to be obtained. The location(s) for testing and trigger levels for halting works will be agreed between the project ecologist and the site foreman or appointed, suitably qualified site staff member at the commencement of works.

Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.

It is likely that the surface water run-off from the site will be discharged to the existing public surface water network, post treatment. This will need to be confirmed between the Contractor and Local Authority, as well as any further conditions such as the permitted levels of contamination as well as frequency for testing, as part of the Contractor's application for a discharge licence.

All water pumped from the excavations will require to be treated for silt and deleterious matter. During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water

samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

In addition to daily visual inspections, a surface water monitoring programme, as outlined in the table below must be followed during construction in order to ensure maintenance of water quality protection. This is in line with Transport Infrastructure Ireland (TII)'s 'Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan'. It is considered that the parameter limit values (Guide/Mandatory) defined in the Fresh Water Quality Regulations (EU Directive 2006/44/EEC) should act as a trigger value for the monitoring of Surface Water.

Table 16.5 Monitoring Guidelines (Fresh Water Quality Regulations)

Parameter	Limit		Frequency and Manner of Samplings
	Limit Value	Guide/Mandatory	
Temperature	1.5°C	Mandatory Limit	Weekly, and at appropriate intervals where the works activities associated with the scheme have the potential to alter the temperature of the waters.
Dissolved oxygen	50% of Samples ≥ 9 (mg/l O2) 100% of Samples ≥ 7 (mg/l O2)	Guide Limit	Weekly, minimum one sample representative of flow oxygen conditions of the day of sampling
pH	6 to 9	Mandatory Limit	Weekly
Nitrites	≤0.01 (mg/l N02)	Guide Limit	Monthly
Suspended Solids	≤25 (mg/l)	Guide Limit	Monthly
BOD5	≤3 (mg/l)	Guide Limit	Monthly
Phenolic Compounds	-	-	Monthly where the presence of phenolic compounds is presumed (An examination by test)
Petroleum Hydrocarbons	5 (mg/l)	Guide Limit	Monthly (visual)
Non-Ionized Ammonia	≤ 0.005 (mg/l NH3)	Guide Limit	Monthly
Total Ammonium	≤ 0.004 (mg/l NH4)	Guide Limit	Monthly
Total Residual Chlorine	≤ 0.005 (mg/l HOCl)	Mandatory Limit	At appropriate intervals where works activities associated with the scheme have the potential to alter the Total residual Chlorine of the waters
Electrical Conductivity	-	-	Weekly

The Main Contractor will have overall responsibility for the implementation of the project Construction Surface Water Management Plan (CSWMP) during the construction phase. The appointed person from the Main Contractors team will be appropriately trained and assigned the authority to instruct all site personnel to comply with the specific provisions of the CSWMP. At the operational level, a designated person from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the CSWMP are performed on an on-going basis.

Copies of the Construction Surface Water Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the CSWMP and informed of the responsibilities which fall upon them because of its provisions.

The responsibilities of the appointed person will be as follows;

- Updating the CSWMP as necessary to reflect activities on site.
- Advise site management (including, but not limited to, the site Construction Manager) on environmental matters.
- Ensure pre-construction checks for protected species, are undertaken.
- Review method statement of the sub-contractors to ensure that it incorporates all aspects of CSWMP.
- Provide toolbox talks and other training, and ensure understanding by all involved of all mitigation measures.
- Assess effectiveness of mitigation, check weather forecast and site conditions where trigger levels are required.
- Ensure adherence to the specific measures listed in the Planning Conditions.
- Advise upon the production of written method statements and site environmental rules and on the arrangements to bring these to the attention of the workforce.
- Investigate incidents of significant, potential, or actual environmental damage, ensure corrective actions are carried out and recommend means to prevent recurrence.
- Be responsible for maintaining all environmental related documentation.
- Ensure plant suggested is environmentally suited to the task in hand.
- Co-ordinate environmental planning of the construction activities to comply with environmental authorities' requirements and with minimal risk to the environment. Give contractors precise instructions as to their responsibility to ensure correct working methods where risk of environmental damage exists.
- To minimise the adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the stripping back of the site.

Where possible, precast concrete units are to be used to avoid on-site "wet" mix concrete usage. In-situ concrete pours are to be managed in accordance with best practice to avoid overspills.

Wheel wash and wash down facilities are to be provided in designated areas. Discharge from these areas is to be directed into the settlement ponds/silt traps.

In order to reduce the risk of defective or surface sewers, the following measures will be implemented:

- All private drainage will be inspected and signed off by the Design Engineer in accordance with the Building Regulations Part H and BCAR requirements.
- Prior to connection, sewers will be surveyed by CCTV to identify possible physical defects.
- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.

- Surface water networks will be constructed and tested in line with the Local Authority's requirements for Taking in Charge.

The implementation of the following operation stage mitigation measures will minimise the impact on the hydrology and hydrogeology aspects of the development lands.

Operational Phase

The implementation of the following operation stage mitigation measures will minimise the impact on the hydrology and hydrogeology aspects of the development lands:

The surface water drainage network has been designed in accordance with the CIRIA SUDS Manual and the Greater Dublin Strategic Drainage Scheme. The appropriate interception mechanisms and treatment train process has been incorporated into the design.

Surface water outflow will be restricted to below the equivalent greenfield runoff rate from the proposed attenuation tanks and basins as per the catchment design, in accordance with Dublin City Council requirements.

Sustainable urban drainage measures, including green roofs, permeable paving, and filter strips/swales will be provided to improve water quality.

A petrol interceptor will be installed to prevent hydrocarbons entering the local drainage system at all outfalls.

A maintenance regime for the SuDS features will be incorporated to the Operation and Maintenance manual for the development. Surface SuDS features can typically be maintained as part of the regular maintenance of the landscape, incorporating litter picking, grass cutting, and inspections. The table overleaf is an extract from Section 12.3 of the SuDS Design & Evaluation Guide, and generally describes the regular maintenance aspect for the SuDS.

Table 16.6 Regular Maintenance Requirements for SuDS

Type	Activity	Normal site care (Site) or SuDS-specific maintenance (SuDS)	Suggested frequency
Regular Maintenance			
Litter	Pick up all litter in SUDS Landscape areas along with remainder of the site – remove from site	Site	1 visit monthly
Grass	Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. Leaving cuttings in situ	Site	As required or 1 visit monthly
Grass	Mow all dry swales, dry SUDS basins and margins to low flow channels and other SUDS features at 100mm with 150mm max. Cut wet swales or basins annually as wildflower areas – 1st and last cuts to be collected	Site	4-8 visits per year or as required
Grass	Wildflower areas strimmed to 100mm in Sept or at end of school holidays – all cuttings removed Or Wildflower areas strimmed to 100mm on 3 year rotation – 30% each year – all cuttings removed	Site	1 visit annually 1 visit annually
Inlets & outlets	Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	SuDS	1 visit monthly
Permeable paving	Sweep all paving regularly to keep surface tidy	Site	1 visit annually or as required

There will still be a remaining requirement for more intensive maintenance tasks to be undertaken however, the severity of these tasks can be reduced by regular inspections and proactive responses being incorporated as a part of the regular maintenance regime discussed above. A table showing the typical requirements for the occasional maintenance tasks and remedial works is extracted from the SuDS Design & Evaluation Guide to overleaf.

Table 16.7 Further Maintenance Requirements for SuDS

Occasional Tasks			
Permeable paving	Sweep and suction brush permeable paving when ponding occurs	SuDS	As required - estimate 10-15 year intervals
Flow controls	Annual inspection of control chambers - remove silt and check free flow	SuDS	1 visit annually
Wetland & pond	Wetland vegetation to be cut at 100mm on 3 – 5 year rotation or 30% each year. All cuttings to be removed to wildlife piles or from site.	Site	As required
Silt	Inspect swales, ponds, wetlands annually for silt accumulation	Site & SuDS	1 visit annually
Silt	Excavate silt, stack and dry within 10m of the SUDS feature, but outside the design profile where water flows. Spread, rake and overseed.	Site & SuDS	As required
Native planting	Remove lower branches where necessary to ensure good ground cover to protect soil profile from erosion.	SuDS	1 visit annually
Remedial Work			
General SuDS	Inspect SuDS system to check for damage or failure when carrying out other tasks. Undertake remedial work as required.	SuDS	Monthly As required

Surface water sewers will generally consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with Dublin City Council requirements for taking in charge. It is intended that all sewers within the public domain will be handed over to Dublin City Council for taking in charge.

All private outfall manholes will be built in accordance with the Greater Dublin Regional Code of Practice for Drainage Works. No private drainage will be located within public areas.

Drains will be laid in accordance with the requirements of the Building Regulations, Technical Guidance Document H.

All SuDS and surface water drainage networks proposed in the public domain will be constructed to the standards required for Taking in Charge.

It is not envisaged that any further remedial or reductive measures will be necessary upon completion.

16.5.4 Electricity

16.5.4.1 Construction Phase

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.

16.5.4.2 Operational Phase

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.

16.5.5 Gas

Construction Phase

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.

Operational Phase

All works will be completed in accordance with GNI details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

16.5.6 Telecommunications

Construction Phase

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

All works will be completed in accordance with the relevant details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

16.6 Residual Impacts

16.6.1 Water Supply

Construction Phase

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in water demand and foul water outflow during the period of construction. This increase in water demand will be negative, slight (not significant), likely, and short-term in nature.

Operational Phase

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development.

There will be an increased water demand generated for the proposed development. Uisce Eireann have confirmed in their Confirmation of Feasibility Letter that the existing network has sufficient capacity to cater for the development. The impact will be slight (not significant), negative, & permanent.

It is not envisaged that any other remedial or reductive measures will be necessary upon the completion of the development.

16.6.2 Foul Sewerage

Construction Phase

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in foul water outflow during the period of construction. This increase in foul flows generated with be slightly negative, slight (not significant), likely, and short-term in nature.

Operational Phase

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development.

There will be an increased foul flow volume generated for the proposed development. Uisce Eireann have confirmed in their Confirmation of Feasibility Letter that the existing network has sufficient capacity to cater for the development, subject to completion of upgrade works. The impact will be slight (not significant), negative, & permanent.

16.6.3 Surface Water

Construction Phase

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in surface water outflow during the period of construction. This increase generated with be negative, slight (not significant), likely, and short-term in nature.

Operational Phase

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 on its water body status or prevent attainment or potential to achieve the WFD objectives.

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 the underlying aquifer long-term and as such will not impact on trends in water quality and over all status assessments.

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development on surface water and groundwater quality.

Surface water discharge from the site will be restricted by means of attenuation to below the current greenfield runoff rate, therefore, no adverse impact in respect of flooding downstream will arise from the proposed development. The impact will be positive, slight, & permanent.

The installation of a Sustainable Urban Drainage System will ensure surface water runoff will be of high quality before discharge to the local surface water network and will not have an impact on the receiving waters downstream of the development. The impact will be positive, slight (not significant), & permanent.

16.6.4 Electricity

Construction Phase

Due to the proposed mitigation measures outlined above no significant impact will arise during the construction phase of the proposed development on ESB infrastructure.

Operational Phase

There will be an increased demand on the ESB Network as a result of the development however it is not expected that this will have any impact on the operation of the network.

16.6.5 Gas

Construction Phase

Due to the proposed mitigation measures outlined above no significant impact will arise during the construction phase of the proposed development on gas infrastructure.

Operational Phase

There will be an increased demand on the Gas Network as a result of the development however it is not expected that this will have any impact on the operation of the network.

16.6.6 Telecommunications

Construction Phase

Due to the proposed mitigation measures outlined above no significant impact will arise during the construction phase of the proposed development on telecommunications infrastructure.

Operational Phase

There will be an increased demand on the telecommunications network as a result of the development however it is not expected that this will have any impact on the operation of the network.

16.7 Cumulative Impacts

The main interactions relating to this EIAR Chapter are Land & Soils, Biodiversity, and Utilities.

During construction stage, the connection of wastewater services has the potential to impact groundwater and soils if wastewater were to leak from the network during the construction process. 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 Transport 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.

In respect of Land & Soils, interaction between surface and ground water and the bedrock geology is feasible. The implementation of the mitigation measures outlined in this chapter will reduce the potential of surface contaminants leaking into the underlying geology.

In respect of Biodiversity, there is interaction between hydrology and the downstream habitats present as the public surface water network outfalls volume and water quality to the natural watercourse. The mitigation measures ensure that surface water runoff is treated to the required standards so that downstream habitats are not negatively impacted.

16.7.1 Electricity

In the event of future development adjacent to the proposed development, there are no predicted cumulative impacts arising from the construction or operation phase related to the material assets – built services for foul, water supply and surface water drainage, provided that the other developments implement appropriate mitigation measures.

16.7.2 Gas

In the event of future development adjacent to the proposed development, there are no predicted cumulative impacts arising from the construction or operation phase related to the material assets – built services provided that the other developments implement appropriate mitigation measures.

16.7.3 Telecommunications

In the event of future development adjacent to the proposed development, there are no predicted cumulative impacts arising from the construction or operation phase related to the material assets – built services provided that the other developments implement appropriate mitigation measures.

16.8 Monitoring

Implementation of the Construction Management Plan is required to protect the hydrology and groundwater elements of the subject lands during construction stage. Maintenance of the mitigation measures and monitoring of the management processed is required to ensure best practice.

The monitoring measures to be implemented include:

- Monitoring of the management and storage of dangerous chemicals and fuel.
- Monitoring and maintenance of the wash and wheel wash facilities.
- Regular maintenance and monitoring of the sediment control measures.
- Monitoring and maintenance of the SUDS features, road gullies and, attenuation ponds and or sedimentation facilities during the construction phase of the development. (this will become the responsibility of the Local Authority when Taken in Charge).

Monitoring to be undertaken by others upon handover of utility networks includes:

- The water usage within the proposed development will be monitored via the bulk water meters. Records will be maintained by Uisce Eireann to ensure any excess usage is identified and investigated as necessary.
- Uisce Eireann 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, gas and broadband will be monitored by the relevant utility provider.

16.9 Difficulties Encountered

There were no particular difficulties encountered compiling the Material Assets –Utilities chapter of the EIAR.

16.10 Interactions

The main interactions relating to this EIAR Chapter are Water (Hydrology and Hydrogeology), Soils & Geology, Population and Human Health, and Traffic and Transport.

During construction stage, the connection of wastewater services has the potential to impact the local surface water and soils from a hydrology and hydrogeology perspective and soils and geology perspective, respectively. 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 Transport 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.

16.11 References

- Code of Practice for Water Infrastructure – Connections and Developer Services, (2017), Uisce Eireann
- Code of Practice for Wastewater Infrastructure – Connections and Developer Services, (2017), Uisce Eireann
- Eircom and Virgin Emaps
- Environmental Impact Assessment Reports – Draft Guidelines, (2017), Environmental Protection Agency
- ESB Networks
- Gas Networks Ireland – Cork Design Department
- Greater Dublin Strategic Drainage Study (GDSDS), (2015), Dublin Drainage
- Irish Building Regulations – Part H 2010 – Drainage and Wastewater Disposal
- Uisce Eireann Network Maps

17 Interactions

17.1 Introduction

This chapter deals with likely interactions between effects predicted as a result of the proposed development. This chapter has been prepared in accordance with the requirements set out in within the Planning and Development Regulations 2001 (as amended) and Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the "**EIA Directive**").

17.2 Definitions

Article 3(1) of the EIA Directive requires environmental impact assessments to include interactions of key effects assessed. 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 b.

Accordingly, this EIAR seeks to identify all potential impacts of the subject scheme, and this chapter has been compiled to list in one location all of the interactions identified in the assessment of impacts set out in Chapters 5 to 16.

