

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME II



PROPOSED MIXED USE RESIDENTIAL DEVELOPMENT
AT
CLONBURRIS TILE 2 – CUCS3 & CSWS3
Prepared by



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LIST OF ABBREVIATIONS

AA	Appropriate Assessment	LAP	Local Area Plan
ABP	An Bord Pleanála	NHA/pNHA	Natural Heritage Area / proposed Natural Heritage Area
CDP	County Development Plan	NIAH	National Archive of Architectural Heritage
CMP	Construction Management Plan	NPWS	National Parks and Wildlife Service
CA	Competent Authority (An Bord Pleanála)	NRA	National Roads Authority
CSO	Central Statistics Office	NPF	National Planning Framework
DAHG	Department of Arts, Heritage and the Gaeltacht	OPW	Office of Public Works
DCENR	Department of Communications, Energy and Natural Resources	PBSA	Purpose-Built Student Accommodation
DEHLG	Department of Housing, Planning and Local Government	RMP	Record of Monuments and Places
EIA	Environmental Impact Assessment	RPG	Regional Planning Guidelines
EIAR	Environmental Impact Assessment Report	RPS	Record of Protected Structures
EMP	Environmental Management Plan	SAC	Special Area of Conservation
EPA	Environmental Protection Agency	SDCC	South Dublin County Council
ESRI	Economic and Social Research Institute	SMR	Sites and Monuments Record
FLR	Flemington Link Road (C Link Road)	SPA	Special Protection Area
GDP	Gross Domestic Product	SUDS	Sustainable Drainage System
GSI	Geology Survey Ireland	TMP	Traffic Management Plan
IAA	Irish Aviation Association	WFD	Water Framework Directive
IEEM	Institute of Ecology and Environmental Management		
IFI	Inland Fisheries Ireland		

GLOSSARY OF TERMS¹

Alternatives A description of other options that may have been considered during the conception of a project; these include alternative locations, alternative designs and alternative processes.

Baseline Scenario The current state of environmental characteristics – including any evident trends in its status.

Competent Authority (CA) The term ‘competent authority’ means the Minister or public authority to which an EIAR is required to be submitted, i.e. the authority charged with examining an EIAR with a view to issuing a consent to develop or operate.

Development A project involving new works [including alteration and/or demolition] or altered patterns of activity.

¹ Selected – From Guidelines on the information to be contained in Environmental Impact Assessment Reports – EPA, May 2022

'Do-nothing' Scenario The situation or environment which would exist if a proposed, development, project or process were not carried out. This scenario needs to take account of the continuation or change of current management regimes, as well as the continuation or change of trends currently evident in the environment.

Effect / Impact A change resulting from the implementation of a project.

Environmental Impact Assessment – EIA The process of examining the anticipated environmental effects of a proposed project – from consideration of environmental aspects at design stage, through consultation and preparation of an Environmental Impact Assessment Report (EIA), evaluation of the EIA by a competent authority, and the subsequent decision as to whether the project should be permitted to proceed, encompassing public response to that decision.

Environmental Impact Assessment Report – EIA A report or statement of the effects, if any, that the proposed project, if carried out, would have on the environment. EPA The Environmental Protection Agency.

Impact / Effect A change resulting from the implementation of a project

Impact Avoidance The modification of project decisions (about site location or design, for example) having regard to predictions about potentially significant environmental effects.

Infrastructure The basic structure, framework or system which supports the operation of a project, for example roads and sewers, which are necessary to support development projects.

Land Use The human activities which take place within a given area of space.

Likely Effects (or Likely Impacts) The effects that are specifically predicted to take place – based on an understanding of the interaction of the proposed project and the receiving environment. (See also Potential Effects and Residual Effects.)

Methodology The specific approach or techniques used to analyse impacts or describe environments.

Mitigation Measures Measures designed to avoid, prevent or reduce impacts. These measures can mitigate impacts: \ by Avoidance When no impact is caused (often through consideration of alternatives). \ by Prevention When a potential impact is prevented by a measure to avoid the possibility of the impact occurring. \ by Reduction When an impact is lessened.

Monitoring The observation, measurement and evaluation of environmental data to follow changes over a period of time, to assess the efficiency of control measures and to record any unforeseen effects in order to be able to undertake appropriate remedial action. This is typically a repetitive and continued process carried out during construction, operation or decommissioning of a project.

Pathway The route by which an effect is conveyed between a source and a receptor.

Planning Application Report Documentation that accompanies the planning application which describes the conformity of the proposal with relevant legislation and planning matters – such as the County, City or Local Area Plans – and sectoral policies, as well as social and economic activity.

Pollution Any release to the environment which has a subsequent adverse effect on the environment or man.

Potential Effect/ Impact The effect / impact that would occur without mitigation.

Processes The activities which take place within a project.

Project For the purposes of the Guidelines, the term project is used to encompass all of the various forms of development, works and activity which are subject to EIA requirements, as set out in the relevant legislation and as understood by the Directive.

Sensitivity The potential of a receptor to be significantly affected. **Significance (of impact)** The importance of the outcome of the impact (or the consequence of change) for the receiving environment. **Source** The activity or place from which an effect originates.

1.0 INTRODUCTION AND METHODOLOGY

John Spain Associates, Planning & Development Consultants, have been commissioned by Cairn Homes Properties Ltd., to prepare an Environmental Impact Assessment Report (EIA) for the construction of 594 no. apartments, creche (609 sq.m), commercial office floorspace (c. 4,516 sq. m), 4 no. retail units (c. 887.5 sq.m) on a site of c. 5.18 hectares along with public open space of c. 1.42 hectares. This chapter of the EIA was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

Rory Kunz has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has 19 years of experience of Environmental Impact Assessment and urban development.

Rory has acted as lead planning consultant on a range of high-quality complex planning applications across the country over an extended period. Rory has wide-ranging experience in the management and review of Environmental Impact Assessment Reports (EIA) for major residential and mixed-use development and redevelopment projects.

The subject site is located to the north of the permitted Phase 1A (Tile1), under Planning Reg. Ref. SDZ21A/0022 to the south of the Fonthill Irish Rail Station, to the west of the Fonthill Road, and the east of undeveloped lands.

The central purpose of the Environmental Impact Assessment Report (EIA) is to undertake an appraisal of the effects of the proposed development on the environment, and to document this process and describe the likely significant effects on the environment (if any). The EIA is then submitted to the competent/ consent authority to enable it assess the likely significant effects of the project on the environment.

A full description of the proposed development lands together with a description of the proposed development is provided in Chapter 2 of this EIA document.

This EIA document has been prepared in accordance with Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014 (**'the EIA Directives'**), as well as relevant national implementing legislation, i.e. Part X of the Planning and Development Act 2000, as amended (**'the 2000 Act'**), and Part 10 of the Planning and Development Regulations 2001, as amended, (**'the 2001 Regulations'**). A description of the methodological approach to the preparation of this EIA is provided in the following sections of this chapter. A description of the methodological approach to the preparation of this EIA is provided in the following sections of this chapter.

1.1 EIA LEGISLATION, DEFINITION OF EIA AND EIA

Certain public and private projects that are likely to have significant effects on the environment are required to undergo an environmental impact assessment (EIA) in accordance with the EIA Directives, The purpose of the EIA Directives is to ensure that projects likely to have significant effects on the environment are subject to a comprehensive and systematic assessment of environmental effects prior to development consent being given.

Directive 2014/52/EU defines '*environmental impact assessment*' as a process, which includes the responsibility of the developer to prepare an Environmental Impact Assessment Report (EIA), and the responsibility of the competent authority to provide reasoned conclusions following the examination of the EIA and other relevant information.

Article 1(2)(g) of Directive 2011/92/EU, as amended by the 2014 Directive states that "*environmental impact assessment*" means a process consisting of:

- “(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);
- (ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;
- (iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;
- (iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and

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

A definition of “*environmental impact assessment*” is also contained under Section 171A of the 2000 Act, as amended as follows:

‘environmental impact assessment’ means a process—

(a) consisting of—

- (i) the preparation of an environmental impact assessment report by the applicant in accordance with this Act and regulations made thereunder,*
- (ii) the carrying out of consultations in accordance with this Act and regulations made thereunder,*
- (iii) the examination by the planning authority or the Board, as the case may be, of—*
 - (I) the information contained in the environmental impact assessment report,*
 - (II) any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and*
 - (III) any relevant information received through the consultations carried out pursuant to subparagraph (ii),*
- (iv) the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and*
- (v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and*

(b) which includes—

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

- (I) population and human health;*
- (II) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;*
- (III) land, soil, water, air and climate;*
- (IV) material assets, cultural heritage and the landscape;*
- (V) the interaction between the factors mentioned in clauses (I) to (IV),*

and

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

The amended Directive (Directive 2014/52/EU) uses the term environmental impact assessment report (EIAR) rather than environmental impact statement (EIS). Where current national guidelines and regulations refer to an environmental impact statement or an EIS, this can be taken to be the same as an environmental impact assessment report (EIAR).

A definition of Environmental Impact Assessment Report (EIAR) has not been included in the revised directive. However the EPA Guidelines (2022)² (and the Planning and Development Act 2000 as amended) provide the following definition:

“A report or statement of the effects, if any, that the proposed project, if carried out, would have on the environment.”

² Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2022

The information to be included in an EIAR is specified in Article 5(1) and Annex IV of the EIA Directives (see section 1.7 below for more). The EIAR is prepared by the developer (in this instance Cairn Homes Properties Ltd.) and is submitted to a Competent Authority (CA) (in this instance South Dublin County Council) 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 inform its decision as to whether consent should be granted. The information in the EIAR is also used by other parties to evaluate the acceptability of the project and its effects and to inform their submissions to the CA.

The EIAR presents a systematic analysis and evaluation of the potentially significant effects of a proposed project on the receiving environment. Article 3 of the amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment, and which must be addressed in the EIAR:

"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; the interaction between the factors referred to in points (a) to (d)."*

The EIAR should be prepared at a stage in the design process where changes can still be made to avoid adverse effects. This often results in the modification of the project to avoid or reduce effects through redesign.

Where significant and likely environmental effects are identified, the EIA process aims to quantify and minimise the impact development projects have on the environment through appropriate mitigation measures. The preparation of an EIAR requires site-specific considerations and the preparation of baseline assessment against which the likely impacts of a proposed development can be assessed by way of a concise, standardised and systematic methodology.

1.2 EIA GUIDELINES

EIA practice has evolved substantially since the introduction of the EIA Directive in 1985. Practice continues to evolve and takes into account the growing body of experience in carrying out EIARs in the development sector. Table 1.1 sets out the relevant key EIA Guidance which has been consulted in the preparation of this EIAR document. In addition, the individual chapters of this EIAR should be referred to for further information on the documents consulted by each competent expert.

We would also note that the pre-application discussions with the Planning Authority informed the content of the EIAR.

Table 1.1 – EIA Guidelines Consulted as Part of the Preparation of this EIAR

Irish
<ul style="list-style-type: none"> • Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022 • Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018 • Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems - Key Issues Consultation Paper, Department of Housing, Planning, Community and Local Government, 2017. • Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017). • Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoECLG, March 2013). • Development Management Guidelines (DoEHLG, 2007). • Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003). • Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
European Union (in addition to Directives referenced above)
<ul style="list-style-type: none"> • 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 (2017).
- Environmental Impact Assessment of Projects Guidance on Scoping (2017).
- EU Commission Notice on changes and extensions to projects (2021)
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).

The content of this Environmental Impact Assessment Report has been prepared in accordance with the provisions of Article 5(1) and Annex IV of Directive 2014/52/EU and Article 94 and Schedule 6 the 2001 Regulations as amended.

1.3 EIA PROCESS OVERVIEW

The main purpose of the EIA process is to identify, describe and assess the direct and indirect significant impacts of the proposed project on the environment, and specifically 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; the interaction between the factors referred to in points (a) to (d)."*

The EIAR presents the results of the analysis and assessment of the significant effects of the proposed development on the receiving environment undertaken by the competent experts appointed by the developer to prepare the EIAR and sets out measures to be incorporated into the project to eliminate or minimise these impacts. .

Several interacting steps typify the early stages of the EIA process and include:

- Screening;
- Scoping;
- Assessing Alternatives; and
- Assessing and Evaluating.

Screening: Screening is the term used to describe the process for determining whether a proposed development requires an EIA.

Scoping: This stage firstly identifies the extent of the proposed development and associated site, which will be assessed as part of the EIA process, and secondly, it identifies the environmental issues likely to be important during the course of completing the EIA process having regard to the nature of the proposed development and the receiving environment and through consultation with statutory and non-statutory stakeholders. Scoping request letters were issued to a range of stakeholders at the commencement of this EIA process and the responses received have been considered as part of the compilation of the EIAR.

Assessing Alternatives: This stage describes the reasonable alternative approaches to the proposed development and sets out the main reasons for the chosen approach having regard to the effects of the respective alternatives on the environment. Consideration of alternatives is set out in Chapter 2 of this EIAR.

Assessing and Evaluating: The central steps of the EIA process include baseline assessment (desk study and field surveys) to determine the status of the existing environment, impact prediction and evaluation, and determining appropriate mitigation measures where necessary. This stage of the EIAR is presented in Chapters 3 to 15.

1.4 SCREENING – REQUIREMENT FOR EIA

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

Article 4(1) of the EIA Directives requires as mandatory the preparation of an EIA for all development projects listed in Annex I of the Directive.

Article 4(2) of the EIA Directives provides EU Member States discretion in determining the need for an EIA on a case-by-case basis for certain classes of project listed in Annex II of the Directives 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 of the projects of a type listed in Annex II of the EIA Directives, which if exceeded will require such a project to be subject to an EIA.

Paragraph 10((b)(i) refers to Infrastructure projects comprising the construction of more than 500 dwelling units. The proposed development which comprises 594 no. dwellings is above the threshold and EIA is required.

1.5 SCOPING

The EPA Guidelines state that ‘*scoping*’ is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in the EC guidance³ as:

“The process of identifying the content and extent of the information to be submitted to the Competent Authority under the EIA process.”

The EIAR team has extensive professional experience on undertaking similar EIAR projects on similar sites (e.g. Phase 1A to the south by Cairn) and elsewhere over an extended period.

The provisions included in the revised EIA Directive and all of the issues listed in Schedule 6, Sections 1, 2 and 3 of the Planning and Development Regulations 2001 (as amended) and in recent guidance documents have been addressed in the EIAR.

In this context the following topics/issues have been reviewed and addressed in the context of the proposed development:

- Introduction and Methodology,
- Project Description and Alternatives Examined,
- Population and Human Health,
- Biodiversity,
- Land and Soils,
- Water,
- Air Quality and Climate,
- Noise and Vibration,
- Landscape and Visual Impact,
- Material Assets - Traffic,
- Material Assets - Waste
- Material Assets - Utilities,
- Cultural Heritage - Archaeology,
- Cultural Heritage Architectural Heritage,
- Risk Management for Major Accidents and or Disasters,
- Interactions of the Foregoing,
- Summary of EIA Mitigation and Monitoring Measures,
- Non-Technical Summary.

In addition to the above a series of standalone reports have been prepared to accompany the application and which have helped inform the above chapters of the EIAR where relevant. Chapter 2 provides details of the envisaged phased delivery of development on the lands.

In addition, consultation has taken place with the technical staff of South Dublin County Council and a consultation meeting has taken place between the Applicant.

³ Environmental Impact Assessment of Projects Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU)

1.6 INFORMATION TO BE CONTAINED IN AN EIA

The content of this Environmental Impact Assessment Report has been prepared in accordance with the provisions of Article 5(1) and Annex IV of Directive 2014/52/EU. Article 5(1) states:

“The information to be provided by the developer shall include at least:

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

Annex IV states:

“1. A Description of the project, including in particular:

- (a) a description of the location of the project;
 - (b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
 - (c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
 - (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.
2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
4. A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
5. A description of the likely significant effects of the project on the environment resulting from, inter alia:
- (a) the construction and existence of the project, including, where relevant, demolition works;
 - (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
 - (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
 - (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
 - (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
 - (g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project.

6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.
8. A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
9. A non-technical summary of the information provided under points 1 to 8.
10. A reference list detailing the sources used for the descriptions and assessments included in the report.”

Article 94 and Schedule 6 of the Planning and Development Regulations 2001, as amended, transpose into Irish law the EIA Directive requirements in relation to information to be contained in an EIAR.

Article 94 states:

“An EIAR shall take into account the available results of other relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments and shall contain—

(a) the information specified in paragraph 1 of Schedule 6,

(b) any additional information specified in paragraph 2 of Schedule 6 relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, and methods of assessment,

(c) a summary in non-technical language of the information required under paragraphs (a) and (b),

(d) a reference list detailing the sources used for the descriptions and assessments included in the report, and

(e) a list of the experts who contributed to the preparation of the report, identifying for each such expert— (i) the part or parts of the report which he or she is responsible for or to which he or she contributed, (ii) his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and (iii) such additional information in relation to his or her expertise that the person or persons preparing the EIAR consider demonstrates the expert’s competence in the preparation of the report and ensures its completeness and quality.”

Schedule 6 provides for the following information to be furnished:

1. (a) A description of the proposed development comprising information on the site, design, size and other relevant features of the proposed development.

(b) A description of the likely significant effects on the environment of the proposed development.

(c) A description of the features, if any, of the proposed development and the measures, if any, envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment of the development.

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

2. Additional information, relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, on the following matters, by way of explanation or amplification of the information referred to in paragraph 1:

- (a) a description of the proposed development, including, in particular—
- (i) a description of the location of the proposed development,
 - (ii) a description of the physical characteristics of the whole proposed development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases,
 - (iii) a description of the main characteristics of the operational phase of the proposed development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used, and
 - (iv) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases;
- (b) a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;
- (c) a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge;
- (d) a description of the factors specified in paragraph (b)(i)(I) to (V) of the definition of ‘environmental impact assessment’ in section 171A of the Act likely to be significantly affected by the proposed development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape;
- (e) (i) a description of the likely significant effects on the environment of the proposed development resulting from, among other things—
- (I) the construction and existence of the proposed development, including, where relevant, demolition works,
 - (II) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources,
 - (III) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste,
 - (IV) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters),
 - (V) the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources,
 - (VI) the impact of the proposed development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the proposed development to climate change, and
 - (VII) the technologies and the substances used, and
- (ii) the description of the likely significant effects on the factors specified in paragraph (b)(i)(I) to (V) of the definition of ‘environmental impact assessment’ in section 171A of the Act 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 proposed development, taking into account the environmental protection objectives established at European Union level or by a Member State of the European Union which are relevant to the proposed development;
- (f) a description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved;

(g) a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of an analysis after completion of the development), explaining the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset during both the construction and operational phases of the development;

(h) a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events.

Annex IV of the EIA Directive and Article 94 of the 2001 Regulations, also require that the EIAR shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation. The available result of other such assessments, where relevant, have been considered in each of the chapters.

The likely significant effects in this EIAR are, unless otherwise indicated in a particular Chapter, described using the terminology in Table 3.4 in the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022 (the EPA Guidelines 2022), which are presented in the Table below. The use of these terms for the classification of impacts ensures that the EIA employs a systematic approach, which can be replicated across most disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the proposed development on the receiving environment.

Table 1.2 – Description of Effects

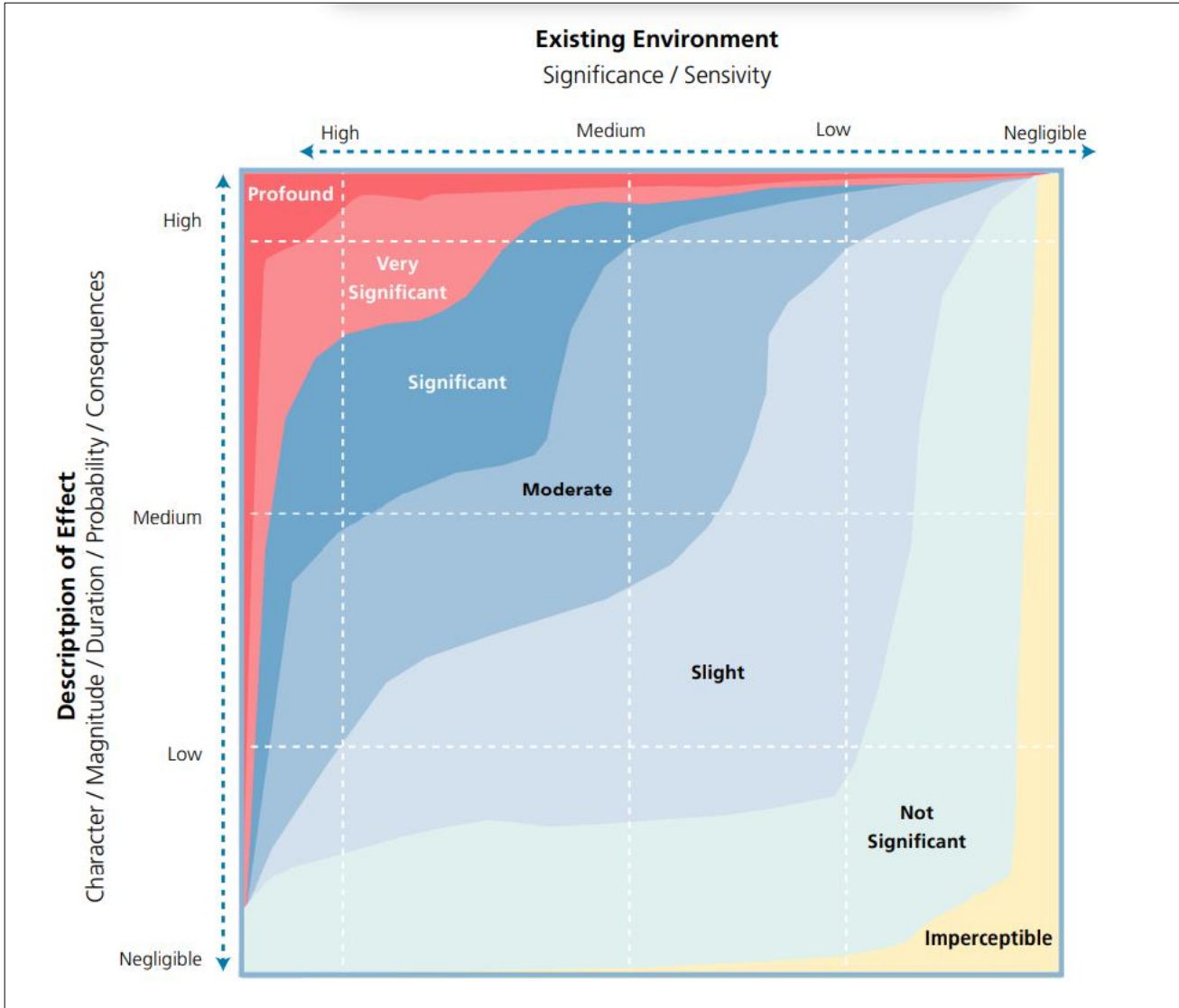
Quality of Effects	Definition
Negative /Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Positive	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Significance of Effects on the Receiving Environment	Description of Potential Effects
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Extent and Context of Effects	Describing the Extent and Context of Effects

Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Probability of Effects	Describing the Probability of Effects
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration of Impact	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Types of Effect	Describing the Types of Effects
Indirect Effects (a.k.a. Secondary Effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects
'Do-Nothing Effects'	The environment as it would be in the future should the subject project not be carried out.
'Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO _x and NO _x to produce smog).

Source: Table 3.4 EPA Guidelines 2022

The diagram below shows how comparison of the character of the predicted impact to the sensitivity of the receiving environment can determine the significance of the impact.

Figure 1.1 – Chart showing typical classifications of the significance of impacts



Source: Figure 3.4 of EPA Guidelines 2022

1.7 PURPOSE OF THIS EIAR

The EPA Guidelines 2022 state that the main purpose of an EIAR ‘is to identify, describe and present an assessment of the likely significant effects of a project on the environment’. This informs the competent authority’s assessment process, its decision on whether to grant consent for a project and, if granting consent, what conditions to attach. The EIAR focuses on:

- effects that are both likely and significant; and;
- description of effects that are accurate and credible.

In addition to identifying and predicting the likely predicted significant environmental impacts resulting from the proposed development, the EIAR should describe the means and extent by which they can be reduced or ameliorated, to interpret and communicate information about the likely impacts and to provide an input into the decision making and planning process.

The EIAR documents the consideration of environmental effects that influenced the evaluation of alternatives. It also documents how the selected project design incorporates mitigation measures; including impact avoidance, reduction or amelioration; to explain how significant adverse effects will be avoided.

It is intended that this EIAR will assist South Dublin County Council (the competent authority) statutory consultees and the public in assessing all aspects of the application proposals.

1.8 OBJECTIVES OF THIS EIAR

The EPA guidelines (2022) list the following fundamental principles to be followed when preparing an EIAR:

- Anticipating, predicting, avoiding and reducing significant effects;
- Assessing and mitigating effects;
- Maintaining objectivity;
- Ensuring clarity and quality;
- Providing relevant information to decision makers; and
- Facilitating better consultation.

The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and the environmental impact assessment should 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 prescribed environmental factors which are:

- (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 documents the analysis, evaluation and assessment of the likely significant effects of the proposed mixed-use development at Emmet Road, Inchicore, Dublin 8 on each of these environmental factors.

Pursuing preventative action is the most effective means by which potential negative environmental impacts can be avoided. Avoidance of impacts has been principally achieved through the consideration of alternatives and through the review of the project design in light of identified key environmental constraints. This is outlined in greater detail in Chapter 2.

The EIAR document enables South Dublin County Council, as competent authority, to reach a decision on the acceptability of the proposed development in the full knowledge of the project's likely significant impacts on the environment, if any.

Decisions are taken by competent/consent authorities through the statutory planning process which allows for public participation and consultation while receiving advice from other key stakeholders and statutory authorities with specific environmental responsibilities.

The structure, presentation and the non-technical summary of the EIAR document as well as the arrangements for public access all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of any likely environmental impacts of projects prior to the granting of consent.

1.9 FORMAT AND STRUCTURE OF THIS EIAR

1.9.1 EIAR Structure

The structure of the EIAR is laid out in the preface of each volume for clarity. It consists of three volumes as follows:

- Volume I: Non-Technical Summary

This is a non-technical summary of the information contained within Volume II.

- Volume II: Environmental Impact Assessment Report.

This is the main volume of the EIA. It provides information on the location and scale of the proposed development, details on design and impacts on the environment (both positive and negative) as a result of the proposed development.

Each of the environmental aspects as listed below are examined in terms of the existing or baseline environment, identification of potential construction and operational stage impacts and where necessary proposed mitigation measures are identified. The interaction of the environmental aspects with each other is also examined. Each chapter below includes an assessment of potential cumulative impacts with other existing and planned developments, where relevant. Environmental aspects considered include:

Chapter 3	Population and Human Health;
Chapter 4	Biodiversity;
Chapter 5	Land and Soils;
Chapter 6	Water;
Chapter 7	Air Quality and Climate;
Chapter 8	Noise and Vibration;
Chapter 9	Landscape & Visual;
Chapter 10	Material Assets – Traffic;
Chapter 11	Material Assets - Waste Management;
Chapter 12	Material Assets – Utilities;
Chapter 13	Cultural Heritage – Local History, Archaeology;
Chapter 14	Cultural Heritage – Architectural Heritage;
Chapter 15	Risk Management for Major Accidents and or Disasters;
Chapter 16	Interactions of the Foregoing;
Chapter 17	Summary of EIA Mitigation and Monitoring Measures;

- Volume III: Technical Appendices

Volume III contains specialists' technical data and other related reports.

1.9.2 EIA Volume II Structure

The preparation of an EIA document requires the assimilation, co-ordination, and presentation of a wide range of relevant information in order to allow for the overall assessment of a proposed development. For clarity and to allow for ease of presentation and consistency when considering the various elements of the proposed development, a systematic structure is used for the main body of this EIA document.

The structure used in this EIA document is a Grouped Format structure. This structure examines each environmental topic⁴ in a separate chapter of this EIA document. The structure of the EIA document is set out in Table 1.3 below.

Table 1.3 – Structure of this EIA

Chapter	Title	Content
1	Introduction and Methodology	Sets out the purpose, methodology and scope of the document.
2	Project Description and Alternatives Examined	Sets out the description of the site, design and scale of development, considers all relevant phases from construction through to existence and operation together with a description and evaluation of the reasonable alternatives studied by the developer including alternative locations, designs and processes considered; and a justification for the option chosen taking into account the effects of the project on the environment.

⁴ In some instances similar environmental topics are grouped.

Chapter	Title	Content
3	Population and Human Health	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.
4	Biodiversity	Describes the existing ecology on site and in the surrounding catchment and assesses the potential impact of the proposed development and mitigation measures incorporated into the design of the scheme and includes mitigation measures.
5	Land and Soils	Provides an overview of the baseline position, the potential impact of the proposed development on the site's soil and geology and impacts in relation to land take and includes mitigation measures.
6	Water	Provides an overview of the baseline position, the potential impact of the proposed development on water quality and quantity and includes mitigation measures.
7	Air Quality and Climate	Provides an overview of the baseline air quality and climatic environment, the potential impact of the proposed development, the vulnerability of the project to climate change, and includes mitigation measures.
8	Noise and Vibration	Provides an overview of the baseline noise environment, the potential impact of the proposed development and includes mitigation measures.
9	Landscape & Visual Impact	Provides an overview of the baseline position, the potential impact of the proposed development on the landscape appearance and character and visual environment and includes mitigation measures.
10-12	Material Assets	Describes the existing traffic, waste management and services and infrastructural requirements of the proposed development and the likely impact of the proposed development on material assets and includes mitigation measures.
13	Archaeology and Architectural and Cultural Heritage	Provides an assessment of the site and considers the potential impact of the proposed development on the local archaeology, architectural and cultural heritage; and includes mitigation measures.
14	Risk Management	Provides a review of the potential vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned
15	Interactions of the Foregoing	Describes the potential interactions and interrelationships between the various environmental factors.
16	Summary of Mitigation and Monitoring Measures	Sets out the key mitigation and monitoring measures included in the EIAR Document for ease of reference.

This systematic approach described above employs standard descriptive methods, replicable assessment techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration. An outline of the methodology employed consistently in each chapter to examine each environmental topic is provided below:

Table 1.4 – Methodology Employed to Evaluate Environmental Topic

- Introduction:
- Study Methodology:
- The Existing Receiving Environment (Baseline Situation):
- Do Nothing Scenario:
- Characteristics of the Proposed Development:
- Potential Impact of the Proposed Development:
- Avoidance, Remedial and Mitigation Measures: Avoidance:

- Predicted Impacts of the Proposed Development (Assessing the significance of residual effects, taking account of any mitigation measures):
- Monitoring:
- Reinstatement:
- Interactions and Cumulative Impacts:
- Difficulties Encountered in Compiling:
- References.

1.10 EIAR PROJECT TEAM

1.10.1 EIAR Project Management

The preparation of this EIAR was project managed, co-ordinated and produced by John Spain Associates. John Spain Associates role was to liaise between the design team and various environmental specialist consultants. John Spain Associates were also responsible for editing the EIAR document to ensure that it is cohesive and not a disjointed collection of disparate reports by various environmental specialists. John Spain Associates does not accept responsibility for the input of the competent specialist consultants or the design team.

1.10.2 EIAR Competent Experts/Environmental Specialists

Recital 33 of the amended EIA Directive (Directive 2014/52/EU) states the following in relation to the persons responsible for preparing the environmental impact assessment reports:

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

Article 5(3) of the EIA Directive (Directive 2014/52/EU) obliges the project developer to "ensure that the environmental impact assessment report is prepared by competent experts". To demonstrate compliance with this, Article 94(e) of the Planning and Development Regulations 2001 to 2021 requires the developer to include the following information in the EIAR:

a list of the experts who contributed to the preparation of the report, identifying for each such expert—

- (i) the part or parts of the report which he or she is responsible for or to which he or she contributed,*
- (ii) his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and*
- (iii) such additional information in relation to his or her expertise that the person or persons preparing the EIAR consider demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality.*

Each environmental specialist engaged in the preparation of this EIAR was commissioned having regard to their previous experience in EIA; their knowledge of relevant environmental legislation relevant to their topic; familiarity with the relevant standards and criteria for evaluation relevant to their topic; ability to interpret the specialised documentation of the construction sector and to understand and anticipate how their topic will be affected during construction and operation phases of development; ability to arrive at practicable and reliable measure to mitigate or avoid adverse environmental impacts; and to clearly and comprehensively present their findings.

Each environmental specialist was required to characterise the receiving baseline environment; evaluate its significance and sensitivity; predict how the receiving environment will interact with the proposed development and to work with the EIA project design team to devise measures to mitigate any adverse environmental impacts identified.

The relevant specialist consultants who contributed to the EIAR and their inputs are set out in Table 1.5 below.

Table 1.5 – EIAR List of Competent Experts

Organisation	EIAR Specialist Topics / Inputs
John Spain Associates, Planning & Development Consultants, 39 Fitzwilliam Place, Dublin 2, D02 ND61 T: 01 662 5803 Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt	Introduction and Methodology Project Description and Alternatives Examined Population and Human Health Interactions of the Foregoing Principal Mitigation and Monitoring Measures Non-Technical Summary
Patrick Ellison (B.Sc., M.Sc. ACIEEM).	Biodiversity
Dr Tina Aughney of Bat Eco Services	Biodiversity (Bats)
Dieter Bester, Chartered Civil Engineer [B.Eng CEng].	Land and Soils/ Population and Human Health
Dieter Bester, Chartered Civil Engineer [B.Eng CEng].	Water and Hydrogeology
Daniel Garvey, Transportation Engineer, and reviewed by Danny Pio Murphy, Senior Transportation Engineer from DBFL Consulting Engineers	Material Assets-Traffic
Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd	Material Assets (Waste Management)
Dieter Bester, Chartered Civil Engineer [B.Eng CEng].	Material Assets (Utilities)
Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd	Air Quality and Climate (Population and Human Health)
Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd	Noise and Vibration (Population and Human Health)
Declan O’Leary B.Agr Sc. Land. Hort., Dip LA., CLI, MILI, of Cunnane Stratton Reynolds Ltd. Declan has over 30 years’ experience in the design and analysis of landscape and the impacts of change, and the preparation of assessments for inclusion EIA. Thorsten Peters Dipl Ing Arch, MSc Sust Dev, MRIA of Cunnane Stratton Reynolds Ltd. Thorsten has over 26 years’ experience in the field of Architecture, Urban Design and Sustainable Development.	Landscape and Visual Impacts
Dieter Bester, Chartered Civil Engineer [B.Eng CEng].	Risk Management
Faith Bailey MA, BA (Hons), MCIIfA Associate Director.	Archaeology, Architectural and Cultural Heritage

1.11 NON-TECHNICAL SUMMARY

One of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions. Article 5(1)(e) requires the developer to include a non-technical summary in the EIA.