Impact interactions and inter-relationships have been considered throughout in the preparation of the individual, topic specific chapter so that it can take into account the broader picture of how the proposed scheme may affect the various environmental media. All environmental topics are interlinked to a degree such that interrelationships exist on numerous levels. As outlined in the *Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022)* prepared by the EPA, it is general practice, to evaluate interaction of effects as a matrix between effects and key factors assessed, accompanied by brief text describing the interactions identified. The matrix incorporated in Table 17.1 inter-relates the various Chapters of the EIAR to the various impact headings referred to in Schedule 6 item 2(d) of the Planning and Development Regulations 2001 as amended.

17.3 Interactions of Effects

Table 17.1: Interaction between key factors assessed

Some interaction ✓ No Interaction x	Air Quality		Climate Factors		Noise and Vibration		Biodiversity		Archaeological, Architectural and Cultural Heritage		Landscape and Visual		Land ,Soils and Geology		Water		Population and Human Health		Traffic and Transport		Waste Management		Utilities	
	Con	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*	*Con*	*Ope*
Air Quality			✓	✓	x	x	x	x	x	x	x	x	✓	x	x	x	✓	✓	✓	✓	x	x	x	x
Climate Factors	x	x			x	x	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	✓	✓	x	x
Noise and Vibration	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	✓	x	x	x	x	x
Biodiversity	x	✓	x	x	✓	✓			x	x	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x
Archaeological, Architectural and Cultural Heritage	x	x	x	x	X	x	x	x			✓	x	✓	x	x	x	x	x	x	x	x	x	x	x
Landscape and Visual	x	✓	x	✓	x	x	✓	✓	x	✓			x	x	x	✓	x	✓	x	✓	x	x	x	✓
Land and Soils	✓	x	x	x	x	X	x	x	x	x	x	x			✓	x	x	x	✓	x	x	x	x	x
Water	x	x	x	x	x	x	x	✓	x	x	x	x	✓	✓			✓	x	✓	x	x	x	✓	✓
Population and Human Health	✓	x	✓	x	✓	x	x	x	x	x	✓	✓	✓	x	✓	x			✓	✓	✓	x	x	x
Traffic and Transport	✓	✓	x	x	✓	x	x	x	x	x	x	x	✓	x	x	x	✓	✓			✓	✓	x	x
Waste Management	x	x	x	x	x	x	x	x	x	x	x	x	✓	x	x	x	✓	✓	✓	✓			x	x
Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	x	✓	✓	x	x		

'Con' = Construction Phase Interactions

'Ope' = Operations Phase Interactions

17.3.1 Air Quality

The main interactions with air quality and climate and other topics/media are set out below.

The interactions identified are between population and human health and air quality.

Population and Human Health

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, negative and non-significant with respect to population and human health during construction, and long-term, imperceptible, neutral, and non-significant during the operational phase.

Traffic

Interactions between air quality and traffic (Chapter 14) can occur. 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. These interactions have the potential to impact both human health (Chapter 13) and ecology (Chapter 8).

Climate

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 6). There is no impact on climate due to air quality; however, the sources of impacts on air quality and climate are strongly linked.

Land and Soils

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land 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 11 (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.

17.3.2 Climate Factors

The main interactions with Climate Factors and other topics/media are set out below. Climate has the potential to interact with a number of other environmental attributes.

Water

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. Interactions between climate and hydrology are not considered significant.

Material Assets: Waste

Interactions between climate and Material Assets – Waste can occur. 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. Therefore, no significant interactions between climate and waste are predicted.

No other significant interactions between climate and other environmental topics have been identified.

17.3.3 Noise and Vibration

The main interaction with noise and vibration and other / topics media are set out below.

Traffic and Transportation

With increased traffic movements, the noise levels in the surrounding area have the potential to increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be imperceptible to not significant on all junctions.

17.3.4 Biodiversity

The main interaction with biodiversity and other / topics media are set out below.

Land, Soils and Geology

When soil is exposed after vegetative clearance there may be increased run-off and evaporation. Mitigation measures will be implemented during construction to prevent this run-off water from discharging directly to watercourses. Potential construction stage effects arising from the general loss and fragmentation of some habitats and reduction of associated opportunities for biodiversity are considered neutral to slight negative during the construction phase, while potential operational stage effects are considered imperceptible neutral as new planting/landscaping matures. Residual soils arising as a result of excavation at the development site will be used in landscaping works in the proposed public open space as much as possible rather than transporting off-site.

Water

When land surfaces are exposed after vegetative clearance there may be increased run-off and evaporation. Mitigation measures will be implemented during construction to prevent this run-off water from discharging directly to watercourses. As concluded in the Appropriate Assessment Screening Statement submitted with the application there are no elements of the proposed development that are likely to give rise to significant effects on the local Natura 2000 sites. The implementation of construction and operational phase soils and water management proposals, together with the site drainage design

will adequately reduce such potential impacts arising from the development site on these aquatic habitats in the wider area. Potential construction and operational phase effects on biodiversity associated with aquatic habitats in the wider area are considered imperceptible neutral with the implementation of soils and water management proposals.

Landscape and Visual

The landscape masterplan proposed as part of the development will retain and enhance the remaining hedgerows features with native planting, tree cluster/treelines, small areas of wildflower meadow and parkland/garden habitat. Potential construction stage effects arising from the general loss and fragmentation of some habitats and reduction of associated opportunities for biodiversity are considered neutral to slight negative during the construction phase, while potential operational stage effects are considered imperceptible neutral as new planting/landscaping matures. Due to the existing degraded nature of the habitats on site the loss of these will have little residual negative impact on this locality and no residual impact in the national or international context. Otherwise the successful implementation of the mitigation measures as outlined in this EIAR and accompanying documents, together with the landscape masterplan will minimise the potential impacts of the proposed development on local biodiversity such that its residual impact on other habitats, flora and fauna will be imperceptible neutral overall. There will be an increase in ecological niche availability associated with the post construction phase of this development. The removal of some vegetation within the development footprint and surrounding areas is likely to result in a change to the visual landscape during the construction phase, which will become part of the normal landscape of the wider area for the duration of the operational phase. The visual effect of this change is considered to be long-term, localised and slight.

Noise

Increased noise levels during the construction phase will only be temporary and are not expected to have a long-term significant adverse effect upon remaining fauna within the wider landscape. Operational noise will be audible at a low level in the ambient noise and the impact is predicted to be minor.

Air Quality

Exposed soil during the construction phase of the proposed scheme may give rise to increased dust emissions. However, the implementation of dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust.

17.3.5 Archaeological, Architectural and Cultural Heritage

The main interactions with Archaeological, Architectural and Cultural Heritage and other topics/media are set out below.

Should archaeological material be recorded in the course of monitoring, this may necessitate areas being left open to the elements for a period in order to facilitate consultation with DHLGH, processing of licences and/or full excavation/preservation-by-record of archaeological features. Consequently, in this scenario, there may be interactions (should a possible find be preserved in-situ) with landscape and visual (Chapter 9 Landscape and Visual) land and soils (Chapter 10 Land, Soils and Geology).

17.3.6 Landscape and Visual

Whilst there are relationships with the landscape aspects of the scheme to subjects within the EIAR, The most significant interactions with Landscape and Visual qualities are related to the following:

Air Quality:

The maturing landscape, particularly the tree planting assists in mitigating air pollution at operational stage. This is long term slight and positive.

Climate Factors

The maturing landscape assists in mitigating wind and creating beneficial microclimates including shade in summer and light in winter at operational stage. This is long term moderate and positive.

Biodiversity

The protection of existing vegetation to be retained is beneficial to biodiversity at construction stage, although much of the existing vegetation is removed which is a negative effect in the short term, mitigated by carrying out work in the appropriate seasons. This effect is short term, moderate and neutral. The maturing landscape supports existing and new habitats, thus diversifying the site's habitats at operation stage. This is long term moderate and positive.

Archaeological, Architectural and Cultural Heritage

The retention of the confluence of the 3 townland boundaries is a long term, moderate and positive effect on cultural heritage at operational stage.

Water

The inclusion of nature-based drainage solutions in the landscape design will assist in sustainable water management (filtration, attenuation, replenishing groundwater and habitat creation) at operational stage in a long term, moderate and positive way.

Population and Human Health

The inclusion of a diverse series of amenities to cater to a new community in the setting of a good visual environment will be a long term moderate and positive effect in the operational stage.

Traffic and Transport

The integration of cyclepaths and cycle routes within the landscape design will be a long term, moderate and positive effect at operational stage.

Utilities

By locating utilities underground, and coordinating above-ground services such as service covers, sub stations and lighting, in the landscape design, the visual quality at operational stage is long term, moderate and positive.

Summary

The protection of the landscape elements to be retained at construction stage is an important interaction with Biodiversity and Cultural Heritage. This is long term, moderate and positive.

At operational stage, the implementation of the scheme and its maturing characteristics in the long term will have slight to moderate, positive effects.

The landscape and visual aspects of the development invariably intertwine in relation to the social qualities of passive and active amenities and civic qualities in the public realm, transport, natural heritage particularly relating to enhancing biodiversity and creating resilience to climate change.

17.3.7 Land and Soil

There will be an interaction between this chapter and the following chapters:

Material Assets - Traffic. There will likely be a requirement for surplus excavated soil volumes to be transported by road for disposal or re-use. Haulage details are discussed in the Traffic and Transport Chapter of this document.

Water: Site preparation works can potentially lead to elevated silt/sediment or other contaminant loading due to construction site runoff. Dewatering of excavations during the construction phase can result in water with elevated silt and possible chemical contaminants requiring discharge to the local drainage system. Construction stage works can potentially impact water due to the risk of accidental spills, cross-contamination due to incorrect waste soils management, use of contaminated material as fill, etc.

Air Quality: Dust generated during site clearance, reprofiling, excavation, and soil reinstatement works can lead to temporarily diminished air quality.

17.3.8 Water

The main interactions with Water and other topics/media are set out below.

The main interactions relating to Water are the interactions with Land & Soils, Biodiversity, and Utilities.

Land and Soils

In respect of Land & Soils, interaction between surface and ground water and the bedrock geology is feasible. The implementation of the mitigation measures outlined in this chapter will reduce the potential of surface contaminants leaking into the underlying geology.

Biodiversity

In respect of Biodiversity, there is interaction between hydrology and the downstream habitats present as the public surface water network outfalls volume and water quality to the natural watercourse. The mitigation measures ensure that surface water runoff is treated to the required standards so that downstream habitats are not negatively impacted.

Utilities

During construction stage, the connection of wastewater services has the potential to impact groundwater and soils if wastewater were to leak from the network during the construction process. 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 Transport 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.

17.3.9 Population and Human Health

There are numerous inter-related environmental topics described in detail throughout this EIAR which are of relevance to population and human health. The main high-level interactions between Population and Human Health and other environmental factors include Air Quality and Climate Factors, Noise and Vibration, Landscape and Visual Impact, Water, Waste Management, and Traffic and Transportation. Although these have been covered in detail in the respective Chapters of this EIAR, it was considered prudent to provide a robust description of the same within this section.

Air Quality and Climate Factors

The interactions of population and human health with air quality and climate can occur during both the construction and operational phases of the proposed development. The Chapter 5 on Air Quality notes that during the construction stage the greatest potential for air quality impacts is from fugitive emissions

impacting nearby sensitive receptors. Construction phase traffic can also impact air quality, particularly due to the number of HGVs accessing the site. Construction phase traffic levels were reviewed, and it was found that the change in traffic was not of the magnitude to require a detailed assessment, therefore the impact is considered short-term and neutral. In terms of the operational stage air quality and climate impacts will predominantly occur as a result of the change in traffic flows on the local roads associated with the proposed development.

However, the Chapter concluded that the local area is considered of low sensitivity to human health impacts from dust emissions. 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.

Noise and Vibration

The interaction with Noise and Vibration can have an impact on Population and Human Health, mainly during the construction phase. Chapter 7 on Noise and Vibration notes that the largest noise and vibration impact will occur during the construction stage due to the operation of various plant machinery and HGV to, from and around the site, noise levels relating to site clearance, ground excavation and loading lorries etc. The Chapter also notes that the additional traffic introduced into the local road network due to the construction phase of the proposed development will not result in a significant noise impact. The predicted impact assessment in Chapter 7 has concluded that, provided the proposed mitigation measures are implemented, there is no long-term significant impact from owing to noise and vibration from the proposed development. As a result, there is no significant impact perceived from the same on population and human health.

Landscape and Visual Impact

The proposed development will potentially visually impact the appearance of the Development Sites. The sites are currently vacant and underutilized, with no previous uses or development identified. It is considered that the proposed development, by virtue of its visual appearance, will positively impact the visual amenity of the site in its current form. There will be no significant direct impact of the changes to visual appearance on human health. It is however considered that the proposed landscaping and green infrastructure will have a long-term positive impact on the population within the local area. The proposed development includes dedicated cycle lanes connecting the development and its public open space to the rest of the local area, pedestrian paths providing internal access / links, a park and MUGA pitch in combination with the community, art, and cultural spaces. This will increase the aesthetic and amenity value of the local area, positively contributing to the community, creating a sense of belonging and hence, improving social health within the area.

Water

The proposed development can impact the water quality within the local area as a result of contamination during any given phase of the development. Chapter 12 on Water identifies that there is a risk to Human Health should the ground water become contaminated during the construction or operational stages, and water is consumed. In order to mitigate the risk of 'leaching of contaminated soil into groundwater, Chapter 12, Table 12.5 notes that "spill kits will contain 10 hr terrestrial oil booms (80mm diameter x 1000mm) and a plastic sheet, upon which contaminated soil can be placed to prevent leaching to ground water", this will prevent contamination of aquatic zone by petrochemicals.

Material Assets – Traffic and Transportation

As per Chapter 14 on 'Material Assets – Traffic and Transport', during the construction stage, some of the construction traffic movements will be undertaken by heavy goods vehicles (HGVs), including vehicles movements associated with appointed contractors and staff. The Chapter notes that the

expected increase in the day-to-day traffic movements associated with construction activities is less than the benchmark of 10% set out in the TTA Guidelines published by TII. The Chapter concluded as such no significant impact on roads and traffic will arise from the Construction Stage of the proposed development.

In the operational stage however, the proposed development is expected to increase in terms of population and consequently experience an increase in the number of vehicles generated from the scheme. This might result in an impact on human health arising from the capacity and operation of the surrounding road network. The Chapter notes that the traffic impact from the proposed development during the operational stage is predicted to be 10% or higher at all junctions included in the traffic modelling undertaken for the project. This is generally in exceedance of the benchmark set out in the TTA guidelines. The results of the traffic modelling assessments indicate that all assessed junctions except Junction 4 Signalised Crossing (Park West Avenue / Barnville Walk) and Junction 7 (Park West Avenue / Park West Road), will operate within capacity with the proposed development in place in the Opening Year 2027 through the Design Year in 2032 to the Future Year 2042.

With regard to the overall impact of the development on traffic and transport, the Chapter concludes that no significant impact on the existing and proposed traffic and transport in the surrounding area is predicted to arise from the Construction or Operational Stages of the proposed development at Cherry Orchard Point. It is further noted that there will also be no significant impact on population and human health resulting from traffic and transport.

Material Assets – Waste Management

The inappropriate management of waste during the construction phase, including storage, handling and the use of insufficient segregation techniques has the potential to negatively impact the health of the construction workers. Likewise, during the operational phase the potential impacts on the environment and subsequently human health, from the proposed development would be caused by improper or the lack thereof of waste management. According to Chapter 15 on Material Assets – Waste Management, a carefully planned approach to waste management and adherence to the site-specific Resource and Waste Management Plan during the construction phase, will ensure that the effect on the environment will be ***short-term, neutral*** and ***imperceptible.*** With regard to the operational phase, the Chapter concludes – provided the mitigation measures in the development OWMP (Appendix 15.2) and in Chapter 15 are implemented, and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be ***long-term, neutral*** and ***imperceptible***.

As a result, it is considered that there is no subsequent significant impact on population and human health from the proposed development during the construction or operational phases.

17.3.10 Material Assets – Traffic and Transportation

The interactions between Material Assets – Traffic and Transport and the other chapters of the EIAR anticipated from the proposed development are set out below.

Population & Human Health

Traffic movements and delays during the construction phase are likely to result in short-term, slight to not significant, neutral effects for the users of the surrounding road network.
Reordering of the pedestrian and cycle facilities on Park West Avenue is likely to result in result in a positive long term significant impact on population and human health during the operational phase.

Material Assets –Soil & Geology

Excess material excavated during the construction of the groundworks within the subject site will be transported by road for disposal in approved locations. The impact of this interaction would be local, neutral, not significant and at worst short term in duration.
Excess material will be disposed of as provided for in Chapter 11 *Land, Soils and Geology* of this EIAR.

Air – Noise and Vibration

The noise and vibration generated by construction traffic and construction works on the subject site may result in short term localised noise and vibration effects. The effect of this interaction would be local, neutral, not significant and at worst short term in duration.
Noise and vibration will be controlled and monitored as set out in Chapter 7 *Noise and Vibration* of this EIAR.

Climate – Air Quality

Emissions from construction traffic may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles. With mitigation measures in place, no significant temporary or permanent residual negative impacts will occur.

Emissions from traffic during the operational stage may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles. However, having regard to the reduced number of parking spaces proposed to serve the development, this interaction would not be significant.

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

Climate and air quality will be controlled and monitored as set out in *Chapter 5 Air Quality and Chapter 6 Climatic Factors* of this EIAR.

Waste Management

Excess material excavated during construction works for Cherry Orchard Point will be transported by road for disposal in approved locations. The impact of this interaction local, neutral, not significant and at worst short term in duration.

During the operational phase, suitably contained wheelie bins / waste receptacles will be provided by private waste contractors to the residential areas and commercial facilities by private waste contractors. Waste will be collected on a regular basis and the effect of this interaction would be local, neutral, not significant and at worst short term in duration.

Waste will be managed as provided for in Chapter 15 *Material Assets – Waste Management* of this EIAR.

17.3.11 Material Assets – Waste Management

The main interactions with Material Assets – Waste Management and other topics/media are set out below.

Land & Soils

During the construction phase, excavated topsoil, made ground and clay (c. 31,300 m^3) will be generated from the excavations required to facilitate site levelling, construction of new foundations and installations of site services. It is currently envisaged that up to 20,000 m^3 of excavated material will be removed off site for appropriate offsite reuse, recovery, recycling and / or disposal. It is envisaged that the remainder of the excavated material will be reused on site.

If material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 11, Chapter 15 and the requirements of the RWMP (Appendix 15.1), will ensure the effect is ***long-term, imperceptible*** and ***neutral***.

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 14 (Traffic and Transportation). Provided the mitigation measures detailed in Chapter 14 and Chapter 15 are adhered to, the predicted effects are ***short to long-term, imperceptible*** and ***neutral***.

Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and mitigation measures in Chapter 13 and Chapter 15, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be ***long-term, imperceptible*** and ***neutral***.

17.3.12 Material Assets – Utilities

The main interactions with Material Assets – Utilities and other topics/media are set out below.

The primary interactions identified are Water (Hydrology and Hydrogeology), Soils & Geology, Population and Human Health, and Traffic and Transport.

Water / Land and Soils

During construction stage, the connection of wastewater services has the potential to impact the local surface water and soils from a hydrology and hydrogeology perspective and soils and geology perspective, respectively.

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.

Population and Human Health

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.

Transport and Transport

The construction of the various services will also interact with construction traffic as outlined in the Traffic and Transport Chapter.

17.4 Other effects

Schedule 6 Item 2(e) of the Planning and Development Regulations, 2001 as Amended requires that an EIAR contains a description of the likely significant effects (including direct, indirect, secondary, cumulative, transboundary, short, medium and long-term, permanent and temporary, positive and negative) of the project on the environment resulting from the following:

- *the Use of Natural Resources*

As the proposed development will not require the use of natural resources that are in short supply no likely significant effects on the environment are expected to arise from the use of natural resources in the construction / operation of the project

- *the emission of pollutants, the creation of nuisances and the disposal and recovery of waste.*

No likely significant effects on the environment are expected to arise from the emission of pollutants, the creation of nuisances or the elimination of waste associated with this project, as the relevant assessments included in this EIAR set out.

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

The likely significant effects of risks due to major accidents or disasters are described in Section 1.5.4 of this EIAR and in the Assessment Chapters, where relevant.

- *The technologies and the substances used.*

This is an urban residential led mixed use development and there are no technologies or substances associated with the project which would significantly or adversely affect the environment.

17.5 References

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency2022)
- Advice Notes for Preparing Environmental Impact Statements, Draft September 2017
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002)
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2002)

18 Summary of Mitigation Measures and Residual Impacts

18.1 Introduction

The preparation of the EIAR was an iterative process, linking into the design development process. The approach adopted in the impact assessment and preparation of the EIAR was based on the recommendations in the *Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA, 2022)*.

The proposed design was developed and the potential impacts of the proposal on the receiving environment was identified. Mitigation measures, once identified and assessed, have been incorporated into the design.

18.2 Mitigation Measures

This Section of the EIAR provides a summary overview of the various mitigation measures proposed across the various environmental topics. The mitigation measures, where relevant, will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. An outline CEMP has been prepared and is enclosed separately.

The mitigation measures as set out in the CEMP can be categorised as follows:

Ecology

- Meeting the requirements of the Dublin City Council surface water policy.
- The area demarcated by Grid Reference GR IO 07758 32794 will remain undeveloped post construction to protect the orchid rich soils. An area running the length of the motorway hedgerow boundary and 5 metres in depth shall form a green area post development and will receive no fertilizers or other artificial inputs. No Shrub flora will be planted in this area and mowing of the grassland will occur only after seed dispersal has occurred in late July/early August annually.
- Works can be undertaken after September 1st when bird nesting will have ceased. Nesting birds will have left (the nests must remain undisturbed until chicks have fledged).
- Where chemical treatment of roof timbers and construction timbers is necessary then only bat safe compounds may be used. (A suitable list of chemicals is given in the appendix to the Bat Survey Report).
- Hedgerows: All new plantings of screening and landscaping shrubs and trees will mimic the naturally occurring hedgerows with long, linear plantings being favoured. Native species will be planted and locally occurring species will be sourced.
- Lighting: Lighting can impact on bats' roosting sites, commuting routes, and foraging areas. Avoid lighting along important commuting routes. Avoid the use of mercury or metal halide lamps. Minimise light pills using shield, masking, and louvres. Keep light columns as low as possible. Restrict lights to ensure that there are dark areas. Restrict lights to ensure there are dark hours. Investigate the potential for sensor lights to reduce energy wastage.

Archaeology

- The identified archaeology be preserved by record, i.e., subject to full archaeological excavation in advance of construction.
- That the topsoil stripping for the development be subject to monitoring by a suitably qualified archaeologist. If any additional archaeology is identified, additional mitigation strategies will be required following consultation with the DHLGH.

Earthworks and Dust Suppression

- The roads around the site are all surfaced, and no dust is anticipated arising from unsealed surfaces.
- A regime of 'wet' road sweeping will be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
- Footpaths immediately around the site will be cleaned by hand regularly, with damping, as necessary.
- High level walkways and surfaces such as scaffolding will be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
- Vehicle waiting areas or hard standings will be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
- Vehicle and wheel washing facilities will be provided at the site exit(s). If necessary, vehicles will be washed down before exiting the site.
- Netting will be provided to enclose scaffolding in order to mitigate escape of airborne dust from the new buildings.
- Vehicles and equipment will not emit black smoke from exhaust system, except during ignition at start up.
- Engines and exhaust systems will be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
- Servicing of vehicles and plant will be carried out regularly, rather than just following breakdowns.
- Internal combustion plant will not be left running unnecessarily.
- Exhaust direction and heights will be such as not to disturb dust on the ground and to ensure adequate local dispersal of emissions.
- Fixed plant such as generators will be located away from residential areas.
- The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
- The transport of dusty materials and aggregates will be carried out using covered / sheeted lorries.
- Material handling areas will be clean, tidy, and free from dust.
- Vehicle loading will be dampened down and drop heights for material to be kept to a minimum.
- Drop heights for chutes / skips will be kept to a minimum.
- Dust dispersal over the site boundary will be minimised using static sprinklers or other watering methods, as necessary.
- Stockpiles of materials will be kept to a minimum and if necessary, they will be kept away from sensitive receptors such as residential areas etc.
- Stockpiles where necessary, will be sheeted or watered down.
- Methods and equipment will be in place for immediate clean-up of spillages of dusty material.
- No burning of materials will be permitted on site.
- Earthworks excavations will be kept damp where necessary and where reasonably practicable.
- Cutting on site will be avoided where possible by using pre-fabrication methods.
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, will be employed.
- Where scabbling is to be employed, tools will be fitted with dust bags, residual dust will be vacuumed up rather than swept away, and areas to be scabbled will be screened off.
- Wet processes will be used to clean building facades if possible. If dry grit blasting is unavoidable, then areas of work will be sealed off and dust extraction systems used.
- Where possible pre-mixed plasters and masonry compounds will be used to minimise dust arising from on-site mixing.

- Prior to commencement, the main contractor will identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the main contractor will prepare environmental risk assessments for all dust generating processes, which are envisaged.
- The main contractor will allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced road, the limit shall be 20 kph, and on surfaced roads as site management dictates.

Noise and Vibration

General Considerations:

1. All site staff will be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.

2. Site hoarding will be erected to maximise the reduction in noise levels.

3. The contact details of the Main Contractor and site manager will be displayed to the public, together with the permitted operating hours, including any special permissions given for out of hours work.

4. In the event that the Main Contractor gets a complaint about noise from a neighbour he or she will act immediately to remedy the situation.

5. The site entrance will be located to minimise disturbance to noise sensitive receptors.

6. Internal haul routes will be maintained, and steep gradients will be avoided.

7. Material and plant loading and unloading will only take place during normal working hours unless the requirement for extended hours is for traffic management (i.e. road closure) or health and safety reasons (advance notification, or possibly an application to the local council would be required if proposing to work outside non-typical hours).

8. Use rubber linings in chutes, dumpers, and hoppers to reduce impact noise.

9. Minimise opening and shutting of gates through good coordination of deliveries and vehicle movements.

Plant:

1. Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC.

2. Fit all plant and equipment with appropriate mufflers or silencers of the type recommended by the manufacturer.

3. Use all plant and equipment only for the tasks for which it has been designed.

4. Shut down all plant and equipment in intermittent use in the intervening periods between work or throttle down to a minimum.

5. Power all plant by mains electricity where possible rather than generators.

6. Maximise screening from existing features or structures and employ the use of partial or full enclosures for fixed plant.

7. Locate movable plant away from noise sensitive receptors where possible.

8. All plant operators will be qualified in their specific piece of plant.

9. Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable.

Vehicle activity:

1. Ensure all vehicle movement (on site) occur within normal working hours. (Other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons).

2. Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public highway, if unavoidable engines should be turned off.

3. Plan the site layout to ensure that reversing is kept to a minimum.

4. Where reversing is required use broadband reverse sirens or where it is safe to do so disengage all sirens and use banks-men.

5. Rubber/neoprene or similar non-metal lining material matting to line the inside of material transportation vehicles to avoid first drop high noise levels.

6. Wheel washing of vehicles prior to exiting the site will take place to ensure that adjoining roads are kept clean of dirt and debris. Regular washing of adjoining streets will also take place as required by road sweepers.

Ground Works and Piling Phase:

1. The following hierarchy of groundwork/piling methods will be used if ground conditions, design and safety allow;

- Pressed in methods, e.g., hydraulic jacking
- Auger/bored piling
- Diaphragm walling
- Vibratory piling or vibro-replacement
- Driven Piling or dynamic consolidation

2. The location and layout of the piling plant will be designed to minimise potential noise impact of generators and motors.

3. Where impact piling is the only option, utilise a non-metallic dolly between the hammer and driving helmet or enclose the hammer and helmet with an acoustic shroud.

4. Consider concrete pour sizes and pump locations. Plan the start of concrete pours as early as possible to avoid overruns.

5. Where obstructions are encountered, work will be stopped, and a review undertaken to ensure that work methods that minimise noise are used.

6. When using an auger piling rig do not dislodge material from the auger by rotating it back and forth. Use alternate methods where safe to do so.

7. Prepare pile caps using methods which minimise the use of breakers, e.g., use hydraulic splitters to crack the top of the pile.

Monitoring:

1. Carry out regular on-site observation monitoring and checks/audits to ensure that BPM is being used at all times. Such checks will include;

- Hours of work
- Presence of mitigation measures
- Number and type of plant
- Construction methods

2. In the event that the Main Contractor gets a complaint about noise from a neighbour he or she will act immediately to remedy the situation.

3. A sound level digital meter will be employed as necessary to monitor noise, with results recorded to inform the contractor of noise level.

4. Site reviews must be recorded and made available for inspection.

5. Appraise and review working methods, processes, and procedures on a regular basis to ensure continuous development of BPM.

Communication and Liaison:

1. A Community Liaison Strategy will be developed by the developer in consultation with local residents/businesses and a single point of contact nominated to engage with Dublin City Council and the residents/businesses and to handle complaints and communication of site information.

2. All site staff will be briefed on the complaints procedure and mitigation requirements and their responsibilities to register and escalate complaints received. Where appropriate, a resident monitoring committee will be established for the duration of the project in order to promote best construction management and considered construction practices to protect the amenities of adjacent properties as provided in Section 15.18.1 of the Development Plan.

18.2.1 Air Quality

Construction Stage

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 5.1.

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.

Operational Stage

There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be neutral and imperceptible.

18.2.2 Climate Factors

Proposed Development

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:

- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.
- Target embodied carbon rates for detailed design (LETI 2020):
    - Housing units: Reduce embodied carbon to <500 $kgCO^2/m^2$
    - Commercial units: Reduce embodied carbon or to <600 $kgCO^2/m^2$

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 6.2.3).

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. The Climate Action 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 $m^3/m^2/hr$;
- Achieve a minimum of an A3 BER Rating
- Ensure thermal bridging details are designed to achieve thermal bridging factors of 0.15W/m^2K or less;
- Meet or exceed minimum U-Value standards identified in *Part L 2022 Dwellings* (see Table 6.8);
- Provide an appropriate combination of technologies to ensure energy consumption is in line with *Part L 2022 Dwellings* requirements; and
- Out of 442 car parking spaces; 221 number spaces equipped with fully functional EV Charging Point(s) and the remaining 221 spaces designed to facilitate the relevant infrastructure to accommodate future EV charging. On-site car sharing scheme through Go-Car (3 spaces).

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 including the Climate Action Plan and objectives of the Dublin City Council Development Plan 2022-2028, including climate mitigation measures.