The EPA guidelines 2022 note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by the Competent Authority.

The 2018 EIA Guidelines (paragraph 4.6) prepared by the DHPLG state that the Non-Technical Summary “*should be concise and comprehensive and should be written in language easily understood by a lay member of the public not having a background in environmental matters or an in-depth knowledge of the proposed project.*”

A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document in Volume I.

1.12 DESCRIPTION OF THE OPERATION STAGE OF THE PROJECT

Pursuant to the EIA Directive an EIAR document is required to set out a description of the project processes, activities, materials and natural resources utilised; and the activities, materials and natural resources and the effects, residues and emissions anticipated by the operation of the project.

The proposed development is a residential development including associated roads and services infrastructural works, areas of open space along with commercial development in Phase 3D. The primary direct significant environmental effects will arise during the construction stage. As a result, post-construction, the operation of the proposed development is therefore relatively benign and not likely to give rise to any significant additional impacts in terms of activities, materials or natural resources used or effects, residues or emissions which are likely to have a significant impact on population and human health, biodiversity, soils, water, air, climate, or landscape.

The primary likely and significant environmental impacts of the operation of the proposed development are fully addressed in the EIAR document; and relate to Population and Human Health, Landscape and Visual Impact and Noise and Air impacts associated with the traffic generated.

The proposed development also has the potential for cumulative, secondary and indirect impacts particularly with respect to such topics as traffic – which in many instances – are often difficult to quantify due to complex inter-relationships. However, all cumulative secondary and indirect impacts are unlikely to be significant; and where appropriate, have been addressed in the content of this EIAR document.

1.12.1 Description of Changes to the Project

The Guidelines on the information to be contained in environmental impact assessment reports were published by the EPA in May 2022.

The EPA EIAR Guidelines 2022 state in relation to change:

“Very few projects remain unaltered throughout their existence. Success may bring growth; technology or market forces may cause processes or activities to alter. All projects change and – like living entities – will someday cease to function. The life cycles of some types of projects, such as quarries, are finite and predictable. Such projects often consider their closure and decommissioning in detail from the outset, while for most projects a general indication of the nature of possible future changes may suffice. While the examination of the potential consequences of change (such as extension) does not imply permission for such extension, its identification and consideration can be an important factor in the determination of the application. Descriptions of likely changes may cover:

- *Extension*
- *Decommissioning*
- *Other Changes.”*

As per the EPA guidelines and in the interests of proper planning and sustainable development it is important to consider the potential future growth and longer-term expansion of a proposed development in order to ensure that the geographical area in the vicinity of the proposed development has the assimilative carrying capacity to accommodate future development.

Given the proposed site layout extent and the limitations of physical boundaries, adjoining land uses and land ownership the potential for growth of the proposed development is considered limited and confined primarily to potential minor domestic extensions which will have a negligible impact.

The parameters for the future development of the area in the vicinity of the subject site are governed by the South Dublin County Development Plan 2022-2028. Any adjacent undeveloped lands will be the subject of separate planning applications in the future, where they are identified as being suitable for development, and where the provision of the requisite physical and other infrastructure is available.

1.12.2 Description of Secondary and Off-Site Developments

No significant secondary enabling development is deemed necessary to facilitate the proposed development. The planning application includes details of the necessary road works, which are required to facilitate this development. These works are assessed within this Environmental Impact Assessment Report.

1.12.3 Risks of Major Accidents and/or Disasters

The surrounding context consists of a mix of residential, agricultural, employment, educational and open space public amenity lands. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which would be likely to result in a risk to human health and safety.

Article 3 of the Environmental Impact Assessment (EIA) Directive 2014/52/EU, requires the assessment of expected effects of major accidents and/or disasters within an EIA. Article 3(2) of the Directive states that “*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*”.

1.12.4 Construction Phase Mitigation

With reference to the construction phase of the proposed development, the objective of the *Resource & Waste Management Plan*, included with the application, is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 (as amended) are complied with.

An Environmental Management Plan and Construction Health and Safety Plan will be developed to include all aspects of the project, which will implement the relevant mitigation contained in the EIAR.

During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network on the R113. The vast majority of the works are away from the public road in a controlled environment.

There will be some short-term impacts during the construction phase as the pipes are laid, particularly in respect of traffic management with regards to sensitive receptors. This may cause local short-term inconvenience and disturbance to residents and business in the vicinity of the works. However, the works would normally be undertaken in sections on a phased/rolling programme so that the number of persons experiencing local inconveniences at any one time is kept to a minimum.

Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.

With reference to the operational phase of the development the design of the scheme has had regard to DMURS during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site-Specific Flood Risk Assessment, contained in the engineering report prepared by MPA Consulting Engineers. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding.

1.13 RELATED DEVELOPMENT AND CUMULATIVE IMPACTS

The proposed development also has the potential for cumulative, secondary and indirect impacts particularly with respect to such topics as traffic which in many instances are often difficult to quantify due to complex inter-relationships. All cumulative, secondary and indirect impacts are unlikely to be significant and, where appropriate, have been addressed in the content of this EIAR document.

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other permitted projects in the immediate area. The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the following EIAR chapters has regard to these in the assessment and mitigation measures proposes.

As such, with the necessary mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the proposed development in conjunction with the other planned developments will be minimal.

For the noise impact assessment in Chapter 8 the potential noise emissions arising from the proposed development during construction and operation are combined (using cumulative AADT figures from Traffic chapter) with background noise levels (predominantly road traffic) were assessed.

Each of the relevant specialists has considered the potential for cumulative impact in preparing their assessments, where relevant. While there is the potential for negative impacts to occur during the construction stage of the scheme, with the implementation of the appropriate mitigation outlined in the EIAR, the residual cumulative impact is not considered to be significant.

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented. A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently under construction. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development. Should this scheme be granted it is anticipated that construction phase of the Link Street may overlap with construction of the proposed development. The CSLS application included an EIAR as part of its planning application and has identified similar mitigation measures therefore no significant potential cumulative impacts are not anticipated.

Other projects in the wider Clonburris SDZ comprise:

SDZ21A/0022 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.

SD228/0001 - Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)

SD228/0003 - Part 8 Development 263 no. units within Kishogue South West

SDZ22A/0010 – 294 dwellings, creche and retail unit -Further Information lodged on the 28th of November 2022.

SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements – granted 26th September 2022.

SDZ21A/0006 - Wastewater pumping station granted permission 8th November 2022.

Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)

SDZ22A/0017 Tile 3 application 158 no. dwellings lodged 2nd December 2022.

Cumulative impacts to land and soil, during construction and demolition processes are associated with spillage and leakage of oils and fuels and disturbance of land. Individual impacts from the Proposed Development are generally considered to be negligible to medium impacts to a low to medium sensitivity environment and the significance of the impacts has been assessed as imperceptible to moderate. Mitigation measures proposed to manage and control potential impacts during construction of the Proposed Development will reduce the magnitude and significance of impacts from these developments to a minimum.

1.14 DIRECT AND INDIRECT EFFECTS RESULTING FROM USE OF NATURAL RESOURCES

Details of significant direct and indirect effects arising from the proposed development are outlined in Chapters 3-15 which deal with '*Aspects of the Environment Considered*'. No significant adverse impact is predicted to arise from the use of natural resources.

1.15 DIRECT AND INDIRECT EFFECTS RESULTING FROM EMISSION OF POLLUTANTS, CREATION OF NUISANCES AND ELIMINATION OF WASTE

Details of emissions arising from the development together with any direct and indirect effects resulting from same have been comprehensively assessed and are outlined in the relevant in Chapters 3-15 which deal with ‘*Aspects of the Environment Considered*’. There will be no significant direct or indirect effects arising from these sources.

1.16 FORECASTING METHODS USED FOR ENVIRONMENTAL EFFECTS

The methods employed to forecast, and the evidence used to identify the significant effects on the various aspects of the environment are standard techniques used by each of the particular individual disciplines. The general format followed was to identify the receiving environment, to add to that a projection of the “loading” placed on the various aspects of the environment by the development, to put forward amelioration measures, to lessen or remove an impact and thereby arrive at net predicted impact.

Where specific methodologies are employed for various sections of the EIAR they are referred to in the Receiving Environment (Baseline Scenario) sections in the EIAR. Some of the more detailed/specialised information sources and methodologies for several the environmental assessments are outlined hereunder.

1.17 TRANSBOUNDARY IMPACTS

Large-scale transboundary projects⁵ are defined as projects which are implemented in at least two Member States or having at least two Parties of Origin, and which are likely to cause significant effects on the environment or significant adverse transboundary impact.

Having regard to the nature and extent of the proposed development, which comprises a residential development, located in the SDZ of Clonburris, within the administrative area of South Dublin County Council, transboundary impacts on the environment are not considered relevant, in this regard.

1.18 LINKS BETWEEN EIA AND APPROPRIATE ASSESSMENT/NIS

Article 6(3) of the Habitats Directive (92/43/EEC) provides that any project not directly connected with or necessary to the management of a Natura 2000 site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to an Appropriate Assessment of its implications for the site in view of the site's conservation objectives.

In January 2010 the DoEHLG issued a guidance document entitled ‘*Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*’. This guidance document enshrines the ‘*Source-Pathway-Receptor*’ into the assessment of plans and projects which may have an impact on Natura 2000 sites.

An Appropriate Assessment screening by Altemar was carried out in accordance with ‘*Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance on the Provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC*’ - Brussels, 28.9.2021 C(2021) 6913 final. The AA Screening is included with the SHD application.

In accordance with these Guidelines, the Appropriate Assessment may be a separate document or form part of the EIAR. In the case of the proposed development a separate Appropriate Assessment Screening Report is submitted with this application as a standalone report and referenced in the Biodiversity Chapter.

Article 5(1) of the Directive also states that the EIAR shall include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. The developer shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation, in preparing the environmental impact assessment report.

In this regard a brief account of how the results of other relevant assessments considered in the preparation of this EIAR is included as Appendix A Volume III of the EIAR.

⁵ The definition is based on Articles 2(1) and 4 of the EIA Directive and Article 2(3) and (5) of the Espoo Convention, respectively. <http://ec.europa.eu/environment/eia/pdf/Transboundry%20EIA%20Guide.pdf>

1.19 AVAILABILITY OF EIA DOC

A copy of this EIA document and Non-Technical Summary of the EIA document is available for purchase at the offices of South Dublin County Council (Planning Authority) at a fee not exceeding the reasonable cost of reproducing the document.

1.20 IMPARTIALITY

This EIA document has been prepared with reference to a standardised methodology which is universally accepted and acknowledged. Recognised and experienced environmental specialists have been used throughout the EIA process to ensure the EIA document produced is robust, impartial and objective.

1.21 STATEMENT OF DIFFICULTIES ENCOUNTERED

No particular difficulties, such as technical deficiencies or lack of knowledge, were encountered in compiling any of the specified information contained in this statement, such that that the prediction of impacts has not been possible. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIA.

1.22 EIA QUALITY CONTROL AND REVIEW

John Spain Associates is committed to consistently monitoring the quality of EIA documents prepared both in draft form and before they are finalised, published and submitted to the appropriate competent authority taking into account latest best-practice procedure, legislation and policy. The EPA published draft guidelines on information to be contained in Environmental Impact Assessment Report⁶ and the Department of Housing, Planning, Community and Local Government have published a consultation paper⁷, which have been consulted in the preparation of this EIA. This document includes a detailed EIA Review Checklist which has been used to undertake a review of this EIA document.

1.23 ERRORS

While every effort has been made to ensure that the content of this EIA document is error free and consistent there may be instances in this document where typographical errors and/or minor inconsistencies do occur. These typographical errors and/or minor inconsistencies are unlikely to have any material impact on the overall findings and assessment contained in this EIA.

⁶ *Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2022*

⁷ *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.*

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT AND ALTERNATIVES EXAMINED

2.1 INTRODUCTION AND TERMS OF REFERENCE

This section of the EIAR has been prepared by John Spain Associates, Planning & Development Consultants, and provides a description of the proposed development and also explains the evolution of the scheme design through the reasonable alternatives examined. This chapter of the EIAR was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates who has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has 19 years of experience of Environmental Impact Assessment and urban development.

The description of the proposed development is one of the two foundations upon which an EIAR is based (the other being the description of the existing environment described in this chapter and by each of the specialist consultants in the subsequent chapters). Annex IV sets out the requirements for describing the proposed development as follows:

"1. Description of the project, including in particular:

- (a) a description of the location of the project;*
- (b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;*
- (c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;*
- (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases."*

It is also a requirement of the EIA Directive (as amended) to present "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."

2.2 DESCRIPTION OF THE LOCATION OF THE PROJECT

The subject site of circa 5.18 hectares is located in a Strategic Development Zone (SDZ) in Clonburris, to the west of the M50, Co. Dublin. The SDZ lands consist of approximately 280 hectares within the established suburban context of Lucan, Clondalkin and Liffey Valley.

The subject site is the second phase of a multi-phase development intended to deliver a new community of the western edge of Dublin.

The lands are currently characterised by an agricultural landscape and greenfield site. The townland of Lucan is located to the North West and Clondalkin to the South East. The subject site is surrounded by three smaller communities, namely Deansrath, Ronanstown and Cappaghmore.

The subject site is bounded the Clondalkin/Fonthill Railway Station and railway line to the north, R113 Fonthill Road to the east, a recently permitted Clonburris Southern Link Street (CSLS) under SDZ20A/0021 to the south and a proposed residential development (Planning Ref. SDZ 21A/0022) which consists of the construction of 569 dwellings, a creche, innovation hub and open space in the Clonburris South West Development Area of the Clonburris SDZ Planning Scheme 2019 currently under consideration.

The permitted Clonburris South Link Street which links R113 to R136 will provide access to the subject site, which unlocks a significant land bank for a higher-density development at this phase of the Planning Scheme.

The proposed development is a key building block in realising SDCC's Strategic Development Zone vision for a new vibrant community at Clonburris, West Dublin. It is the intent of the Applicant that the development of Clonburris Urban Centre CUC-S3 will be an exemplar mixed use community, creating an attractive neighbourhood of a sustainable residential density, maximising its adjacency to the Clondalkin/Fonthill Railway Station and local bus routes.

The Urban Centre will provide supporting service and mixed use facilities for the surrounding Community, together with Employment Opportunities. Adhering to the hierarchy of the Urban Centre Strategy in the SDZ, local retail, service retail and catering uses will serve residents of the emerging neighbourhoods.

Figure 2.1 – Site Location



Source: Altu Architects

The subject site is located in the south-western section of the SDZ lands, within development areas CUC-S3 and CSW-S3 as defined within the Clonburris SDZ Planning Scheme.

Figure 2.2 – Planning Scheme Development Areas

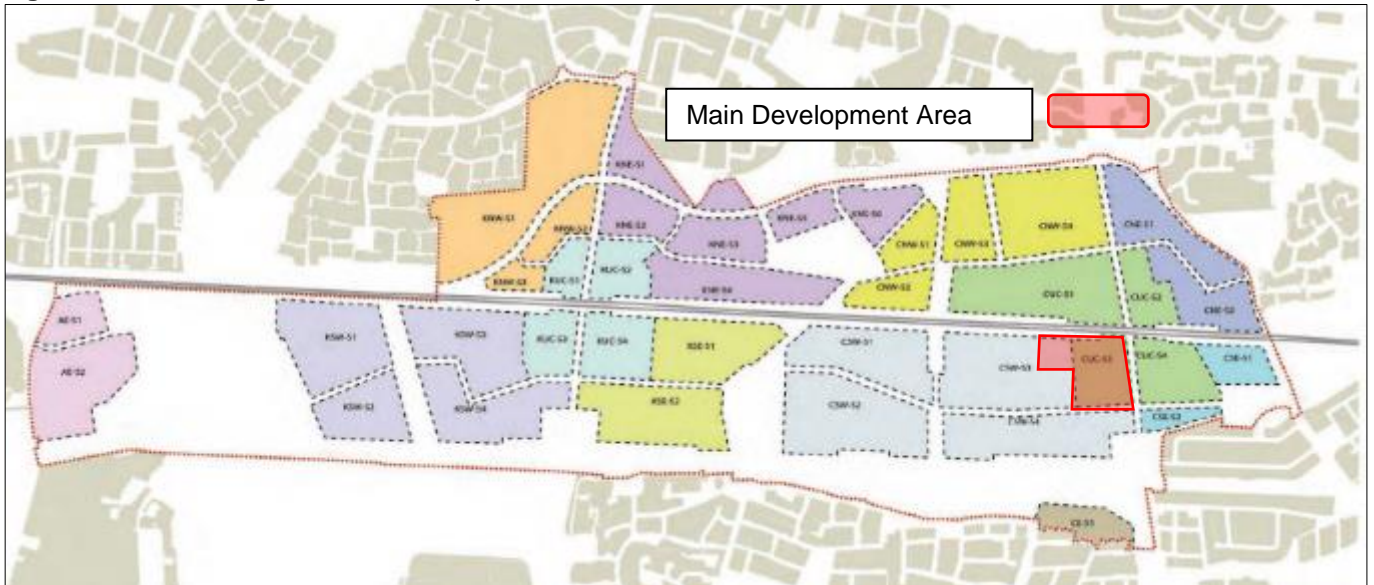
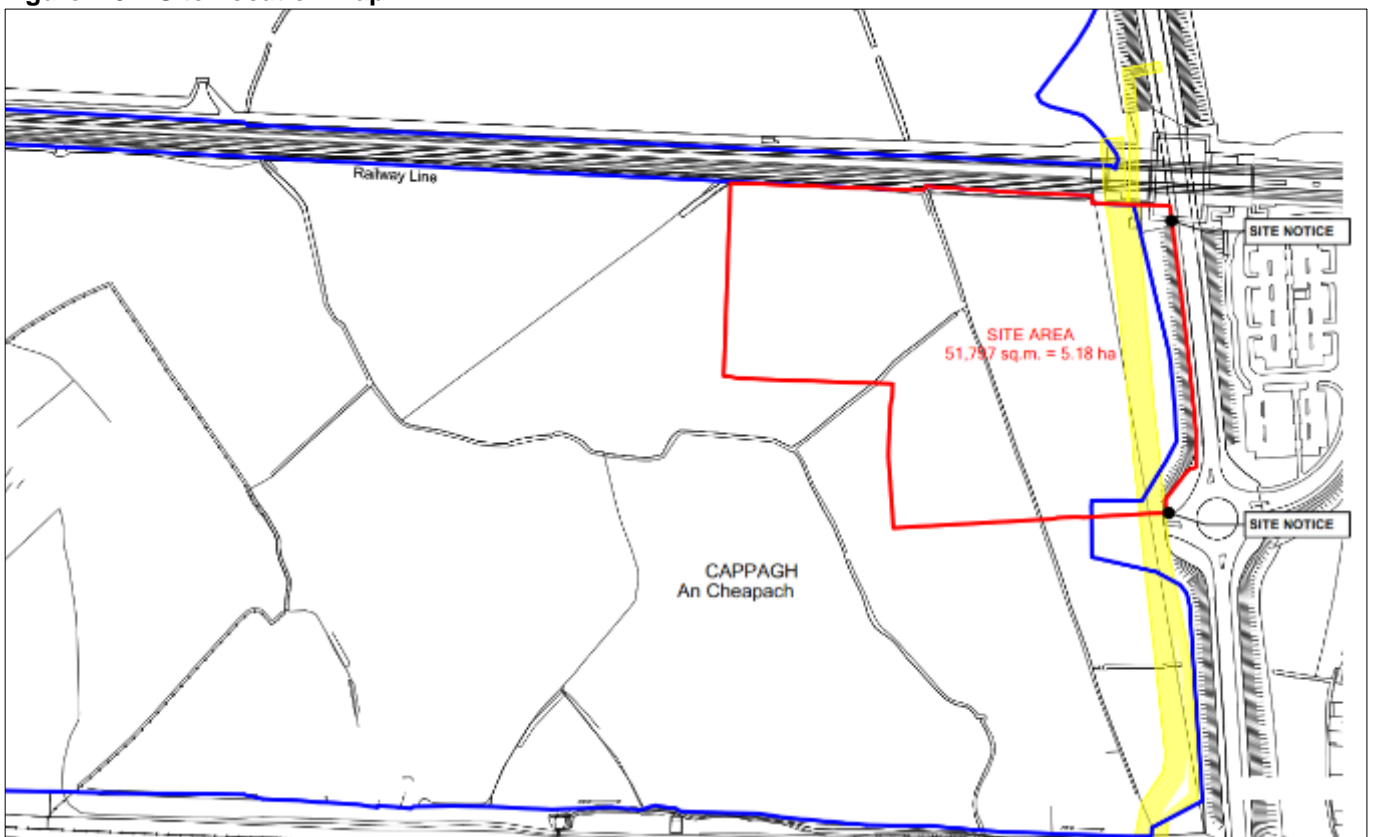


Figure 2.3 – Site Location Map



Source: Altu Architects

Figure 2.4 – Overall Layout



Source: Altu Architects

2.3 DESCRIPTION OF THE PHYSICAL CHARACTERISTICS OF THE WHOLE PROPOSED DEVELOPMENT

2.3.1 Main Characteristics of the Operational phase of the project

The Site Layout Plan (figure 2.4) prepared by ALTU Architects shows the Main Development Area layout in context.

2.3.2 Demolition

There is no demolition of habitable or any other structures relating to the proposed development.

2.3.3 Summary

Table 2.1 – Summary of Key Site/Development Statistics

Site Area	5.18 ha.
No. of Apartments	594
Density	114 units per hectare
Creche	609 sq. m
Commercial Office Floorspace	4,516 sq. m
4 no. retail/retail service units	887.5 sq. m
Public Open Space	1.42 Hectares Urban Space – 0.52 hectares Eastern Linear Park – 0.72 hectares Main Street Axis 0.18 hectares
Communal Open Space	5,047 (3,674 sq. m required Apartment Guidelines 2020)
Internal Communal Resident Facilities (Multipurpose room, gym, meeting room, concierge)	685.6 sq. m
Building Heights	4-7 storeys
Dual Aspect	43%
Car Parking	396
Motorcycle spaces	16
Bicycle Parking	1,232
Total Gross Floor Area (excluding plant, bin, bike stores)	60,097 sq. m

Source: ALTU Schedule of Areas

2.3.3.1 Summary of Apartments

The overall mix across the 2 no. Development Areas is as follows:

Table 2.2 – Overall Dwelling Mix

	1 bedroom	2 bedroom (3 person)	2 bedroom (3 person)	3 bedroom	Overall
Apartments	255	38	36	32	594
Overall Mix	255	38	36	32	594
	42.9%	6.4%	45.3%	5.4%	

Source: ALTU Architects Schedule of Areas

A total of 594 residential units, circa 6,012 sq.m of commercial development, consisting of a creche, office floorspace and retail units have been proposed to meet the requirements of the Planning Scheme.

Table 2.3 – Overall Dwelling Mix – Development Areas CUC-S3 & CWS-S3

	1 bedroom	2 bedroom (3 person)	2 bedroom	3 bedroom	Overall
Apartments (Development Area CUC-S3)	239	34	224	32	529
Apartments (Development Area CSW-S3)	16	4	45		65
	255	38	269	32	594

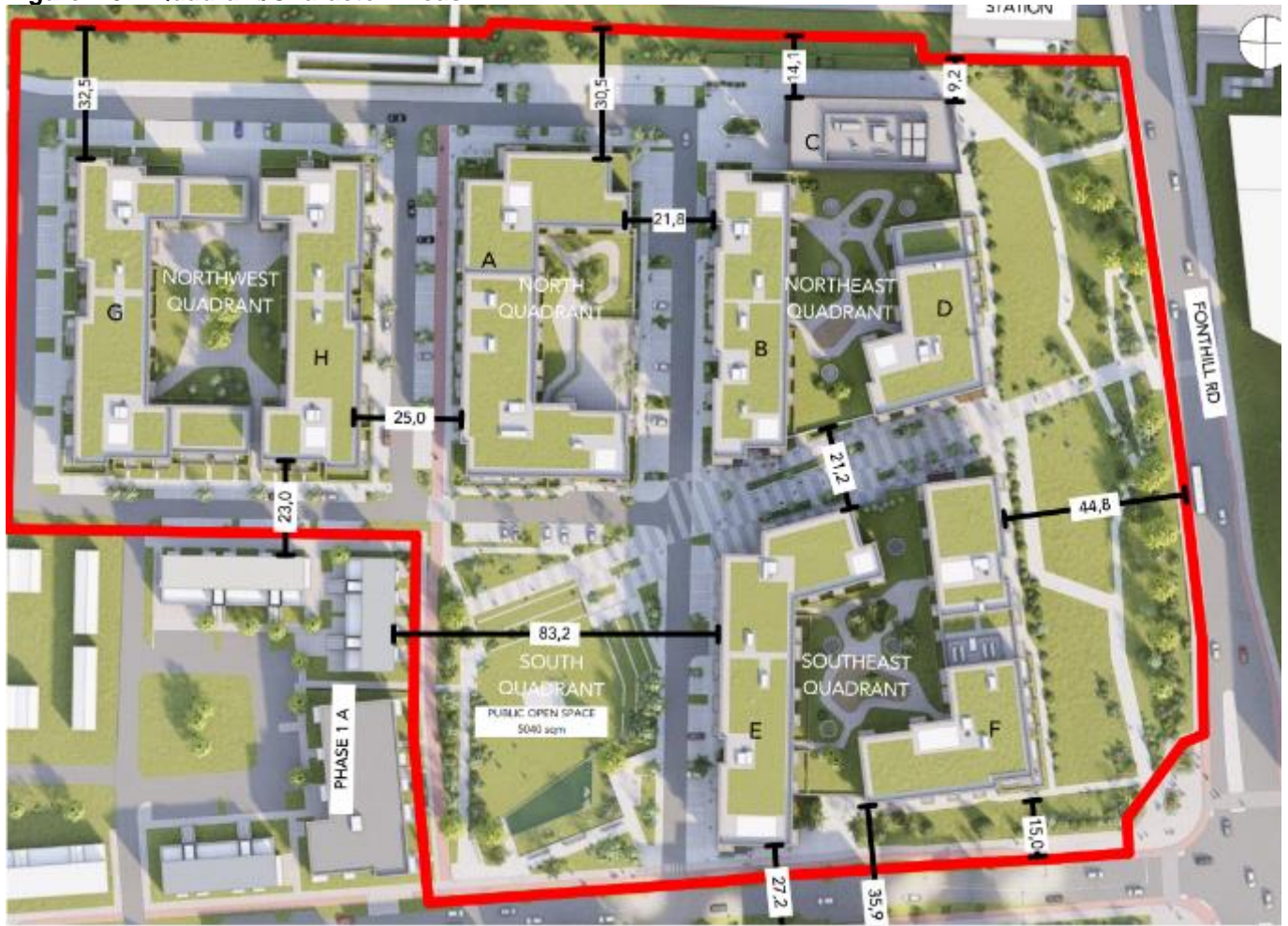
Source: ALTU Architects Schedule of Areas

A wide variety of apartment typologies are included in the proposal, including 1-bed, 2-bed and 3-bed apartments.

To date, across the Clonburris South-West Development Area, some 4.41 hectares of public open space has been permitted under SDCC Reg. Ref. SDZ21A/0022 comprising the local park (c.1.56ha) adjacent to the T3 lands subject of this application, and a portion of the wider Grand Canal Park (c. 2.85ha), totalling 4.41 Hectares, located to the south.

It is also proposed to provide 0.5047 ha. of public open space to include a significant green public urban square and 685.6 sqm of communal open space for residential blocks D and F as part of the residential scheme on the subject lands.

Figure 2.5 – Quadrant/Character Areas



Source: Altu Architects

2.3.4 Character Area 1 - North Quadrant (CUC-S3)

The urban block, comprising a single C shape structure (Block A), enclosing a communal open space at podium level on 3 sides, is located adjacent to development sector CSW-S3 to the west and railway line to the north.

Table 2.4 – North Quadrant (Block A)

	1 bedroom	2 bedroom (3 person)	2 bedroom	3 bedroom	Overall
Block A	36	7	41	12	96

2.3.5 Character Area 2 - Northeast Quadrant (CUC-S3)

This urban block, consisting of 3 distinct structures, again enclosing a communal open space at podium level on all sides. A residential building (Block B) fronting on to Block A, thus enclosing the communal open space in Character Area 1.

Within this character, commercial building (Block C) is appropriately located to the north, adjacent to Clondalkin/Fonthill Road Railway Station to act as a landmark or nodal building. A commercial building has been designed at this location as a landmark building adjacent to the transport hub.

The office floor plate has been designed to the maximum efficiency which also allows for flexibility with subdivision on a floor to floor basis. The main entrance fronts a plaza on the western elevation that includes a vehicle drop of area. A secondary pedestrian entrance is located on the eastern side to facilitate access to the train station.

Building design as opposed to building height is the key determinant in producing an acceptable Landmark Building. Therefore, it should be designed in a manner that is distinctive from surrounding buildings both in terms of architectural treatment and use of materials. The office use is situated in the landmark building adjacent to the railway station in Block C. Architectural diversity and a vibrant mix of finishes, colour and detailing is used to identify the building within the urban centre (CUC-S3).

Figure 2.6 – Block C – Landmark Building



Source: Altu Architects

The window to wall ratio has been carefully considered, especially for the commercial office building. A cement board cladding material has been selected to differentiate the building from the other residential blocks.

Another corner residential building (Block D) in this urban block, providing an edge to Fonthill Road and landscaped pedestrian and cyclist connection over the wayleave from Grand Canal and pedestrian linkage from the urban square.

Table 2.5 – North East Quadrant (Block B and D)

	1 bedroom	2 bedroom (3 person)	2 bedroom	3 bedroom	Overall
Block B	44	9	19	5	77
Block D	39		32		71
	83	9	51	5	148

Figure 2.7 – Internal Street – Block D



Source: Altu Architects

2.3.6 Character Area 3 - South Quadrant (CUC-S3)

Clonburris Square is well prescribed and conceived in the Planning Scheme. A quality landscape public space with a biodiversity pond is at a prominent location, at the heart of all development sectors in Clonburris, connecting to sectors CSW-S3 and CSW-S4, through CUC-S3 to the transport hub.

2.3.7 Character Area 4 - Southeast Quadrant (CUC-S3)

This urban block, comprising 2 L-Shape structures enclosing a communal open space at podium level, is located at the junction of Fonthill Road and the permitted East West Clonburris Southern Link Street (CSLS), linking to R136.

Table 2.6 – South Quadrant (Blocks E and F)

	1 bedroom	2 bedroom (3 person)	2 bedroom	3 bedroom	Overall
Block E	47	9	39	5	100
Block F	57	9	52	6	124
	104	18	91	11	224

The prominent location of this urban block at the south-eastern side of the main entrance to the scheme together with its proximity to Apartment Block 1 in CSW-C4, has prompted a collaborative design response to reflect the 'gateway' nature and appropriate settings at this location.

Figure 2.8 – Block E



Source: Altu Architects

Block E an east-west facing apartment block, addresses the urban square with height and scale, and one end, signify the pedestrian link to the transport hub and another marking the vehicular entrance to the development. The majority of retail uses are located at street level on Block E providing a busy and active frontage onto Clonburris Square.

Block F, mirroring its form from CSW-S4, provides a strong urban edge to the east and south. The existence of the gas wayleave and existing change of levels from the permitted junction at Fonthill Road, prompted a design response to increase in building quality and height to address its gateway nature but not competing with the landmark element to the north of the sector adjacent to the station.

A significant break between both blocks E and F on the southern side allows for maximum daylight and sunlight penetration to the communal open space in the middle of the urban block.

2.3.8 Character Area 5 - Northwest Quadrant (CSW-S3)

This urban block comprising 2 mirrored c-shape residential blocks, enclosing a communal open space at street level. This quadrant is a part of CSW-S3 which adjoins CUC-S3 to the east, railway line to the north and CSW-S4 to the south.