18.2.3 Noise and Vibration

Construction Phase

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. Predictions indicate that moderate construction noise impacts are expected to occur when work is ongoing at boundary locations adjacent to noise sensitive locations, hence the contractor will ensure that all best practice noise and vibration control methods will be used. In this regard, various mitigation measures will be considered and applied during the construction of the proposed development, such as:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring typical levels of noise and vibration during critical periods and at sensitive locations;
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, a variety of practicable noise and vibration control measures will be employed. These will include as standard:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around noisy processes and items such as generators heavy mechanical plant or high duty compressors;
- placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

Operational Phase

Mechanical Plant and Services

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 noise-sensitive locations within the development. Due to the relative proximity of the Noise Sensitive Locations within the development, this will also prevent a negative impact on NSLs in the surrounding area. The over-riding requirement is that the criteria in Section 7.4.5 is adhered to through implementation of best practice measures at the design stage including the following:

- Where ventilation is required for plant rooms, consideration will be given to acoustic louvers or attenuated acoustic vents, where required, to reduce noise breakout;
- Ventilation plant serving plant rooms and car parks will be fitted with effective acoustic attenuators to reduce noise emissions to the external environment;
- The use of perimeter plant screens will be used, where required, for roof-top plant areas to screen 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;
- Installed plant will have no tonal or impulsive characteristics when in operation.

Inward Noise Impact

As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. block work or concrete and spandrel elements) 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.

In this instance the facades highlighted in Figure 7.10 will be provided with glazing that achieves the minimum sound insulation performance as set out in Table 18.1. Any passive ventilation units will have to be carefully selected at the design stage to ensure that the composite sound reduction index of the façade is not compromised.

Table 18.1 Sound Insulation Performance Requirements for Glazing, SRI (dB)

Façade Ref	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
Red	28	23	32	38	42	44	35
Orange	22	20	26	36	39	31	31
Green							

The overall R_w outlined above is provided for information purposes only. The over-riding requirement is the Octave Band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same level of sound insulation performance set out in Table 18.1 or greater.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. 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 assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

18.2.4 Biodiversity

There are no Key Ecological Receptors on site and as such mitigation measures are unnecessary to protect these.

18.2.5 Archaeological, Architectural and Cultural Heritage

Mitigation measures shall be undertaken as directed by the DHLGH in compliance with national policy guidelines and statutory provisions for the protection of archaeology and cultural heritage.

Advance archaeological assessments were commissioned at the site at design stage in order to identify adverse effects on archaeological and cultural heritage sites/features at an early stage and to inform the design process.

Pre Construction Phase

Due to the discovery of a Bronze Age Fulacht Fia within the subject area, it is recommended as mitigation prior to any further ground works within the subject area that a full archaeological excavation take place in order to preserve the identified archaeological features by record.

Construction Phase

All ground disturbance works across the development site will be monitored by a suitably qualified archaeologist. In the event that further archaeological material is recorded during monitoring, discussion/consultation with the DHLGH will be sought in order to ascertain the appropriate treatment (i.e. preservation by record/preservation in situ) of any additional archaeological remains. Should the DHLGH recommend preservation by record/full archaeological excavation, this work will be undertaken under the appropriate licence. The DHLGH may recommend preservation in situ, should avoidance of any newly discovered archaeological remains be possible.

Operational Phase

No operational phase mitigation is anticipated. Issues of archaeological and cultural heritage interest will have been resolved prior to or during the construction phase.

18.2.6 Landscape and Visual

Construction Phase

The building site including a site compound with site offices, site security fencing, scaffolding and temporary works will be visible during the construction phase, from a range of viewpoints around the site. Such elements are generally viewed as temporary and unavoidable features of construction in any setting. The perimeter site hoarding will screen from view much of the construction activity and materials at ground level. Other mitigation measures proposed during this delivery stage of the development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting, storage of materials, placement of site offices and compounds, control of vehicular access, and effective dust and dirt control measures, etc. Such mitigation will be set out in the Construction Management Plan prepared for the scheme. This will be a working document which will be continually reviewed and amended through the construction phase to ensure effective mitigation throughout.

The Construction Management Plan to be prepared by the appointed contractor, and agreed with the Local Authority prior to the commencement of any construction works, will deal with all issues related to the construction, delivery and management of the scheme during the construction stage and will ultimately include details on the following:

Daily and weekly working hours;

- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites;
- Travel arrangements for construction personnel;

- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Temporary construction entrances to be provided;
- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place if required;
- Temporary construction signage to be put in place and maintained.

The planning application includes an Outline Construction Management Plan, prepared by Waterman Moylan Consulting Engineers, which outlines a range of construction phase mitigation measures, many of which are relevant to the reduction of the temporary impacts on the landscape and visual environment during the construction phase. This Outline Construction Management Plan forms the basis for the required measures to be included in the appointed Contractor's Construction Management Plan. As such it references construction phase mitigation measures which are relevant to the assessment of Landscape and Visual Impact.

Operational Phase

The design rationale and detail employed seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Establishing an integrated relationship between the proposed development and surrounding buildings, infrastructure and the broader urban landscape beyond, incorporating aspects of current and emerging trends in built-form, scale, texturing, colour and materials;
- The insertion, positioning and detailed modelling of the buildings, in order to assist in the appropriate visual assimilation of their mass
- Appropriate architectural detailing to assist in the integration of the external building facades – including the modulation of openings and fenestration;
- Rationalisation of all services elements and any other potential visual clutter and its incorporation internally within building envelopes (as far as practically possible);
- Simplification and rationalisation of the proposed roof lines, including green roofs
- Use of appropriate materials in the architectural expression of the buildings. In this instance, brick is used in the facades across the scheme, with variation in colour, pattern, texture and tone occurring in the individual character areas or emphasising specific parts of facades. This approach reinforces the articulation of the massing of the blocks, as well as lending importance and interest to specific areas.
- The provision of community uses within the development, including public open space and associated amenities, in turn combining with internal cultural spaces.
- The provision of secure communal spaces with each residential block.
- Sustainable approach to drainage and biodiversity
- Detailing in the architectural and landscape design to mitigate wind and shadow effects to create good microclimates.

18.2.7 Lands and Soil

Construction Phase

The project archaeologist, Archer Heritage Planning ltd., has found evidence of a Fulacht Fia on-site and recommends that this be preserved by record, i.e., subject to full archaeological excavations, in advance of construction. The project archaeologist also recommends that site stripping be monitored by a suitably qualified archaeologist. If any additional archaeology is identified, additional mitigation strategies will be required following consultation with the DHLGH. Please refer to the Archaeologist reports and EIAR chapter for full details.

The project ecologist, Gerry Tobin, has noted that the area demarcated by Grid Reference GR IO 07758 32794 will remain undeveloped post construction to protect the orchid rich soils. An area running the length of the motorway hedgerow boundary and 5 metres in depth shall form a green area post development and will receive no fertilizers or other artificial inputs. No Shrub flora will be planted in this area and mowing of the grassland will occur only after seed dispersal has occurred in late July/early August annually. Please refer to the Project ecologist's reports and EIAR Chapter for full and further details.

The Site Investigation Reports (S.I. Report) included as an Appendix, has shown that the sites are composed of stratified layers of topsoil, cohesive deposits (brown sandy gravelly clays), and bedrock. Made ground has also been identified on the sites and these deposits are typically composed of brown slightly sandy slightly gravelly clay with occasional cobbles and contained occasional fragments of concrete, red brick, glass, rope, timber, ceramic, metal, and plastic.

Excavated soils to be disposed of will be referenced against the Waste Classification Report also included as part of the Site investigation report. Environmental Laboratory chemical analysis has indicated that the in-fill constituents are non-hazardous. Excavated material from this location will be continuously monitored/inspected for signs of hazardous material contamination during excavation. Should there be any indication of hazardous material contamination, it may be required to be further sampled and analysed to confirm its chemical properties and waste category classification as per the waste landfill facility requirements.

Practical measures have been implemented during the design process to ensure that cut and fill volumes generated have been kept to a minimum by ensure proposed road and building levels match existing ground levels, however, it is anticipated that a volume of cut will be generated on site, that may be suitable for use on the Phase 2 site. This owes to the requirement to raise levels in select areas in order to meet Irish Water's foul drainage strategy for the locality. Furthermore, surplus subsoil and rock may be relocated to other approved areas of the site that may require in-fill, or if required to be removed from site, will be deposited in approved fill areas off-site (Article 27 notification to the EPA required), or to an approved waste disposal facility.

In the case of topsoil careful planning and on-site storage will ensure that this resource is reused on-site as much as possible. Any surplus of soil not reused on site can be sold. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly.

- Topsoil will be kept completely separate from all other construction waste as any cross-contamination of the topsoil can render it useless for reuse.
- Topsoil will be protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas, and site plant and vehicle storage areas.
- Careful separation of builder's rubble packaging and contaminated waste from re-usable material will result in the minimisation of the disposal of material to landfill.
- Spoil heap/stockpiles will not be located within 20m of the existing surface water networks.
- Spoil heaps/stockpiles will be considered for seeding if their storage is likely to be longer than a few seasons.
- Topsoil will be stored in stockpiles less than two metres in height as otherwise the soil matrix (internal structure) can be damaged beyond repair. It will also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

In the unlikely case of a topsoil surplus the Contractor will carry out appropriate environmental chemistry testing in order to determine the waste classification of the soils that are to be excavated and that will include Waste Acceptance Criteria testing. The test regime will be agreed with the receiving landfill

operator, if not suitable for an Article 27 transfer, and the testing will be carried out by an accredited laboratory.

Records of topsoil storage, movements and transfer from site will be kept by the C&D Waste Manager. It is projected that all the topsoil will be reused on-site for landscaping purposes in both private residential gardens and public green areas.

A Discharge Licence will need to be obtained from the local Authority by the Main Contractor. If topography doesn't allow for a gravity outfall from the sedimentation/settlement pond, a commercially available modular settlement tank will be utilised for the project, or outfall volumes may instead be pumped. Untreated surface water will not be permitted to flow to any natural or piped surface water network.

Silt traps, silt fences and tailing ponds will be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction phase. All surface water will be treated for silts and sediment prior to disposal to the surface water network. Any and all other conditions, restrictions, or limits associated with the discharge license shall be adhered to.

The provision of wheel wash areas at the exit to the development as necessary will minimise the amount of soil deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis. All trucks carrying soils on the public road will be covered and carry a maximum of 10 cubic metres of material to prevent spillage and damage to the surrounding road network.

Appropriate storage and bunding measures will be implemented throughout the construction stage to prevent contamination of the soil and groundwater from oil and petrol leakage from site plant. Refuelling will be restricted to allocated re-fuelling areas. This storage area is to be an impermeable, roofed, bunded area, designed to contain 110% of the volume of fuel stored. Emergency fuel spill kits are to be stored on-site with designated staff familiar with their usage. Spill kit facilities will be provided for across the site.

If groundwater is encountered during excavations, mechanical pumps will be required to remove that groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

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. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite.

Nuisance dust emissions from construction activities are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution.

The main contractor will be required to demonstrate that both nuisance dust and fine particle emissions from the site are adequately controlled and are within acceptable limits.

Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming airborne, since suppression is virtually impossible once it has become airborne.

The following are techniques and methods which are widely used currently throughout the construction industry, and which will be used in the development.

33. The roads around the site are all surfaced, and no dust is anticipated arising from unsealed surfaces.

34. A regime of 'wet' road sweeping will be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
35. Footpaths immediately around the site will be cleaned by hand regularly, with damping, as necessary.
36. High level walkways and surfaces such as scaffolding will be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
37. Vehicle waiting areas or hard standings will be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
38. Vehicle and wheel washing facilities will be provided at the site exit(s). If necessary, vehicles will be washed down before exiting the site.
39. Netting will be provided to enclose scaffolding in order to mitigate escape of airborne dust from the new buildings.
40. Vehicles and equipment will not emit black smoke from exhaust system, except during ignition at start up.
41. Engines and exhaust systems will be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
42. Servicing of vehicles and plant will be carried out regularly, rather than just following breakdowns.
43. Internal combustion plant will not be left running unnecessarily.
44. Exhaust direction and heights will be such as not to disturb dust on the ground and to ensure adequate local dispersal of emissions.
45. Fixed plant such as generators will be located away from residential areas.
46. The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
47. The transport of dusty materials and aggregates will be carried out using covered / sheeted lorries.
48. Material handling areas will be clean, tidy, and free from dust.
49. Vehicle loading will be dampened down and drop heights for material to be kept to a minimum.
50. Drop heights for chutes / skips will be kept to a minimum.
51. Dust dispersal over the site boundary will be minimised using static sprinklers or other watering methods, as necessary.
52. Stockpiles of materials will be kept to a minimum and if necessary, they will be kept away from sensitive receptors such as residential areas etc.
53. Stockpiles where necessary, will be sheeted or watered down.
54. Methods and equipment will be in place for immediate clean-up of spillages of dusty material.
55. No burning of materials will be permitted on site.
56. Earthworks excavations will be kept damp where necessary and where reasonably practicable.
57. Cutting on site will be avoided where possible by using pre-fabrication methods.
58. Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, will be employed.

59. Where scabbling is to be employed, tools will be fitted with dust bags, residual dust will be vacuumed up rather than swept away, and areas to be scabbled will be screened off.
60. Wet processes will be used to clean building facades if possible. If dry grit blasting is unavoidable, then areas of work will be sealed off and dust extraction systems used.
61. Where possible pre-mixed plasters and masonry compounds will be used to minimise dust arising from on-site mixing.
62. Prior to commencement, the main contractor will identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the main contractor will prepare environmental risk assessments for all dust generating processes, which are envisaged.
63. The main contractor will allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
64. Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced road, the limit shall be 20 kph, and on surfaced roads as site management dictates.

The construction of the proposed development has potential to cause a slight, adverse, temporary, residual impact on soils in the immediate vicinity of the site.

Operational Phase

On completion of the construction phase and following replacement of topsoil, a planting programme will commence to prevent soil erosion.

SuDS and filtration devices are proposed to be provided as part of the development. These will help to remove pollutants from rainwater runoff. They will require periodic inspection and maintenance as per their installation manuals. These have been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works Volume 6.0 (GDRCPDW) and the SuDS Manual CIRIA C753.

Foul drainage and watermains have been designed in accordance with their respective Codes of Practice by Irish Water. A Statement of Design Acceptance has been issued by Irish Water and is included as an appendix to the EIAR, submitted under a separate cover.

Therefore, the risk of accidental discharge has been adequately addressed and mitigated through design.

The operation of the proposed development is not considered to have an impact on soils in the immediate vicinity of the site.

18.2.8 Water

Construction Stage

The sites have no direct hydrological connectivity to natural watercourses or surface water networks. There may be an indirect link from surface water runoff which may have the potential to run off the site boundary to the surface water gullies on the adjacent road networks. These networks outfall to the Blackditch Stream.

The following Mitigation Measures are to address potential impacts to water quality and are required to protect the Blackditch Stream, and the Camac River which has an ultimate outfall to the River Liffey at Heuston. All works will be undertaken with reference to the following guidelines:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams et al., 2001);

- CIRIA C692: Environmental Good Practice on Site, (Audus et al., 2010)
- BPGCS005: Oil Storage Guidelines;
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Technical Guidance (Murnane et al., 2006a)
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane et al., 2006a)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016)
- Guidelines for Planning Authorities – Architectural Heritage Protection – Guidance on Part IV of the Planning and Development Act 2000. (Part 2, Chapter 7) and ICOMOS Principles.
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.
- CIRIA 697, The SUDS Manual, 2007; and
- UK pollution Prevention Guidelines (PPG) UK Environment Agency, 2004

The schedule of mitigation presented within the following table summarises measures that will be undertaken in order to reduce impacts on ecological receptors within the zone of influence of the proposed development.