Figure 2.9 – Block G - H



Source: Altu Architects

Table 2.7 – South Quadrant (Blocks G and H)

	1 bedroom	2 bedroom (3 person)	2 bedroom	3 bedroom	Overall
Block G	16	4	41	4	65
Block H	16	0	45	0	61
	32	4	86	4	126

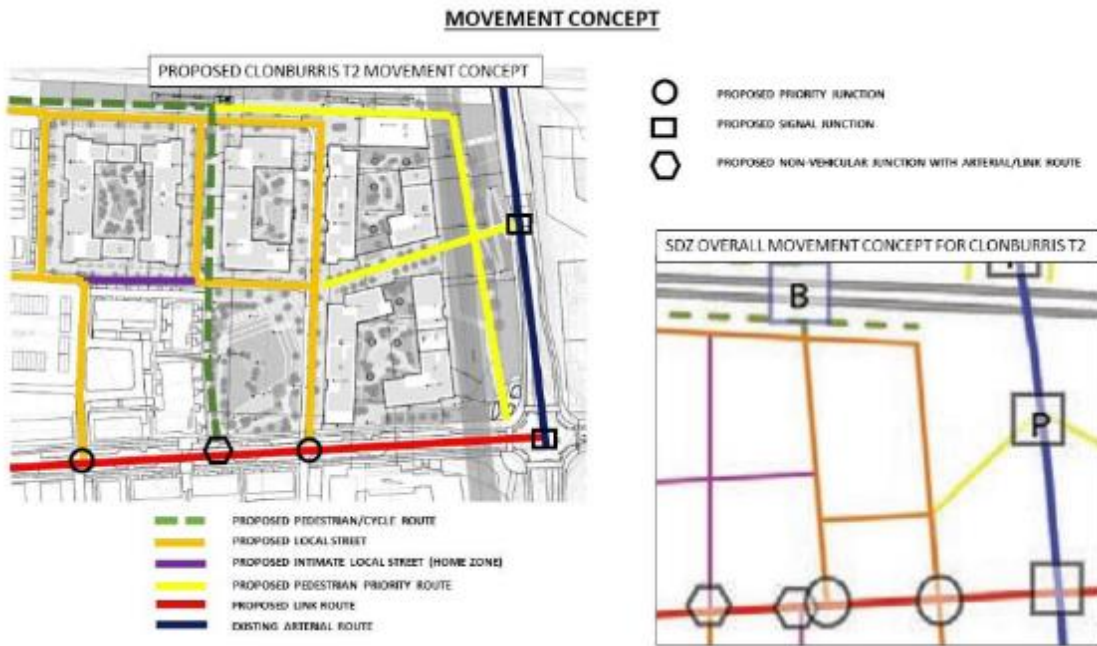
2.3.8.1 Communal Open Space

Communal open space is provided within the Development Area consisting of 1,398 sq. m, comprising 1,698 sq.m for the apartments, and 840 sq. m for the duplex units.

2.4 INTERNAL ROAD LAYOUT & DMURS

The subject site’s internal road layout has been designed with a number of junctions and a meandering alignment through the development to promote traffic calming and discourage “rat running” through the development. The proposed road hierarchy and typologies are generally consistent with those set out in Section 2.2.4 of the Clonburris SDZ.

Figure 2.10 – Street Hierarchy and DMURS



Source: DBFL

The proposed road hierarchy and typologies are generally consistent with those set out in section 2.2.4 of Clonburris SDZ. Generally the proposed Local streets will be 6.0m wide with a 2m wide footpath on either side of the road. The homezone south of Blocks G and H is 4.8m wide, with minimum 2m footpaths on either side of the road. The development’s internal layout has been designed flat top table ramps at strategic locations to calm traffic at junctions. Design speed limits of 30km/hr are applied throughout the development as per Design Manual for Urban Roads and Streets (DMURS).

It is intended that the roads and footpaths of the proposed development are designed to accommodate pedestrian and cycle links to future infrastructure to be constructed as part of the overall Clonburris SDZ. There are number of vehicular and pedestrian/cycle bridges proposed within the SDZ boundary. It is intended that the road, pedestrian and cycle infrastructure of the proposed development will be extended in the future to provide links to these locations.

The proposed development’s road layout will comprise the following;

- Local Streets – typically 6m wide carriageway with 2m to 3m footpaths and intermittent 2.4m wide private parallel and perpendicular parking bays.
- Homezones - typically 5m wide carriageway with 2m to 3m footpaths and intermittent 2.4m wide private parallel parking bays.
- Maximum road corner radii of 4.5m are provided within the local streets, with the exception of certain turning heads which have corner radii 6m to accommodate refuse vehicles.

2.5 ACCESS AND PARKING

The Clonburris Southern Link Street (CSLS) permitted under SDZ20A/0021 is located to the south of the proposed T3 development. North of the CSLS, the subject site is within sub sectors of CUC-S3 and CSW-S3 of the Clonburris South-West Development Area. The CSLS which links the R113 to the R136 will provide access to the subject site directly with a junction at the south of the subject site. The Fonthill Road is located to the east of the proposed development.

The CSLS includes minor priority-controlled junctions along the street alignment to provide access to future development cells within the Clonburris SDZ including the subject site and lands adjacent to the west.

2.5.1 Vehicle Access

The main vehicular accesses to/from the subject development will be provided via the Clonburris Southern Link Street, as shown below. In addition to this access there will be two vehicular access to proposed developments on the western border of the site. All of the vehicle accesses are in the form of priority junctions.

Figure 2.11 – Vehicle Access Locations



2.5.2 Pedestrian and Cyclist Access

The vehicular accesses will also be accessible to both pedestrian and cyclists. There are three additional pedestrian access points on the eastern boundary of the site as shown below. These non-vehicular access points provide filtered permeability, ensuring shorter walking and cycling distances and increasing the attractiveness of these sustainable modes.

Figure 2.12 – Pedestrian and Cyclist Access Locations



2.5.3 Car Parking

Reference has been made to the Transport Assessment & Transport Strategy section of the *Clonburris Strategic Development Zone (SDZ) Draft Planning Scheme*, as published in September 2017.

The subject development site is located within SDCC Zone 2 Parking and therefore the quantum of car parking provision should be minimised. The car parking standards as set out in the South Dublin County Council Development Plan 2022 – 2028 are illustrated in **Table 10.8** below.

Table 2.8 – SDCC County Development Plan 2022 – 2028 Maximum Parking Rates

Land Use		Zone 2
Apartment / Duplex	1-Bed	0.75 Space
	2-Bed	1 Space
	3-Bed	1.25 Space
Retail	Retail Convenience	1 Space per 25sqm
Enterprise and Employment	Offices Manufacturing	1 Space per 75sqm GFA
Education	Creche	0.5 Space per Classroom

In addition, as per the SDCC Parking Standards, 20% of the apartment/duplex car parking provision will be allocated as electric vehicle charging stations while the remainder of the parking spaces should be constructed to be capable of accommodating future charging points, as required. Although Chapter 12 of the Development Plan does not

explicitly raise the requirement for the provision of accessible car parking at private developments, it is suggested that in reference to national guidance, at least 5% of car parking spaces are designated for accessible parking.

Table 2.9 – SDCC County Development Plan 2022 – 2028 Maximum Parking Rates

Land Use		Zone 2
Apartment / Duplex	1-Bed	0.75 Space
	2-Bed	1 Space
	3-Bed	1.25 Space
Retail	Retail Convenience	1 Space per 25sqm
Enterprise and Employment	Offices Manufacturing	1 Space per 75sqm GFA
Education	Creche	0.5 Space per Classroom
Total Maximum Spaces		645

It is proposed that the 594 no. apartments will be provided with 330 no. car parking spaces, (0.56/ unit), 166 no. car parking spaces will be provided undercroft and 101 no. car parking spaces will be provided on the surface. Additionally, 20 no. mobility impaired car parking spaces, 39 no. electric vehicle car parking spaces and 4 no. car sharing car parking spaces will be provided undercroft for the apartments. Additionally, 44 no. car parking spaces are provided for the offices, (32 no. on the surface, 12 no. undercroft including 8 no. electric vehicle car parking spaces), 17 no. car parking spaces are provided for the retail units on the surface and 5 no. car parking spaces are provided for the creche, (2 no. on the surface and 3 no. undercroft). The proposed development will provide 396 no. car parking spaces in total.

Table 2.10 – Car Parking Provision

	Surface	Undercroft	Universal Access	Electrical Vehicle	Car Sharing	Total
Office	32	4		8		44
Apartment	101	166	20	39	4	330
Retail	17					17
Creche	2	3				5
Total	152	173	20	47	4	396

Source: Altu Architects

2.6 LANDSCAPING

The Landscape Design Statement prepared by Murray Associates sets out the Landscaping Strategy for the subject lands.

Figure 2.13 – Landscape Strategy



Source: Murray Associates

There are three main public open spaces identified within the T2 Lands. The Urban Space (0.52ha), a portion of the linear park (0.72ha) to the east, both connected by the Main Street Axis, totaling 1.42ha.

The design intent is to create a high quality and appropriate landscape for future residents, which will meet their recreational needs and provide an attractive visual setting and associated social amenity spaces. The principles of inclusivity for all age groups, universal accessibility and sustainable development are applied to ensure an inclusive and environmentally responsible design solution.

A restrained palette of materials will also be used to integrate the proposed architectural forms and materials within the landscape.

Figure 2.14 – Landscape Masterplan



Source: Murray Associates

2.6.1 Main Street Axis

As set out in the Murray Associates Landscape Planning Report, the main street provides the necessary integration to the whole development, thus becoming its highlight.

Through the use of an organizing, unifying paving scheme, itself derived from the multiple facade orientations present, and the adoption of a traffic calmed solution where the main road intersects it, the street acquires its own character that contributes greatly to the sense of place, creating a strong axis with multiple focal points.

The proposed lighting scheme enhances the main street feeling and plenty of accessible seating is available with the use of raised planter walls, being further complemented in the park area by the amphitheatre. seating.

Figure 2.15 – Main Street Axis



Source Murray Associates

2.6.2 Urban Space

The Urban Space provides a range of robust amenities integrated within the urban centre and becoming its focal point for the SDZ.

A Play Area is positioned to the north-west of the open space. Taking advantage of the level difference, there's amphitheatre-type seating where the design is adapted so that the required volume for the attenuation pond achieved. The space itself acts as a detention basin to cater for the 1:100-year stormwater runoff.

Visible SuDS send a sustainable message to the communities. Permeable pavement is proposed throughout. The grassed area can be reached by ramps to allow for universal access and there's also accessible seating.

Permeable paving is proposed for all pedestrian areas. Green roofs, SuDS tree pits, bioretention swales and planter areas, rain gardens and run off drainage all work together to make full use of the proposed SuDS area - the resulting combined flows are directed to it, where they get collected, going through further attenuation, filtration and infiltration.

Figure 2.16 – Urban Space



Source Murray Associates

2.6.3 Communal Open Space

With reference to Appendix 1 of the Apartment Guidelines 2020, communal open space the proposed development would require a communal open space provision of 3,674 sq. m. The communal open space provided of c. 5,047 sq. m is substantially above the requirements.

Table 2.11 – Communal Open Space Requirement

Communal Open Space	Requirement	No. of Units	Requirement	Provided
Overall Development				
1 bed	5 sq.m.	255	1,275	
2 bed (3 person)	6 sq.m.	38	228	
2 bed	7 sq.m.	269	1,883	
3 bed	9 sq.m.	32	288	
		594	3,674 sq. m	5,047 sq. m
North Quadrant (Block A)				
1 bed	5 sq.m.	36	180	
2 bed (3 person)	6 sq.m.	7	42	
2 bed	7 sq.m.	41	287	
3 bed	9 sq.m.	12	108	
		96	617 sq. m	622 sq. m

Communal Open Space	Requirement	No. of Units	Requirement	Provided
North East Quadrant (Blocks B and D)				
1 bed	5 sq.m.	83	415	
2 bed (3 person)	6 sq.m.	9	54	
2 bed	7 sq.m.	51	357	
3 bed	9 sq.m.	5	45	
		148	871 sq. m	1,415 sq. m
South East Quadrant (Blocks E and F)				
1 bed	5 sq.m.	104	520	
2 bed (3 person)	6 sq.m.	18	108	
2 bed	7 sq.m.	91	637	
3 bed	9 sq.m.	11	99	
		224	1,364 sq. m	1,646 sq. m
South West Quadrant (Blocks G and H)				
1 bed	5 sq.m.	32	160	
2 bed (3 person)	6 sq.m.	4	24	
2 bed	7 sq.m.	86	602	
3 bed	9 sq.m.	4	36	
		126	822 sq. m	1,324 sq. m

Figure 2.17 – Communal Open Space Areas Blocks GH, and A



Secure communal amenity spaces are proposed to the courtyards of the apartment blocks. Access is provided from each adjacent block, with podium edge glass balustrades that provide visual permeability to the public realm.

Within these spaces there are areas for toddlers and some exercise equipment included within the play spaces.

Planting is divided on two levels: a lower one, next to the building, and a higher one, contained within raised planter walls to allow for more robust choices and small trees.

Central hard landscaped areas with age-friendly seating give residents an area to gather and relax while providing passive observation of the play areas.

Figure 2.18 – Communal Open Space Areas Blocks B,D, and E, F



2.6.4 Planting Strategy

Planting proposals form a vital part of the strategy for the site, in accordance with County Development Plan objectives and national policy on biodiversity. Green Infrastructure is a term that is used to describe the interconnected networks of land and water that sustain environmental quality and enhance the quality of our lives. The European Union’s Biodiversity Strategy recognises the application of Green Infrastructure policies as a way to maintain bio- diversity and ecosystems in the wider landscape. Green Infrastructure networks operate on many scales, from the national to local, and the protection and enhance- ment of these networks has the ability to positively affect communities into the future, especially in terms of climate change, sustainable development and spatial planning.

In the wider landscape, there are areas of landscape, woodland and habitat. The proposals for the site will create linkages and steppingstones for some species, notably bats, birds and insects, including pollinators and the planting proposals are intended to benefit these species.

2.7 SERVICES

The proposed site will benefit from trunk infrastructure proposed as part of the Clonburris Infrastructure Development for which planning has been granted in August 2021 under planning reference SDZ20A/0021. The CSLS includes trunk road, drainage, watermain and utility infrastructure to serve the Clonburris Strategic Development Zone lands to the south of the Kildare/Cork Railway Line which includes the subject site.

2.7.1 Surface Water Drainage and Attenuation

The Clonburris SDZ Planning Scheme included a pre-construction requirement to prepare a Surface Water Management Plan (SWMP) to implement the SDZ Surface Water Strategy for the overall SDZ lands. DBFL prepared this SWMP to provide robust, effective and economic measures for the management of surface water quality and quantity in the SDZ. This plan has been agreed with South Dublin County Council's Drainage Department.

The proposed surface water drainage strategy for this planning application has been developed in accordance with the agreed measures in this SWMP.

The key objectives of the drainage strategy are as follows:

- Provide adequate infrastructure to discharge surface water generated on site to the trunk surface water sewer constructed as part of the greater SDZ.
- Minimise the risk of flooding of the development and avoid a flood risk increase upstream or downstream of the site.
- Provide an allowance for the effects of climate change.
- Implement a treatment train of Sustainable Drainage Systems (SuDS) measures within the drainage network to improve water quality prior to discharge to receiving watercourses.
- Establish the key infrastructural requirements required to implement the surface water management measures set out by the SWMP.

The Surface Water Management Plan intends for the proposed development to discharge east under the R113 via a new drainage network within a new gravity sewer to be constructed as part of the Clonburris Southern Link Street (CSLS), subject to a current planning application SDZ20A/0021. Trunk surface water sewers and regional attenuation are to be constructed as part of the CSLS to serve all lands in the southern portion of the SDZ including the proposed development.

2.7.2 Foul Sewer

A Water and Wastewater Design Report has been prepared by DBFL for the overall Clonburris SDZ. As part of the CSLS application, a trunk foul sewer is to be constructed within the CSLS. It is proposed that the wastewater generated from the new houses and apartments for this application will be collected by new gravity sewers that discharges to the trunk sewer within the new Link Road. Foul water from Blocks G and H will drain west through the Clonburris Phase T3 and then discharge into the CSLS trunk sewer. This in turn discharges to a future Irish Water pumping station adjacent to the R113 Fonthill Road. This future pumping station and its rising main connection to the existing 9B trunk sewer on Fonthill Road is being delivered by Irish Water as part of the Irish Water Clonburris Local Infrastructure Housing Activation Fund (LIHAF) Scheme. The pump station is currently at planning application stage with SDCC under planning reference SDZ21A/0006.

2.7.3 Water Supply

The Water and Wastewater Design Report prepared by DBFL sets out a strategy for the water infrastructure to be constructed as part of the Joint Infrastructure Works (JIW) for the overall Clonburris SDZ. 200mm, 300mm and 400mm internal diameter trunk watermains are proposed to supply the site in order to satisfy the water requirement of the SDZ lands. DBFL have further developed the water supply strategy within the SDZ planning scheme through consultation with Irish Water and the preparation of preliminary watermain layouts. A number of trunk watermains are proposed along the main Arterial and Link Streets as shown in Figure 12.8. Water supply to the new houses and apartments in this application will be provided via new mains located with the footpaths of the proposed development which will feed from the new 400mm trunk main to be installed within the new Clonburris Southern Link Street to be constructed as part of the overall Clonburris SDZ.

2.7.4 ESB Networks

The existing underground services on the site will be diverted as required. A new Medium Voltage below ground network will be provided in the proposed development which will connect to the existing ESB Networks infrastructure in the area. Up to 5 new sub-stations will be provided throughout the site to meet the electrical demands associated with the development.

The location of the incoming connections will be agreed with ESB Networks and ESB Network MV planners during the design stage of the project.

2.8 CONSTRUCTION MANAGEMENT STRATEGY

2.8.1 Introduction

It is envisaged that the development of the lands will occur for up to approximately 3-4 years having regard to the nature of the project and the need for flexibility to respond to market demand. A Preliminary Construction Management Plan has been prepared by DBFL and is included with the application. The CMP will be developed and agreed between the contractor and South Dublin County Council prior to commencement of development. The contractor shall also incorporate all mitigation measures outlined in the EIA.

In the event that the phases were not developed (due to unforeseen circumstances) the construction period may extend, having regard to the nature of the project and the need for flexibility, contractor pricing etc. It is important to note that the mitigation measures outlined in the EIA will ensure that an extension to the construction period will not have a negative impact on the receiving environment.

This EIA presents proposed mitigation measures to ensure that the planned development of the lands does not generate significant adverse impacts for residential and working communities in the vicinity of the site.

Construction of the development involves the following principal elements:

- Site strip. Earthworks associated with the construction of the houses and roads in the development.
- Construction of new buildings - houses, duplex units & creche.
- Construction of roads, footpaths & hard/soft landscaping.
- Buried site services installation. Connection to public services.

2.8.2 Construction Coordination

The proposed development is likely to be constructed in parallel with the CSLS works and the adjacent Clonburris T3 development west of the subject site. Construction of the permitted T1A to the west and south-west of the subject site will likely overlap with construction of the subject site though only for a limited period of time during the fourth quarter 2023. Therefore, interactions will be required between the developments throughout the works. The adjacent Clonburris phases T1A and T3 have the same applicant, Cairn Homes Properties Ltd, as the subject site.

In order to manage interactions between the sites a Project Liaison Group will be established. This group will have regular meetings to ensure a co-ordinated approach to design interfaces, works programmes and environmental management activities for all sites.

As part of the southern SDZ planning scheme, the infrastructure and services of the proposed development are to connect into those provided by the CSLS works at certain locations. Coordination is required between the developments to ensure a programme detailing an accurate sequence of works for each infrastructure and services element of the CSLS is established. The following elements need to be co-ordinated prior to commencement of the works:

- Works programmes. Activities which may impact the adjoining site will be co-ordinated. For example where road construction works or service installation affect access along the CSLS to the residential development, the works shall be phased so that alternative access routes are maintained via haul routes or second site access. Likewise key residential development phases such as bulk material import/export shall be co-ordinated with CSLS so that arrangements can be made to maintain this traffic through the CSLS site.

- **Site Levels-** Permanent access to the proposed development is to be via the Clonburris Southern Link Street. All road, footpath and floor levels are to be finalised and co-ordinated with the CSLS levels prior to construction of the internal roads network.
- **Attenuation/Surface Water Drainage –** Stormwater run-off generated on the proposed site is to be collected, attenuated and discharged to the CSLS surface water network at a controlled rate as required by the SDZ for urban core developments. After the surface water from the proposed site is discharged into the CSLS surface water network, it would be stored and controlled via the attenuation structures provided as part of the separately approved CSLS. The surface water network constructed as part of the CSLS needs to be complete prior to final connection from the proposed development. All drainage works for the proposed development to be carried out in accordance with the Clonburris “Surface Water Management Plan”.
- **Foul Sewer –** The foul sewers constructed as part the CSLS to be completed prior to final connection from the proposed development. The adjacent permitted Clonburris T1A and proposed T3 development’s foul water network is to be completed before final connection of the subject site to the site’s outfall point as the sites foul will be partially received by the Clonburris T1A development and convey foul water to the CSL bulk foul sewer. All connections and discharge points to be approved by Irish Water.
- **Water Supply –** The subject site’s water will be supplied by the CSLS bulk water pipeline. All connections and discharge points to be approved by Irish Water.

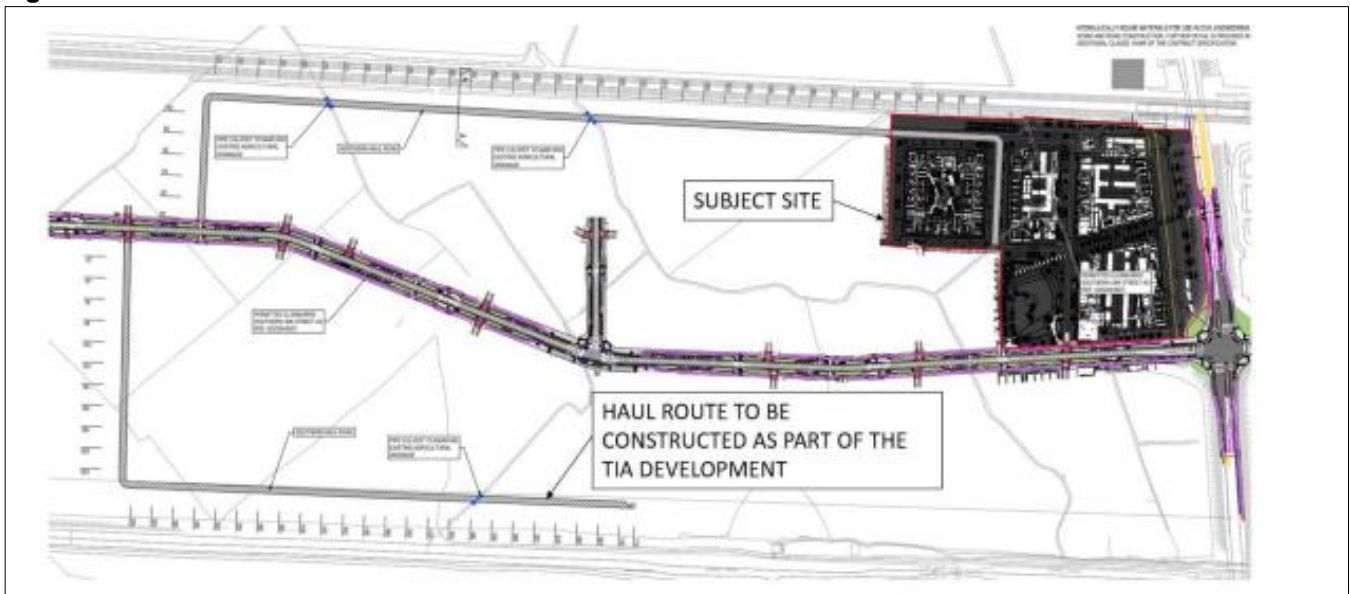
2.8.3 Demolition

There are no demolition works required on the subject lands.

2.8.4 Site Access

The primary site access is to be from the R113 where an existing stubbed access has been formed from the Roundabout. This location coincides with the intended location for the junction of the CSLS with the R113. It is noted the haul routes are already permitted under Tile 1 permission (SDZ21A/0022)

Figure 2.19 – Site Access



There may be certain times when access from this location is constrained due to works as part of the CSLS, for example during works to modify the existing roundabout to a signalised junction. Therefore, alternative routes to access the site are provided via haul routes from the west. The haul routes initially follow the route of the permitted CSLS from the R136 before diverging to provide a route to both the northern and southern development parcels. The routes are generally designed to follow the future road network identified in the SDZ to minimise environmental impacts.

2.8.5 Site Compound Facilities and Parking

The exact location of the construction compound is to be confirmed in advance of commencement of the works. The location of the construction compound may be relocated during the course of the works.

- The construction compound will include adequate welfare facilities such as washrooms, drying rooms, canteen and first aid room as well as foul drainage and potable water supply.
- The proposed construction compound is to be located in area with easy access to the CSLS and the two proposed haul routes. Indicative location shown above.
- Contractor is to liaise with the CSLS construction team to ensure access to and from the compound has minimal impact on the CSLS construction.
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials
- The construction compound will be enclosed by a security fence
- Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure
- A permeable hardstand area will be provided for staff carparking
- A separate permeable hardstand area will be provided for construction machinery and plant
- The construction compound will include a designated construction material recycling area
- A series of way finding signage will be provided to direct staff, visitors and deliveries as required
- All construction materials, debris, temporary hardstands etc. in the vicinity of the site compound will be removed off-site on completion of the works
- Site security will be provided by way of a monitored infrastructure systems such as site lighting and CCTV cameras, when deemed necessary.

2.8.6 Working Hours

For the duration of the proposed infrastructure works, the maximum working hours shall be 07:00 to 19:00 Monday to Friday (excluding bank holidays) and 09:00 to 13:00 Saturdays, subject to the restrictions imposed by the local authority. No working will be allowed on Sundays and Public Holidays. Subject to the agreement of the local authority, out of hours working may be required for water main connections, foul drainage connections etc.

2.8.7 Traffic and Transportation

A construction stage Traffic Management Plan (TMP) will be prepared for the works by the main contractor. The principal objective of the TMP is to ensure that the impacts of all building activities generated during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders thereby ensuring that both the public's and construction workers safety is maintained at all time, disruptions minimised and undertaken within a controlled hazard free / minimised environment.

The TMP shall be prepared in accordance with the principles outlined above and shall comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS)

In general, the impact of the construction period will be temporary in nature and less significant than the operational stage of the proposed development (HGV vehicle movements not expected to exceed 5 vehicles per hour during the busiest period of construction works). Construction Traffic will consist of the following categories:

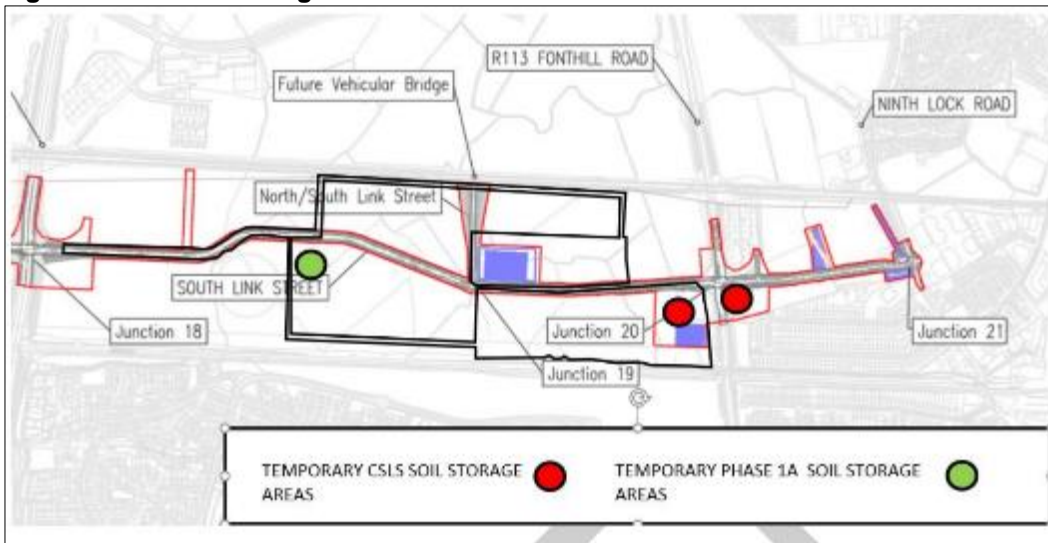
- Private vehicles owned and driven by site staff and management
- Construction vehicles e.g. excavation plant, dump trucks

- Materials delivery vehicles involved in site development works (including trucks for delivery of imported fill to site. On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 16:00, unless otherwise required.
- Excavated material will be reused as part of the site development works (e.g. use as non-structural fill under green areas) in order to minimise truck movements to and from the site

2.8.8 Soil Stripping/Storage

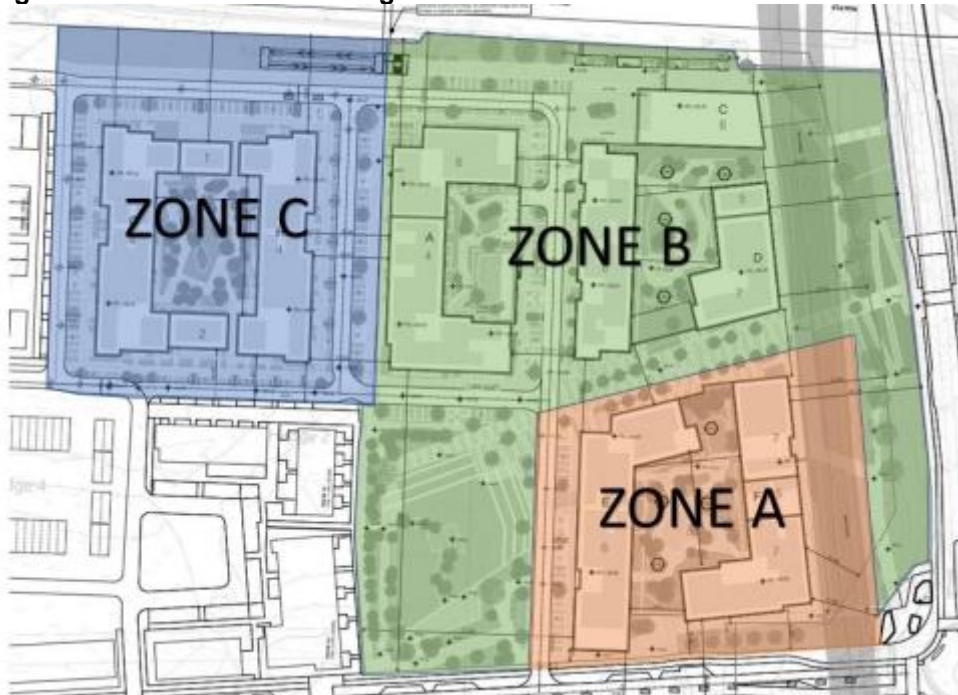
Site development works will include stripping of topsoil, excavation of subsoil layers and importation of fill. These activities have potential to expose the soils and geological environment to pollution. The Contractor shall obtain approval of their proposed erosion and sediment control measures from South Dublin City County Council’s Environment Section prior to commencing works on site.

Figure 2.20 – Soil Storage



2.8.9 Construction Phasing

The project is currently at planning stage and subject to approval. It is estimated that the works would be tendered in the third quarter of 2023 with commencement expected in the fourth quarter of 2023. The development would have an estimated site program of 36-48 months, depending on phasing. The preliminary phasing plan is indicated.

Figure 2.21 – Indicative Phasing

However, the project may be constructed over in a number of phases for commercial reasons. The exact number of phases and the make-up of each will be subject to market conditions and commercial considerations at the time.

2.9 ENERGY STATEMENT

The OCSC Energy Statement enclosed with the application sets out to demonstrate a number of methodologies in Energy Efficiency, Conservation and Renewable Technologies that will be employed in part or in combination with each other for this development. These techniques will be employed to achieve compliance with the building regulations Part L and NZEB standards.

2.9.1 Environment / Global Issues

Increasing levels of greenhouse gases have been linked with changes in climate and predicted global warming. By far the biggest human contribution to the greenhouse gases is in emissions of carbon dioxide. The development is likely to increase carbon dioxide levels in the atmosphere by the embodied emissions in the building materials used, and in the operational energy consumed during the life of each building.

To minimise the embodied emissions impact, materials will be sourced locally where possible (reducing carbon dioxide emissions associated with transportation), and preference will be given to reusing materials, and using materials in their natural state (reducing the emissions associated with processing). Chapter 7 of the EIAR sets out the potential impacts and mitigation in respect of Air Quality and Climate.

2.10 EMISSIONS AND WASTE

2.10.1 Effluents

Effluent arising from foul drainage from the proposed development will be discharged through piped systems to the local authority sewers. Operation of the development will involve the discharge of uncontaminated surface water from the impermeable areas to a proposed network all linking into the established public system in the environs. Details of the impacts and mitigation measures for surface water and foul drainage are recorded at Chapter 6 of this Environmental Impact Assessment Report. Mitigation measures include measures designed to avoid, reduce, remedy or offset impacts.

2.10.2 Construction Waste Disposal Management

Chapter 11 of the EIAR (Material Assets – Waste Management) and the Construction and Demolition Waste and By-Product Management Plan, prepared by Byrne Environmental (included with the application), provides detail on the construction related waste management for the proposal.

The Objective of the Waste Management Plan is to minimise the quantity of waste generated by construction activities, to maximise the use of materials in an efficient manner and to maximise the segregation of construction waste materials on-site to produce uncontaminated waste streams for off-site recycling.

The Waste Management Plan shall be implemented throughout the construction phase of the development to ensure the following:

- That all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials.
- To ensure that all waste materials are segregated into different waste fractions and stored on-site in a managed and dedicated waste storage area.
- To ensure that all waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated Waste Management Regulations.

2.10.3 Contaminated Soil

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the 2002 Landfill Directive (2003/33/EC) for contamination, and pending the results of laboratory WAC testing, will be excavated and exported off-site by an appropriately Permitted Waste Contractor holding an appropriate Waste Collection permit and that this hazardous material will be sent for appropriate treatment / disposal to an appropriately Permitted / Licensed Waste Facility.

2.10.4 Domestic Municipal Waste/Waste Management

Chapter 11 of the EIAR (Material Assets – Waste Management) and the Operational Waste Management Plan, prepared by Byrne Environmental, provides detail on the domestic waste management for the proposal.

The Objective of the Waste Management Plan is to maximise the quantity of waste recycled by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information to the residents of the development. The Operational Phase of the Waste Management Plan has been prepared with regard to The Eastern-Midlands Region Waste Management Plan 2015-2021 as referenced in the South Dublin County Council Development Plan 2022-2028.

Key Aspects to achieve Waste Targets include

- All residential units shall be provided with information on the segregation of waste at source and how to reduce the generation of waste by the Facilities Management Company.
- All waste handling and storage activities shall occur in the dedicated communal apartment waste storage areas or within the curtilage of individual houses.
- The development's Facility Management Company shall appoint a dedicated Waste Services Manager to ensure that waste is correctly and efficiently managed throughout the development.

All accommodation units shall be provided with a Waste Management Information document, prepared by the Facilities Management Company, which shall clearly state the methods of source waste segregation, storage, and recycling initiatives that shall apply to the Management of the development. This Information document shall be issued to all residential units on an annual basis.

2.10.4.1 Apartment Units

The design of the residential apartments shall provide sufficient internal kitchen space for the storage of up to 10kg of general domestic waste, green recyclable waste and organic waste. A 3-compartment bin system shall be integrated into the kitchen design or be included as free-standing system to have a capacity of up to 30 litres. Each

unit shall include waste storage bins which will be of such a size that will allow their easy manual handling to be brought to the communal waste storage areas.

2.10.5 Emissions

The principal forms of air emissions relate to discharges from motor vehicles and heating appliances. With regard to heating appliances, the emission of nitrogen oxides and carbon monoxide will be minimised by the use of modern, efficient heating appliances and as a result, the potential impact is estimated to be negligible. Exhaust gases from motor vehicles will arise from car parking areas and will be discharged directly to the atmosphere. Car parking for motor vehicles is provided at surface level. Chapter 7 of the EIAR sets out the potential impacts and mitigation in respect of Air Quality and Climate.

Noise may be considered in two separate stages, during construction, and when the development is operational. Construction related noise impacts are an inevitable short term limited inconvenience feature which, in general, is accepted by members of the public, subject to the standard controls typical of planning conditions attached to urban based development projects. These impacts can be reduced in a number of ways. It is standard practice to limit construction to normal working hours during the day. In addition, there are a number of regulations relating to noise during construction which the contractor will be expected to adhere to throughout the construction phase. Chapter 8 of the EIAR sets out the potential impacts and mitigation in respect of Noise and Vibration.

2.11 ALTERNATIVES CONSIDERED

As the site is located in a SDZ and subject to an adopted Planning Scheme, this means that alternatives were considered in the adoption of the Planning Scheme.

The EIA Directive (2014/52/EU) requires that Environmental Impact Assessment Reports include:

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

Article 94 and Schedule 6, paragraph 1(d) of the Planning and Development Regulations 2001, as amended, requires the following information to be furnished in relation to alternatives:

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

The presentation and consideration of various alternatives investigated by the project design team is an important requirement of the EIA process. This section of the EIAR document provides an outline of the main alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison the environmental effects. Reasonable alternatives may relate to project design, technology, location, size and scale which were studied in the preparation of the EIAR pertinent to the proposed development and its particular characteristics, together with the main reasons for selecting the chosen option, including a comparison of the environmental effects. Alternatives may be described at three levels:

- Alternative Locations.
- Alternative Designs.
- Alternative Processes

The DHPLG 2018 EIA Guidelines state:

“Reasonable alternatives may relate to matters such as project design, technology, location, size and scale. The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. **A ‘mini- EIA’ is not required for each alternative studied.**” (Emphasis added).

This approach above is reflected in section 3.4.1 of the EPA EIAR Guidelines 2022 which state:

“The alternatives should be described with ‘an indication of the main reasons for selecting the chosen option’. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or ‘mini-EIA’) of each alternative is not required.”⁸

Pursuant to Section 3.4.1 of the EPA EIAR Guidelines 2022, the consideration of alternatives also needs to be cognisant of the fact that *“Clearly, in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant ‘alternative location’ ...”*

The EPA EIAR Guidelines 2022 are also instructive in stating:

“Analysis of high-level or sectoral strategic alternatives should not be expected within a project level EIAR... It should be borne in mind that the amended Directive refers to ‘reasonable alternatives... which are relevant to the proposed project and its specific characteristics.’”

⁸ Ref CJEU Case 461/17

The consideration of the main alternatives in respect of the development of the subject lands was undertaken by the Design Team and has occurred throughout an extensive and coordinated decision-making process, over a considerable period of time. The main alternatives considered are identified below.

2.11.1 Alternative Locations

The South Dublin County Council County Development Plan 2022-2028 zoning map notes the subject site as being within the Clonburris SDZ. As such the Clonburris SDZ Planning Scheme applies to this site. Given the project comprises the development of a site within the Clonburris SDZ and Planning Scheme area, the consideration of alternative locations is not relevant in this instance.

The Clonburris SDZ Planning Scheme was prepared by SDCC to provide a framework for the future development of the subject lands. The Planning Scheme itself was subject to the Strategic Environmental Assessment (SEA) process.

2.11.2 “Do-Nothing” Alternative

A “do-nothing” scenario was considered to represent an inappropriate unsustainable and inefficient use of these serviced residential zoned lands within the SDZ.

SI No. 604 of 2015 states that the SDZ at Clonburris:

“is designated as a site for the establishment of a strategic development zone in accordance with the provisions of Part IX of the Act for residential development and the provision of schools and other educational facilities, commercial activities, including employment office, hotel, leisure and retail facilities, rail infrastructure, emergency services and the provision of community facilities.”

The EIAR Guidelines 2022 also note that:

“Higher level alternatives may already have been addressed during the strategic environmental assessment of relevant strategies or plans. Assessment at that level is likely to have taken account of environmental considerations associated, for example, with the cumulative impact of an area zoned for industry on a sensitive landscape.”

Article 5 of SI no 604 confirms the rationale for the designation of the lands as a SDZ for significant residential development noting:

“The site referred to in Article 4 has been designated for the establishment of a strategic development zone for the development specified in that Article, taking into consideration the deficiency in the supply of housing nationally and in the Greater Dublin Area particularly, the number and phasing of the housing units which would be delivered by the inclusion of the lands within a strategic development zone, the potential for comprehensive planning and development of the site due to its scale and configuration, the efficient use of public investment in infrastructural facilities, including public transport, water, waste water and roads and that development of the site will help give effect to the policies in the Regional Planning Guidelines for the Greater Dublin Area 2004-2016.”

On the strategic or ‘higher’ matters of already determined policy, we refer to the SDZ designation of the lands and the supporting Planning Scheme of Clonburris 2019, which support the development of the lands.

In this regard, it is worth highlighting that by virtue of the development in question being located in the Clonburris SDZ and where the acceptability of any development is determined by compliance with the Clonburris Planning Scheme, the extent of any alternatives that in fact open to be considered have been reduced as compared to a development located outside of an SDZ.

A do-nothing approach would be contrary to the Council’s objectives to promote the development of the SDZ, in accordance with the adopted Planning Scheme and an opportunity to achieve efficient and compact development which will benefit from existing and improved public transport (Dart+ programme) would be lost. A do nothing approach is considered to be inappropriate and an unsustainable use of zoned land in close proximity to public transport.

2.11.3 Alternative Uses

The proposed development is located in the Clonburris SDZ and subject of a Planning Scheme. The proposed residential development with creche, innovation hub and open space is consistent with the zoning and related uses of the Clonburris Planning Scheme 2019. The location of new residential development at this site has therefore been pre-empted in the adopted Planning Scheme which itself was subject to Strategic Environment Assessment (SEA) and the consideration of alternatives for this site and area.

2.11.4 Description of Alternative Processes

This is not considered relevant to this EIA having regard to the nature of the proposed (residential) development. It is noted the proposed construction works comprise relatively standard building construction processes. As such there are no specific alternative construction processes identified. With reference to the operational phase, no new, unusual or technically challenging operational techniques are required, as such no alternative operational processes have been considered.

2.11.5 Alternative Designs and Layouts

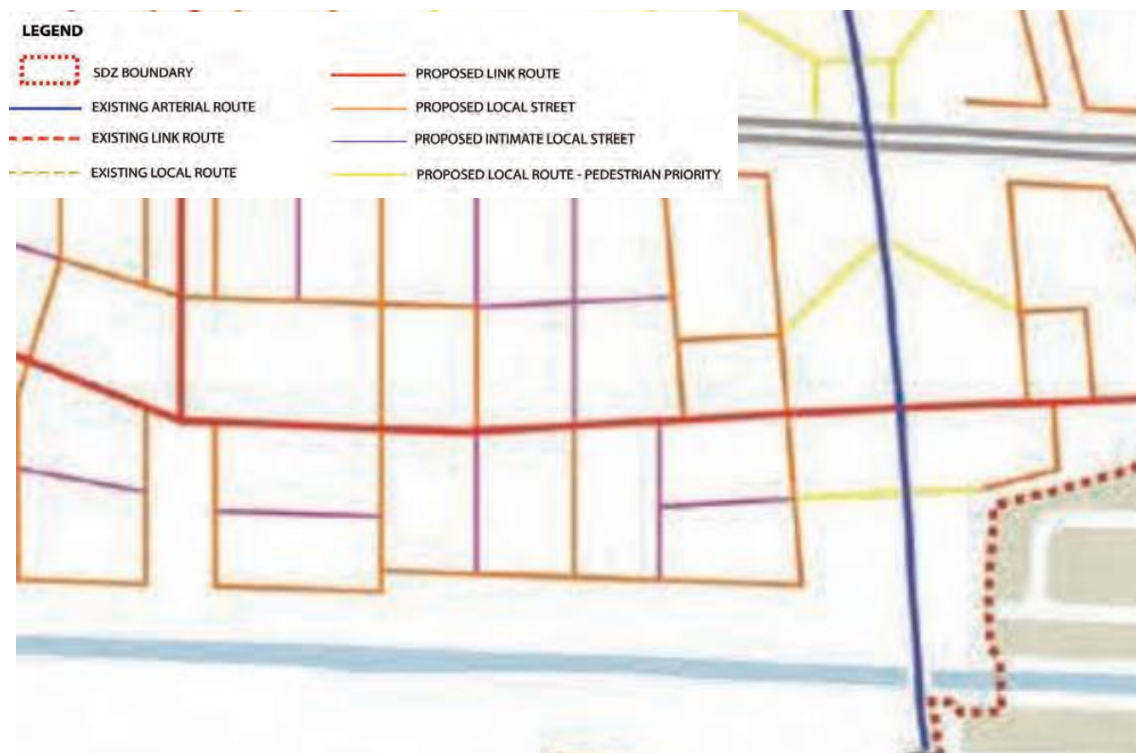
The project architects undertook an extensive appraisal to determine the appropriate scale, massing and layout of the proposed development. We refer the Planning Authority to the Architectural Design Statement prepared by ALTU Architects.

The analysis includes an assessment of:

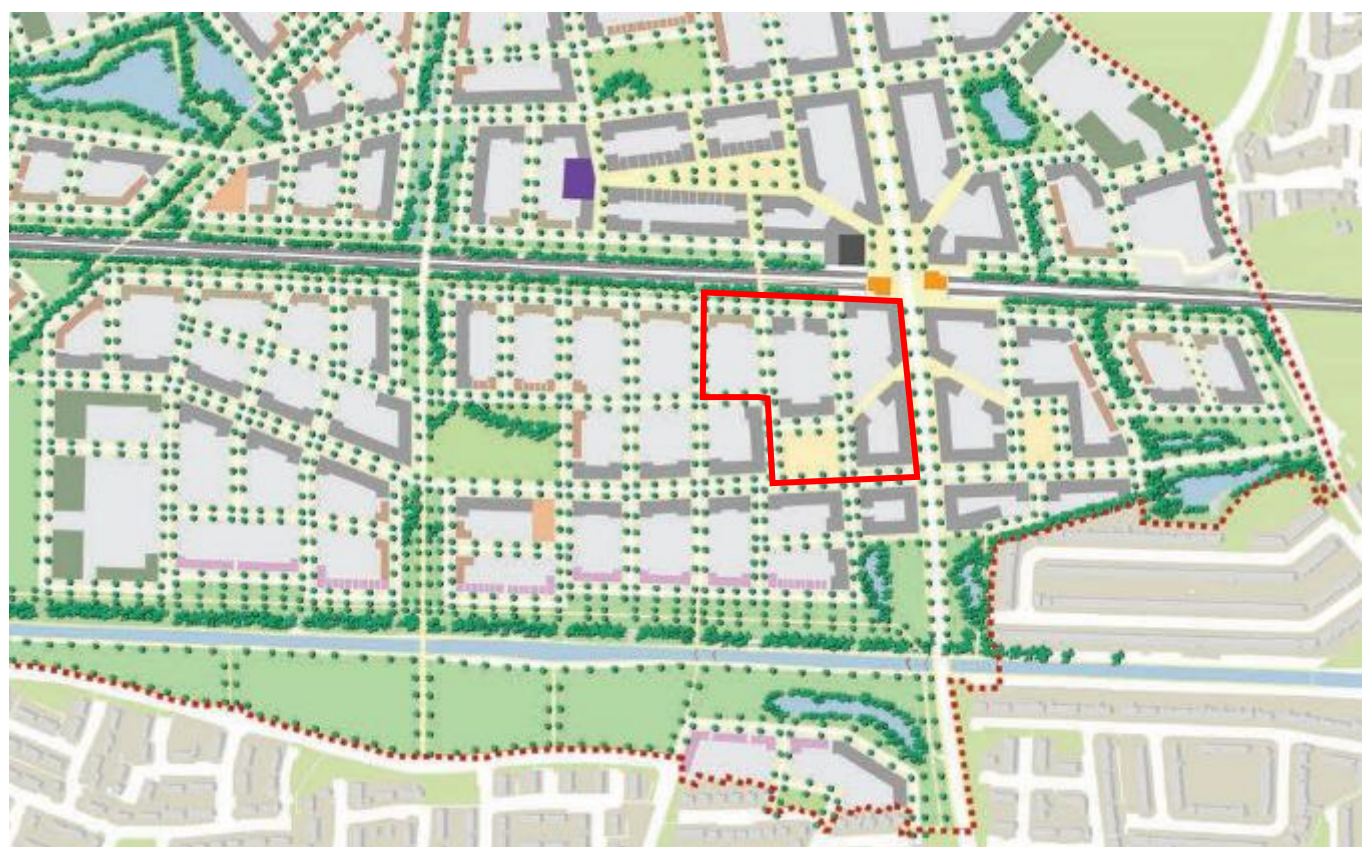
- The characteristics of the subject site and wider environs
- Site constraints such as high-pressure gas pipeline & the railway line to the north.
- The provisions of the Clonburris Planning Scheme which provides a range of design standards and objectives uses, masterplan form, and a range of building heights.

The masterplan for the site has been informed by the guidance set out in the Clonburris Planning Scheme 2019, with respect to the placement of blocks on the site, including the fixed elements which relate to the permitted Clonburris Southern Link Street, which bounds the site to the south. To the east, the alignment of the Fonthill Road is fixed as is the high-pressure Gas Networks Ireland gas main wayleave, which is located along the western side of the Fonthill Road.

The principle of all designated streets under this Planning Scheme is fixed and the alignment of each street including its centre line (see Figure 2.8.5 in Section 2.8 – Building Centre Line & Urban Grain) are either fixed or flexible depending on typology. The planned street hierarchy for the SDZ lands is illustrated in Figure 2.2.1. The arterial streets and Link streets are fixed whereas the local streets are flexible.



It is noted the Planning Scheme outlines that some slight plot adjustment for each Sub Sector may be acceptable provided that this would not affect prescribed dwelling numbers/densities or non-residential floorspace for any Sub Sector; would not significantly affect the gross or net development area of any Sub Sector.



In this regard the main alternative would have been to present the blocks closer to the Fonthill Road. However, given the location of the Gas Networks Ireland wayleave which prohibits development over the wayleave, from a Human

Health and Safety, as well as Risk Management perspective, that particular alternative was discounted as not possible.

The proposed layout of the preferred alternative will not affect the alignment or centre line of any fixed street; would not significantly affect prescribed building lines of any fixed street; would not adversely impact on the environment or environmental objectives contained in the SEA Environmental Report (including required setback from the Grand Canal); and would not have any implications in relation to European Sites.

2.11.5.1 Alternative Design 1 – 449 apartments

Figure 2.22 – Alternative no. 1



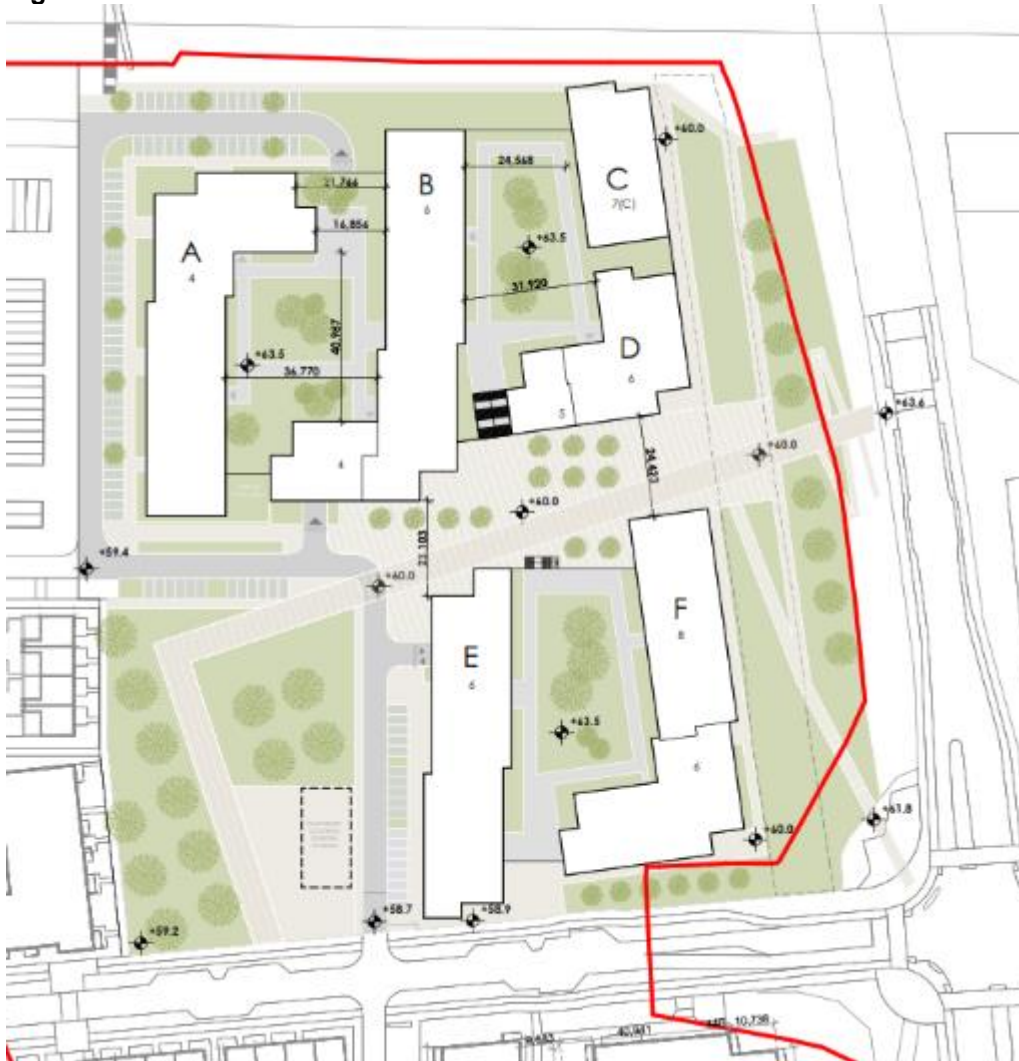
The first design alternative related to the provision of c. 449 no. apartments which was not fully compliant with SDZ road diagram, where the building lines divert significantly from SDZ. The proposed employment block was located between residential buildings resulting in potential non-compliance with Planning Scheme and also potential overlooking issues etc.

In addition, it was proposed to provide a large podium-undercroft- resulting with larger non active areas at street level – all of which affected permeability within the layout.

2.11.5.2 Alternative Design 2 – January 2021

The second alternative considered relates to the provision of 451 no. apartments across 6 no. buildings ranging from 3 no. to 9 no. storeys, c. 972sqm of retail floorspace provided at ground floor level, a creche, communal and public open space including an urban square, new streets, pedestrian and cycle links, carparking, attenuation and site services, hard and soft landscaping and all associated site development works all on a site of c. 3.53 hectares.

Figure 2.23 – Alternative no. 2



2.11.5.3 Alternative Design 3 – July 2022

the proposed development comprises some 468 no. apartments comprising 229 no. 1 bedroom apartments, 178 no. 2 bedroom apartments, 33 no. 2 bedroom (3 person) apartments, and 28 no. 3 bedroom apartments, along with a creche c. 600 sq. m, employment (office) c. 5,270 sq. m, as well as 4 no. retail units (c. 906 sq. m) all on a site of c. 2.96 hectares.

The proposed 5 no. apartment buildings are located within the development area. Block A is part 4 part 6 storeys, Block B is 6 storeys, Block D is part 5 and part 7 storeys, Block E is 6 storeys and Block F is part 5 and 7 storeys. The blocks have communal open space centrally within the apartment layout (above the undercroft parking).

Figure 2.24 – Alternative no. 3



2.11.6 Comparison of Environmental Effects

The key structuring principles of the Planning Scheme Development Areas CUC S3 and CSW S3 within which the proposed development is located was taken into account. The proposal will support the range of densities identified in the Planning Scheme.

The key environmental and practical considerations which have influenced the design of the proposed development and the alternative layouts on the subject lands have been influenced by the following:

- The need to achieve an appropriate density in the context of the Sustainable Residential Development in Urban Areas Guidelines for Planning Authorities (2009) having regard to the location of the site within the Clonburris Planning Scheme.
- Transition in scale between proposed buildings on site.
- Building heights proposed and compliance with the Planning Scheme.
- The need to ensure any residential development provides a good mix of housing typologies which meet current market demand and which are deliverable in the short to medium term.
- Interface of proposed buildings and constructed roads to ensure as much passive surveillance as possible for animation and security.
- Building heights proposed in compliance with the Planning Scheme 2019.
- The need to provide a sustainable level of housing provision on the residential zoned lands.

- The need to deliver good quality open space in appropriate locations with a clear hierarchy as set out in the Clonburris Planning Scheme
- Protection of existing trees and hedgerows where possible,

The final layout proposed is not considered to give rise to any significant adverse environmental impacts. Mitigation measures to be implemented at construction and operational phases of the project are summarised in Chapter 16 (Summary of Mitigation and Monitoring Measures).

Population and Human Health

The alternatives examined would result in similar effects as the design is set within the parameters of the Planning Scheme. The preferred alternative would be a positive effect at a local context and the effect would be permanent.

Biodiversity

With reference to Biodiversity the implementation of the preferred alternative would be the proposed development will not result in the loss of habitats or species of high ecological significance and will not have any significant effects on the ecology of the wider area. Similar effects would arise from the other alternatives examined.

Land and Soils

Development of the land would require site clearance and minor excavations to facilitate the construction of the buildings and services. The effect would be not significant and negative due to the loss of underlying soils. However, this is consistent with achieving compact growth. The effect is locally negative, with a significance rating of imperceptible to not significant and of permanent duration. Similar effects would arise from the other alternatives examined.

Water/Hydrology

The application area is not within a sensitive hydrological environment and there is no surface water body within the site. The implementation of the preferred alternative would require sustainable urban drainage (SuDS) measures in line with the requirements of the Greater Dublin Strategic Drainage Study (GSDSDS).

The significance of the identified impacts will be reduce to a “Not significant” residual impact on the identified hydrological/ hydrogeological receptors. Similar effects would arise from the other alternatives examined.

Air Quality and Climate

The construction phase of the development would result in slight, local negative effects on the air quality for the preferred alternative. With reference to the operational phase the preferred alternative would result in a not significant, local, negative, long-term effects. Similar effects would arise from the other alternatives examined for both the construction and operation phases.

Noise and Vibration

The impact of the construction phase will result in an increase in daytime noise levels at the closest receptors to the site. The operational phase of the development will not adversely impact the existing noise climate at local receptors. The effects are similar across all the alternatives.

Landscape and Visual

Any proposed viable development will give rise to impacts of a similar nature. While the intensification of land use, as it changes from now neglected farmland into a residential development is a change that cannot be mitigated, the proposals reflect best practice in residential area layout, reflect the concepts in the wider masterplan and will consolidate the urban area here with an overall beneficial effect locally and to the wider surrounding area.

Material Assets

All of the alternatives would place additional demand on existing infrastructure including drainage and water supply. Irish Water have confirmed the feasibility of the proposed development and the effect is neutral, imperceptible and permanent.

Cultural Heritage

Whilst it is acknowledged that preservation in-situ is the best manner in which to conserve the archaeological resource, the layout and density requirements of the development within the SDZ means that the recorded enclosure cannot be preserved in-situ. As such enclosure DU017-036 will be preserved by record (archaeological excavation),

prior to the commencement of construction. This work will be carried out under licence from the DoHLGH and full provision for the excavation of the site will be made available by the applicant – both during the course of fieldwork and during the post excavation process. The effects are the same for all alternatives.

With reference to the final layout, the iterative process outlined above, which included alternative site layouts were considered with the objective of producing a new high quality residential development, which has undergone a robust consideration of relevant alternatives having regard to the comparison of environmental effects and meets the requirements of the EIA Directive, based on the multidisciplinary review across all environmental topics.

3.0 POPULATION AND HUMAN HEALTH

3.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has replaced 'Human Beings' with 'Population and Human Health'. This chapter also meets the requirement for assessment of 'Human Beings' as per Schedule 6 of the Planning and Development Regulations 2001-2018.

This chapter of the EIAR was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates who has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has 19 years of experience of Environmental Impact Assessment and urban development.

In preparing this chapter, consideration has been given to the other inputs to this EIAR including, in particular, the chapters addressing Air Quality and Climate, Noise and Vibration, Traffic as well as Risk Assessment Chapter (accidents or disasters) and the separate reports addressing Construction and Demolition Waste Management, and the Construction and Environmental Management Plan.

Population and Human Health comprise an important aspect of the environment to be considered. Any significant impact on the status of human health, which may be potentially caused by a development proposal, must therefore be comprehensively addressed.

Population and Human Health is a broad ranging topic and addresses the existence, activities and wellbeing of people as groups or '*populations*'. While most developments by people will affect other people, this EIAR document concentrates on those topics which are manifested in the environment, such as new land uses, more buildings or greater emissions.

3.2 STUDY METHODOLOGY

At the time of writing there is no specific guidance from the EU Commission on the 2014 EIA Directive to indicate how the term 'Human Health' should be addressed. However, the European Commission's *Guidance on the preparation of the Environmental Impact Assessment Report* (2017) does reference the requirement to describe and, where appropriate, quantify the primary and secondary effects on human health and welfare. Moreover, the European Commission guidance states the following in relation to the assessment of Human Health:

"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."

EU Commission's SEA Implementation Guidance from 2003, as it gives an indication of how 'human health' should be considered in terms of environmental assessment and notes:

"The notion of human health should be considered in the context of the other issues mentioned [in the list of factors to be identified, described and assessed] and thus environmentally related health issues such as exposure to traffic noise or air pollutants are obvious aspects to study." (para 5.26).

In accordance with this approach to Human Health espoused in the Commission Guidance, this chapter addresses human health in the context of other factors addressed elsewhere in further detail within the EIAR where relevant. Relevant factors identified include inter alia water, air quality, noise, and the risk of major accidents and disasters.

In addition, this chapter of the EIAR has been prepared with reference to recent national publications which provide guidance on the 2014 EIA Directive including the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and the Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in May 2022.

A site visit was undertaken to appraise the location and likely and significant potential impact upon human receptors. Published reference documents such as Central Statistics Office Census data, the National Planning Framework 2040, the Regional Planning Guidelines for the Greater Dublin Area 2010-2022, the South Dublin County Council Development Plan 2022-2028 were also examined.

The 2022 EPA Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA states that 'In an EIAR, the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc..'

This chapter of the EIAR document focuses primarily on the potential likely and significant impact on Population, which includes Human Beings as required under the Schedule 6 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, and Human Health in relation to health effects/issues and environmental hazards arising from the other environmental factors. Where there are identified associated and inter-related potential likely and significant impacts which are more comprehensively addressed elsewhere in this EIAR document, these are referred to. The reader is directed to the relevant environmental chapter of this EIAR document for a more detailed assessment.

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

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

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

3.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

3.3.1 Introduction

A description of the relevant aspects of the current state of the environment (baseline scenario) in relation to population and human health is provided below. Specific environmental chapters in this EIAR provide a baseline scenario relevant to the environmental topic being discussed. Therefore, the baseline scenario for separate environmental topics is not duplicated in this section; however, in line with guidance provided by the EPA and the Department, the assessment of impacts on population and human health refers to those environmental topics under which human health effects might occur, e.g. noise, water, air quality etc.

An outline of the likely evolution without implementation of the project as regards natural changes from the baseline scenario is also provided.

The existing environment is considered in this section under the following headings:

- Economic Activity;
- Social Patterns;
- Land-Use and Settlement Patterns;
- Employment; and
- Health & Safety.

The subject site is located in the south-eastern section of Clonburris SDZ (Strategic Development Zone) and forms a section of the Clonburris Character Area within the Clonburris SDZ. The Clonburris SDZ Planning Scheme comprises 280 hectares and is located to the west of Dublin City Centre and the M50 - within the triangle between Lucan, Clondalkin and Liffey Valley.

The subject site is located in the CUCS3 and CSW-S3 Development Areas of the Planning Scheme 2019. The subject lands comprise an undeveloped, greenfield site of c. 5.18 hectares and is situated to the north of the Grand Canal

and to the west of the Fonthill Road (R113). The site is located approximately 200m from Clondalkin Train Station, 500m from Banougue Neighbourhood centre and c. 1km from Clondalkin Centre. There is a vehicle access point to the site from Fonthill Road which is currently subject to the development of roads infrastructure, namely the 4km new road to be known as Clonburris Southern Link Street, which shall connect the adjacent Fonthill Road to the southern Clonburris lands via this entrance, as permitted under SDCC Reg. Ref. SDZ20A/0021.

The subject site is located within the boundaries of the Electoral division (ED) of Clondalkin-Cappaghmore as defined by the Central Statics Office. This Electoral Division comprised the immediate catchment area of the subject site.

The ED's comprising the wider study area of the Dublin Mid-West constituency include the Clondalkin-Dunawley, Clondalkin-Moorfield, Clondalkin-Rowlagh, Clondalkin Village, Lucan-Esker, Lucan Heights, Lucan-St. Helens, Newcastle, Palmerston Village, Palmerston West, Rathcoole and Saggart. Figure 3.1 indicates the geographical extent of the immediate catchment and the wider study area.

Figure 3.1 – Catchment and Study Area: Source: Google Maps



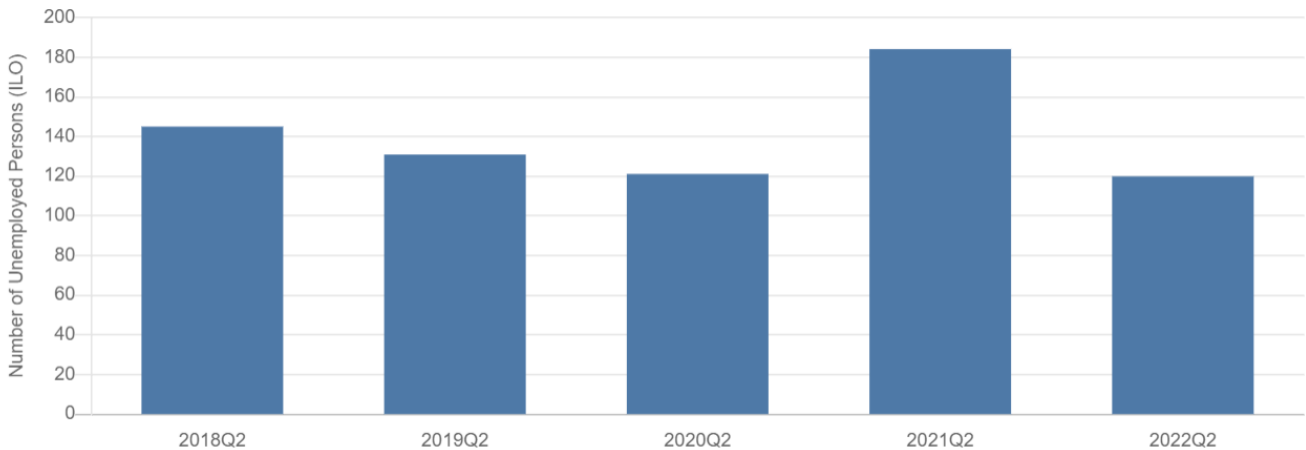
3.1.1 Employment & Economic Activity

The CSO's Labour Force Survey for Q2 2022, states there was an annual increase in employment of 8.9% or 205,500 in the year to the second quarter of 2022, bringing total employment to 2,554,600. This has been mainly due to the large rebound in economic activity post the effects of the COVID-19 pandemic on the Irish economy and workforce.

Simultaneously, unemployment decreased by 64,200 (7.3%) in the year to Q2 2022 bringing the total number of persons unemployed to 119,900 or 4.5%. This is the lowest the unemployment rate has been since 2007. The seasonally adjusted unemployment rate was 4.4% for Q2 2022 and the seasonally adjusted number of persons unemployed decreased by 12,000 to 116,400. Such decreases can once again be attributed to the strong economic rebound after the influence of COVID-19.

The total number of persons in the labour force in the second quarter of 2022 was 2,672,600, representing an increase of 19,600 (0.7%) over the year. The number of persons not in the labour force in Q2 2022 was 1,422,000, an increase of 5,300 (0.3%) over the year.