Table 12.5 – Schedule of Surface Water Mitigation Measures sets out the various mitigation measures proposed in relation to surface water.

As mentioned previously, there is no direct hydrological connectivity from the sites to natural watercourses or surface water networks. There is potential for an indirect hydrological connectivity to the local surface water drainage network, whereby during heavy rainfall events, surface water from the sites flows over the site boundary to the road gullies on the adjacent streets.

The most likely potential sources of contamination to the local surface water network are from silt and suspended particles, and from chemical compounds entering these networks as surface water runoff.

Silt and suspended particles may arise from surface runoff from stockpiled materials or from the pumping of water volumes in excavations.

Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area will pass through a sediment entrapment facility before it exits the site and flows downstream.

Site stripping will be minimised as far as practicable.

Straw Bales:

Straw bales can be placed at the base of a slope to act as a sediment barrier. These are not recommended for use within a swale or channel. Straw bales are temporary in nature and may perform for only a period of weeks or months. Proper installation and maintenance is necessary to ensure their performance.

Silt Fencing

A silt fence is made of a woven synthetic material, geotextile, and acts to filter run-off. Silt fencing can be placed as a temporary barrier along the contour at the base of a disturbed area but is not recommended for use in a channel or swale. The material is durable and will last for more than one season if properly installed and maintained. Silt fencing is not intended to be used as a perimeter fence or in area of concentrated flow. If concentrated flow conditions exist, a more robust filter should be considered.

Silt Barriers

Silt barriers can also be temporarily installed in any road gullies of partially constructed roads to prevent sediment movement into downstream drainage systems or SUDS components.

When the catchment area is greater than that allowed for straw bale barriers or silt fences, runoff should be collected in diversion drains and routed through temporary sediment basins.

Diversion Drains

Diversion drains are simple linear ditches, often with an earth bund, for channelling water to a desired location. If the drains are being eroded, they can be lined with geotextile fabric or large stones or boulders.

Settlement tank

Commercially available settlement tanks, also known as sediment tanks, have compartments that allow suspended solid contents such as sand and silts to precipitate and sink to the bottom, falling out of suspension. The settlement tank has an inlet for the runoff which enters a chamber where it is held before flowing to the next compartment or tank for further treatment, prior to outfall.

Spoil heap/stockpiles will not be located within 20m of the existing surface water networks. Spoil heaps/stockpiles will be considered for seeding if their storage is likely to be longer than a few seasons. Drainage diversion ditches will be constructed between the stockpile area and local surface water networks. This drainage ditch will flow to a sedimentation/settlement pond prior to outfalling to the surface water network. A Discharge Licence will need to be obtained from the local Authority by the Main Contractor. If topography doesn't allow for a gravity outfall from the sedimentation/settlement pond, a commercially available modular settlement tank will be utilised for the project, or outfall volumes may instead be pumped. Untreated surface water will not be permitted to flow to any natural or piped surface water network.

A site compound(s) including offices and welfare facilities will be set up by the main contractor in locations to be decided within the subject site. Sanitary connections will need to be arranged by the contractor with Uisce Eireann at the appropriate time via a Temporary Connection Application. The main contractor will be required to schedule delivery of materials daily. The main contractor will be required to provide a site compound on the site for the secure storage of materials.

Chemical contamination can result due to fuel/chemical leaks and spills.

Spills and leaks may contaminate soil, groundwater, and surface water networks via surface run-off. Method statements and mitigation measures reduce the potential for leaks and spills and limit their impact should they occur.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and surrounding watercourses from oil and petrol leakages and significant siltation. Suitable bunded and roofed areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Spill kits will be provided by the Contractor to cater for any other spills.

Where possible, and subject to licence, the permanent connection to the public foul sewer will be used temporarily for construction phase. Vehicle wash down water will discharge directly, via suitable pollution control and attenuation, to the foul sewer system. If this connection is not permitted, then

wastewater generated will be required to be stored for collection and treatment off-site at a suitable waste disposal facility.

On-site treatment measures will be installed to treat surface water run-off from the site prior to discharge to the receiving surface water sewer as noted above. This treatment will be achieved by the construction of settlement tanks/ponds, in conjunction with the installation of proprietary surface water treatment systems including class 1 full retention petrol interceptors, and spill protection control measures. Settlement tanks/ponds will be sized to deal with surface run-off and any groundwater encountered.

A sampling chamber with shut down valve will be installed downstream of the settlement pond/tank and water quality monitoring will be carried out here prior to discharge to the surface water sewer.

Regular testing of surface water discharges will be undertaken at the outfall from the subject lands in accordance with the requirements of the discharge licence to be obtained. The location(s) for testing and trigger levels for halting works will be agreed between the project ecologist and the site foreman or appointed, suitably qualified site staff member at the commencement of works.

Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.

It is likely that the surface water run-off from the site will be discharged to the existing public surface water network, post treatment. This will need to be confirmed between the Contractor and Local Authority, as well as any further conditions such as the permitted levels of contamination as well as frequency for testing, as part of the Contractor's application for a discharge licence.

All water pumped from the excavations will require to be treated for silt and deleterious matter. During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

In addition to daily visual inspections, a surface water monitoring programme, as outlined in the table below must be followed during construction in order to ensure maintenance of water quality protection. This is in line with Transport Infrastructure Ireland (TII)'s 'Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan'. It is considered that the parameter limit values (Guide/Mandatory) defined in the Fresh Water Quality Regulations (EU Directive 2006/44/EEC) should act as a trigger value for the monitoring of Surface Water.

The Main Contractor will have overall responsibility for the implementation of the project Construction Surface Water Management Plan (CSWMP) during the construction phase. The appointed person from the Main Contractors team will be appropriately trained and assigned the authority to instruct all site personnel to comply with the specific provisions of the CSWMP. At the operational level, a designated person from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the CSWMP are performed on an on-going basis.

Copies of the Construction Surface Water Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the CSWMP and informed of the responsibilities which fall upon them because of its provisions.

The responsibilities of the appointed person will be as follows;

- Updating the CSWMP as necessary to reflect activities on site.
- Advise site management (including, but not limited to, the site Construction Manager) on environmental matters.

- Ensure pre-construction checks for protected species, are undertaken.
- Review method statement of the sub-contractors to ensure that it incorporates all aspects of CSWMP.
- Provide toolbox talks and other training, and ensure understanding by all involved of all mitigation measures.
- Assess effectiveness of mitigation, check weather forecast and site conditions where trigger levels are required.
- Ensure adherence to the specific measures listed in the Planning Conditions.
- Advise upon the production of written method statements and site environmental rules and on the arrangements to bring these to the attention of the workforce.
- Investigate incidents of significant, potential, or actual environmental damage, ensure corrective actions are carried out and recommend means to prevent recurrence.
- Be responsible for maintaining all environmental related documentation.
- Ensure plant suggested is environmentally suited to the task in hand.
- Co-ordinate environmental planning of the construction activities to comply with environmental authorities' requirements and with minimal risk to the environment. Give contractors precise instructions as to their responsibility to ensure correct working methods where risk of environmental damage exists.
- To minimise the adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the stripping back of the site.

Where possible, precast concrete units are to be used to avoid on-site "wet" mix concrete usage. In-situ concrete pours are to be managed in accordance with best practice to avoid overspills.

Wheel wash and wash down facilities are to be provided in designated areas. Discharge from these areas is to be directed into the settlement ponds/silt traps.

A method statement setting out in detail the procedure to be used when working in the vicinity of existing watermains will be produced by the contractor for any construction works within the vicinity of watermains and for roads and or services crossing watermains.

All watermains will be cleaned and tested in accordance with Uisce Eireann guidelines prior to connection to the public watermain.

All connections to the public watermain will be carried out and tested by or under the supervision of Uisce Eireann.

In order to reduce the risk of defective or leaking foul and surface sewers, the following measures will be implemented:

- All new foul sewers will be tested by means of an approved air test during the construction phase in accordance with Uisce Eireann's Code of Practice and Standard Details.
- All private drainage will be inspected and signed off by the Design Engineer in accordance with the Building Regulations Part H and BCAR requirements.
- Prior to connection, foul sewers will be surveyed by CCTV to identify possible physical defects.

- The connection of the new foul sewers to the public sewer will be carried out by or under the supervision of Uisce Eireann and will be checked prior to commissioning.

- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.

- Surface water networks will be constructed and tested in line with the Local Authority's requirements for Taking in Charge.

Operational Stage

The implementation of the following operation stage mitigation measures will minimise the impact on the hydrology and hydrogeology aspects of the development lands:

The surface water drainage network has been designed in accordance with the CIRIA SUDS Manual and the Greater Dublin Strategic Drainage Scheme. The appropriate interception mechanisms and treatment train process has been incorporated into the design.

Surface water outflow will be restricted to below the equivalent greenfield runoff rate from the proposed attenuation tanks and basins as per the catchment design, in accordance with Dublin City Council requirements.

Sustainable urban drainage measures, including green roofs, permeable paving, and filter strips/swales will be provided to improve water quality.

A petrol interceptor will be installed to prevent hydrocarbons entering the local drainage system at all outfalls.

A maintenance regime for the SuDS features will be incorporated to the Operation and Maintenance manual for the development. Surface SuDS features can typically be maintained as part of the regular maintenance of the landscape, incorporating litter picking, grass cutting, and inspections. There will still be a remaining requirement for more intensive maintenance tasks to be undertaken however, the severity of these tasks can be reduced by regular inspections and proactive responses being incorporated as a part of the regular maintenance regime discussed above. A table showing the typical requirements for the occasional maintenance tasks and remedial works is extracted from the SuDS Design & Evaluation Guide and provided at Table 12.7 earlier in the Report.

Surface water sewers will generally consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with Dublin City Council requirements for taking in charge. It is intended that all sewers within the public domain will be handed over to Dublin City Council for taking in charge.

All private outfall manholes will be built in accordance with the Greater Dublin Regional Code of Practice for Drainage Works. No private drainage will be located within public areas.

Drains will be laid in accordance with the requirements of the Building Regulations, Technical Guidance Document H.

All SuDS and surface water drainage networks proposed in the public domain will be constructed to the standards required for Taking in Charge.

Water metering via district meters will be installed to Uisce Eireann requirements. Monitoring of the telemetry data will indicate any excessive water usage which may indicate the potential for a leak in the

watermain network. Early identification of potential leaks will lead a faster response in determining the exact location of leaks and completion of remedial works.

It is not envisaged that any further remedial or reductive measures will be necessary upon completion.

18.2.9 Population and Human Health

Construction Phase

A range of construction related remedial and mitigation measures are proposed throughout this EIAR with reference to the various environmental topics examined, and the inter-relationships between each topic. Through the provision of these remedial and mitigation measures, any negative impacts on population and human health during the construction phase shall be appropriately mitigated. The mitigation measures set our under other topics will serve to mitigate impacts on population and human health arising from the construction phase.

Operational Phase

The Proposed Development has been designed to avoid negative impacts on population and human health through the design and provision of physical and social infrastructure as described in Chapter 2 'Background to the Proposed Scheme' of this EIAR. Compliance with the proposed design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Furthermore, measures outlined in the Chapters of this EIAR which address other environmental matters such as Water, Air Quality, Climate Factors, Landscape and Visual Impact and Noise sufficiently address monitoring requirements. The mitigation measures set out under other topics will serve to mitigate impacts on population and human health arising from the operational phase.

18.2.10 Material Assets – Traffic and Transportation

Construction Phase

The primary mitigation and monitoring measures during the Construction Stage will be the implementation by the selected Contractor of the *Construction Management Plan* and the *Construction Traffic Management Plan*.

The assessment of predicted impacts concluded that the construction stage of the proposed development is not anticipated to impact on the operational performance of the local road network. However, good practice requires the preparation of a Construction Management Plan (CMP) and a Construction Traffic Management Plan (CTMP), both of which set out measures to manage construction traffic.

Due to the proximity of the subject site to bus and rail services together with existing cycle lanes, it is intended to limit parking for construction staff and to encourage the use of car sharing and public transport.

The main Contractor as part of their site set up arrangements, will appoint a Coordinator responsible for the implementation of the Construction Stage Mobility Management and Travel Plan and shall carry out the following tasks as part of their role:

- Provide an extensive information service for public transport options and routes at a public location(s) within the development for construction workers.
- Update the public transport information adjacent to the development on an ongoing basis; and
- Advise company staff of tax incentives for public transport and bicycles.

For those wishing to cycle to and from the development, dedicated cycle parking will be provided for the duration of the works within the site. Shower facilities and lockers will also be provided.

Adequate signposting will be located on-site to ensure the safety of all road users and construction workers.

Dedicated construction haul routes will be identified and agreed upon with Dublin City Council before the commencement of construction activities on site.

A dedicated "construction site"' access/egress system will be implemented during the construction phases. Hoarding will be set up around the perimeter to prevent pedestrian access.

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

A detailed Construction and Traffic Management Plan (CTMP) will be prepared by the contractor and agreed with Dublin City Council before commencing works on site.

The contractor will be obliged to ensure that any sub-contractors engaged on the site are made fully aware of the required mitigation measures and that they are properly implemented as part of any works that they undertake.

Operational Phase

The primary mitigation and monitoring measure during the Operational Stage will be the implementation of the *Mobility Management and Travel Plan.*

To reduce traffic impact, mitigate against possible overspill car parking and to promote more sustainable modes of transport, a Mobility Management and Travel Plan has been prepared for the development and will be updated on an ongoing basis.

The proposed development will include car parking for residents at less than the maximum rate set out in the Dublin City Development plan 2022 – 2028. The level of car parking proposed has been informed by national standards for transport strategy and car parking for new apartments. The implementation of the measures set out in the Mobility Management and Travel Plan are designed inter alia to promote non-car modes of travel thereby discouraging high levels of car ownership and demand for car parking from residents.

A management company will be appointed by the developer to manage the development. A senior member of staff from the management company who supports the philosophy of the Plan will be appointed as the Coordinator. The Coordinator will be responsible for:

- Implementation and maintenance of the Plan.
- Monitoring progress of the Plan
- Liaison with public transport operators and officers of the Planning and Roads Authority.
- Production of information reports for the developer, the occupier(s) and the Planning and Road Authorities; and
- Ongoing assessment of the objectives of the Plan.

Up to date, local bus and rail timetables will be maintained within the resident amenity areas and other fixed points within the buildings on the site. Residents will be advised of their location. In addition, internet access to travel information will be provided. The developer will provide all new residents with a travel pack showing alternative modes of travel to the development. Where possible, the developer will advise visitors to the site of alternative modes of travel to that of the car.

Adequate and secure bicycle parking facilities with a total of 1,618 spaces will be provided within the development for residents, visitors, Creche users and staff. Local cycle route information will also be

provided in the resident amenity areas and at other fixed points within the development. Residents will be advised of these locations.

The Mobility Management and Travel Plan Co-ordinator will be responsible for the management of inappropriate parking within the development. This parking management will ensure that spaces are reserved for those who have been allocated the space and will be accessible only to those users.

18.2.11 Material Assets – Waste Management

Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development:

As previously stated, 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 15.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site and are listed in summary below. 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.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 15.1) in agreement with DCC and in compliance with any planning conditions, or submit an addendum to the RWMP to DCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases.