Figure 3.2 – Unemployment during Q2 2018-2022 (Source: CSO)



According to the CSO, the COVID-19 crisis continued to have an impact on the labour market in Ireland in May 2022. While the standard measure of Monthly Unemployment was 4.5% in August 2022, the COVID-19 Adjusted Measure of Unemployment could indicate a rate as high as 7.3%, if all claimants of the Pandemic Unemployment Payment (PUP) were classified as unemployed. In actual numbers this represents a decrease of 64,200 people unemployed between Q12021 and Q2 2022. Unemployment decreased by 36,300 (-36.5%) for males to 63,200 in the year to Q2 2022 compared with a fall of 27,900 (-33.0%) to 56,700 for females over the same period. The unemployment rate for males was 4.5% in Q2 2022 down from 7.4% a year earlier while the corresponding rates for females were 4.5% and 7.2% respectively.

The CSO Monthly release (3rd November 2022) notes that *“the seasonally adjusted unemployment rate for October 2022 was unchanged at 4.4% from September 2022 and down from 5.3% in October 2021. The rate of 4.4% in October 2022 was lower than the pre-pandemic level of 4.8% recorded in October 2019.”* The seasonally adjusted number of persons unemployed was 117,500 in October 2022, compared with 115,500 in September 2022. There was a decrease of 20,400 in the seasonally adjusted number of persons unemployed in October 2022 when compared with a year earlier.

The Economic Social Research Institute (ESRI) quarterly economic commentary for Autumn 2022 notes that *“Considerable uncertainty surrounds international macroeconomic conditions with an increasing probability of recession in the United States, the United Kingdom and the euro area. While the pace of consumption growth is moderating significantly, the domestic economy is still expected to grow robustly this year. This reflects both the contribution of modified investment and the strong performance of the traded sector. Modified domestic demand (MDD) is now forecast to grow by 7.5 per cent in 2022. Furthermore, the unemployment rate is set to fall to 4.1 per cent by the end of the year and the General Government Balance (GGB) is expected to register a surplus of 0.3 per cent”.*

The ESRI notes that Unemployment is now set to fall to 4.1% by the end of 2022.

The ESRI Commentary outlines that *“Inflationary pressures are, however, set to continue with some moderation in the inflation rate expected in 2023. We now forecast inflation of 8.1 per cent in 2022 and 6.8 per cent in 2023.”*

Nevertheless, the steady increases in national levels of employment, and the decreases in the number of unemployed is as a result of the significant revival of the Irish economy after the influence of the COVID-19 pandemic on the Irish economy and workforce over the last 18 to 24 months. The magnitude and extent of the national economic rebound speaks to the resilience and efficiency of the Irish economy and workforce which could have a beneficial effect heading into the unknown economic future starting to arise following inflationary pressures on energy and food markets caused by Russia’s war in Ukraine. Therefore, Ireland must prepare to cope with this unknown and therefore must ensure that adequate provision of social and affordable housing is had to facilitate the potential additional influx of individuals and families in search of such housing options due to the economic shock and downturn experienced as a result of the cost-of-living crisis. The proposed development will aid in this endeavour through its provision of a high-quality residential mix at a strategic location, which will deliver sustainable economic development which will significantly contribute to the development of the area and will positively impact on the existing and future population of the region, through its housing, connections, amenity provision and potential future employment opportunities.

The Central Bank of Ireland Quarterly Bulletin Q4 2022, released in October 2022, forecasts for economic growth in Ireland for the remainder of the year and into 2023 and beyond. This document indicates that Modified Domestic Demand (MDD) is expected to grow by approximately 6.4% this year, with a further slowed-down growth rate of 2.3% in 2023 and 3.3% in 2024. The slowing down of the economy can be attributed in large part to the Russian war in Ukraine and its consequent effects on global energy and food markets contributing to inflationary pressures as forecast to be up to 8% in 2022 and 6.3% in 2023.

However, the above sources demonstrate that the national economy will continue to remain steady and improve overall towards returning to the levels of growth experienced pre-inflation and pre-COVID by 2024. This, in turn, results in increased levels of economic activity, increases in investment and employment therefore, results in a demand for increased housing provision particularly within the Dublin region, to accommodate a growing workforce and population.

3.1.2 Social Patterns

For the purposes of this EIAR, a review has been carried out of data from the 2006, 2011 and the 2016 Census of Population in order to identify any significant changes in population levels and age profile at national, regional, county, city and local levels. The 2016 Census results provide for an overview of the current population, employment and economic statistics and trends of the State.

A review was also carried out of the census data relating to social class and household size at each of these levels. The following section provides a summary description of the existing environment in terms of each of these indicators.

3.1.2.1 Population

The preliminary results of the 2022 Census were published on the 23rd of June 2022. The main Census results will be published over several months starting in April 2023.

The preliminary population figures for the State were 5,123,536 persons in 2022. This is the first time that a census has recorded a population of over five million people in over 170 years. The population increased by 361,671 persons, or 8% since April 2016. The population of Dublin County increased by 7.7% between 2016 and 2022 to now comprise 1,450,701 persons or an increase of some 105,299. The population of the Greater Dublin Area is now 2,073,459 persons, an increase of 8.8% compared to 2016.

Table 3.2 below shows the population of the State, the Greater Dublin Area, Dublin County and City, South Dublin, the wider study area of Dublin Mid-West constituency and the Clondalkin-Cappaghmore electoral division area for 2006, 2011 and 2016. (It should be noted that that the Greater Dublin Area (GDA) includes Dublin County as well as Wicklow, Kildare and Meath. Dublin County includes Fingal, South Dublin, Dún-Laoghaire Rathdown and Dublin City).

Table 3.1 – Population at State, Regional, County and Local Level, 2006- 2016

Area	2006	2011	2016	Change 06 - 16	% change
State	4,239,848	4,588,252	4,757,976	518,128	12.2%
Greater Dublin Area	1,662,536	1,804,156	1,904,806	242,270	14.5%
Dublin County	1,187,176	1,273,069	1,345,402	158,226	13.3%
Dublin City	506,211	527,612	553,165	46,954	9.2%
South Dublin	246,935	265,205	278,767	31,832	12.9%
Dublin Mid-West	99,459	110,427	117,986	18,527	18.6%
Clondalkin-Cappaghmore ED	1,925	2,605	2,581	656	34.1%

Source: Census of Population 2006, 2011 and 2016

Table 3.2 indicates that the population of the state grew from approximately 4.2 million to 4.7 million between 2006 and 2016, representing an increase of 12.2% in 10 years. The population of Dublin County increased by 13.3% (158,226 persons) over the same period while Dublin City grew by 9.2% (46,954 persons) between 2006 and 2016. The population of South Dublin county grew faster than the city with a growth rate of 12.9%. The lower population growth rate experienced in Dublin City compared to the increase experienced in South Dublin county may reflect the

restricted availability of development land within the area. There is an abundance of available land in South Dublin and if its potential is realised, the county would be more than able to accommodate the significant quantities of housing needed to facilitate such a growing population. The subject lands at Clonburris would see such potential realised through the proposed development.

In particular, population growth within the wider study area of Dublin Mid-West constituency rose from 2006 to 2011 by 18.6%, while Clondalkin-Cappaghmore electoral division itself experienced major growth of 34.1% since 2006 to 2016. This trend of rapid growth in the surrounding area of Clonburris brings with it a proportional increase in demand for housing and associated services provision in the area to accommodate present and future population growth in the area. The proposed development at Clonburris would help alleviate such demand pressures while also providing much needed social and affordable housing options for a range of family and individual demographics.

3.1.2.2 Age Profile

Table 3.3 shows the population of the State, the Greater Dublin Area, Dublin County and City, South Dublin, the wider study area of Dublin-Mid West constituency and the Clondalkin-Cappaghmore ED level for 2006, 2011 and 2016.

Table 3.2 – Age Profile at State, County and Local Level, 2006-2011-2016

Area	0-14	15-24	25-44	45-64	65+
State 2006	20.4%	14.9%	31.7%	21.9%	11.0%
State 2011	21.3%	12.6%	31.6%	22.7%	11.7%
State 2016	21.1%	12.1%	29.5%	23.8%	13.4%
GDA 2006	19.6%	15.6%	34.4%	20.7%	9.7%
GDA 2011	20.8%	13.1%	34.2%	21.5%	10.4%
GDA 2016	20.7%	12.4%	32.5%	22.5%	11.9%
Dublin County 2006	18.3%	16.2%	34.5%	20.6%	10.3%
Dublin County 2011	19.3%	13.6%	34.9%	21.3%	10.9%
Dublin County 2016	19.3%	12.7%	33.8%	22.0%	12.2%
Dublin City 2006	15.0%	16.9%	35.7%	19.7%	12.7%
Dublin City 2011	15.2%	14.5%	37.2%	20.5%	12.6%
Dublin City 2016	15.0%	13.2%	37.4%	21.3%	13.0%
South Dublin 2006	21.7%	16.4%	33.1%	21.6%	7.2%
South Dublin 2011	23.1%	13.1%	33%	22.1%	8.7%
South Dublin 2016	23%	12.3%	31.4%	22.3%	11%
Dublin Mid-West 2006	22.9%	15.9%	36.4%	19.2%	5.6%
Dublin Mid-West 2011	24.7%	12.8%	35.7%	20.2%	6.5%
Dublin Mid-West 2016	24.5%	12%	33.2%	21.6%	8.7%
Clondalkin-Cappaghmore ED 2006	28.4%	20.1%	25.8%	17.8%	7.9%
Clondalkin-Cappaghmore ED 2011	33.4%	15.8%	27.1%	16.7%	7%
Clondalkin-Cappaghmore ED 2016	28%	16.5%	29.3%	18.4%	7.8%

Source: Census of Population 2006, 2011 and 2016

The table indicates that the highest percentage of population in the study area relates to the working age group (22-44). It is considered that the available working population in the immediate vicinity of the proposed development will enhance the attractiveness of investors to locate in this area to benefit from the significant available work force. In addition the following statistics further indicate the appropriateness of the proposed office development in relation to the highly skilled and educated work force in the surrounding area.

3.1.2.3 Social Class

The Census of Population determines social class by the nature of employment, and is therefore useful as a guide to the principal types of occupation in which the population is employed or in which the population is capable of being employed. Table 3.4 overleaf shows the number and percentage of people in each of the 11 socio-economic groups identified in the 2016 Census of Population.

Table 3.3 – Persons by Socio-Economic Group, 2016

Socio-Economic Group	State	Dublin County	South Dublin	Dublin Mid-West	Clondalkin-Cappaghmore ED
A Employers and managers	735,031 (15.4%)	241,883 (18.5%)	47,948 (17.3%)	18,354 (15.8%)	196 (7.7%)
B Higher professional	338,897 (7.1%)	124,836 (9.5%)	18,435 (6.7%)	6,870 (5.9%)	63 (2.5%)
C Lower professional	623,756 (13.1%)	171,934 (13.1%)	32,421 (11.7%)	13,014 (11.2%)	138 (5.4%)
D Non-manual	996,696 (20.9%)	261,082 (19.9%)	58,882 (21.2%)	25,330 (21.7%)	496 (19.5%)
E Manual skilled	359,586 (7.6%)	96,384 (7.4%)	26,593 (9.6%)	12,037 (10.3%)	179 (7%)
F Semi-skilled	369,501 (7.8%)	88,725 (6.8%)	22,152 (8%)	9,926 (8.5%)	272 (10.7%)
G Unskilled	153,784 (3.2%)	43,541 (3.3%)	9,663 (3.5%)	4,535 (3.9%)	149 (5.9%)
H Own account workers	179,281 (3.8%)	60,087 (4.6%)	15,243 (5.5%)	6,422 (5.5%)	84 (3.3%)
I Farmers	154,022 (3.2%)	3,174 (0.2%)	442 (0.1%)	268 (0.2%)	3 (0.1%)
J Agricultural workers	23,145 (0.5%)	1,384 (0.1%)	176 (0.1%)	49 (0.1%)	1 (0.1%)
Z All others gainfully occupied and unknown	828,166 (17.4%)	215,824 (16.5%)	45,213 (16.3%)	19,710 (16.9%)	968 (37.8%)
Totals	4,761,865	1,308,854	277,168	116,515	2,549

Source: Census of Population 2016

Table 3.4 indicates that the wider study area of Dublin Mid-West is predominantly in tune with the norms of the Dublin region, GDA and State, the electoral division of Clondalkin-Cappaghmore shows some divergent results in relation to more professional occupations and skill-levels. The Clondalkin-Cappaghmore ED indicates a lower percentage of people in higher skilled and professional socio-economic groups such as 'Employers and managers', 'higher professionals' and 'lower professionals', while the ED also sees higher percentages of people in unskilled or partially skilled professions.

3.1.2.4 Educational Attainment

Advancing from second level education to third level assists the ability of the population to gain access to employment and enter the labour market for higher earnings. Table 3.5 overleaf contains CSO data from 2016 relating to the educational attainment of people at national, regional, county, city and local level.

Table 3.4 – Persons by Educational Attainment, 2016

Education	State	Dublin County	South Dublin	Dublin Mid-West	Clondalkin-Cappaghmore ED
No Formal Education	52,214 (1.7%)	11,856 (1.3%)	2,727 (1.6%)	1,252 (1.8%)	65 (4.6%)
Primary Education	334,284 (10.8%)	81,187 (9.2%)	18,045 (10.4%)	7,067 (10%)	242 (17%)
Lower Secondary	449,766	102,020	25,123	10,473	293

	(14.5%)	(11.6%)	(14.4%)	(14.8%)	(20.6%)
Upper Secondary	573,643 (18.5%)	149,177 (17.0%)	34,240 (19.6%)	13,896 (19.6%)	258 (18.2%)
Technical or Vocational qualification	271,532 (8.8%)	65,919 (7.5%)	15,819 (9%)	6,861 (9.7%)	121 (8.5%)
Advanced Cert. / Completed Apprenticeship	182,318 (5.9%)	40,123 (4.6%)	9,912 (5.7%)	4,230 (6%)	50 (3.5%)
Higher Certificate	153,351 (5.0%)	40,165 (4.6%)	8,598 (4.9%)	3,542 (5%)	44 (3.1%)
Ordinary Bachelor Degree or National Diploma	237,117 (7.7%)	70,487 (8.0%)	13,073 (7.5%)	5,339 (7.5%)	59 (4.2%)
Honours Bachelor Degree, and/or Professional Qualification	231,293 (10.7%)	118,090 (13.4%)	18,568 (10.7%)	6,826 (9.6%)	48 (3.4%)
Postgraduate Diploma or Degree	284,107 (9.2%)	116,562 (13.3%)	15,260 (8.8%)	5,669 (8%)	42 (2.9%)
Doctorate (Ph.D.) or higher	28,759 (0.9%)	12,643 (1.4%)	1,322 (0.7%)	441 (0.6%)	4 (0.3%)
Not Stated	198,668 (6.4%)	70,870 (8.1%)	11,603 (6.7%)	5,330 (7.4%)	195 (13.7%)
Totals	3,097,052	878,829	174,290	70,926	1,421

Source: Census of Population 2016

The table indicates that only 3.4% of people living in the Clondalkin-Cappaghmore ED respectively have studied up to Honours Bachelor Degree / Professional Qualification level. A further 2.9% have studied to Postgraduate Diploma or Degree level, which is significantly lower than the national averages of 10.7% and 9.2% respectively.

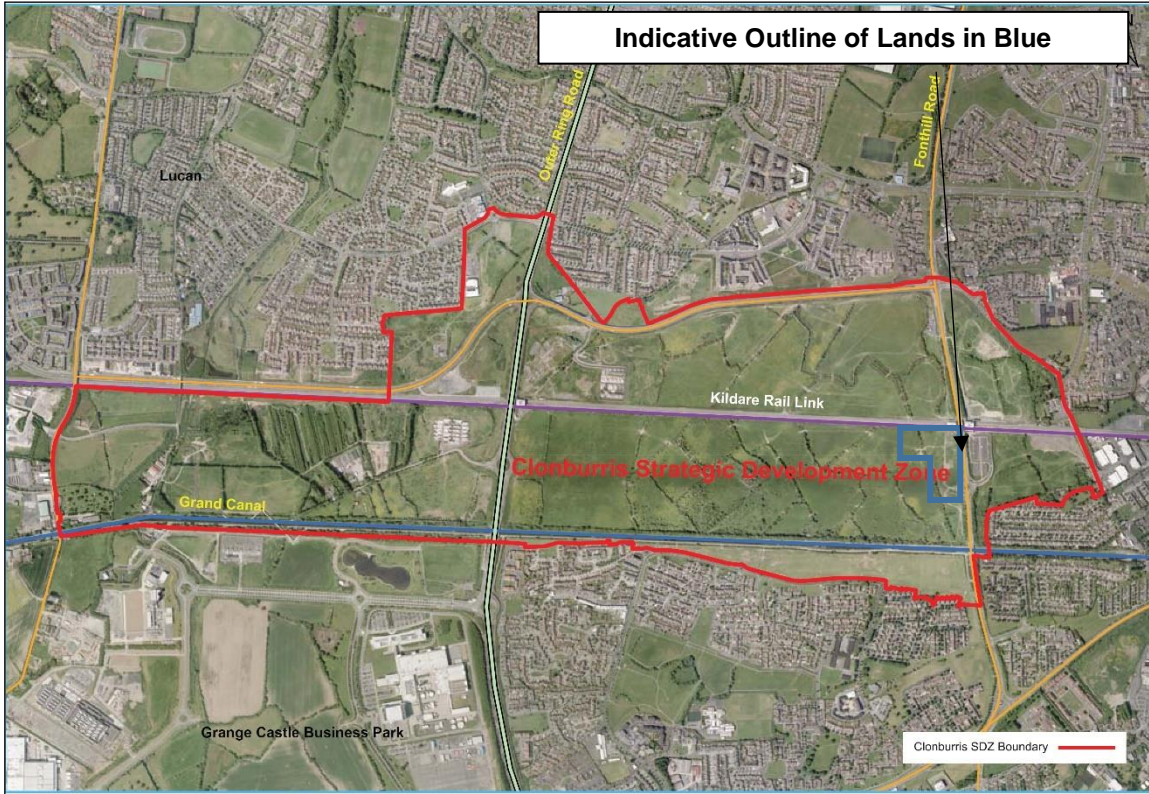
Predominantly, as the data in Table 3.5 illustrates, the majority of the population in the Clondalkin-Cappaghmore ED chose to leave their education reasonably early with 17% leaving their education at primary school level and a further 20.6% only attaining their education to junior certificate level. While the rate of completion at Leaving Certificate level (18.2%) is relatively coordinated with national and regional norms, the completion rates at lower levels of education as discussed remains significantly higher than such averages. The incidence of 'No Formal Education' amongst the population of the Clondalkin-Cappaghmore ED (4.6%) is almost 2.5 times greater than that of the state, GDA, Dublin County and wider study area of Dublin Mid-West constituency.

Overall, Table 3.5 indicates that when compared to other areas that the resident population of the wider study area, and the Clondalkin-Cappaghmore ED is characterised by considerably low levels of educational attainment. This is consistent with the indicative data in Table 3.4 showing the concentration of unskilled workers in the area.

3.1.3 Land Use & Settlement Patterns

The subject site is located on a substantial greenfield site of 5.18 ha. The predominant land use immediately surrounding the subject site is the remainder of undeveloped greenfield land at the Clonburris SDZ. Beyond the boundaries of the SDZ, predominant land-uses include; a mix of residential development to the north (i.e. Balgaddy), east (i.e. Ronanstown, Neilstown and Cappaghmore) and south (i.e. Bawnogue, Deansrath and Kilmahuddrick) of the site; educational development, in the form of Kishoge Community College and Griffeen Community College, to the immediate north-west of the site; and, a considerable amount of commercial and industrial development lying to the west and south-west of the wider Clonburris site also at Grange Castle Industrial Park. The land use pattern of much of the wider study area is also consistently characterised by such land-uses. The site is within a 20 minute walking distance of Clondalkin Village and its associated retail, commercial and cultural uses.

Figure 3.3 – Subject Lands in Clonburris SDZ

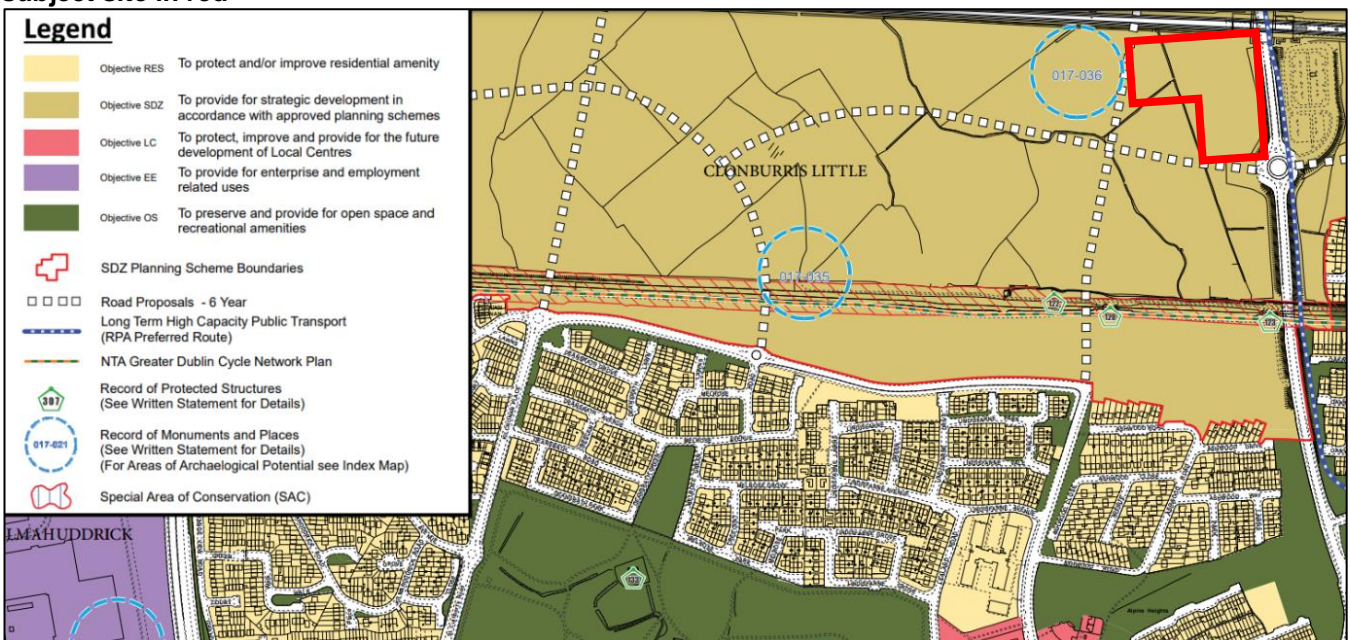


The site is located within the administrative area of South Dublin County Council and is therefore subject to the land use policies and objectives of the South Dublin County Development Plan 2022-2028. The lands are zoned objective SDZ which seeks “To provide for strategic development in accordance with approved planning schemes”.

The Clonburris Planning Scheme 2019 is designated as the land-use plan for the area and subject lands and forms part of the current County Development Plan 2022-2028.

The Planning Report which accompanies this application addresses the planning context issues in more detail.

Figure 3.4 – Land Use Zoning Map (South Dublin County Development Plan), with approximate outline of subject site in red

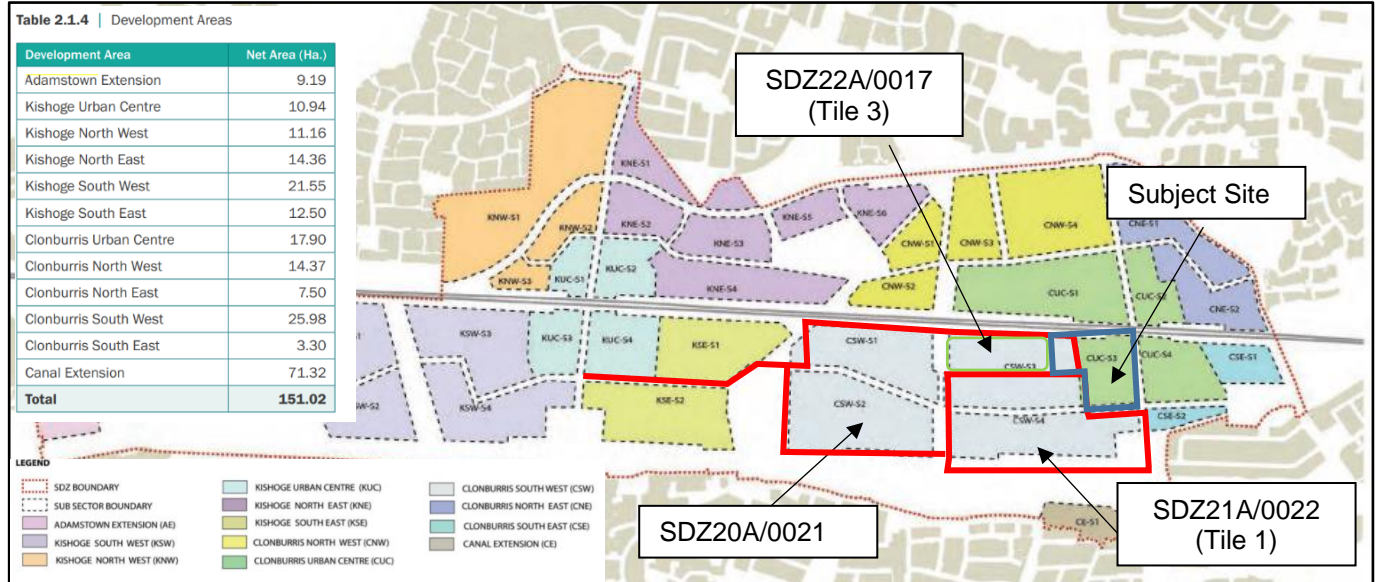


Map 4 Extract from South Dublin County Development Plan 2022-2028

The Planning Scheme provides for the establishment of three Character Areas - Clonburris, Kishoge and Adamstown Extension. Clonburris and Kishoge with a focus around an urban centre established at the two points of highest accessibility within the SDZ lands, namely Clondalkin-Fonthill and Kishoge railway stations.

The subject lands are situated within the Character and Development Area 3 Clonburris South West as outlined below:

Figure 3.5 – Location of subject lands



(and permitted developments within Development/Character Areas, with approximate outline of subject site in blue)

The following land uses are permissible in the residential area:

Table 2.1.1 | Uses Permissible & Open for Consideration in Residential Areas

Permitted in Principle	Open for Consideration
Bed & Breakfast, Childcare Facilities, Community Centre, Cultural Use, Doctor/Dentist, Education, Embassy, Enterprise Centre, Funeral Home, Guest House, Health Centre, Housing for Older People, Hotel/Hostel, Industry-Light, Live-Work Units, Nursing Home, Offices less than 100 sq.m, Open Space, Public House, Public Services, Recreational Facility, Recycling Facility, Residential Institution, Residential, Restaurant/Café, Retirement Home, Shop-Locala, Shop-Neighbourhoodb, Sports Club/Facility, Traveller Accommodation, Veterinary Surgery..	Advertisements and Advertising Structures, Agriculture, Allotments, Betting Officea, Crematorium, Garden Centre, Home Based Economic Activities, Industry-General, Motor Sales, Nightclub, Office-Based Industry, Offices 100 sq.m - 1,000 sq.m, Off-Licencea, Petrol Station, Place of Worship, Science and Technology Based Enterprise, Social Club, Stadium.

- a. Local Nodes only
- b. Local Nodes only and subject to SDZ Section 2.5 (Retail) convenience cap for Local Nodes

The residential, childcare and employment uses are noted as being permitted in principle.

3.1.4 Housing

The ‘Housing For All’ plan by the Irish Government and Department of Housing, Local Government and Heritage states that “right now, Ireland’s housing system is not meeting the needs of enough of our people”.

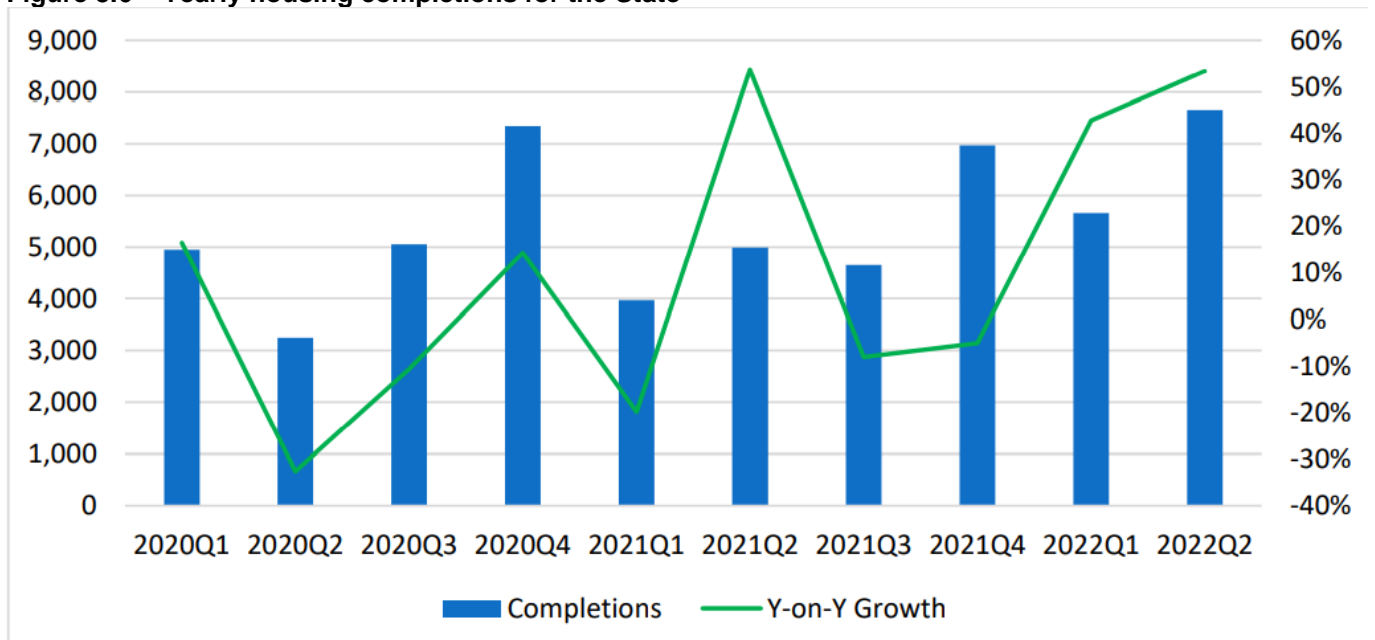
Over the last few years, the steady growing demand in combination with the critical undersupply of quality housing provision has led to significant problems of homelessness, unaffordability and vacancy amongst others, particularly in Dublin.

There is a significant and established housing need in Dublin and the State as a whole, as recognised within Government housing and planning policy, including the 2016 Rebuilding Ireland Plan for Housing and Homelessness and Housing for All, published in September 2021, which reinforces the critical and strategic need for new dwellings where it is a target to provide 300,000 housing units by the year 2030. The government’s vision for the housing system over the longer term is to achieve a steady supply of housing in the right locations with economic, social and environmental sustainability built into the system. The proposed development will allow for a new residential community, built to a high standard and quality, adjacent to existing settlements, with a range of amenities and services provided, in proximity to public transport services.

While the number of residential units being completed yearly nationally has rebounded, compared to the period 2010-2015, the level of completions remains significantly less than the estimated equilibrium demand for housing (estimated at 35,000 per annum by the ESRI) in the State. Moreover, the current level of housing need and demand is not at equilibrium, being significantly augmented by the extremely low level of housing completions in the decade since 2010 (See figure below). Over this period, a significant shortfall in housing has amassed year on year, which is reflected in the data collected in Census 2016 – which revealed overcrowding and increasing numbers of households living in cramped conditions.

It is further noted that the number of housing completions in the state reduced significantly (falling well below projected completions) since 2020, due to the impact of the COVID-19 public health crisis. There had been a gradual increase (see figure below) in the number of completions over the past decade as supply increased to meet the level of structural demand, estimated by the ESRI to be in the region of 35,000 new homes a year (ESRI 2022).

Figure 3.6 – Yearly housing completions for the State



Source: Figure 28 ESRI Autumn Commentary

The ESRI Autumn Commentary 2022 notes that “housing investment (is) to continue to increase with completions of approximately 28,000 residential units in 2022 and 26,000 units in 2023”. An increase in construction activity over the coming years is also likely to be facilitated by recently announced policy measures contained within the Housing for All plan, the aim of which is to increase the supply of housing.

The ESRI state that in the second quarter of 2022, a total of 7,654 residential units were completed in Ireland; a 53 per cent increase on the same period in 2021 (Figure 3.5). This brings the total completions for the first half of the year to 13,316. In terms of the growth rates, the base periods in 2021 were still likely affected by the public health restrictions on activity that were in place in the first and second quarters

Census 2016 revealed an increase in the national housing stock of just 8,800 units during the five-year intercensal period (taking into account obsolescence during that period) representing an increase of just 0.4 percent (as shown in the figure below).

This is notable given the increase in population seen concurrently (173,613 or 3.8%). Furthermore, almost 40% of these additional units were one off houses, the majority of which would never have come to market. Census 2016 also revealed a rise in the average household size (from 2.73 to 2.75) (CSO, 2017). This was attributed to household formation falling behind population growth, another indicator of lacking housing availability and increasing housing need.