A quantity of topsoil, made ground and clay will need to be excavated to facilitate the proposed development. The Project engineers have estimated up to 20,000 m^3 of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out 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.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
    - A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;

- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, where possible. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 of the EC (Waste Directive) Regulations (2011-2020). EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, the EMR Waste Management Plan 2015 – 2021 and the draft NWMPCE 2023. 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

As previously stated, a project specific OWMP has been prepared and is included as Appendix 15.2 and are listed in summary below. The mitigation measures outlined in the OWMP will be implemented in full and form part of 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, draft NWMPCE (2023), Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland and the DCC waste bye-laws.

- The operator of the proposed development 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.
- The operator of the proposed development will regularly audit the onsite waste storage facilities and infrastructure, and maintain a full paper trail of waste documentation for all waste movements from the site.

The following mitigation measures will be implemented:

- The residents / commercial tenants / operator of the proposed development will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):
    - Organic waste;
    - Dry Mixed Recyclables;
    - Mixed Non-Recyclable Waste;
    - Glass;
    - Cardboard;
    - Plastic;
    - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
    - Waste Electrical and Electronic Equipment
    - Cooking oil;
    - Cleaning chemicals (paints, adhesives, resins, detergents, etc.);
    - Furniture (and from time-to-time other bulky waste); and

- Abandoned bicycles

- The residents / commercial tenants / operator of the proposed development 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 of the proposed development 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 of the proposed development 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, draft NWMPCE (2023) and the DCC Waste Bye-Laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

18.2.12 Material Assets – Utilities

Water Supply

Construction Phase

- 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 Irish Water/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 Irish Water/Local Authority.

Operational Phase

- Water metering via district meters will be installed to Uisce Eireann requirements. Monitoring of the telemetry data will indicate any excessive water usage which may indicate the potential for a leak in the watermain network. Early identification of potential leaks will lead a faster response in determining the exact location of leaks and completion of remedial works.

Foul Sewerage

Construction Phase

In order to reduce the risk of defective or leaking foul sewers, the following measures will be implemented:

- All new foul sewers will be tested by means of an approved air test during the construction phase in accordance with Uisce Eireann's Code of Practice and Standard Details.
- All private drainage will be inspected and signed off by the Design Engineer in accordance with the Building Regulations Part H and BCAR requirements.
- Prior to connection, foul sewers will be surveyed by CCTV to identify possible physical defects.
- The connection of the new foul sewers to the public sewer will be carried out by or under the supervision of Uisce Eireann and will be checked prior to commissioning.

- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.

- Surface water networks will be constructed and tested in line with the Local Authority's requirements for Taking in Charge.

- Public networks are proposed to be taken in charge by Uisce Eireann, and as such will be subject to post construction review and inspection as part of this process.

Operational Phase

It is not envisaged that any further remedial or reductive measures will be necessary upon completion.

Surface Water

Construction Phase

The sites have no direct hydrological connectivity to natural watercourses or surface water networks. There may be an indirect link from surface water runoff which may have the potential to run off the site boundary to the surface water gullies on the adjacent road networks. These networks outfall to the Blackditch Stream.

The following Mitigation Measures are to address potential impacts to water quality and are required to protect the Blackditch Stream, and the Camac River which has an ultimate outfall to the River Liffey at Heuston. All works will be undertaken with reference to the following guidelines:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams et al., 2001);
- CIRIA C692: Environmental Good Practice on Site, (Audus et al., 2010)
- BPGCS005: Oil Storage Guidelines;
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Technical Guidance (Murnane et al., 2006a)
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane et al., 2006a)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016)
- Guidelines for Planning Authorities – Architectural Heritage Protection – Guidance on Part IV of the Planning and Development Act 2000. (Part 2, Chapter 7) and ICOMOS Principles.

- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005.

- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.

- CIRIA 697, The SUDS Manual, 2007; and

- UK pollution Prevention Guidelines (PPG) UK Environment Agency, 2004

The schedule of mitigation presented within the following table summarises measures that will be undertaken in order to reduce impacts on ecological receptors within the zone of influence of the proposed development.

Table 18.2: Surface Water Mitigation Measures

No.	Risk	Possible Impact	Mitigation	Result of Mitigation
1	Hydrocarbons from carparking area entering the watercourse.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Designated parking at least 50m from any watercourse.	Ensures no soil disturbance or hydrocarbons leaks
2	Pollutants from site compound areas entering the watercourse.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	The site compound will be located at least 50m from any watercourse.	Prevents pollution of the aquatic zone from toxic pollutants
3	Pollutants from material storage areas entering the watercourse.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Fuels, oils, greases, and other potentially polluting chemicals will be stored in bunded compounds at the Contractor's compound or at a location at least 50m from any body of water. Bunds are to be provided with 110% capacity of storage container. Spill kits will be kept on site at all times and all staff trained in their appropriate use. Method statements for dealing with accidental spillages will be provided the Contractor for review by the Employer's Representative.	Prevents contamination of aquatic zone by toxic pollutants
4	Concrete/ cementitious materials entering the watercourse from washdown.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	A designated wash down area within the Contractor's compound will be used for cleaning of any equipment or plant, with the safe disposal of any contaminated water.	Prevents contamination of aquatic zone by suspended solids or pollutants, ensures invasive species material is not transported off site
5	Concrete/ cementitious materials entering the watercourse from concrete pours.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Pouring of cementitious materials will be carried out in the dry.	Prevents contamination of aquatic zone by suspended solids or pollutants, ensures invasive species material is not transported off site
6	Leaching of contaminated soil into groundwater.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Spill kits will contain 10 hr terrestrial oil booms (80mm diameter x 1000mm) and a plastic sheet, upon which contaminated soil can be placed to prevent leaching to ground water	Prevents contamination of aquatic zone by petrochemicals
7	Pollutants from equipment storage/ refuelling area entering the watercourse.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Any refuelling and maintenance of equipment will be done at designated bunded areas with full attendance of plant operative(s) within contained areas at least 50m from any watercourse	Prevents contamination of aquatic zone by petrochemicals

No.	Risk	Possible Impact	Mitigation	Result of Mitigation
8	Runoff from exposed work areas and excavated material storage areas entering the watercourse.	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Contractor to prepare a site plan showing the location of all surface water drainage lines and proposed discharge points to the sewer. The plan will include the location of all surface water protection measures, including monitoring points and treatment facilities.	Prevents contamination of aquatic zone by suspended solids or pollutants.

As mentioned previously, there is no direct hydrological connectivity from the sites to natural watercourses or surface water networks. There is potential for an indirect hydrological connectivity to the local surface water drainage network, whereby during heavy rainfall events, surface water from the sites flows over the site boundary to the road gullies on the adjacent streets.

The most likely potential sources of contamination to the local surface water network are from silt and suspended particles, and from chemical compounds entering these networks as surface water runoff.

Silt and suspended particles may arise from surface runoff from stockpiled materials or from the pumping of water volumes in excavations.

Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area will pass through a sediment entrapment facility before it exits the site and flows downstream.

Site stripping will be minimised as far as practicable.

Straw Bales:

Straw bales can be placed at the base of a slope to act as a sediment barrier. These are not recommended for use within a swale or channel. Straw bales are temporary in nature and may perform for only a period of weeks or months. Proper installation and maintenance is necessary to ensure their performance.

Silt Fencing

A silt fence is made of a woven synthetic material, geotextile, and acts to filter run-off. Silt fencing can be placed as a temporary barrier along the contour at the base of a disturbed area but is not recommended for use in a channel or swale. The material is durable and will last for more than one season if properly installed and maintained. Silt fencing is not intended to be used as a perimeter fence or in area of concentrated flow. If concentrated flow conditions exist, a more robust filter should be considered.

Silt Barriers

Silt barriers can also be temporarily installed in any road gullies of partially constructed roads to prevent sediment movement into downstream drainage systems or SUDS components.

When the catchment area is greater than that allowed for straw bale barriers or silt fences, runoff should be collected in diversion drains and routed through temporary sediment basins.

Diversion Drains

Diversion drains are simple linear ditches, often with an earth bund, for channelling water to a desired location. If the drains are being eroded, they can be lined with geotextile fabric or large stones or boulders.

Settlement tank

Commercially available settlement tanks, also known as sediment tanks, have compartments that allow suspended solid contents such as sand and silts to precipitate and sink to the bottom, falling out of suspension. The settlement tank has an inlet for the runoff which enters a chamber where it is held before flowing to the next compartment or tank for further treatment, prior to outfall.

Spoil heap/stockpiles will not be located within 20m of the existing surface water networks. Spoil heaps/stockpiles will be considered for seeding if their storage is likely to be longer than a few seasons. Drainage diversion ditches will be constructed between the stockpile area and local surface water networks. This drainage ditch will flow to a sedimentation/settlement pond prior to outfalling to the surface water network. A Discharge Licence will need to be obtained from the local Authority by the Main Contractor. If topography doesn't allow for a gravity outfall from the sedimentation/settlement pond, a commercially available modular settlement tank will be utilised for the project, or outfall volumes may instead be pumped. Untreated surface water will not be permitted to flow to any natural or piped surface water network.

A site compound(s) including offices and welfare facilities will be set up by the main contractor in locations to be decided within the subject site. A discharge Licence for surface water will need to be arranged by the contractor with the Local Authority at the appropriate time. The main contractor will be required to schedule delivery of materials daily. The main contractor will be required to provide a site compound on the site for the secure storage of materials.

Chemical contamination can result due to fuel/chemical leaks and spills.

Spills and leaks may contaminate soil, groundwater, and surface water networks via surface run-off. Method statements and mitigation measures reduce the potential for leaks and spills and limit their impact should they occur.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and surrounding watercourses from oil and petrol leakages and significant siltation. Suitable bunded and roofed areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Spill kits will be provided by the Contractor to cater for any other spills.

On-site treatment measures will be installed to treat surface water run-off from the site prior to discharge to the receiving surface water sewer as noted above. This treatment will be achieved by the construction of settlement tanks/ponds, in conjunction with the installation of proprietary surface water treatment systems including class 1 full retention petrol interceptors, and spill protection control measures. Settlement tanks/ponds will be sized to deal with surface run-off and any groundwater encountered.

A sampling chamber with shut down valve will be installed downstream of the settlement pond/tank and water quality monitoring will be carried out here prior to discharge to the surface water sewer.

Regular testing of surface water discharges will be undertaken at the outfall from the subject lands in accordance with the requirements of the discharge licence to be obtained. The location(s) for testing and trigger levels for halting works will be agreed between the project ecologist and the site foreman or appointed, suitably qualified site staff member at the commencement of works.

Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.

It is likely that the surface water run-off from the site will be discharged to the existing public surface water network, post treatment. This will need to be confirmed between the Contractor and Local Authority, as well as any further conditions such as the permitted levels of contamination as well as frequency for testing, as part of the Contractor's application for a discharge licence.

All water pumped from the excavations will require to be treated for silt and deleterious matter. During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

In addition to daily visual inspections, a surface water monitoring programme, as outlined in the table below must be followed during construction in order to ensure maintenance of water quality protection. This is in line with Transport Infrastructure Ireland (TII)'s 'Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan'. It is considered that the parameter limit values (Guide/Mandatory) defined in the Fresh Water Quality Regulations (EU Directive 2006/44/EEC) should act as a trigger value for the monitoring of Surface Water.

Table 18.3 Monitoring Guidelines (Fresh Water Quality Regulations)

Parameter	**Limit**		**Frequency and Manner of Samplings**
	Limit Value	**Guide/Mandatory**	
Temperature	1.5°C	Mandatory Limit	Weekly, and at appropriate intervals where the works activities associated with the scheme have the potential to alter the temperature of the waters.
Dissolved oxygen	50% of Samples ≥ 9 (mg/l O2) 100% of Samples ≥ 7 (mg/l O2)	Guide Limit	Weekly, minimum one sample representative of flow oxygen conditions of the day of sampling
pH	6 to 9	Mandatory Limit	Weekly
Nitrites	≤0.01 (mg/l N02)	Guide Limit	Monthly
Suspended Solids	≤25 (mg/l)	Guide Limit	Monthly
BOD5	≤3 (mg/l)	Guide Limit	Monthly
Phenolic Compounds	-	-	Monthly where the presence of phenolic compounds is presumed (An examination by test)
Petroleum Hydrocarbons	5 (mg/l)	Guide Limit	Monthly (visual)
Non-Ionized Ammonia	≤ 0.005 (mg/l NH3)	Guide Limit	Monthly
Total Ammonium	≤ 0.004 (mg/l NH4)	Guide Limit	Monthly
Total Residual Chlorine	≤ 0.005 (mg/l HOCl)	Mandatory Limit	At appropriate intervals where works activities associated with the scheme have the potential to alter the Total residual Chlorine of the waters
Electrical Conductivity	-	-	Weekly

The Main Contractor will have overall responsibility for the implementation of the project Construction Surface Water Management Plan (CSWMP) during the construction phase. The appointed person from the Main Contractors team will be appropriately trained and assigned the authority to instruct all site personnel to comply with the specific provisions of the CSWMP. At the operational level, a designated

person from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the CSWMP are performed on an on-going basis.

Copies of the Construction Surface Water Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the CSWMP and informed of the responsibilities which fall upon them because of its provisions.

The responsibilities of the appointed person will be as follows;

- Updating the CSWMP as necessary to reflect activities on site.
- Advise site management (including, but not limited to, the site Construction Manager) on environmental matters.
- Ensure pre-construction checks for protected species, are undertaken.
- Review method statement of the sub-contractors to ensure that it incorporates all aspects of CSWMP.
- Provide toolbox talks and other training, and ensure understanding by all involved of all mitigation measures.
- Assess effectiveness of mitigation, check weather forecast and site conditions where trigger levels are required.
- Ensure adherence to the specific measures listed in the Planning Conditions.
- Advise upon the production of written method statements and site environmental rules and on the arrangements to bring these to the attention of the workforce.
- Investigate incidents of significant, potential, or actual environmental damage, ensure corrective actions are carried out and recommend means to prevent recurrence.
- Be responsible for maintaining all environmental related documentation.
- Ensure plant suggested is environmentally suited to the task in hand.
- Co-ordinate environmental planning of the construction activities to comply with environmental authorities' requirements and with minimal risk to the environment. Give contractors precise instructions as to their responsibility to ensure correct working methods where risk of environmental damage exists.
- To minimise the adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the stripping back of the site.

Where possible, precast concrete units are to be used to avoid on-site "wet" mix concrete usage. In-situ concrete pours are to be managed in accordance with best practice to avoid overspills.

Wheel wash and wash down facilities are to be provided in designated areas. Discharge from these areas is to be directed into the settlement ponds/silt traps.

In order to reduce the risk of defective or surface sewers, the following measures will be implemented:

- All private drainage will be inspected and signed off by the Design Engineer in accordance with the Building Regulations Part H and BCAR requirements.
- Prior to connection, sewers will be surveyed by CCTV to identify possible physical defects.

- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.

- Surface water networks will be constructed and tested in line with the Local Authority's requirements for Taking in Charge.

The implementation of the following operation stage mitigation measures will minimise the impact on the hydrology and hydrogeology aspects of the development lands.

Operational Phase

The design of the surface water network, SuDS strategy, and attenuation storage has been undertaken in accordance with The Greater Dublin Strategic Drainage Strategy and The SuDS Manual. The use of a maximum outflow rate of 2 l/s/ha as per DCC policy has been incorporated which will reduce the outflow rate to below the current greenfield runoff rate. The Main Contractor will incorporate details on the maintenance and management of the drainage and SuDS network to the operational & Maintenance manual required to be produced for the development. No other mitigation measures, other than regular inspection and maintenance are envisaged to be required.

Electricity

Construction Phase

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.

Operational Phase

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.

Gas

Construction Phase

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.