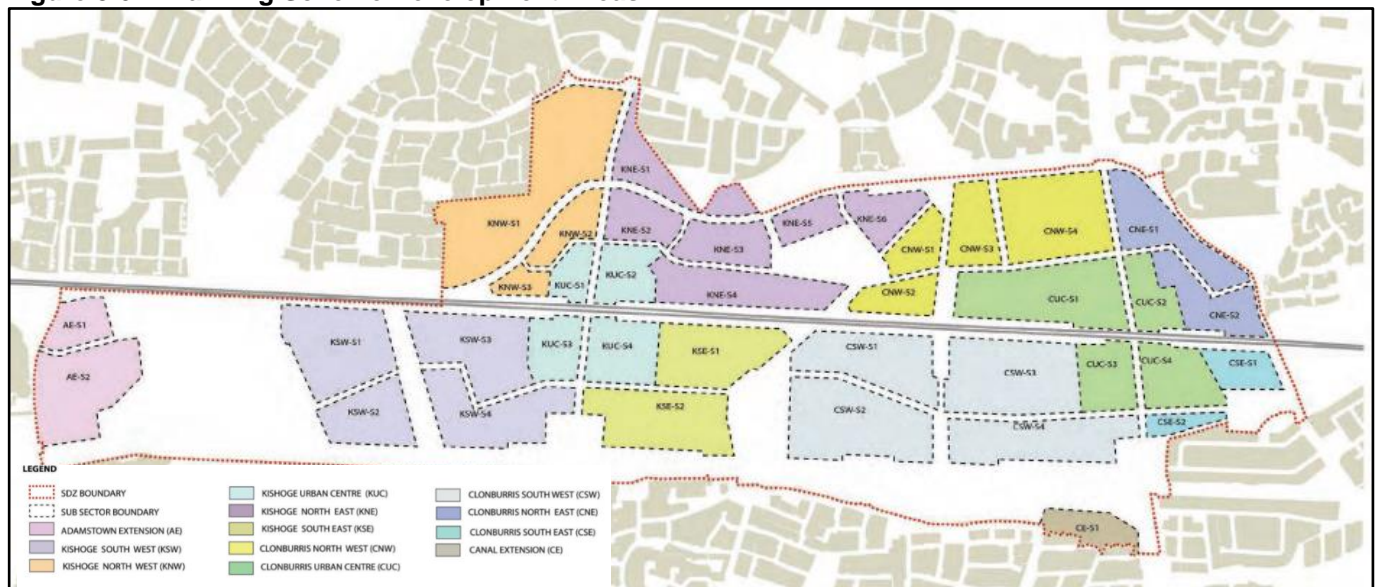
In terms of increasing future housing delivery, the proposed development is located at a location which is zoned for significant and rapid residential development, and which is appropriate for the uses proposed.

The proposed development which provides for 594 no. residential units has been designed to help address the existing deficit of housing provision in the State. The application site is strategically located at a public transport interchange in suburban Dublin which is served by numerous Dublin Bus routes (i.e. 13, 40, 151, 239) and the proposed BusConnects routes, the Dublin-Cork, Dublin-Waterford and Dublin-Portlaoise railway lines through Fonthill Station and by a good network of cycleways along the Grand Canal and to/from Clondalkin Village and Liffey Valley. There is a significant demand and need for additional housing provision not only in the State but in the area exclusively as recognized in the South Dublin County Development Plan 2022-2028, as such it is considered that the provision of a significant residential development at this location will improve the housing shortage in the surrounding area.

The overall development at Clonburris will also provide for a much-enhanced public realm with new through routes and pedestrian and cyclist connections.

The site is located within the administrative area of South Dublin County Council and is therefore subject to the land use policies and objectives of the County Development Plan 2022-2028. The site is zoned objective SDZ which seeks “To provide for strategic development in accordance with approved planning schemes”, under the South Dublin County Development Plan 2022-2028.

Figure 3.6 – Planning Scheme Development Areas



The development of the subject lands has the potential to provide significant additional housing provision as part of a mixed-use development to include commercial office floorspace, 4 no. retail units, a creche, 0.5047 ha of public

open green space (including a significant urban square), car parking, bicycle parking and all other ancillary services and amenities. It is considered that the proposed development will contribute significantly to the national economy by meeting the market and social demand for high quality housing within the Dublin region, and will encourage development at a strategic location surrounding public transport nodes. It will also provide much needed housing accommodation to cater for the increasing population of homeless and disadvantaged persons in the increasingly inaccessible housing market through social and affordable housing provision within the scheme. It will therefore assist in delivering the strategic long term sustainable development objectives of both South Dublin County Council, Dublin City and the Greater Dublin Area.

The National Planning Framework 2040 states:

“Carefully managing the sustainable growth of compact cities, towns and villages will add value and create more attractive places in which people can live and work. All our urban settlements contain many potential development areas, centrally located and frequently publicly owned, that are suitable and capable of re-use to provide housing, jobs, amenities and services, but which need a streamlined and co-ordinated approach to their development, with investment in enabling infrastructure and supporting amenities, to realise their potential. Activating these strategic areas and achieving effective density and consolidation rather than more sprawl or urban development, is a top priority”.

There is clear support and a need for compact housing growth at well serviced urban locations through the creation of vibrant and mixed neighbourhoods and communities. Clonburris aims to achieve this through the development of significant housing pool with associated green spaces including an urban square, retail, childcare and employment opportunities and new and improved pedestrian and cyclist infrastructure.

3.1.5 Health & Safety

The adjoining context consists of undeveloped lands and a mix of residential, educational and open amenity space development. It does not include any significant man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which would be likely to result in a risk to human health and safety.

3.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Consideration of the characteristics of the proposed development allows for a projection of the 'level of impact' on any particular aspect of the proposed environment that could arise. For this chapter the potential impact on Populations and Human Health is discussed.

A full description of the proposed development is provided in Section 2 of this EIAR document. In summary, the proposed development consists of the construction of a mixed-use development comprising 594 no. apartments, c. 5,195 sqm of office floorspace, 4 no. retail units, a creche and urban square in the Clonburris Urban Centre Development Area (CUCS3) of the Clonburris SDZ Planning Scheme 2019 extending to c. 3.96 hectares.

Based on the mix and potential occupancy the proposal could potentially result in a population of c. 1,262 when fully built and occupied (based on 1.5 persons per 1 bedroom apartment, 2.5 persons per 2 bed apartment and 3.5 persons per 3 bed apartment).

3.2 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

3.2.1 Introduction

This section provides a description of the specific, direct and indirect, impacts that the proposed development may have during both the construction and operational phases of the proposed development. As stated, guidance documents from the EPA and the Department outline that the assessment of impacts on population and human health should focus on health issues and environmental hazards arising from the other environmental factors and does not require a wider consideration of human health effects which do not relate to the factors identified in the EIA Directive. Additionally, this section addresses the socio-economic and employment impacts of the proposed development.

The specific chapters of the EIAR (4-15) assess the environmental topics outlined in the EIA Directive.

3.2.2 Water

3.2.2.1 Construction Phase

Provision of water infrastructure for the proposed development would involve construction activities within the subject lands mainly involving trench excavations conducted in parallel with the other services. The potential impact on the local public water supply network would be short term and imperceptible. Therefore, the impact on human health and population in this regard is considered to be not significant.

During the course of the construction phase of the proposed development, there is potential, in the absence of mitigation, for surface water runoff to suffer from increased levels of silt or other pollutants, in addition to potential pollution from spillages, wheel washing and water from trucks on site. The Preliminary Construction and Environmental Management Plan, and the Resource Waste Management Plan (RWMP) included with the application, set out how all materials will be managed, stored and disposed of in an appropriate manner, mitigating the potential negative effects as outlined.

Potential impact on water is addressed in Chapter 6 (Water) and a number of mitigation measures are outlined in that chapter of this Environmental Impact Assessment Report. These mitigation measures will serve to minimise potential adverse impacts of the construction phase to the water environment, thereby minimising any associated risk to human health from water contamination. Therefore, the impact of construction of the proposed development in relation to water is likely to be short-term and imperceptible with respect to human health.

3.2.2.2 Operational Phase

All new foul drainage lines will be constructed in accordance with Irish Water Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational. The design of proposed site levels (roads, buildings etc.) has been carried out in such a way as to replicate existing surface gradients where possible, therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as part of the greater SDZ as outlined in the SWMP prepared for the overall Clonburris SDZ. Surface water discharge rates will be controlled by a Hydrobrake flow control device in conjunction with attenuation storage.

SuDS features such as swales and filter drains to provide additional storage and promote infiltration of and treatment of surface water run-off have been provided in landscaped areas.

All new surface water drainage on site will be pressure tested and will have a CCTV survey carried out prior to being made operational. The site is attenuated to mimic the greenfield scenario as part of the overall Clonburris SDZ.

3.2.3 Noise And Vibration

3.2.3.1 Construction Phase

Noise and Vibration are addressed in Chapter 8 (Noise and Vibration) which was prepared by Byrne Environmental.

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site, and construction traffic, which will all generate noise. The highest noise levels will be generated during the general construction activities and during rock excavation. The construction noise levels will only occur during daytime hours which will serve to minimise the noise impacts at local existing receptors over the course of the construction phase.

Chapter 8 of this EIAR sets out mitigation measures in relation to noise.

Any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Chapter 8. Following the implementation of mitigation and based on the standards which will be maintained, Chapter 8 predicts that vibration impacts during the construction stage will be negative, not significant, and temporary.

3.2.3.2 Operational Phase

Once operational, if building services plant items are required to serve the development, the cumulative operational noise level at the nearest noise sensitive location within the development (e.g. apartments, etc.) will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods.

The residual construction noise impact will be negative, temporary to short-term and moderate to significant.

3.2.4 Air Quality & Climate

3.2.4.1 Construction Phase

During the construction phase, site clearance and ground excavation works have the potential to generate dust emissions rising from the operation and movement of machinery on site. This could have a potential impact on population and human health.

Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, human health and climate. However, the potential construction phase impacts shall be mitigated as detailed above to ensure there is no adverse impact on ambient air quality for the duration of all construction phase works. It is predicted that the construction phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or on local human health or on the local micro-climate or the wider macro-climate.

The predicted construction phase residual impacts on air quality will be negative, slight and short-term.

The predicted residual operational phase impacts on air quality and climate will be negative, imperceptible and long-term.

3.2.4.2 Operational Phase

The operational phase of the proposed development will result in a slight impact on local air quality primarily as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

It is predicted that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health, as stated in Chapter 9 – Air Quality and Climate.

3.2.5 Landscape & Visual Impact

3.2.5.1 Construction Phase

The construction phase will have short term landscape and visual impacts. The impacts are not considered significant on population and human health.

3.2.5.2 Operational Phase

The operational phase will result in landscape and visual impacts, as set out in Volume II of this EIAR. The impacts are not considered significant on population and human health.

3.2.6 Economic Activity

3.2.6.1 Construction Phase

The construction phase of the proposed development is likely to result in a positive net improvement in economic activity in the area of the proposed development site, particularly in the construction sector and in associated and secondary building services industries. The sector has grown strongly in recent years and this development will help to further enhance growth and reduce the increasing pressure on the housing market. Given the short term negative economic impact of COVID-19, this development will help to sustain and promote employment, and short term slight positive impacts.

It is further noted that due to the scale and extent of the overall Cairn landbank that it is likely that construction teams will carry on from tile to tile creating sustainable employment over the medium term. Cairn are examining the potential to undertake an apprentice scheme aimed at disadvantaged students of the wider area.

The construction of the development and all associated infrastructure will precipitate a short term slight positive impact on construction-related employment for the duration of the construction phase. The phased construction of the proposed residential units, open space, and a childcare facility alongside associated physical infrastructure will result in a construction period over an approximate 24-48 month timeline and will consequently enhance economic activity during this period, which is considered to be a slight temporary positive impact. A considerable amount of the work will be undertaken by sub-contractors who will also work elsewhere on a phased basis over the construction phase.

The construction phase will also have secondary and indirect 'spin-off' impacts on ancillary support services in the wider area of the site, such as retail services, together with wider benefits in the aggregate extraction (quarry) sector, building supply services, professional and technical professions etc. These beneficial not significant positive 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.

3.2.6.2 Operational Phase

The operational phase of the proposed development will result in the provision of 594 residential units, c. 5,195 sqm of employment floorspace, a creche and 4 no. retail units. This has the potential to provide accommodation for approximately 1,262 persons, based upon the average occupancy rate per apartment typology (based on 1.5 persons per 1 bedroom apartment, 2.5 persons per 2 bed apartment and 3.5 persons per 3 bed apartment). This increase in occupancy in the area will enhance local spending power and will assist with the delivery of a critical mass of population which will support a wide range of additional local businesses, services, transport infrastructure and employment opportunities, which will accrue as the development of the Planning Scheme progresses. The proposal will provide much needed residential accommodation and accords with National Policy on delivering Sustainable Residential Communities and is considered a positive permanent slight impact.

3.2.7 Social Patterns

3.2.7.1 Construction Phase

The construction phase of the proposed development is unlikely to have any significant impact on social patterns within the surrounding area. Some temporary additional local populations may arise out of construction activity. However, these impacts are imperceptible, temporary in nature and therefore not considered significant.

It is acknowledged that the construction phase of the project may have some short-term negative impacts on local businesses and residents. Such impacts are likely to be associated with construction traffic and possible nuisances associated with construction access requirements. These impacts are dealt with separately and assessed elsewhere in the EIA, including Chapter 2 - Project Description and Alternatives Examined, Chapter 10 - Air Quality and Climate and Chapter 11 - Noise and Vibration. Any disturbance is predicted to be commensurate with the normal disturbance associated with the construction industry where a site is efficiently and properly managed having regard to neighbouring activities. The construction methods employed, and the hours of construction proposed will be designed to minimise potential impacts to nearby residents. A Preliminary Construction Environmental Management Plan (prepared by DBFL) has been prepared and is submitted with this planning application. The mitigation contained in Chapter 16 of this EIA and CMP will be contained in the contractor's CEMP/CMP.

3.2.7.2 Operational Phase

The addition of new residents and an additional employment to the area will improve the vibrancy and vitality of the area and will help to support existing community and social infrastructure. This is an imperceptible positive long term impact.

The proposed development includes the provision of a childcare facility with a GFA of 600 sq.m. This childcare facility will accommodate the likely demand arising from the proposed development.

Once operational, the proposed development will give rise to much needed additional residential accommodation. Residents will spend a portion of their income locally which would not happen without the proposed development. The creche and employment hub will provide some employment opportunities in the operational phase of the development.

The proposal includes an element of Part V provision in accordance with the requirements of the Planning Authority, which will provide for an enhanced mix of tenures, and add to the existing social housing stock. The overall benefit to the social patterns of the surrounding area resulting from the development can be considered slight, long term, and positive.

Having regard to the fact that the area within which the development is situated benefits from a good level of social and community infrastructure and noting the elements of the proposed development which will improve and strengthen this infrastructure, it is concluded that the proposed development will precipitate a slight positive, long-term impact on social patterns in the operational phase.

3.2.8 Land-Use & Settlement Patterns

3.2.8.1 Construction Phase

The construction phase of the proposed development will primarily consist of site clearing, excavation and construction works, and the erection of the proposed new buildings on site and has the potential to impact adversely and result in the temporary degradation of the local visual environment on a short-term basis. The visual impacts precipitated by the proposed development are assessed in greater detail in Chapter 9 of the EIA 'Landscape and Visual Impacts'.

Secondary land use impacts include off-site quarry activity and appropriate disposal sites for removed spoil and other materials transported off site. Chapter 11 Material Assets Waste considers these potential impacts in more detail and Chapter 11 (as well as the Construction and Demolition Waste Management Plan) describes the relevant mitigation measures).

The phase may result in a marginally increased population in the wider area due to increased construction employment in the area, however, this would be temporary in nature and the impact would be imperceptible.

3.2.8.2 Operational Phase

The operational phase of the proposed development will result in the introduction of a sustainable density of residential development, delivering wider public realm improvements, in accordance with national and local planning policy objectives which seeks to deliver compact growth at suitable locations. Adequate provision of high-quality housing to serve the existing and future population of the county and the wider Greater Dublin Area is an important contributor to the establishment and maintenance of good human / public health. The high-quality design of the proposed development, will contribute to a positive impact on the wellbeing of future residents.

3.2.9 Housing

3.2.9.1 Construction Phase

The proposed development will not result in any impact in terms of loss of housing stock during the construction stage.

3.2.9.2 Operational Phase

The operational phase of the proposed development will see the delivery of 594 residential units, in a range of housing typologies (houses, apartments, duplex apartments).

The proposed development will respond to established housing need and demand in the area of the proposed development, and the wider region. The proposed residential units will assist in addressing the significant shortfall of residential development, which has been further impacted by the COVID-19 crisis.

The proposed development delivers a range of housing unit sizes and types, including one-, two-, and three-bedroom apartments. The scheme also benefits from a high level of good quality public open space through the provision of a new large, green public urban square and new linkages provided through the site.

The delivery of 594 no. well-designed high-quality residential units at an appropriate location close to public transport links will have a direct, positive, and significant impact on the future residents of the proposed development and will support the population growth targeted for the South County Dublin area and Dublin City.

3.2.10 Employment

The impact of the proposed development in relation to employment has been discussed under economic activity.

3.2.11 Health & Safety

The surrounding context consists of a mix of residential, employment, retail and recreational lands. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which might result in a risk to human health and safety. It is not within the consultation zone of a SEVESO Site as defined by the Health and Safety Authority. Chapter 14 – Risk Management addresses the potential health and safety aspects of the proposed development during the construction and operational phases.

In the absence of mitigation, the proposed development could have a slight negative, short-term impact on the surrounding area during construction phase due to traffic and associated nuisance, dust and noise. These issues and appropriate mitigation measures are addressed in Chapters 7, 8 and 12 of the EIAR, in the Traffic and Transportation Assessment, Construction Management Plan and the Waste Management Plan which accompany the application. The Traffic and Transportation Chapter recommends that a Construction Traffic Management Plan be implemented for the site which will minimise disruption to the surrounding road network, which will be submitted and agreed with the Planning Authority.

No significant health and safety effects are envisaged during either the construction or operational phases of the proposed development. The standard Health and Safety policy, procedures and work practices of the proposed development will conform to all relevant health and safety legislation both during the construction and operational stages of the proposed development. The proposed development will be designed and constructed to best industry standards, with an emphasis being placed on the health and safety of employees, local residents and the community at large.

3.2.11.1 Construction Phase

The construction methods employed and the hours of work proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced. A Preliminary Construction Management Plan has been prepared by DBFL Consulting Engineers, included with the application and the measures specified therein will be complied with during the construction phase of the project.

3.2.11.2 Operational Phase

The operational stage of the development will not precipitate long term negative impacts in terms of health and safety. The design of the proposed development has been formulated to provide for a safe environment for future residents and visitors alike. The paths, roadways and public areas have all been designed in accordance with best practice and the applicable guidelines including DMURS. Likewise, the proposed residential units and childcare facility accord with the relevant guidelines and will meet all relevant safety and building standards and regulations, ensuring a development which promotes a high standard of health and safety for all occupants and visitors.

The Air Quality Chapter (Ch 7) of the EIAR predicts that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health and that there will be a negligible impact on local air quality generated by increased traffic movements associated with the development.

The proposed development will not cause significant impacts on human health and safety once completed and operational and any impact will be imperceptible, and unlikely.

3.2.12 Risk of Major Accidents Or Disasters

Chapter 14 – Risk Management addresses the potential risks of major accidents or disasters relating to the proposed development during the construction and operational phases.

3.2.13 Construction Phase

The location of the proposed development is within Flood Zone C and it is unlikely there will be any impacts related to a major accident or disaster during the construction phase of the proposed development, stemming internally from within the development, or externally.

The works proposed in proximity to roadways will be governed by best practice and appropriate safety procedures, ameliorating any risk of a major accident in those contexts.

3.2.14 Operational Stage

The proposed development will be located on land which is not at any significant risk of flooding. The Eastern CFRAM (Catchment Flood Risk Assessment and Management) study details the predicted risk for a variety of fluvial and coastal flood scenarios. The mapping does not include the watercourse reaches affected by the proposed scheme and only maps downstream flooding. The proposed development is therefore outside of the Q100 and Q1000 flood extents and is therefore in within Flood Zone C (low risk of flooding). The proposed development is appropriate for the application site's flood zone categories and that the proposed development is considered to have the required level of flood protection.

Therefore, it is considered that there is no likely significant risk related to major accidents or disasters, external or internal, man-made or natural in respect of the proposed development.

3.3 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts of the proposed development on population and human health have been considered in conjunction with the ongoing changes in the surrounding area. Visits to the subject site and surrounding area and desk-based review of online planning files have been undertaken to identify the existing pattern of development, nearby uses, and any permitted / ongoing developments of relevance to the current proposals in the context of population and human health. The surrounding area is defined by a broad and varied mix of uses, including residential, commercial, recreational and civic uses.

The lands on which the proposed development is to take place have been zoned under the South Dublin County Council Development Plan 2022-2028 *“To provide for strategic development in accordance with approved planning*

schemes” and in the case for the subject lands for substantial residential development under the approved Clonburris Planning Scheme 2019, which envisages a c. 1,938 dwelling target for the Clonburris Urban Centre and a c. 1,441 dwelling target for the Clonburris South West Development Area (within which the subject lands are located). This zoning and the associated approved Planning Scheme within the entire SDZ lands will see more development to the west of the subject lands. The permitted Roads and Drainage Infrastructure works application (SDZ20A/0021), provides the infrastructure in the southern portion of the Planning Scheme, which the proposed development will utilise and connect to, similar to the permitted and proposed schemes at Tile 1 (SDCC Reg Ref. SDZ21A/0022) to the south and Tile 3 (SDZ22A/0017) to the west.

The development of the Planning Scheme will influence demographic change, population growth, and the intensity of commercial use in this area, cumulatively contributing to increasing population and employment growth in the wider area which represents a positive cumulative impact which accords with the planning policy context for the area.

An increase in local housing, and some increase in employment opportunities and service provision (crèche, retail and employment) has the potential to generate direct, indirect impacts. The visual appearance of the landscape will be altered with the introduction of the proposed built elements including infrastructure, in cumulation with other development in the area. Implementation of the remedial and reductive measures in respect of noise/traffic management etc. in the EIAR would ensure a minimal impact on the existing communities of this area during the construction phase.

The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. This will have a moderate positive long-term impact on the population in the immediate area of the SDZ, and a slight positive long term impact in the wider area of Clondalkin.

- Other projects in the wider Clonburris SDZ comprise:
 - SDZ21A/0022 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.
 - SD228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
 - SD228/0003 Part 8 Development 263 no. units within Kishogue South West
 - SDZ22A/0010 – 294 dwellings, creche and retail unit
 - SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements.
 - SDZ21A/0006 - Wastewater pumping station
 - Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)

Chapter 7 (Air Quality) states that the operational phases of the subject development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and national published air quality data confirm that the existing air quality is good and that the operational phases of the subject development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

Chapter 8 (Noise and Vibration) states that once the subject development is completed and if the lands to the east and west are developed there will be no residual adverse noise impact on the receiving environment associated with their operation. Increased traffic movements associated with both developments will generate a long-term not significant impact on the local noise climate during peak hour times.

The overall cumulative impact of the proposed development will therefore be long term and positive as residents will benefit from a high quality, visually attractive living environment, with strong links and pedestrian permeability. Having regard to the assessment of cumulative impacts, it is not considered that any additional mitigation measures are required further to those which are outlined above.

3.4 ‘DO NOTHING’ IMPACT

In order to provide a qualitative and equitable assessment of the proposed development, this section considers the proposed development in the context of the likely impacts upon the receiving environment should the proposed development not take place.

A 'do nothing' scenario would result in the subject lands remaining fallow and undeveloped. This would be an underutilisation of the subject site from a sustainable planning and development perspective, also noting the lands being designated as a Strategic Development Zone.

In the do-nothing scenario, the absence of the proposed development would perpetuate the housing shortfall in the Dublin area, contrary to the aims and objectives of national, regional, and local planning and housing policy, all of which promote the delivery of additional housing at strategic locations such as the subject site.

The local economy would not experience the direct and indirect positive effects of the construction phase of development, including employment creation. The local construction sector and associated industries and services would be less viable than they might otherwise be.

The 'do-nothing' scenario would result in the status of the environmental receptors described throughout this EIAR document remaining unchanged. The potential for any likely and significant adverse environmental impacts arising from both the construction and operational phases of the proposed development would not arise. In terms of the likely evolution without implementation of the project as regards natural changes from the baseline scenario, it is considered there would be limited neutral change from the baseline scenario in relation to population (human beings) and human health.

3.5 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts.

3.5.1 Construction Phase

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. These remedial and mitigation measures are likely to result in any significant and likely adverse environmental impacts on population and human health during the construction phases being avoided. Readers are directed to Chapter 16 of this EIAR document which summarises all of the remedial and mitigation measures proposed as a result of this EIAR.

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Environment Management Plan will be submitted by the contractor and implemented during the construction phase. The content of the CEMP will be based on the mitigation set out in this EIAR.

With reference to the construction phase of the proposed development, the objectives of the Resource Waste Management Plan prepared by Byrne Environmental Consulting Ltd (and also Chapter 11 of the EIAR) is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 - 2013 are complied with.

3.5.2 Operational Phase

The operational phase is considered to have likely positive impacts on population in relation to the provision of additional residential units, open space, childcare provision, to cater for the demands of a growing population in accordance with the residential zoning objectives pertaining to the subject site.

During the operational phase of the development the design of the scheme has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

For the operational phase, no further specific mitigation is required having regard to the mitigation included within the other chapters of this EIAR.

3.6 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section provides a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied. It should be noted that in addition to remedial and mitigation measures, impact avoidance measures have also been built in to

the EIAR and project design processes through the assessment of alternatives described in Chapter 2 of this EIAR document. Impact interactions are considered further in Chapter 15.

There are numerous inter-related environmental topics described throughout this EIAR document which are also of relevance to Population and Human Health. For detailed reference to the residual impacts of particular environmental topics please refer to the relevant corresponding chapter of the EIAR (land and soils, water and hydrology, air quality and climate, noise and vibration, traffic, and risk management).

3.6.1 Construction Phase

The construction phase of the proposed development will primarily consist of site clearance, excavation and construction works, which will be largely confined to the proposed development site (including haul routes). Notwithstanding the implementation of remedial and mitigation measures there will be some minor temporary residual impacts on population (human beings) and human health most likely with respect to nuisance caused by construction activities, predominantly related to noise and traffic as detailed in chapters, 8 and 10.

It is anticipated that subject to the careful implementation of the remedial and mitigation measures proposed throughout this EIAR document, and as controlled through the Construction and Environmental Management Plan any adverse likely and significant environmental impacts will be avoided. The overall predicted likely impact of the construction phase will be short-term not significant, and neutral. A CEMP (with the mitigation contained in this EIAR) will be developed by the contractor and submitted to the Local Authority.

Imperceptible, positive short-term impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development.

3.6.2 Operational Phase

The proposed development will result in a generally positive alteration to the existing undeveloped site in terms of the provision of residential, retail and office units to serve the growing residential and working population of the area in accordance with the objectives of the South Dublin County Council Development Plan and the Clonburris Planning Scheme 2019. Positive impacts on population and human health will include health benefits associated with the provision of a significant quantity of open space, pedestrian and cyclist/green routes, a highly permeable layout which will connect to adjacent development areas within the Planning Scheme. The provision of creche and employment facilities on site enhances the quality of the development and helps to create sustainable communities.

The implementation of the range of remedial and mitigation measures included throughout this EIAR document is likely to have the impact of limiting any adverse significant and likely environmental impacts of the operational phase of the proposed development on population and human health (as set out in relevant chapters land and soils, water and hydrology, air quality and climate, noise and vibration, traffic, and risk management).

This chapter of the EIAR has provided an assessment of the likely impact of the proposed development on population and human health. As set out above, the proposed development will result in a long-term positive impact on housing and is not likely to result in any significant negative effects on population and human health, and will result in some other positive impacts, including settlement patterns of a sustainable density at an appropriate location and economic benefits derived from the employment opportunities within childcare facility and employment hub proposed. Through generating additional economic activity in the area, and providing for a high standard of residential accommodation, there will be a slight positive impact arising from the proposed development in the short-term (for economic activity) and in the long term for residential accommodation.

3.6.3 Cumulative

The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. This will have a moderate positive long-term impact on the population in the immediate area of the SDZ, and a slight positive long term impact in the wider area of Clondalkin.

Chapter 7 (Air Quality) states that the operational phases of the subject development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and National published air quality data confirm that the existing air

quality is good and that the operational phases of the subject development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

Chapter 8 (Noise and Vibration) states that the cumulative noise and vibration impacts associated with the proposed development and future local developments will not result in an increased impact on the closest receptors to the proposed development site.

There is a possibility that multiple developments in the Planning Scheme area could run concurrently or overlap in the construction phase and contribute to additional impacts in terms of traffic, dust and noise. However, the mitigation measures highlighted above and included in the individual chapters of this EIAR, along with the fact that any other significant construction project in the Planning Scheme would also require an EIAR and inclusion of mitigation measures to reduce the cumulative impacts to sensitive receptors in the area. The construction phase of the proposed development together with any relevant other planned or permitted developments would have a positive impact in terms of employment. Contractors for the proposed development would be required to operate in compliance with a project-specific CMP and CTMP, which will include mitigation measures outlined in this EIAR. It is considered that there would be no cumulative effects on human health. The mitigation contained in Chapter 16 of this EIAR and CMP will be contained in the contractor's CEMP/CMP.

3.6.4 'Worst-case' Scenario

The failure of the proposed development to proceed will mean that there would be no resulting new housing or local employment generated. However, failure of the proposed development to proceed or failure of any proposed mitigation measures, will not lead to any profound, irreversible or life-threatening consequences. In these circumstances no further consideration of this scenario is necessary in respect of health, community, employment or population issues.

3.7 MONITORING

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in this EIAR in regard to the other environmental topics such as water, air quality and climate and noise and vibration sufficiently address monitoring requirements.

3.8 REINSTATEMENT

While not applicable to every aspect of the environment considered within the EIAR, certain measures may be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.

There are no reinstatement works proposed specifically with respect to population and human health.

3.9 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant particular difficulties were experienced in compiling this chapter of this EIAR document.

4.0 BIODIVERSITY

4.1 INTRODUCTION

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 avoid, 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, as well as any role they may play in providing a supporting network for European Sites and their QIs and SCIs. These include species and habitats with national and international protection under the Wildlife Acts 1976-2021 and the EU Habitats Directive 92/43/EEC. The full description of the Proposed Development is provided in Chapter 2 of this EIAR.

The chapter is structured as follows:

- 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.
- This is followed by an Assessment of Effects which are described with regard to each phase of the Proposed Development: construction phase, operational phase and decommissioning phase. 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 defines terms utilised in this chapter:

- Where the 'Proposed Development' is referred to, this relates to all the project components described in detail in Chapter 2 of this EIAR.
- Where 'the Site' is referred to, this relates to the lands as delineated by the Tile 2 Site Boundary in red as shown on Figure 4.1.
- "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 Impact" (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.

4.2 REQUIREMENTS FOR ECOLOGICAL IMPACT ASSESSMENT

4.2.1 European Legislation

The EU Habitats Directive (92/43/EEC) (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 *inter alia* through Part XAB of the Planning and Development Act 2000 (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 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) has been specifically assessed in this EIAR.

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).

4.2.2 National Legislation

The Wildlife Act, 1976–2021, 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. The Appropriate Assessment (“AA”) process, or screening for same, under Part XAB of the Planning Acts therefore does not apply to NHAs or pNHAs. pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated⁹ 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 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).

4.2.3 National Policy

The National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2017) (the “**Plan**”) and the forthcoming draft National Biodiversity Action Plan 2023 – 2027 demonstrate 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.

Relevant national policies have informed the evaluation of ecological features recorded within the EIAR Site Boundary and the ecological assessment process.

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. As per EPA Guidance 2022, “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”. However, the relevant conclusions of the AA Screening Report has been cross-referenced and incorporated.

⁹ <https://www.npws.ie/protected-sites/nha> (accessed 06 December 2022).

4.3 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, Coastal and Marine (CIEEM, 2018) (amended 2019).
- Draft Revised guidelines on the information to be contained in Environmental Impact Statements (EPA, 2017).
- Environmental Impact Assessment of National Road Schemes –A Practical Guide (NRA, 2009).
- Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
- Environmental Assessment and Construction Guidelines (NRA, 2006).

The preparation of the EIAR has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Chapter 1 of the EIAR.

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. 327 of 2012 - European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2012; S.I. No. 386 of 2015 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015; 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 Act 2000 (as amended).

The following legislation applies with respect to non-native species:

- Regulation 49 and 50 of European Communities (Birds and Natural Habitats) (Amendment) Regulations 2021 (SI 293 of 2021)

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

- South Dublin County Council Development Plan 2022-2028
- Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031 (RSES)
- National Biodiversity Action Plan 2017-2021
- Clonburris Strategic Development Zone Planning Scheme 2019

4.4 STATEMENT OF AUTHORITY

This EIAR chapter has been prepared by Patrick Ellison (B.Sc., M.Sc. ACIEEM). Patrick has over 6 years' professional ecological consultancy experience and is an Associate member of the Chartered Institute of Ecology and Environmental Management. The baseline ecological surveys were undertaken by Patrick Ellison and Pat Roberts (B.Sc., MCIEEM). Pat has over 10 years' experience in ecological management and assessment.

Detailed bat surveys and assessment of the site were carried out between 2018 - 2021 within the wider SDZ lands and in June 2022 by Dr Tina Aughney of Bat Eco Services (see Appendix C 1 Volume III of this EIAR – Bat Assessment). Dr Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement (NPWS licence DER/BAT 2019-138 (Survey licence, expires 29th March 2022)). All analysis and reporting has been completed by

Dr Tina Aughney. Data collected and surveying is completed with the assistance of a trained field assistant, Mr. Shaun Boyle (NPWS licence DER/BAT 2021-19 ()).

Wintering bird surveys, barn owl surveys and breeding bird and raptor surveys within the Clonburris SDZ lands were carried out by André Robinson (independent ornithologist) and Emmi Virkki for Scott Cawley between 2020 and 2021 (see Appendix C 2 and Appendix C 3 Volume III of this EIAR for the Wintering Bird Survey and Barn Owl Survey reports respectively. Breeding bird survey results were reported within the EIAR Biodiversity Chapter for the Clonburris Infrastructure application (SDZ20A/0021).