Operational Phase

All works will be completed in accordance with GNI details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

Telecommunications

Construction Phase

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

All works will be completed in accordance with the relevant details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

18.3 Residual Impacts

18.3.1 Air Quality

Construction Stage

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 5.1). 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 5.1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is negative, direct, short-term and imperceptible.

Operational Stage

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 5.4 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.

With respect to ecological impacts due to operational phase traffic, there is a are overall negative, slight and long-term which is not significant in EIA terms.

Worst Case Impact

Conservative assumptions have been made throughout this assessment including for background air quality and requirements for dust mitigation measures. Therefore, the impacts can be considered inherently worst-case.

18.3.2 Climate Factors

Construction Stage

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 6.3 the impact of the proposed development in relation to GHG emissions is considered long-term, minor adverse and not significant in EIA terms based on the information available at the time of compiling this assessment.

Operational Stage

The proposed development will result in some impacts to climate through the release of GHGs, however the projects Climate Action 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 6.3 the impact of the proposed development in relation to GHG emissions is considered long-term, minor adverse and not significant in EIA terms based on the information available at the time of compiling this assessment.

In relation to climate change vulnerability, it has been assessed that there is a low risk as a result of the majority of future climate change hazards with the exception of flooding and extreme cold associated with landscaping elements which have a medium risk. The design is currently in line with a low vulnerability to the moderate-risk future scenario (RCP4.5). Landscaping has a medium vulnerability to extreme cold temperatures. Available mitigation for this will be considered during detailed design. All other vulnerabilities to future climate change have been identified as low. The identified climate vulnerabilities are not considered a significant risk in relation to the proposed development based on the information available at the time of compiling this assessment.

Throughout detailed design phase, the architects will be using guidance documents to inform with design detail decisions including; The EU Commission technical guidance on Adapting Buildings to Climate Change (European Commission (2021a), LETI emergency design guide (LETI 2020), and the latest available IPCC report. In addition, should the updated EuroCodes be published prior to completion of detailed design, which will include consideration for climate impacts, these design standards will be taken into account.

Worst Case Impact

The GHG assessment conducted has been based on the best available information at the time of completing this assessment. Exact material types were not known when carrying out this assessment and a worst-case approach was applied when inputting materials which will potentially over-estimate associated GHG emissions. There is the potential for the development to have lower GHG emissions once constructed if lower carbon intensive materials are chosen as part of the detailed design. However, this assessment has been based on a conservative, worst-case approach.

With respect to the climate risk assessment, in accordance with TII's Guidance document PE-ENV-01104 (TII 2022c), the high risk (RCP8.5) future climate change scenario has been considered. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken. This is considered the worst case scenario.

18.3.3 Noise and Vibration

Construction Phase

Given the distance to local receptors the residual vibration impacts are predicted to be negative, short-term and slight to moderate.

Operational Phase

Inward Noise Impact

Following implementation of the sound insulation mitigation the residual impacts are predicted to be long-term, neutral and not significant.

Additional Traffic on Public Roads

All assessed junctions indicate that impacts will be neutral to negative, imperceptible to slight and long term.

Mechanical Plant

Once noise emissions from operational plant and activities are designed in accordance with BS 4142 Methods for Rating and Assessing Industrial and Commercial Sound the residual impacts are predicted to be long-term, negative and not significant.

18.3.4 Biodiversity

The proposed development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects. In the review of the projects that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development.

Specifically there will be no loss of Key Ecological Receptor habitats or species. There will be no impact on population numbers of Key Ecological Receptors.

There will be no fragmentation of Key Ecological Receptor habitats or species. There will be no negative impacts on Natura 2000 sites within the potential impact zone. There will be no effect on the natural range of protected habitats or species, and areas they cover within that range, are stable or increasing.

The specific structure and functions which are necessary for the long-term maintenance of species and habitats exist and are likely to continue to exist for the foreseeable future. The conservation status of habitats and species is favourable.

There will be no effects on the population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats. The natural range of the species will neither being reduced nor is likely to be reduced for the foreseeable future.

There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

18.3.5 Archaeological, Architectural and Cultural Heritage

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented. It is not anticipated that there will be any residual impacts with the

appropriate mitigation measures in place during the construction phase. No significant residual impacts are predicted in light of the mitigation measures identified above.

18.3.6 Landscape and Visual

The proposed development will impact on the urban landscape to varying degrees in terms of its perceived nature and scale. These effects are tempered and conditioned by sensitivities associated with the receptor. The duration of such impacts is however determined by the design life of the proposed development. In this case the building development has a design life of up to 60 years. Impacts on landscape character are therefore deemed to be of long-term duration in this instance.

In assessing the landscape character impacts, there are three main inter-related aspects to be addressed in considering the development proposals, namely:

- The perceived character of the area, how it is affected by the proposal and how well it integrates, particularly in the context of a changing environment.
- Effects of the proposed development on social and cultural amenity
- The proposed views of the development, relative to the existing site and context and the associated impact on visual amenity

Construction Phase

No residual impacts.

Operational Phase

In demonstrating the trend for increased density for housing as a national policy the scheme is demonstrating an intensification of the current suburban and derelict landscape. The effect is described as moderate in that it follows the principles and trends currently extant in the neighbourhood, and positive in that it asserts these new spatial definitions in a considered way and brings with it the vibrancy of a consolidated urban plan.

The assessment of visual effects concludes for the most part that the established residential areas will benefit from the views. Moderate effects occur closer to the subject site, and the massing and treatment of the facades tends to lead towards a positive effect.

18.3.7 Land, Soil and Geology

Construction Stage

With the protective measures noted in Section 18.2.7 (and Chapter 11) in place during the excavation works, any potential impacts on soils and geology in the area will not have significant adverse impacts, and no significant adverse impacts on the soils and geology of the subject lands are envisaged.

The residual risk associated with site clearance, excavation and construction are considered to be slightly negative to slightly positive, local, likely and permanent.

Operational Stage

There will be minor permanent regrading of the sites in line with the ground levels proposed for the buildings and roads. Open spaces will be regraded to meet these buildings and roads.

Reinstatement measures in relation to soils consist primarily of the re-soiling of open areas / landscaping and the replanting of these areas. No post development reinstatement works will be required.

On completion of the construction phase and following replacement of topsoil and implementation of a planting programme, no further impacts on the soil are envisaged.

SuDS measures, including permeable paving and infiltration drains, will assist with cleaning surface water runoff while replenishing the natural ground water table and their impact will be slightly positive, likely and permanent.

18.3.8 Water

Construction Phase

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in water demand and foul water outflow during the period of construction. This increase in water demand and foul flows generated with be negative, slight (not significant), likely and short-term in nature.

Operational Phase

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development on surface water and groundwater quality.

Surface water discharge from the site will be restricted by means of attenuation to below the current greenfield runoff rate, therefore, no adverse impact in respect of flooding downstream will arise from the proposed development. The impact will be positive, slight (not significant), & permanent.

The installation of a Sustainable Urban Drainage System will ensure surface water runoff will be of high quality before discharge to the local surface water network and will not have an impact on the receiving waters downstream of the development. The impact will be positive, slight (not significant), & permanent.

There will be an increased water demand and an increased foul flow volume generated for the proposed development. Uisce Eireann have confirmed in their Confirmation of Feasibility Letter that the existing network has sufficient capacity to cater for the development. The impact will be negative, slight (not significant) and permanent.

18.3.9 Population and Human Health

Residual impacts are those which remain following the implementation of the proposed mitigation measures; however, no significant adverse residual impacts have been identified. The character and condition of the land will change from disused, green field site to a residential land use. This change is in line with the specific zoning (Z14) of the site and the impacts is considered acceptable when balanced with the other positive impacts in terms of building a critical mass of population, compact urban development, provision of housing on strategic, edge of centre site, provision of new local services and amenities (créche facility, retail and commercial units, community arts and cultural space, new public open space) and the indirect benefits arising for employment.

The development of the site in terms of increased population and provision of services and amenities is line planning objectives for the site as set out in the Dublin City Development Plan and relevant Local Area Plan, and represents plan led, compact growth.

18.3.10 Material Assets – Traffic and Transport

Construction Phase

Development traffic during the construction stage is predicted to have a low-level impact on surrounding road network in comparison to the existing baseline traffic flows. The preparation and implementation of a detailed Construction Traffic Management Plan (CTMP) to manage construction traffic will further mitigate any residual impacts.

In line with their experience working on projects of this scale in similar locations, the developer will build a construction car park on the Phase 2 site at the start of works by laying a temporary surface for vehicles. Staff are likely to arrive to site before 8am, before the morning peak hour of 8am -9am. However staff are likely to leave during the peak PM hour of 5-6pm. As the number of construction staff on site will be less than the number of people on site post development, the number of additional vehicles can be accommodated.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, which will be addressed by the Contractor as part of the Construction Traffic Management Plan (CTMP) and which will be approved by Dublin City Council (DCC). On this basis, construction will likely have a negligible impact on pedestrian and cyclists.

Due to the proposed mitigation measures outlined above, the residual impact of the proposed development will be temporary, slight (not significant), negative and short term for the duration of the construction stage of Cherry Orchard Point.

Operational Stage

During the Operational Stage, there will be an increase in the use of the surrounding road network by private vehicles. However, the Mobility Management and Travel Plan will promote more sustainable forms of transport to help reduce the use of private cars by the residents of the proposed development.

There is likely to be an increase in the number of pedestrians and cyclists in the surroundings of the development particularly on the approaches to the railway station. However, the existing footpaths and cycle paths, both internally and externally along the site frontage, will be upgraded as part of development, thus, the impact should be minimal.

The traffic modelling undertaken includes growth in background traffic flows which accounts for other developments in the area.

The increase in traffic volumes as a result of the proposed development will impact the adjacent existing developments as the traffic flows through access and egress from the site will increase. The transport assessment carried out indicates that six of the eight assessed junctions, operating with the improved junction layouts proposed as part of the subject development, would operate within the capacity of the junctions and the impact arising from the proposed development at these junctions would be considered negligible.

The existing roundabout at the intersection of Park West Avenue and Park West Road to the south of the railway (Junction 7) is likely to reach capacity about 2027 and exceed capacity by 2042 with or without the proposed development. It is expected that this junction which is remote from the subject site will be upgraded, probably to a signalised crossroads by Dublin City Council before 2042.

Due to the proposed mitigation measures outlined above, the residual impact of the proposed development during the operational stage will be slight (not significant) to moderate (significant), negative and long term for the duration of the operation of Cherry Orchard Point.

18.3.11 Material Assets – Waste Management

It is predicted with the implementation of the mitigation measures outlined in section 15.6 and adherence to the RWMP (Appendix 15.1) and OWMP (Appendix 15.2) there will be no significant residual impact in relation to material assets- waste management. The implementation of the mitigation measures outlined in Section 15.6 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the Proposed Development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

Construction Phase

A carefully planned approach to waste management as set out in Section 15.6.1 and adherence to the RWMP (which includes mitigation) (Appendix 15.1) during the construction phase will ensure that the predicted effect on the environment will be ***short-term, imperceptible and neutral***.

Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 15.6.2 and adherence to the OWMP (Appendix 15.2) 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.***

18.3.12 Material Assets – Utilities

Water Supply

Construction Phase

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in water demand and foul water outflow during the period of construction. This increase in water demand will be negative, slight (not significant), likely, and short-term in nature.

Operational Phase

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development.

There will be an increased water demand generated for the proposed development. Uisce Eireann have confirmed in their Confirmation of Feasibility Letter that the existing network has sufficient capacity to cater for the development. The impact will be slight (not significant), negative, & permanent.

It is not envisaged that any other remedial or reductive measures will be necessary upon the completion of the development.

Foul Sewerage

Construction Phase

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in foul water outflow during the period of construction. This increase in foul flows generated with be slightly negative, slight (not significant), likely, and short-term in nature.

Operational Phase

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development.

There will be an increased foul flow volume generated for the proposed development. Uisce Eireann have confirmed in their Confirmation of Feasibility Letter that the existing network has sufficient capacity to cater for the development, subject to completion of upgrade works. The impact will be slight (not significant), negative, & permanent.

Surface Water

Construction Phase

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development. There will be a minor increase in surface water outflow during the period of construction. This increase generated with be negative, slight (not significant), likely, and short-term in nature.

Operational Phase

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 on its water body status or prevent attainment or potential to achieve the WFD objectives.

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 the underlying aquifer long-term and as such will not impact on trends in water quality and over all status assessments.

Due to the proposed mitigation measures outlined above no significant, adverse impacts are expected as many of the potential impacts will not arise during the operational phase of the proposed development on surface water and groundwater quality.

Surface water discharge from the site will be restricted by means of attenuation to below the current greenfield runoff rate, therefore, no adverse impact in respect of flooding downstream will arise from the proposed development. The impact will be positive, slight, & permanent.

The installation of a Sustainable Urban Drainage System will ensure surface water runoff will be of high quality before discharge to the local surface water network and will not have an impact on the receiving waters downstream of the development. The impact will be positive, slight (not significant), & permanent.

Electricity

Construction Phase

Due to the proposed mitigation measures outlined above no significant impact will arise during the construction phase of the proposed development on ESB infrastructure.

Operational Phase

There will be an increased demand on the ESB Network as a result of the development however it is not expected that this will have any impact on the operation of the network.

Gas

Construction Phase

Due to the proposed mitigation measures outlined above no significant impact will arise during the construction phase of the proposed development on gas infrastructure.

Operational Phase

There will be an increased demand on the Gas Network as a result of the development however it is not expected that this will have any impact on the operation of the network.

Telecommunications

Construction Phase

Due to the proposed mitigation measures outlined above no significant impact will arise during the construction phase of the proposed development on telecommunications infrastructure.

Operational Phase

There will be an increased demand on the telecommunications network as a result of the development however it is not expected that this will have any impact on the operation of the network.

18.4 Cumulative Effects

18.4.1 Future Development

As stated elsewhere, while the current planning application to which this EIAR relates to is for Phase 1 of the Cherry Orchard Point development, the EIAR itself has been based on assessment of the environmental impacts of the overall Cherry Orchard Point development. There has been a carefully considered design approach to the planning application itself to ensure that subsequent phases can be delivered in line with the primary objectives for the site as set out in the Local Area Plan.

The cumulative effects of the proposed development alongside other proposed developments have been considered as appropriate within each relevant topic area.

18.4.2 Air Quality

Construction Phase

According to the IAQM guidance (2014), 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. A review of other permitted developments within 350m of the site was conducted in order to identify other developments with the potential for overlapping construction phases that may result in cumulative construction dust impacts. The following permitted developments were identified as having the potential for cumulative

impacts should the construction phases coincide: 4313/22, 312290, 3403/21, SD19A/0098, SD19A0185, SD20A/0309, ABP-316119. Additionally there are 2 no. sites within the LAP lands which have the potential for future development by Dublin City Council, these include Site 1 and Site 2 of the LAP lands which have plans for social and affordable housing schemes. Provided the mitigation measures outlined in Section 5.5.1 and Appendix 5.1 are implemented throughout the construction phase of the proposed development, significant cumulative dust impacts are not predicted.

With mitigation measures (as per Section 5.5.1) in place, there are no significant cumulative impacts to air quality predicted for the construction phase. Impacts will be short-term, localised, negative, imperceptible and non-significant.

Operational Stage

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 14 Material Assets - 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 and neutral with regards to air quality and therefore, not significant.

18.4.3 Climate Factors

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, the assessment of Climate Factors 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.