Additional badger/mammal and non-avian fauna surveys were carried out within the Clonburris SDZ lands on 16th August 2020, the 22nd and 23rd of March 2021 and 6th and 7th April by Dr. Chris Smal B. Sc. Ph. D. (MIEEM) (see Appendix C 4 Volume III of this EIAR).

4.5 METHODOLOGY

The following sections describe the methodologies followed to establish the baseline ecological condition of the Proposed Development site and all lands within the EIAR Site Boundary. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

4.5.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available ecological data including the following:

- Review of NPWS Article 17 maps 2019, 2013 and 2007.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI).
- Inland Fisheries Ireland (IFI) Reports, where available.
- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes¹⁰.
- Review of relevant Plans, including the National Biodiversity Action Plan 2017-2021, County Biodiversity Plan and the All Ireland Pollinator Plan 2021-2025.
- Review of the Bat Conservation Ireland (BCI) Private Database.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- Records from the NPWS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the 10km hectad in which the Proposed Development is located.
- Potential for cumulative effects have been considered in Chapter 2 of this EIAR and Section 4.12 of this Chapter. This was informed by a review of the EIARs prepared for other plans and projects occurring in the wider area.

4.5.2 Field Surveys

A comprehensive survey of the biodiversity within the EIAR Site Boundary was undertaken on the 24th June 2022 by MKO as part of a multidisciplinary ecological walkover survey. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed. A comprehensive walkover of the entire site was completed.

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for badger setts and areas of suitable habitat, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur within the vicinity of the Proposed Development (e.g. otter etc.). In addition, an inventory of other species of local biodiversity interest was compiled including invertebrates (e.g. butterflies, dragonflies, damselflies, beetles), plants, fungi etc.

¹⁰ NPWS, 2019, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>, Accessed: 15/04/2021.

The multi-disciplinary walkover survey comprehensively covered the lands within the Site boundary and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. These surveys were carried out in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009).

The survey design and methodologies was derived from the following best practice guidance documents:

- TII 'Guidelines for the Assessment of Ecological Impacts of National Road Schemes'.
- Department of Environment, Heritage & Local Government 'Appropriate Assessment of Plans and Projects in Ireland'.
- TII 'Guidelines for the Treatment of Bats during the Construction of National Road Schemes'.
- TII 'Guidelines for the Treatment of Otters prior to the construction of National Road Schemes'.
- TII 'Guidelines for the Treatment of Badgers prior to the construction of National Road Schemes'.
- TII 'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes'.
- TII 'Environmental Impact Assessment of National Road Schemes – A Practical Guide'.
- TII 'Guidance for the Protection and Preservation of Trees, Hedgerows and Scrub prior to during and post construction of National Road Schemes'.
- NRA guidance document - Guidelines on management of noxious weeds and non-native invasive plant species on national roads. National Roads Authority (NRA, 2010).

The survey was devised to detect the potential presence of protected species with an emphasis on rare and protected flora, terrestrial mammals, birds and potential habitat features that may potentially support protected species such as reptiles, amphibians, invertebrates and aquatic species. Where encountered, features of key ecological interest were recorded using a handheld GPS (Global Positioning Satellite) device and written notes will be logged using standard recording sheets. A photographic record of geo-referenced images will be taken from the site of all features of interest and as examples of each habitat type, any areas of particular ecological sensitivity and evidence of mammal, bat or bird activity and any examples of other taxa, where possible.

Habitats were classified in accordance with the national habitat classification system used in Ireland - *A Guide to Habitats in Ireland* (Fossitt 2000).

Vegetation (there are no existing buildings within the T2 Site) within the Site were assessed for suitability and signs of use by nesting birds, and incidental sightings of birds seen and heard during the walkover were recorded. The potential of the site to support Annex I or other species of conservation concern was considered as part of the impact assessment.

A badger survey was conducted to determine the presence or absence of badger signs within and outside (areas of identified suitable habitat) the study area. This involved a search for all potential Badger signs as per NRA (2009) (latrines, badger paths and setts).

A detailed search for otter signs e.g., spraints, prints, slides, trails, couches and holts was carried out along watercourses within the Site. All signs of mammal found were noted during the course of the walkover survey.

During the walkover survey landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.) (Collins, 2016). Table 4.1 of the 2016 BCT Guidelines identifies a grading protocol for assessing structures, trees and commuting/foraging habitat for bats. The protocol is divided into four Suitability Categories: *High, Moderate, Low and Negligible*.

The survey had regard to the potential presence of problematic invasive alien species with an emphasis on those species listed on the 'Third Schedule' of Regulations 49 & 50 of the Birds and Natural Habitats Regulations 2011.

Due to the nature of the receiving habitats on site and the nature of the proposed works, a full and comprehensive survey, commensurate with the nature and scale of the works, was achieved.

4.5.2.1 Bats

Detailed bat survey of the site comprised daytime inspections, tree inspections, bat habitat and commuting route mapping, night-time bat detector surveys and (dusk walked transect surveys and passive static bat detector surveys).

Surveys were carried out between 2018-2021 in addition to the 2022 survey work. During 2022, a passive static detector survey at the site was carried out between the 6th and 12th June, with a manned dusk bat survey carried out on the 6th and 7th June.

The full detailed methodology for the bat surveys is provided in Section 2 of the Bat Assessment report (Appendix C 1 Volume III of this EIAR).

4.5.2.2 Birds

Wintering bird surveys, barn owl surveys and breeding bird and raptor surveys within the Clonburris SDZ lands were carried out by Scott Cawley between 2020 and 2021. Full methodologies for the wintering bird and barn owl surveys are provided in the detailed survey reports included as Appendix C 2 and Appendix C 3 Volume III of this EIAR).

Dates and personnel for the bird surveys are provided in Table 4-1 below.

Table 4.1 – Bird survey dates

Survey Type	Surveyors	Survey Dates
Wintering Bird Surveys (Appendix C 2 Volume III of this EIAR)	André Robinson (independent ornithologist). Emmi Virkki of Scott Cawley Ltd.	04/09/2020 15/06/2021 14/11/2021
Breeding Bird Surveys (reported within the EIAR Biodiversity Chapter for Clonburris Infrastructure - SDZ20A/0021)	André Robinson (independent ornithologist). Emmi Virkki of Scott Cawley Ltd.	27/06/2020 30/06/2020
Barn Owl Survey (see Appendix C3 Volume III of this EIAR)	André Robinson (independent ornithologist). Emmi Virkki of Scott Cawley Ltd.	12/11/2020 01/02/2021 02/02/2021 18/06/2021

4.5.3 Methodology for Assessment of Impacts and Effects

4.1.1.1 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 and ecological site survey; “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 1976-2021.
- Species protected under the Flora Protection Order 2015.

Relating to the strict protection of Annex IV animal species, the site was judged to be potentially suitable for bats. Further detailed survey effort for these species has been carried out as required¹¹ and where potential of significant effects on these species was identified they have been classified as Key Ecological Receptors (see below) for the purposes of impact assessment.

4.1.1.2 Determining Importance of Ecological Receptors

¹¹ Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public authority. NPWS 2021.

The importance of the ecological features identified within the survey 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:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

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 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.

4.1.1.3 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 2022). 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.

4.1.1.4 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 (EiA), ‘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, 2022) 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 (2022) as shown in Table 4-2.

Table 4.2 – Criteria for determining significance of effect, based on (EPA, 2022) guidelines

Effect Magnitude	Definition
Imperceptible effect	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound effects	An effect which obliterates sensitive characteristics.

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, that 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.

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).

4.1.1.5 Incorporation of Mitigation

Section 4.8 of this EIAR 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 has been incorporated into the project design or layout to address such impacts. The implemented mitigation measures seeks to avoid or where avoidance is not possible to reduce or offset potentially significant residual effects, post mitigation. The mitigation measures proposed are judged to be appropriate and adequate to remove the potential for significant effects on ecological receptors assuming their full implementation.

4.6 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

4.6.1 Establishing the Ecological Baseline

4.6.1.1 Desk Study

The following sections describe the results of a survey of published material that 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 (see Bibliography).

Designated Sites

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 Ecological Impact Assessment.

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'.

Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this EIAR chapter.

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 EIAR chapter.

Nationally designated sites that are also designated as European Sites have been assessed as those designations within the Appropriate Assessment Screening Report and NIS, with the relevant conclusions are recorded and referenced in this chapter.

In relation to European sites, separate documentation has been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment screening for the Proposed Development in compliance with Article 6(3) of the Habitats Directive. The potential for significant effects on European Sites and adverse impacts on the integrity of European Sites is fully assessed within the AA Screening Report (AASR) and Natura Impact Statement (NIS), respectively, that accompanies this application.

As per the aforementioned EPA Guidance (2022), “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”. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Section 6.7.2 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

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 01/09/2022. The datasets were utilised to identify Designated Sites which could feasibly be affected by the Proposed Development.
- Potential for connectivity with European or Nationally designated sites from the Proposed Development was considered in this initial assessment using the source-pathway-receptor model.
- A map of all the European Sites within the potential likely zone of influence is provided in Figure 4.1 with all Nationally designated sites shown in Figure 4.2.
- Table 4.2 provides details of all relevant designated sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. All European Designated Sites are fully described and assessed in light of their specific conservation objectives within the Screening for Appropriate Assessment and Natura Impact Statement reports 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 24/08/2022.

Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Influence and further assessment is required.

Figure 4.1 – European Sites within 15km

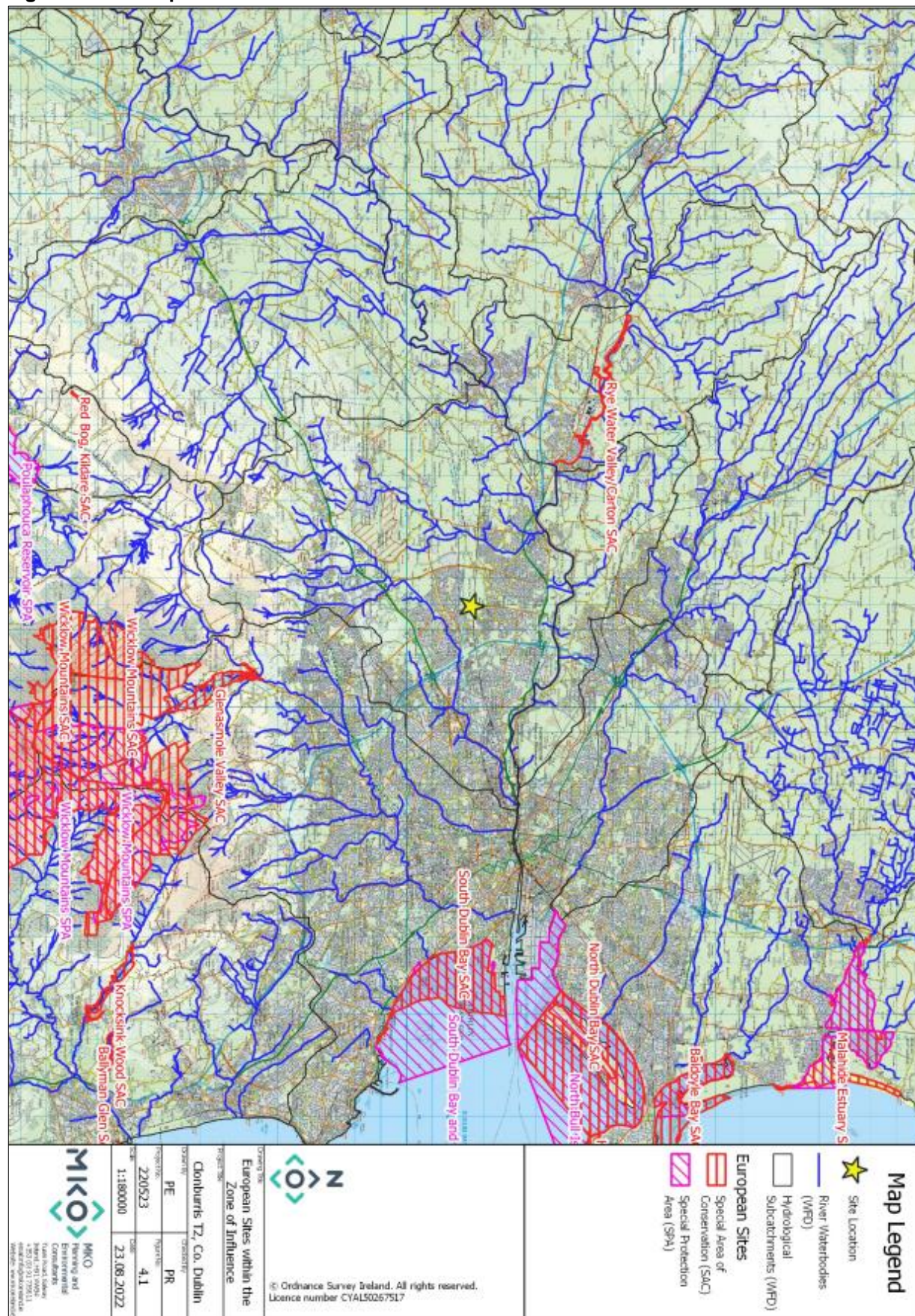


Figure 4.2 – Nationally designated sites within 15km



Table 4.3 – Designated sites within the potential Likely Zone of Influence

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
Special Area of Conservation		
Rye Water Valley/Carton SAC [001398]	6.3km	<p>There will be no direct effects on the SAC or its QIs as it is located entirely outside of the footprint of the proposed developmental site.</p> <p>Due to the intervening distance and the nature and the scale of the proposed works, no potential source-pathway-receptor chain has been identified on the terrestrial QI species for which the SAC has been designated.</p> <p>No potential hydrological connectivity exists from the site of the proposed development to the SAC. Therefore, no potential source-pathway-receptor chain has been identified in relation to hydrological/pollution effects on the SAC exists as a result of the proposed development.</p> <p>The SAC is <i>outside</i> the Likely Zone of Influence and no further assessment is required.</p>
Glenasmole Valley SAC [001209]	8.5km	<p>There will be no direct effects on the SAC or its QIs as it is located entirely outside of the footprint of the proposed developmental site.</p> <p>Due to the intervening distance, the nature and the scale of the proposed works, no potential source-pathway-receptor chain has been identified on the terrestrial QI species for which the SAC has been designated.</p> <p>No potential hydrological connectivity exists from the site of the proposed development to the SAC. Therefore, no potential source-pathway-receptor chain has been identified in relation to hydrological/pollution effects on the SAC exists as a result of the proposed development.</p> <p>The SAC is <i>outside</i> the Likely Zone of Influence and no further assessment is required.</p>
Wicklow Mountains SAC [002122]	10.6km	<p>There will be no direct effects on the SAC or its QIs as it is located entirely outside of the footprint of the proposed developmental site.</p> <p>Due to the intervening distance, the nature and the scale of the proposed works, no potential source-pathway-receptor chain has been identified on the terrestrial QI species for which the SAC has been designated.</p> <p>No potential hydrological connectivity exists from the site of the proposed development to the SAC. Therefore, no potential source-pathway-receptor chain has been identified in relation to hydrological/pollution effects on the SAC exists as a result of the proposed development.</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>Given the lack of riparian connectivity to the Site of the proposed development to the SAC, there is no potential for disturbance or displacement of otters associated with the SAC.</p> <p>The SAC is <i>outside</i> the Likely Zone of Influence and no further assessment is required.</p>
<p>South Dublin Bay SAC [000210]</p>	<p>12.9km</p>	<p>There is no direct pathway for effect on the SAC as it is located over 12km from the proposed development.</p> <p>The Grand Canal runs approximately 200m to the south of the footprint of the proposed development, and ultimately connects to Dublin Bay. Potential for indirect effects as a result of a deterioration in water quality resulting from pollutants and from discharge of foul and surface water during the operational phase of the development has therefore been carefully considered.</p> <p>Foul wastewater resulting from the operational development will be connected to and discharged via the public sewer network, which is subsequently treated at the Ringsend Wastewater Treatment Plant. This will remove all pollutants and silt from the water, ensuring that no effects on the water quality of the SAC would occur.</p> <p>Following on-site attenuation, all surface water runoff will be channelled to the existing surface water drainage network; this ultimately discharges to Dublin Bay via the Rivers Camac and Liffey. Given the on-site attenuation that will take place, combined with the significant distance to the SAC via the existing surface water network (12.9km), the buffering capacity of the intervening water network, and the estuarine nature of the River Liffey, any pollutants or silt would settle out, be diluted or dispersed prior to reaching the SAC; there is therefore no potential for significant effects resulting from discharge of surface water.</p> <p>In the event that any pollutants or runoff generated during the construction phase enter the existing drainage ditch network on site, these may reach the Grand canal. The slow flow rate of the canal and its extensive aquatic vegetation, the presence of the wide waterbody of Grand Canal Dock sites, the estuarine element of the River Liffey and the significant intervening distance along this network (approximately 12.9 km), would result in silt or pollutants settling out, being dispersed, or diluted along this network prior to reaching the SAC. In the absence of mitigation measures, no potential source-pathway-receptor chain has been identified on any QIs of the SAC.</p> <p>This SAC is <i>outside</i> the Likely Zone of Influence; no further assessment is required.</p>
<p>North Dublin Bay SAC [000206]</p>	<p>15.3km</p>	<p>There is no direct pathway for effect on the SAC as it is located over 15km from the proposed development.</p> <p>The Grand Canal runs approximately 200m to the south of the footprint of the proposed development, and ultimately connects to Dublin Bay. Potential for indirect effects as a result of a deterioration in</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>water quality resulting from pollutants and from discharge of foul and surface water during the operational phase of the development has therefore been carefully considered.</p> <p>Foul wastewater resulting from the operational development will be connected to and discharged via the public sewer network, which is subsequently treated at the Ringsend Wastewater Treatment Plant. This will remove all pollutants and silt from the water, ensuring that no effects on the water quality of the SAC would occur.</p> <p>Following on-site attenuation, all surface water runoff will be channelled to the existing surface water drainage network; this ultimately discharges to Dublin Bay via the Rivers Camac and Liffey. Given the on-site attenuation that will take place, combined with the significant distance to the SAC via the existing surface water network (12.9km), the buffering capacity of the intervening water network, and the estuarine nature of the River Liffey, any pollutants or silt would settle out, be diluted or dispersed prior to reaching the SAC; there is therefore no potential for significant effects resulting from discharge of surface water.</p> <p>In the event that any pollutants or runoff generated during the construction phase enter the existing drainage ditch network on site, these may reach the Grand canal. The slow flow rate of the canal and its extensive aquatic vegetation, the presence of the wide waterbody of Grand Canal Dock sites, the estuarine element of the River Liffey and the significant intervening distance along this network (12.9 km), would result in silt or pollutants settling out, being dispersed, or diluted along this network prior to reaching the SAC. In the absence of mitigation measures, no potential source-pathway-receptor chain has been identified on any QIs of the SAC.</p> <p>This SAC is <i>outside</i> the Likely Zone of Influence; no further assessment required.</p>
Special Protection Areas (SPA)		
Wicklow Mountains SPA [004040]	12.2km	<p>There will be no direct effects on the SPA as it is located entirely outside of the footprint of the proposed development. Due to the significant intervening distance from the SPA there is no potential for <i>in situ</i> or <i>ex situ</i> disturbance of SCI species, or for any significant loss of supporting habitat for the SCI species.</p> <p>The site did not provide nesting habitat for the SCI species and no SCI species were recorded utilising the site during the detailed bird surveys carried out at the site by Scott Cawley Ltd. There is judged to be no potential for in situ or ex situ disturbance of SCI species, or for significant loss of supporting habitat for SCI species. No potential source-pathway-receptor chain has therefore been identified.</p> <p>This SPA is <i>outside</i> the Likely Zone of Influence; no further assessment is required</p>
South Dublin Bay and River Tolka Estuary SPA [004024]	12.6km	<p>There will be no direct impact on the SPA as it is located over 12km from the site of the proposed development.</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>No SCI birds were recorded using the site for foraging and/or roosting during the bird surveys carried out at the site (black-headed gull were recorded flying over the site). There is judged to be no potential for in situ or ex situ disturbance of SCI species, or for significant loss of supporting habitat for SCI species.</p> <p>The Grand Canal runs approximately 200m to the south of the footprint of the proposed development, and also connects to Dublin Bay. Potential for indirect effects on wetland supporting habitat (the Wetland and Waterbirds [A999] SCI includes the supporting wetland habitat of all SCI species) as a result of a deterioration in water quality resulting from pollutants and from discharge of foul and surface water during the operational phase of the development has therefore been carefully considered.</p> <p>Foul wastewater resulting from the operational development will be connected to and discharged via the public sewer network, which is subsequently treated at the Ringsend Wastewater Treatment Plant. This will remove pollutants and silt from the water, ensuring that no effects on the water quality of the SAC would occur.</p> <p>Following on-site attenuation, all surface water runoff will be channelled to the existing surface water drainage network; this ultimately discharges to Dublin Bay via the Rivers Camac and Liffey. Given the attenuation that will take place on-site, combined with the significant distance to the SAC via the existing surface water network (12.6km), and the buffering capacity of the intervening water network, and the estuarine nature of the River Liffey at its eastern end, any pollutants or silt would settle out, be diluted or dispersed prior to reaching the SAC; there is no potential for significant effects resulting from discharge of surface water.</p> <p>In the event that pollutants or surface water runoff or dust enters the Grand Canal via the drainage ditch network, the buffering capacity of the Grand Canal and dock sites, the estuarine nature of the River Liffey and the significant intervening distance along this network (approximately 12.6 km), would result in silt or pollutants settling out, being dispersed, or diluted along this network prior to reaching the SPA. In the absence of mitigation measures, no potential source-pathway-receptor chain has been identified on any SCIs of the SPA has been identified.</p> <p>This SPA is <i>outside</i> the Likely Zone of Influence; no further assessment is required.</p>
North Bull Island SPA [004006]	15.5 km	<p>There will be no direct impact on the SPA as it is located over 15km from the site of the proposed development.</p> <p>No SCI birds were recorded using the site for foraging and/or roosting during the bird surveys carried out at the site (black-headed gull were recorded flying over the site). There is judged to be no potential</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>for in situ or ex situ disturbance of SCI species, or for significant loss of supporting habitat for SCI species.</p> <p>The Grand Canal runs approximately 200m to the south of the footprint of the proposed development, and also connects to Dublin Bay. Potential for indirect effects on wetland supporting habitat (the Wetland and Waterbirds [A999] SCI includes the supporting wetland habitat of all SCI species) as a result of a deterioration in water quality resulting from pollutants and from discharge of foul and surface water during the operational phase of the development has therefore been carefully considered.</p> <p>Foul wastewater resulting from the operational development will be connected to and discharged via the public sewer network, which is subsequently treated at the Ringsend Wastewater Treatment Plant. This will remove pollutants and silt from the water, ensuring that no effects on the water quality of the SAC would occur.</p> <p>Following on-site attenuation, all surface water runoff will be channelled to the existing surface water drainage network; this ultimately discharges to Dublin Bay via the Rivers Camac and Liffey. Given the attenuation that will take place on-site, combined with the significant distance to the SAC via the existing surface water network (12.6km), and the buffering capacity of the intervening water network, and the estuarine nature of the River Liffey at its eastern end, any pollutants or silt would settle out, be diluted or dispersed prior to reaching the SAC; there is no potential for significant effects resulting from discharge of surface water.</p> <p>In the event that pollutants or surface water runoff or dust enters the Grand Canal via the drainage ditch network, the buffering capacity of the Grand Canal and dock sites, the estuarine nature of the River Liffey and the significant intervening distance along this network (12.6 km), would result in silt or pollutants settling out, being dispersed, or diluted along this network prior to reaching the SPA. In the absence of mitigation measures, no potential source-pathway-receptor chain has been identified on any SCIs of the SPA.</p> <p>This SPA is <i>outside</i> the Likely Zone of Influence; no further assessment is required.</p>
Proposed Natural Heritage Area (pNHA)		
Grand Canal [002104]	0.2km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>At its closest, the pNHA is located approximately 0.2km from the proposed development. No hydrological connectivity exists between the T2 site and the pNHA; as detailed within Chapter 6 'Water' of this EIA, the drainage ditches within the T2 site discharge beneath the R113 to the east.</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>As described in Section 6.3.2, Chapter 6: 'The lands east of the R113 and south of the railway, drain to the south-east to existing stormwater networks on Ninth Lock Road, as per Figure 6.4 below. The drainage run continues south on Ninth Lock Road where it splits into parallel runs along Station Road which later merge and discharge to an open watercourse within the industrial estate and eventually discharge to the Camac River'.</p> <p>The pNHA is therefore <i>outside</i> the Likely Zone of Influence and further assessment is required.</p>
Liffey Valley [000128]	2.8km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is 2.8km to the south of the pNHA and no hydrological connectivity exists. No pathway for indirect effects on the terrestrial habitat within the pNHA has been identified.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Royal Canal [002103]	5km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment as the proposed development site. No pathway for indirect effects on the features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Rye Water Valley/ Carton [001398]	6.3km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Dodder Valley [000991]	6.7km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the terrestrial features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Lugmore Glen [001212]	6.7km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the terrestrial features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Slade of Saggart and Crooksling Glen [000211]	7.8km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the terrestrial features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Glenasmole Valley [001209]	8.5km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the terrestrial features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
North Dublin Bay [000206]	11.9km	<p>There is no direct pathway for effect on the pNHA as it is located over 12km from the proposed development.</p> <p>The grand canal runs approximately 200m to the south of the footprint of the proposed development, and ultimately connects to Dublin Bay. Foul wastewater resulting from the operational development</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>will be connected to and discharged via the public sewer network, which is subsequently treated at the Ringsend Wastewater Treatment Plant. This will remove all pollutants and silt from the water, ensuring that no effects on the water quality of the pNHA would occur.</p> <p>Following on-site attenuation, all surface water runoff will be channelled to the existing surface water drainage network; this ultimately discharges to Dublin Bay via the Rivers Camac and Liffey. Given the on-site attenuation that will take place, combined with the significant distance to the pNHA via the existing surface water network (12.9km), the buffering capacity of the intervening water network, and the estuarine nature of the River Liffey, any pollutants or silt would settle out, be diluted or dispersed prior to reaching the pNHA; there is therefore no potential for significant effects resulting from discharge of surface water.</p> <p>In the event that any pollutants or runoff generated during the construction phase enter the existing drainage ditch network on site, these may reach the Grand canal. The slow flow rate of the canal and its extensive aquatic vegetation, the presence of the wide waterbody of Grand Canal Dock sites, the estuarine element of the River Liffey and the significant intervening distance along this network (12.6 km), would result in the desilting of the surface water prior to this marine site. Silt or pollutants would settle, be dispersed, or diluted along this network prior to reaching the pNHA.</p> <p>This pNHA is <i>outside</i> the Likely Zone of Influence; no further assessment required.</p>
Santry Demense [000178]	12.6km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
South Dublin Bay [000210]	12.9km	<p>There is no direct pathway for effect on the pNHA as it is located over 12km from the proposed development.</p> <p>The grand canal runs approximately 200m to the south of the footprint of the proposed development, and also connects to Dublin Bay. Potential for indirect effects as a result of a deterioration in water quality resulting from pollutants and from discharge of foul and surface water during the operational phase of the development has therefore been carefully considered as part of this screening assessment.</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
		<p>Foul wastewater resulting from the operational development will be connected to and discharged via the public sewer network, which is subsequently treated at the Ringsend Wastewater Treatment Plant. This will remove pollutants and silt from the water, ensuring that no effects on the water quality of the SAC would occur.</p> <p>Following on-site attenuation, all surface water runoff will be channelled to the existing surface water drainage network; this ultimately discharges to Dublin Bay via the Rivers Camac and Liffey. Given the on-site attenuation that will take place, combined with the significant distance to the SAC via the existing surface water network (12.9km), and the buffering capacity of the intervening water network, and the estuarine nature of the River Liffey, any pollutants or silt would settle out, be diluted or dispersed prior to reaching the SAC; there is therefore no potential for significant effects resulting from discharge of surface water.</p> <p>In the event that any pollutants or runoff enter the existing drainage ditch network on site, these may reach the Grand canal. The slow flow rate of the canal and its extensive aquatic vegetation, the presence of the wide waterbody of Grand Canal Dock sites, the estuarine element of the River Liffey and the significant intervening distance along this network (12.9 km), would result in in silt or pollutants settling out, being dispersed, or diluted along this network prior to reaching the SAC. In the absence of mitigation measures, no potential for significant effects on the QIs of the SAC therefore exists.</p> <p>This pNHA is <i>outside</i> the Likely Zone of Influence; no further assessment required.</p>
Kilteel Wood [001394]	13.1km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the terrestrial features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Fitzsimon's Wood [001753]	13.3km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the terrestrial features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>

Designated Site	Distance from Proposed Development	Likely Zone of Influence Determination
Boosterstown Marsh [001205]	13.9km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is not hydrologically connected to the pNHA and is located within a separate sub catchment to the proposed development site. No pathway for indirect effects on the features for which the pNHA has been designated exists.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>
Dolphins, Dublin Docks [000201]	14km	<p>There is no direct pathway for effect on the pNHA as it is located over 12km from the proposed development.</p> <p>The grand canal runs approximately 200m to the south of the footprint of the proposed development, and ultimately connects to Dublin Bay. Foul wastewater resulting from the operational development will be connected to and discharged via the public sewer network, which is subsequently treated at the Ringsend Wastewater Treatment Plant. This will remove all pollutants and silt from the water, ensuring that no effects on the water quality of the pNHA would occur.</p> <p>Following on-site attenuation, all surface water runoff will be channelled to the existing surface water drainage network; this ultimately discharges to Dublin Bay via the Rivers Camac and Liffey. Given the on-site attenuation that will take place, combined with the significant distance to the pNHA via the existing surface water network (12.9km), the buffering capacity of the intervening water network, and the estuarine nature of the River Liffey, any pollutants or silt would settle out, be diluted or dispersed prior to reaching the pNHA; there is therefore no potential for significant effects resulting from discharge of surface water.</p> <p>In the event that any pollutants or runoff generated during the construction phase enter the existing drainage ditch network on site, these may reach the Grand canal. The slow flow rate of the canal and its extensive aquatic vegetation, the presence of the wide waterbody of Grand Canal Dock sites, the estuarine element of the River Liffey and the significant intervening distance along this network (12.6 km), would result in the desilting of the surface water prior to this marine site. Silt or pollutants would settle, be dispersed, or diluted along this network prior to reaching the pNHA.</p> <p>The pNHA is therefore <i>outside</i> of the Likely Zone of Influence; no further impact assessment is required.</p>

National Parks and Wildlife Service (NPWS) Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets was carried out as part of this assessment.

The closest mapped Annex I habitat to the proposed development site, Hydrophilous tall herb, occurs approximately 3.9km north of the site, as shown in Figure 4.3. An area of orchid rich calcareous grassland occurs approx. 5.3km east of the site.

Figure 4.3 – Site in relation to Annex 1 habitats



Vascular Plants

A search was made in the New Atlas of the British and Irish Flora (Preston et al, 2002) to investigate whether any rare or unusual plant species listed under Annex II of the EU Habitats Directive, The Irish Red Data Book - 1 Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (1999, as amended 2015) had been recorded in the relevant 10km grid square in which the Proposed Development is situated (O03) during the 1987-1999 atlas survey. Table 4-4 lists the rare and protected species records obtained from the New Flora Atlas during this study.

Table 4.4 – Records of species listed under the Flora Protection Order 2015 or the Irish Red Data Book for Vascular Plants

Common Name	Scientific Name	Status	Hectad
Red Hemp Nettle	<i>Galeopsis angustifolia</i>	Vulnerable (VU)	O03
Meadow Barley	<i>Hordeum secalinum</i>	Vulnerable (VU)	O03
Hairy St. John's-wort	<i>Hypericum hirsutum</i>	Vulnerable (VU)	O03
Hairy Violet	<i>Viola hirta</i>	Vulnerable (VU)	O03
Betony	<i>Stachys officinalis</i>	Near Threatened (NT)	O03
Wildflower Thyme	<i>Clinopodium acinos</i>	Near Threatened (NT)	O03
Opposite-leaved Pondweed	<i>Groenlandia densa</i>	Near Threatened (NT)	O03

Red List of Irish Flowering Plants (Wyse Jackson et al., 2016), RE - Regionally Extinct, VU – Vulnerable, NT – Near Threatened, FPO – Floral Protection Order

Bryophytes

A search of the NPWS online database for bryophytes (non-vascular land plants comprising of mosses, hornworts and liverworts) was also undertaken with no protected bryophytes recorded within or adjacent to the Proposed Development (NPWS, 2021).

NPWS Records

A data request was sent to the NPWS and data received in relation to the grid square O03 on the 10/08/2022. Table 4-5 lists the rare and protected species records obtained from the NPWS during this study. No bat roost records were returned.

Table 4.5 – Records for rare and protected species, NPWS.