18.4.4 Noise and Vibration

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, including the following:

Table 18.4 Development Planning permissions that can potentially overlap with the development

Reference	Location	Development Description	Status	Decision Date
4313/22 (Part 8 Application)	Cherry Orchard Green, Dublin 10	Proposed construction of a residential development comprising **172 no. dwellings** (141 no. 3-bedroom two-storey terraced houses and 31 no. 2-bedroom two-storey terraced houses), 2 public open spaces approx. 0.83 ha /14% of site area, associated site infrastructure works/ supporting infrastructure, landscaping, public lighting, access roads/pavements, boundary treatments and provision for a link	City Council – Approved	03.10.2022

		road/ pavements and cycleways to Ballyfermot		
312290	Park West Avenue and Park West Road, Park West, Dublin 12	**750 no. apartments**, creche and associated site works.	Granted	16.06.2022
3403/21	Site (1.26 ha) at Blocks 70 and 72 Park West Avenue and Park West Road, Park West, Dublin 12	Planning permission for the proposed development will consist of modifications to the permitted residential development of **86 no. residential units** over retail/restaurant uses (reg. ref. 3798/18, 3941/20, 2517/21) within blocks 70 and 72.	Granted	21.10.2021
SD188/0006 (Part 8 Application)	New Nangor Road, Clondalkin, Dublin 22.	Social Housing Development comprising of two and three storey housing and apartment units (**44 units in total**) on a site located at New Nangor Road, bounded by Riversdale Estate & Mayfield Park, Clondalkin, Dublin 22. The proposed development shall consist of: 19no. 3-bed, two storey houses, 1no. two storey specially adapted unit and 24no. 2-bed apartments in 3 storey building.	Part 8 Approved by Council	08.10.2018
5311/22	Block 7, Parkwest Business Campus, Parkwest, Dublin 12	The development will consist of the change of use of the ground, first and second floors from class 3 office use to class 8 for use as a health centre / clinic along with all associated works.	Granted	05.04.2023
312290	Park West Avenue and Park West Road, Park West, Dublin 12	Residential Development with a mix of other uses: **Retail Unit – 156 sqm** Block A Crèche – 410 sqm 84 child spaces **Café/bar – 91 sqm** Block G	Granted	16.06.2022
3999/21	Unit 55, Park West Road, Park West Industrial Park, Dublin 12, D12 X9F9	The development will consist of **extension of the existing office space at second floor level resulting in an overall office floorspace increase of 125 sqm approximately, construction of a new mezzanine level in the warehouse area (circa 257 sqm)** and a new stairwell. Creation of 2no. openings to the south elevation and 1no. opening to the west elevation and associated site development works. The development will also include the retention of **the existing office**	Granted Permission and Retention Permission	22.03.2022

		space at ground and first floor level of 250 sqm approximately.		
SD21A/0100	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Construction of a revised two storey mono-pitched Discount Foodstore (with ancillary off-licence use), with an increased **total gross floor space of 2,415sq.m** and an **increased net retail sales area of 1,650sq.m (2,144sq.m and 1,400sq.m respectively permitted under SD19A/0286);** Associated reconfiguration of site layout and all other associated and ancillary modifications to SD19A/0286 above and below ground level, including modifications to pedestrian access and a new electricity substation and switch room building.	Granted	22.07.2021
SD20A/0309	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22	Provision of 4 new information and communications technology (ICT) Facility buildings and associated development at the subject site, **superseding elements of the extant planning permissions on site (Reg. Ref.: SD18A/0068 and Reg, Ref.: SD19A/0185).** The proposed development will comprise the following: The construction **of 4 ICT Facility buildings (ICT Facilities 1, 2, 3, and 4) with a combined total gross floor area {GFA) of c. 47,564.5 sq. m.**	Granted	04.05.2021
SD19A/0185	3-4, Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22.	Alterations to approved plans (Grant of Permission ref PL06S.243151 and PA Reg Ref SD13A/0271 and SD18A/0068) to the previously granted planning permission for the construction of an ESB 110kV Gas Insulated Substation for the use by Crag Digital Limited in support of the development and to incorporate an ESB Network Substation to improve and upgrade power supply to Clondalkin and adjoining areas; **the proposed ESB 110kV Gas Insulated Substation is a two storey building of gross floor area of 1,586sq.m and Client Control Room building of an area of 116sq.m**	Granted	09.09.2019

SD19A/0098	Unit E20, Cloverhill Industrial Estate, Ballymanaggin, Clondalkin, Dublin 22	(1) Demolition of front single storey entrance building and rear storage area; removal of trees to facilitate vehicular entrance, road and associated site preparation work; (2) **630sq.m. two storey front entrance building including café and office space** with flat roof and building signage; 206sq.m. single storey dispatch fridge with flat roof, level loading dock and canopy complete with associated plant; (3) roller shutter door and canopy and pedestrian doors to existing building; (4) enclosed bin store; (5) reorganisation of parking to provide 49 total parking spaces; (6) enlargement of the existing side plant enclosure; (7) all associated site, civil, drainage and landscaping works required for the construction and usage of the proposed building.	Granted	16.09.2019
SD19A/0100	Unit 1, Elmfield Court, Ninth Lock Road, Clondalkin, Dublin 22	Change of use for part of existing retail unit to Off-Licence sales area (**Site area 0.025 ha**)	Granted	01.07.2019
SD19A/0286	Unit 15, Cherry Orchard Industrial Estate, Ballyfermot Road, Dublin 10	Demolition of existing single storey discount food store (with ancillary off-licence use) measuring 1758sq.m gross floor space with a net retail sales area of 1286sq.m; **two storey mono-pitch discount food store (with ancillary off-licence use) measuring 2144sq.m gross floor space with a net retail sales area of 1400sq.m**	Granted	16.12.2019
316119	DART+ South West Electrified Heavy Railway Order - Hazelhatch & Celbridge Station to Heuston Station, and Hesuton Station to Glasnevin		Lodged	Case Due by 18.09.2023

Additionally to the above Table, there are additionally Local Area Plan sites that have been advised by Dublin City Council (DCC)l that could potentially overlap with proposed development during the construction phase, these are as follow:

Site 1 - DCC Affordable Purchase scheme delivering 172 new homes, targeting a construction completion date of Q1 2026.

Site 2 - Currently at design stage. A Part 8 is to be brought to council in Q1 2024 by DCC PPP section. Current iteration outlines 126 social and 47 affordable homes. There will be 3-4 shops. One 250sqm and the others in the region of 120sqm as per the LAP requirements.

The majority of the sites are located at distances greater than 200m from the proposed development and consequently there is likely to be no significant cumulative impacts associated with these developments.

Application 3403/21 is noted to be approximately 50m from the proposed development, however, given that other sensitive receptors with the potential to be impacted by the cumulative noise are located approximately 85m from the proposed development it can be concluded that cumulative construction noise will not be significant at these locations.

If further phases of the overall masterplan for the proposed development proceed simultaneously then elevated construction noise emissions due to cumulative noise are likely to occur at receptor locations proximate to two or more construction sites as well as a potential increase in the length of time that the receptor will be exposed to construction noise. Hence, cumulative construction impacts will need to be considered and managed during the construction phase. It is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors. With mitigation in place the impact of phases being constructed simultaneously will be negative, slight to moderate and brief to short-term.

Operational Stage

Traffic data already accounts for other projects within the area and also for the latter stages of the overall Cherry Orchard masterplan, hence, the cumulative assessment has already been accounted for.

18.4.5 Biodiversity

The proposed development was considered in combination with other plans and projects in the area as set out at the beginning of this Chapter that could result in cumulative impacts on European Sites, Nationally designated sites and protected species. This included a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects.

The residual construction and post operational/construction impacts of the proposed development are considered cumulatively with other plans and projects as described above. Particular focus has been placed on those plans and projects that are in closest proximity to the proposed development.

As such, there is no potential for the proposed development to contribute to any significant cumulative habitat loss when considered in combination with any other plans and projects.

No significant effects as a result of the proposed development in relation to disturbance, displacement or mortality of faunal species has been identified. Therefore, there is no potential for the proposed development to contribute to any cumulative effect in this regard. The proposed development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects. In the review of the projects that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development.

Specifically

- There will be no loss of Key Ecological Receptor habitats or species. There will be no impact on population numbers of Key Ecological Receptors.

- There will be no fragmentation of Key Ecological Receptor habitats or species.
- There will be no negative impacts on Natura 2000 sites within the potential impact zone.
- There will be no effect on the natural range of protected habitats or species, and areas they cover within that range, are stable or increasing
- The specific structure and functions which are necessary for the long-term maintenance of species and habitats exist and are likely to continue to exist for the foreseeable future
- The conservation status of habitats and species is favourable.
- There will be no effects on the population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
- The natural range of the species will neither being reduced nor is likely to be reduced for the foreseeable future
- There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

18.4.6 Archaeological, Architectural and Culture Heritage

It is noted that previous archaeological assessment and excavation has been carried out in advance of development to the west of the M50 Motorway at Gallanstown/Yellowmeadows/Ballymanaggin townlands. This work identified a ring ditch, burnt spreads and metalworking, largely of prehistoric date. Also, previous pre-development assessments at the Parkwest commercial complex identified an early medieval cemetery. Consequently the likely cumulative impacts of the proposed development are site specific and the proposed mitigation outlined in this Chapter will ensure that cumulative effects will not be significant.

18.4.7 Landscape and Visual

The cumulative effects are generated by schemes in the context of the Park West Cherry Orchard Local Area Plan. It is clear from the assessment that the gap sites are causing urban dereliction and antisocial behaviour, with a notable effect on the quality of the public realm. The granting of schemes and the completion of permitted development will further consolidate the ambitions of the LAP and SDRA4 of the Dublin City Development Plan. As schemes are permitted following national, regional and local guidance, it is fair to assume that the quality of design remains appropriate. In that regard, the generation of a good senses of place and innate wayfinding in the streetscape, the provision of public realm and activation of civic and public space is seen in a positive light. Increasing the population and amenity in proximity to public transport, and connecting it through green infrastructure to the local area, should be a positive way to make new, integrated communities. The cumulative effects are therefore seen as **moderate** and **positive**

18.4.8 Land Soil and Geology

On completion of the construction phase and following replacement of topsoil and a planting programme, no further impacts on the soil environment are envisaged except for the possibility of contamination of soil from foul water effluent or oil/chemical spills from the site occupier (residents and commercial interests) operations. This is based on the current EIAR assessment of the masterplan lands as a whole rather than just the subject application site. Mitigation measures noted throughout this report apply to the full masterplan lands and their subsequent planning application and not just the subject application.

18.4.9 Water

Construction Phase

There are no anticipated construction stage cumulative impacts arising from the proposed development, or any further development in the locality in relation to water, other than a slight and temporary increase in water supply demand and increase to foul flows generated.

Operational Phase

There are no anticipated cumulative impacts arising from the proposed development, or any further development in the locality in relation to water, other than a neutral, imperceptible, and permanent increased water supply demand and increase to foul flows generated. This is based on the current EIAR assessment of the masterplan lands as a whole rather than just the subject application site. Mitigation measures noted throughout this report apply to the full masterplan lands and their subsequent planning application and not just the subject application.

18.4.10 Population and Human Health

This EIAR has been prepared to reflect the overall impact of the proposed development of 11.5 hectares of lands, which have been identified as Key Development Site 4 and Site 5 in the Park West Cherry Orchard Local Plan 2019. However, the actual application site subject to the current planning application only relates to part of these lands. As such, cumulative impacts arising from development of the entire subject lands, beyond the extents of the application site, have been considered throughout this EIAR.

The surrounding context of the site consists of a mix of commercial, industrial, residential and relates land uses. The lands are bound by Cloverhill Road to the north, Cedar Brook Avenue and Park West Avenue to the east, Park West Cherry Orchard Rail Station to the southeast, the rail line to the south, and the M50 motorway to the west. Two large industrial estates can be found to the south and southwest of the site as well as many green spaces and parks softening the area. There are established residential communities located to the east of the site within Cederbrook and Barnville, north of the site in St. Oliver's Park and Bridgeview, and south of the site opposite the train station within the Crescent complex.

The potential cumulative impact of the proposed development on population and human health have also been considered in conjunction with recent relevant planning permissions set out in Section 13.7. There are 3 major residential planning applications, delivering a total of 1,008 units, which are expected to have cumulative impacts on the proposed development. There are also 3 planning applications for commercial development, delivering and additional circa 2,8000 sqm of commercial floorspace, which are considered to have cumulative impacts, including a major discount food retail development.

However, it should be considered that the proposed development, alongside the relevant residential and commercial planning applications cited above, form part of a key growth area as identified in Local Area Plan and City Development Plan. The cumulative impact of the development of adjacent lands within Study Area will be the resulting rise in population, in line with national, regional, and local planning policy for Park West and Cherry Orchard. This impact will be long term and positive in the context of the development zoning objectives for the subject site, and wider local, regional, and national planning policy. This is further supported by the strategic location of lands within the Study Area and their proximity to high-quality public transport services, and social and community services. The cumulative impact of the full development of lands in line with the objectives of the Local Area Plan will enhance the social and economic viability of the area.

18.4.11 Material Assets – Traffic and Transportation

No other significant construction projects have been identified in the area of the subject site which would result in a significant cumulative impact on Traffic and Transport either during the construction or operational phases.

However, measures currently being considered by NTA, TII and Dublin City Council for the intensification of public transport services and cycle facilities in the surrounding area are likely to have a cumulative long term significant impact.

18.4.12 Material Assets – Waste Management

It is predicted with the implementation of the mitigation measures outlined in section 15.6 and adherence to the RWMP (Appendix 15.1) and OWMP (Appendix 15.2) there will be no significant cumulative residual impact in the receiving environment section, which includes cumulative developments that are already built and in operation in relation to material assets- waste management.

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.

A review of the permitted and proposed developments, as set out in Chapter 18 of this EIA Report, has been undertaken to identify any substantial projects that are concurrent with the construction phase of the proposed development that may result in cumulative effects in respect of land soils geology and hydrogeology.

This review identified the permitted developments outlined in Section 15.8.1, below, which are capable of combining with the proposed development and have the potential to result in significant cumulative effects due to their scale and close proximity to the proposed development site.

Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area as set out earlier in this Report.

Due to the high number of waste contractors in the Dublin region as provided from the National Waste Collection Permit Office and the Environmental Protection Agency there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, imperceptible*** and ***neutral.***

Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area, and the indicative future masterplan development, will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a ***long-term, imperceptible*** and ***neutral***.

18.4.13 Material Assets – Utilities

The main interactions relating to this EIAR Chapter are Land & Soils, Biodiversity, and Utilities.

During construction stage, the connection of wastewater services has the potential to impact groundwater and soils if wastewater were to leak from the network during the construction process. 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 Transport 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.

In respect of Land & Soils, interaction between surface and ground water and the bedrock geology is feasible. The implementation of the mitigation measures outlined in this chapter will reduce the potential of surface contaminants leaking into the underlying geology.

In respect of Biodiversity, there is interaction between hydrology and the downstream habitats present as the public surface water network outfalls volume and water quality to the natural watercourse. The mitigation measures ensure that surface water runoff is treated to the required standards so that downstream habitats are not negatively impacted.

Electricity

In the event of future development adjacent to the proposed development, there are no predicted cumulative impacts arising from the construction or operation phase related to the material assets – built services for foul, water supply and surface water drainage, provided that the other developments implement appropriate mitigation measures.

Gas

In the event of future development adjacent to the proposed development, there are no predicted cumulative impacts arising from the construction or operation phase related to the material assets – built services provided that the other developments implement appropriate mitigation measures.

Telecommunications

In the event of future development adjacent to the proposed development, there are no predicted cumulative impacts arising from the construction or operation phase related to the material assets – built services provided that the other developments implement appropriate mitigation measures.

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