Common Name	Scientific Name	Status	Hectad
Basil Thyme	<i>Clinopodium acinos</i>	FPO, Near Threatened (NT)	O03
Betony	<i>Stachys officinalis</i>	FPO, Near Threatened (NT)	O03
Brown Long-eared Bat	<i>Plecotus auritus</i>	Annex IV, WA, Least Concern (LC)	O03
Common Frog	<i>Rana temporaria</i>	Annex V, WA, Least Concern (LC)	O03
Common Lizard	<i>Zootoca vivipara</i>	WA, Least Concern (LC)	O03
Desmoulin's Whorl Snail	<i>Vertigo moulinsiana</i>	Annex II, Endangered (EN)	O03
Dwarf Mallow	<i>Malva neglecta</i>	Near Threatened (NT)	O03
Dwarf Spurge	<i>Euphorbia exigua</i>	Near Threatened (NT)	O03
Eurasian Badger	<i>Meles meles</i>	WA	O03
Eurasian Otter	<i>Lutra lutra</i>	Annex II & IV, WA, Least Concern (LC)	O03
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	WA	O03
Field Gentian	<i>Gentianella campestris</i>	Near Threatened (NT)	O03
Autumn Gentian	<i>Gentianella amarella</i>	Near Threatened (NT)	O03
Green Figwort	<i>Scrophularia umbrosa</i>	Near Threatened (NT)	O03
Hairy St John's-wort	<i>Hypericum hirsutum</i>	FPO, Vulnerable (VU)	O03
Hairy Violet	<i>Viola hirta</i>	FPO, Vulnerable (VU)	O03
Henbane	<i>Hyoscyamus niger</i>	Near Threatened (NT)	O03
Irish Hare	<i>Lepus timidus</i>	Annex V, WA, Least Concern (LC)	O03
Irish Stoat	<i>Mustela erminea</i>	WA, Least Concern (LC)	O03
Irish Whitebeam	<i>Sorbus hibernica</i>	Vulnerable (VU)	O03
Meadow Barley	<i>Hordeum secalinum</i>	FPO, Vulnerable (VU)	O03
Opposite-leaved Pondweed	<i>Groenlandia densa</i>	Near Threatened (NT)	O03
Red Hemp-nettle	<i>Galeopsis angustifolia</i>	FPO, Vulnerable (VU)	O03
Shepherd's-needle	<i>Scandix pecten-veneris</i>	Regionally Extinct (RE)	O03
Smooth Newt	<i>Lissotriton vulgaris</i>	WA, Least Concern (LC)	O03
Upright Brome	<i>Bromopsis erecta</i>	Near Threatened (NT)	O03

Common Name	Scientific Name	Status	Hectad
West European Hedgehog	<i>Erinaceus europaeus</i>	WA, Least Concern (LC)	O03
White-clawed crayfish	<i>Austropotamobius pallipes</i>	Annex II & IV, WA	O03
Yellow Bird's-nest	<i>Monotropa hypopitys</i>	Vulnerable (VU)	O03

Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA – Irish Wildlife Acts (1976-2017), BoCCI - Birds of Conservation Concern in Ireland Red List; NT, VU – Of Red Data List (Curtis and McGough 1988)

National Biodiversity Data Centre Records

The National Biodiversity Data centre database was accessed on 11.01.2022 and the following information was obtained. Table 4-6 lists the protected faunal species (excluding birds) recorded within the hectad (O03) which pertains to the current study area. The database was also searched for records of Third Schedule non-native invasive species within the hectad. Table 4-7 lists the non-native invasive species recorded within the hectad. Table 4-8 lists all the protected bird species recorded within the hectad which pertains to the current study area.

Table 4.6 – NBDC records for protected fauna records (excl. birds).

Common Name	Scientific Name	Status	Hectad
Bats			
Daubenton's Bat	<i>Myotis daubentonii</i>	Annex IV, WA	O03
Natterer's Bat	<i>Myotis nattereri</i>	Annex IV, WA	O03
Lesser Noctule	<i>Nyctalus leisleri</i>	Annex IV, WA	O03
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Annex IV, WA	O03
Brown Long-eared Bat	<i>Plecotus auritus</i>	Annex IV, WA	O03
Nathusius's Pipistrelle Bat	<i>Pipistrellus nathusii</i>	Annex IV, WA	O03
Pipistrelle Bat	<i>Pipistrellus pipistrellus sensu lato</i>	Annex IV, WA	O03
Whiskered Bat	<i>Myotis mystacinus</i>	Annex IV, WA	O03
Terrestrial Mammals			
European Otter	<i>Lutra lutra</i>	Annex II, IV, WA	O03
Pine Marten	<i>Martes martes</i>	Annex V, WA	O03
Eurasian Badger	<i>Meles meles</i>	WA	O03
Hedgehog	<i>Erinaceus europaeus</i>	WA	O03
Red Squirrel	<i>Sciurus vulgaris</i>	WA	O03
Pygmy Shrew	<i>Sorex minutus</i>	WA	O03
Red Deer	<i>Dama dama</i>	WA	O03
Amphibians			

Common Name	Scientific Name	Status	Hectad
Smooth Newt	<i>Lissotriton vulgaris</i>	WA	O03
Common Frog	<i>Rana temporaria</i>	Annex V, WA	O03
Crustaceans			
Freshwater White-clawed Crayfish	<i>Austropotamobius pallipes</i>	WA, Annex II & V	O03
Non-crustacean Invertebrates			
Desmoulin's Whorl Snail	<i>Vertigo moulinsiana</i>	WA, Annex II	O03

Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA – Irish Wildlife Acts (1976-2017).

Table 4.7 – NBDC records for Invasive species.

Common Name	Scientific Name	Hectad
Wireweed	<i>Sargassum muticum</i>	O03
Canadian Waterweed	<i>Elodea canadensis</i>	O03
Japanese Knotweed	<i>Fallopia japonica</i>	O03
Rhododendron	<i>Rhododendron ponticum</i>	O03
Giant Hogweed	<i>Heracleum mantegazzianum</i>	O03
Indian Balsam	<i>Impatiens glandulifera</i>	O03
Spanish Bluebell	<i>Hyacinthoides hispanica</i>	O03
Roach	<i>Rutilus rutilus</i>	O03
American Mink	<i>Mustela vison</i>	O03
Fallow Deer	<i>Dama dama</i>	O03
Brown Rat	<i>Rattus norvegicus</i>	O03
Douglas Fir	<i>Pseudotsuga menziesii</i>	O03
Freshwater Shrimp	<i>Gammarus pulex</i>	O03
Water Fern	<i>Azolla filiculoides</i>	O03
New Zealand flatworm	<i>Arthurdendyus triangulatus</i>	O03
Australian flatworm	<i>Australoplana sanguinea</i>	O03
Black Currant	<i>Ribes nigrum</i>	O03
Butterfly-bush	<i>Buddleja davidii</i>	O03
Canadian Fleabane	<i>Conyza canadensis</i>	O03
Cherry Laurel	<i>Prunus laurocerasus</i>	O03
Common Broomrape	<i>Orobanche minor</i>	O03
False-acacia	<i>Robinia pseudoacacia</i>	O03
Himalayan Honeysuckle	<i>Heracleum mantegazzianum</i>	O03
Japanese Rose	<i>Rosa rugosa</i>	O03
Least Duckweed	<i>Lemna minuta</i>	O03
Nuttall's Waterweed	<i>Elodea nuttallii</i>	O03
Russian-vine	<i>Fallopia baldschuanica</i>	O03
Sycamore	<i>Acer pseudoplatanus</i>	O03
Three-cornered Garlic	<i>Allium triquetrum</i>	O03
Traveller's-joy	<i>Clematis vitalba</i>	O03
Harlequin Ladybird	<i>Harmonia axyridis</i>	O03
Budapest Slug	<i>Tandonia budapestensis</i>	O03
Common Garden Snail	<i>Cornu aspersum</i>	O03
Jenkins' Spire Snail	<i>Potamopyrgus antipodarum</i>	O03

Keeled Slug	<i>Tandonia sowerbyi</i>	O03
Wrinkled Snail	<i>Candidula intersecta</i>	O03
Red-eared Terrapin	<i>Trachemys scripta</i>	O03
Eastern Grey Squirrel	<i>Sciurus caroliensis</i>	O03
House Mouse	<i>Mus musculus</i>	O03
Siberian Chipmunk	<i>Tamias sibiricus</i>	O03
Silka Deer	<i>Cervus nippon</i>	O03

Table 4.8 – NBDC Records for Birds

Common Name	Scientific Name	Status	Hectad
Barn Swallow	<i>Hirundo rustica</i>	WA, BoCCI Amber	O03
Barn Owl	<i>Tyto alba</i>	BoCCI Red List	O03
Black-headed Gull	<i>Larus ridibundus</i>	BoCCI Red List, WA	O03
Brent Goose	<i>Branta bernicula</i>	WA, BoCCI Amber List	O03
Common Coot	<i>Fulica atra</i>	WA, Annex II & III, BoCCI Amber List	O03
Common Grasshopper Warbler	<i>Locustella naevia</i>	WA, BoCCI Amber List	O03
Common Kestrel	<i>Falco tinnunculus</i>	WA, BoCCI Amber List	O03
Common Kingfisher	<i>Alcedo atthis</i>	WA, Annex I, BoCCI Amber List	O03
Common Linnet	<i>Carduelis cannabina</i>	WA, BoCCI Amber List	O03
Common Pheasant	<i>Phasianus colchicus</i>	WA, Annex II & Annex III,	O03
Common Pochard	<i>Aythya ferina</i>	WA, Annex II & III, BoCCI Amber List	O03
Redshank	<i>Tringa totanus</i>	BoCCI Red List	O03
Snipe	<i>Gallinago gallinago</i>	BoCCI Red List	O03
Common Starling	<i>Sturnus vulgaris</i>	WA, BoCCI Amber List	O03
Swift	<i>Apus apus</i>	BoCCI Red List	O03
Common Wood Pigeon	<i>Columba palumbus</i>	WA, Annex II & III	O03
Corn Crane	<i>Crex crex</i>	WA, Annex I, BoCCI Red List	O03
Eurasian Curlew	<i>Numenius arquata</i>	BoCCI Red List [Breeding & Wintering], WA	O03
Oystercatcher	<i>Haematopus ostralegus</i>	BoCCI Red List	O03

Common Name	Scientific Name	Status	Hectad
Eurasian Teal	<i>Anas crecca</i>	WA, Annex II & III, BoCCI Amber List	O03
Eurasian Tree Sparrow	<i>Passer montanus</i>	WA, BoCCI Amber List	O03
Eurasian Wigeon	<i>Anas Penelope</i>	WA, Annex II & III, BoCCI Amber List	O03
Eurasian Woodcock	<i>Scolopax rusticola</i>	WA, Annex I, II & III, BoCCI Amber List	O03
Golden Plover	<i>Pluvialis apricaria</i>	Annex I, BoCCI Red List	O03
Gadwall	<i>Anas strepera</i>	WA, Annex II, BoCCI Amber List	O03
Goosander	<i>Mergus merganser</i>	WA, Annex II, BoCCI Amber List	O03
Great Black-billed Gull	<i>Larus marinus</i>	WA, BoCCI Amber List	O03
Great Cormorant	<i>Phalacrocorax carbo</i>	WA, BoCCI Amber List	O03
Great Crested Grebe	<i>Podiceps cristatus</i>	WA, BoCCI Amber List	O03
Grey Partridge	<i>Perdix perdix</i>	WA, Annex II & III. BoCCI Red List	O03
Herring Gull	<i>Larus argentatus</i>	WA, BoCCI Red List	O03
House Martin	<i>Delichon urbicum</i>	WA, BoCCI Amber List	O03
House Sparrow	<i>Passer domesticus</i>	WA, BoCCI Amber List	O03
Lesser Black-billed Gull	<i>Larus fuscus</i>	WA, BoCCI Amber List	O03
Little Egret	<i>Egretta garzetta</i>	WA, Annex I	O03
Little Grebe	<i>Tachybaptus ruficollis</i>	WA, BoCCI Amber List	O03
Mallard	<i>Anas platyrhynchos</i>	WA, Annex II & III	O03
Mew Gull	<i>Larus canus</i>	WA, BoCCI Amber List	O03
Mute Swan	<i>Cygnus olor</i>	WA, BoCCI Amber List	O03
Lapwing	<i>Vanellus vanellus</i>	BoCCI Red List	O03
Northern Pintail	<i>Anas acuta</i>	WA, Annex II & III, BoCCI Red List	O03
Peregrine Falcon	<i>Falco peregrinus</i>	Annex I	O03
Red Grouse	<i>Lagopus lagopus</i>	BoCCI Red List	O03
Red Kite	<i>Milvus milvus</i>	WA, BoCCI Amber List	O03
Rock Pigeon	<i>Columba livia</i>	WA, Annex II	O03

Common Name	Scientific Name	Status	Hectad
Sand Martin		WA, BoCCI Amber List	O03
Sky Lark	<i>Alauda arvensis</i>	WA, BoCCI Amber List	O03
Spotted Flycatcher	<i>Muscicapa striata</i>	WA, BoCCI Amber List	O03
Stock Pigeon	<i>Columba oenas</i>	WA, BoCCI Amber List	O03
Tufted Duck	<i>Aythya fuligula</i>	WA, Annex II & III, BoCCI Amber List	O03
Whooper Swan	<i>Cygnus cygnus</i>	Annex I	O03
Yellowhammer	<i>Emberiza citrinella</i>	BoCCI Red List	O03

Annex I – Of EU Birds Directive, Red List – Birds of Conservation Concern in Ireland (Population for which the species is red listed in brackets).

Bird Records

A number of sources were assessed to determine the likely usage of the site by both breeding and wintering bird species, including Bird Atlases, National Biodiversity Data Centre (NBDC), BirdWatch Ireland and Conservation Objectives Supporting Documents from the National Parks and Wildlife Service (NPWS) for nearby Special Protection Areas (SPAs).

The Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland (Balmer et al., 2013) provides the most up-to-date information regarding the distribution and relative abundance of bird species in Britain and Ireland, based on surveys carried out between 2007 and 2011. The atlases show data for breeding and wintering birds respectively in individual 10 km x 10 km squares (hectads). Table 4-9 shows any species found in the relevant hectads (O03) which are recorded as breeding in the most recent atlas. It also provided species that have been recorded on National Biodiversity Data Centre (NBDC) datasets as well as any listed in Annex I of the EU Birds Directive recorded on the BoCCI Red List. Birds listed under Annex I are offered special protection by the EU Birds Directive. Those listed on the Birds of Conservation Concern in Ireland (BoCCI) Red List meet one or more of the following criteria:

- IUCN: Global conservation status (Critically Endangered (CE), Endangered (E) or Vulnerable (V), but not Near Threatened. These species are recognised as the highest priorities for action at a global scale and are thus priorities at an all-Ireland level.
- European conservation status. The conservation status of all European species was assessed most recently by Birdlife International (2004), one of the main changes in the revision being to include the IUCN criteria. These species are those of global conservation concern (including those classified as Near Threatened) and are Red-listed.
- The Irish breeding population has undergone significant historical decline since 1800.
- The Irish non-breeding population has undergone a significant decline of 50% in the last 25 years.
- The Irish breeding range has undergone a decline of 70% or more in the last 25 years.

No species listed under Annex I of the EU Birds Directive have been recorded within the relevant tetrads (G63W & G73B). No red-listed birds of conservation concern have been recorded breeding within the relevant tetrads with 7 amber listed species being recorded.

Table 4.9 – NBDC Bird data and Bird Atlas data (10km grid square O03)

Common Name	Scientific name	Bird Atlas		Designation
		Breeding 2008-2011	Wintering 2007-2011	
Barn Swallow	<i>Hirundo rustica</i>	Confirmed	Breeding	Protected Species: EU Birds Directive Annex II, III Birds of Conservation Concern -Red & Amber List
Barn Owl	<i>Tyto alba</i>	Confirmed	Breeding	
Black-headed Gull	<i>Larus ridibundus</i>	Present	Winter	
Brent Goose	<i>Branta bernicula</i>	Present	Winter	
Common Coot	<i>Fulica atra</i>	Present	Winter	
Common Grasshopper Warbler	<i>Locustella naevia</i>	Possible	Breeding	
Common Kingfisher	<i>Alcedo atthis</i>	Present	Winter	
Common Linnet	<i>Carduelis cannabina</i>	Confirmed	Breeding	
Redshank	<i>Tringa totanus</i>	Present	Winter	
Snipe	<i>Gallinago gallinago</i>	Present	Winter	
Common Starling	<i>Sturnus vulgaris</i>	Confirmed	Breeding	
Swift	<i>Apus apus</i>	Confirmed	Breeding	
Common Wood Pigeon	<i>Columba palumbus</i>	Confirmed	Breeding	
Corn Crake	<i>Crex crex</i>	Probable	Breeding	
Eurasian Curlew	<i>Numenius arquata</i>	Present	Winter	
Oystercatcher	<i>Haematopus ostralegus</i>	Present	Winter	
Eurasian Teal	<i>Anas crecca</i>	Present	Breeding	
Eurasian Wigeon	<i>Anas Penelope</i>	Present	Winter	
Eurasian Woodcock	<i>Scolopax rusticola</i>	Present	Winter	
Golden Plover	<i>Pluvialis apricaria</i>	Present	Winter	
Gadwall	<i>Anas strepera</i>	Present	Winter	
Great Black-billed Gull	<i>Larus marinus</i>	Present	Winter	

Common Name	Scientific name	Bird Atlas		Designation
		Breeding 2008-2011	Wintering 2007-2011	
Great Cormorant	<i>Phalacrocorax carbo</i>	Present	Winter	
Grey heron	<i>Ardea cinerea</i>	Probable	Breeding	
Great Crested Grebe	<i>Podiceps cristatus</i>	Present	Winter	
Herring Gull	<i>Larus argentatus</i>	Present	Winter	
House Martin	<i>Delichon urbicum</i>	Confirmed	Breeding	
House Sparrow	<i>Passer domesticus</i>	Confirmed	Breeding	
Lesser Black-billed Gull	<i>Larus fuscus</i>	Present	Winter	
Little Egret	<i>Egretta garzetta</i>	Present	Winter	
Little Grebe	<i>Tachybaptus ruficollis</i>	Present	Winter	
Mallard	<i>Anas platyrhynchos</i>	Confirmed	Breeding	
Mute Swan	<i>Cygnus olor</i>	Confirmed	Breeding	
Lapwing	<i>Vanellus vanellus</i>	Present	Winter	
Northern Pintail	<i>Anas acuta</i>	Present	Winter	
Peregrine Falcon	<i>Falco peregrinus</i>	Possible	Breeding	
Sand Martin	<i>Riparia riparia</i>	Confirmed	Breeding	
Sky Lark	<i>Alauda arvensis</i>	Confirmed	Breeding	
Spotted Flycatcher	<i>Muscicapa striata</i>	Confirmed	Breeding	
Whooper Swan	<i>Cygnus cygnus</i>	Present	Winter	

Bat Records

A review of the National Biodiversity Data Centre results was made on the 28/07/2022, to search for records of bats within 10km of the proposed site (hectad O03). Details of the results are provided in Table 4.10 below.

Table 4.10 – Bat Records within 10km of Proposed Development (Hectad O03)

Common Name	Scientific Name	Protection Status
Daubenton's Bat	<i>Myotis daubentonii</i>	Annex IV, WA
Natterer's Bat	<i>Myotis nattereri</i>	Annex IV, WA

Lesser Noctule	<i>Nyctalus leisleri</i>	Annex IV, WA
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Annex IV, WA
Brown Long-eared Bat	<i>Plecotus auritus</i>	Annex IV, WA
Nathusius's Pipistrelle Bat	<i>Pipistrellus nathusii</i>	Annex IV, WA
Pipistrelle Bat	<i>Pipistrellus pipistrellus sensu lato</i>	Annex IV, WA
Whiskered Bat	<i>Myotis mystacinus</i>	Annex IV, WA

Additional detailed data search results for bats, utilizing Bat Conservation Ireland data, are provided within Section 3.4 of the bat Assessment report (see Appendix C 1 Volume III of this EIAR).

Water Quality

The proposed development is situated entirely within the WFD Catchment 09, Liffey and Dublin Bay, (<https://gis.epa.ie/EPAMaps/>). The site is located in the sub-catchments Liffey_SC_090.

The Water Framework Directive (WFD) Transitional Waterbody risk score for the section of Liffey and Dublin Bay closest to the development site known as Liffey Estuary Lower Estuary has been assessed as “Intermediate”.

The site is located in the groundwater catchment: the Dublin area (IE_EA_G_008). The Water Framework Directive (WFD) Groundwater Monitoring Programme (2013-2018) assigned the groundwater catchment as having ‘good’ status. The Dublin groundwater catchment has an assigned WFD Ground Waterbody Approved Risk of ‘Good’.

Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017) was consulted during the desk study. No records of this species were found for the hydrological catchment within which the Proposed Development site is located, and the site is not located within a mapped sensitive area for this species.

Conclusions of the Desk Study

The desktop study has provided information about the existing environment in hectad O03, within which the proposed development is located. The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland. Bat records within 10km of the proposed development site revealed that the wider area has been studied for bats and that a number of common species have been recorded.

No designated European Sites are judged to be within the likely zone of impact, which are fully considered in the AA Screening Report prepared for the Proposed Development.

The proposed development is located within close proximity to the Grand Canal pNHA (located approximately 300m to the south of the T3 Site). The potential for deterioration in water quality during the construction phase via the existing drainage ditch network has been identified as a potential pathway for effect on this nationally designated site, due to its close proximity.

The desk study identified that a variety of protected faunal species are known to occur within the survey area, including bats, otter and badger. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits. The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell et

al, 2009¹²). The site is not located within a freshwater pearl mussel ‘sensitive area’. 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.

4.6.2 Ecological Field Survey Results

4.6.2.1 Description of Habitats and Flora within the Ecological Survey Area

The Site is proposed as T2 of the development of the wider Clonburris scheme. A dedicated multi-disciplinary walkover survey of the area within and in the vicinity of the proposed development was undertaken on the 24th of June 2022. The habitats recorded during the site visit are described below. A total of nine habitats were recorded within the Site as follows:

- Dry meadows and grassy verges (GS2)
- Hedgerows (WL1)
- Treeline (WL2)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Drainage Ditches (FW4)

A habitat map is provided in Figure 4-4.

Grassland Habitats

The majority of the habitat within the proposed development site comprised formerly agricultural grassland that had not been recently managed through grazing; this habitat was classified as **Dry meadows and grassy verges (GS2)**, and comprised of abundant false oat grass (*Arrhenatherum elatius*), cocks foot grass (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*), with meadow foxtail (*Alopecurus pratensis*), red fescue (*Festuca rubra* agg.), silverweed (*Potentilla anserina*), common nettle (*Urtica dioica*), hogweed (*Heracleum sphindylium*), creeping thistle (*Cirsium arvense*), ribwort plantain (*Plantago lanceolata*), white clover (*Trifolium repens*), common vetch (*Vicia sativa*), ragwort (*Jacobaea vulgaris*), selfheal (*Prunella vulgaris*), creeping buttercup (*Ranunculus repens*), cowslip (*Primula veris*), birds foot trefoil (*Lotus corniculatus*), red clover (*Trifolium pratense*), common knapweed (*Centaurea nigra*), lesser stitchwort (*Stellaria graminea*) and sweet vernal grass (*Anthoxanthum odoratum*) (see Plate 4-1).

In some areas, notably the eastern portion of the Site, areas of the grassland had been previously disturbed or cleared and comprised **Recolonising bare ground (ED3)** (see Plate 4.2). These areas comprised areas of bare earth with opportunistic species that included rape (*Brassica napus*), docks (*Rumex* Spp.), silverweed, creeping thistle, spear thistle (*Cirsium vulgare*), bramble (*Rubus fruticosus*), oxeye daisy (*Leucanthemum vulgare*), hoary willowherb (*Epilobium parviflorum*); tall ruderal vegetation was present at margins of this habitat which also included rosebay willowherb (*Chamaenerion angustifolium*), nettle, thistles, hogweed, cleavers (*Galium aparine*) and meadowsweet (*Filipendula ulmaria*). Areas of bare ground within these areas were classified as **Spoil and bare ground (ED2)**.

Hedgerows/ Treelines

A network of Hedgerows (WL1) is present within the wider Site, and part of this wider hedgerow network occurs within the T2 Site and at its northern boundary (see Figure 4-4 and Plates 4-1, 4-4, 4-5 and 4.6). Species that comprised the hedgerows within the western portion of the Site included hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), ash (*Fraxinus excelsior*), dog rose (*Rosa canina*) and elm (*Ulmus glabra*) with beech (*Fagus sylvatica*) also present at the northern end of the hedgerow. The northern boundary hedgerow comprised primarily willow. These hedgerows were also associated with drainage ditches (see below). Where hedgerow features had not been recently managed and had grown to over 5m in height, these were categorised as **Treelines (WL2)**.

Drainage Ditches

¹²Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Drainage ditches were present in association with the hedgerows within the Site. These were dry in the southern part of the site, but had standing water within the northern area and along the northern site boundary. In areas where conditions were wetter, flora associated with the ditches included meadowsweet, dewberry (*Rubus caesius*), horsetail (*Equisetum arvense*), tufted vetch (*Vicia cracca*), nettle, thistle spp., meadow buttercup (*Ranunculus acris*), common knapweed and cleavers. In-channel vegetation was dominated by reedmace (*Typha latifolia*), with abundant fool's watercress (*Apium nodiflorum*) in places.



Plate 4-1: View of the eastern portion of the site showing dry meadows and grassy verges, with ruderal vegetation and hedgerow on the left of the picture.



Plate 4-2: Dry meadows and grassy verges habitat within the eastern portion of the site, with eastern boundary treeline visible in the background and train station and railway line adjacent to the northern site boundary



Plate 4-3: Area of bare ground within the eastern portion site with eastern boundary treeline in the background.



Plate 4-4: Wet ditch associated with the northern site boundary, with willow hedgerow associated on its northern side.



Plate 4-5: Dry meadows and grassy verges habitat within the western portion of the site.



Plate 4-6: Section of treeline and hedgerow bisecting the site at its northern end.

Figure 4.4 – Habitat Map



4.6.2.2 Fauna in the Existing Environment

The following subsections provide a breakdown of the faunal species recorded during the site visit and assessment.

4.6.2.3 Birds

MKO June 2022 Field Survey

Bird species recorded within or immediately adjacent to the proposed development during the ecological walkover surveys comprised of a variety of common bird assemblages. Species recorded are provided in Table 5-1 below. All the bird species recorded during the survey are common and widespread in the wider area.

Table 4.11 – Bird species recorded during the June 2022 site visit.

Common Name	Scientific Name	Conservation Status (BoCCI)
Chaffinch	<i>Fringilla coelebs</i>	Green Listed
Blackbird	<i>Turdus merula</i>	Green Listed
Buzzard	<i>Buteo buteo</i>	Green listed
Robin	<i>Erithacus rubecula</i>	Green Listed
Magpie	<i>Pica pica</i>	Green Listed

Wintering Bird Survey

A wintering bird assessment of the lands within the wider Clonburris SDZ zone, including the Grand Canal, was carried out by Scott Cawley (see Appendix C 2 Volume III of this EIAR). As summarised in the report “*wintering bird surveys carried out between November 2020 and March 2021 recorded 34 species in the Clonburris SDZ lands and its immediate vicinity. Of these species, 12 were wintering species listed as SCIs of nearby European sites, of which one species is Red-listed (i.e. of High Conservation Concern) and eight species Amber-listed (i.e. of Medium Conservation Concern) on the Bird of Conservation Concern in Ireland. In addition, eight non-SCI wetland bird species and 17 other bird species (e.g. passerines and raptors), of which six are Red-listed and nine Amber-listed, were recorded within or immediately adjacent to the Clonburris SDZ lands during the surveys.*

Observations of SCI and non-SCI wetland wintering bird species within the survey area were contextualised against the populations of these species in nearby European sites (SCI species only) and/or against their numbers in terms of international and national population thresholds, where available. The peak counts of these species present in the survey area during the wintering bird surveys were less than 1% of the international population. With regard to the national population thresholds for these species, the numbers of five species exceeded the 1% of the national threshold: coot (present at 11.6% of the national population of the species), lapwing (23.5%), little grebe (40%), mallard (20.4%) and tufted duck (5.2%). It should be noted that the records for peak counts exceeding the national threshold for coot, little grebe, mallard and tufted duck were from outside the Clonburris SDZ lands, from the pond in the Grange Castle Business Park, leaving lapwing as the only species whose numbers exceeded the national threshold within the Clonburris SDZ land.

Lapwing is a bird species of High Conservation Concern which has seen long-term declines since the beginning of I-WeBS counts (Lewis et al., 2019). Lapwing was present in the Clonburris SDZ lands in flock sizes varying mostly between 30 and up to 200+ individuals, with one flock consisting of only five individuals. In addition to the peak count of lapwings exceeding the national threshold for the species, the numbers recorded present over three times the IWeBS peak count numbers recorded in Dublin Bay for the period of 2011/13 – 2017/18. Considering they are known Environmental Impact Assessment Report – EIAR Volume II Clonburris SDZ Phase 1A 4-50 to spend winters in non-wetland habitats, such as grasslands, away from European sites designated for them (Lewis et al., 2019), and they were present in comparatively large flock sizes in the Clonburris SDZ, the grasslands within the Clonburris SDZ lands represent a relatively large, undisturbed feeding and/or roosting resource for lapwing in a largely built up area in the Greater Dublin Area.

In conclusion, the Clonburris SDZ and lands in its immediate vicinity support a variety of gull, wader and waterfowl species during winter months, with the most notable species of them being the Red-listed lapwing that can be present in large flocks. Considering these flocks of lapwing comprised of more than 1% of the national populations on one occasion, the Clonburris SDZ lands are deemed to be of local importance to this particular species. This conclusion

takes into consideration the relatively small area of suitable habitat contained within the SDZ lands in comparison to suitable habitat found to the west of the Clonburris SDZ.”

It should be noted that as the surveys covered the full SDZ including the Grand Canal, the majority of the species outlined above were not recorded within the proposed development area; common gull, herring gull, lesser black-backed gull, buzzard, meadow pipit, starling and goldcrest (single records of each species) were recorded within the T2 site.

Barn Owl

A Barn Owl Survey Report for the wider Clonburris SDZ was prepared by Scott Cawley and is provided Appendix C 3 Volume III of this EIAR. As described in the report, *“Barn owl were not observed foraging within the Clonburris SDZ lands during any survey dates between October 2020 and June 2021, however there are desk study records of individuals within the SDZ lands. One of the desk study records is for a juvenile barn owl. Considering that juvenile barn owls start to disperse from their nesting sites after fledging in September (Lusby and O’Clery, 2014), and that the record for a juvenile at this site is from July 2018, this may indicate the presence of a breeding pair within the Clonburris SDZ in 2018, as any juveniles present would not yet have been ready to disperse from their nest site. The Grange Castle, the only site deemed highly suitable for nesting barn owl, is located c. 1.3km northeast of the juvenile barn owl sighting and across the Grand Canal, and therefore it is unlikely that this juvenile barn owl was from a potentially active nest at the Grange Castle in 2018, considering the distance, the presence of the Grand Canal and the roads between the two locations, and the juveniles inability to fly properly yet.*

*Although there is one suitable barn owl nesting site located adjacent to the Clonburris SDZ lands at the Grange Castle and a sighting of a juvenile barn owl within the SDZ lands, indicating suitable foraging habitat for breeding barn owls, there was no evidence during the 2021 surveys of recent use of the Grange Castle nesting site. It is unlikely that the Grange Castle has recently been used by roosting barn owls either, considering that only one old pellet was found and a confirmed roosting site would be categorised as a regular roost if more than 10 pellets were present and as an occasional roost if less than 10 pellets were present (Barn Owl Trust, 2012). In addition, it cannot be said for certain if this pellet was of a barn owl, or, of another owl species, such as long-eared owl *Asio otus* (Greenlisted Bird of Conservation Concern¹), which was sighted and/or heard on six occasions within the Clonburris SDZ lands during Scott Cawley Ltd. surveys in 2020. Long-eared owl adults and juveniles were recorded during raptor surveys in June 2020 and during bat surveys in July and August 2020.*

Considering that barn owl prefer dark nesting sites (Hardey et al., 2013), their absence from this potential nesting site may be due to recent installation (2020) of spotlights around the castle, which would act as a deterrent. It may have been that barn owl nested and/or roosted in the castle prior to the installation of the spotlights in 2020. Considering that barn owl home ranges can reach up to c. 6km during breeding season, it may be that the barn owls sighted in June 2020 belong to a local breeding population of barn owls; however, no active nest sites were identified within the Clonburris SDZ lands during the surveys undertaken between November 2020 and June 2021. According to Lusby and O’Clery (2014), female barn owl typically remain continuously at the nest, while males are out hunting and/or roosting away from it. Therefore, it may be that the barn owls sighted in June 2020 were hunting males, with a nesting site within c. 6km radius of Clonburris SDZ.

In conclusion, barn owl was not confirmed to be breeding within the Clonburris SDZ during the surveys undertaken between November 2020 and June 2021, however the presence of the species cannot be ruled out due to sighting records within the SDZ lands from recent years, and due to a potential barn owl pellet found at the Grange Castle.”

Breeding Bird and Raptor Surveys

Breeding bird and raptor surveys were carried out by Scott Cawley for the Wider SDZ in 2020; the results of these surveys were originally reported within the EIAR Biodiversity Chapter for the road and infrastructure development within the SDZ lands (SDZ20A/0021). As described within this report, *“A range of common bird species were noted using the site for foraging and breeding purposes during the breeding bird surveys undertaken in June 2020. These include blackbird *Turdus merula*, blackcap *Sylvia atricapilla*, blue tit *Cyanistes caeruleus*, bullfinch *Pyrrhula pyrrhula*, buzzard *Buteo buteo*, chaffinch *Fringilla coelebs*, chiffchaff *Phylloscopus collybita*, coal tit *Parus ater*, dunnock *Prunella greenfinch* *Chloris chloris*, grey wagtail *Motacilla cinerea*, hooded crow *Corvus cornix*, jackdaw *Coloeus modedula*, linnets *Linaria cannabina*, magpie *Pica pica*, meadow pipit *Anthus pratensis*, pheasant *Phasianus colchicus*, reed bunting *Emberiza schoeniclus*, robin *Erithacus rubecula*, song thrush *Turdus philomelos*, spotted flycatcher *Muscicapa striata*, whitethroat *Sylvia communis*, willow warbler *Phylloscopus trochilus*, wren *Troglodytes troglodytes*, and woodpigeon *Columba palumbus*.*

Of these species, four (i.e. greenfinch, linnet, robin and spotted flycatcher) are Amber-listed and are therefore considered to be of Moderate Conservation Concern by Colhoun & Cummins (2013). Two (grey wagtail and meadow pipit) of the total of 29 species recorded are Red-listed and are considered to be of High Conservation Concern by Colhoun & Cummins (2013). The records for these were adjacent to the proposed development site footprint. Grey wagtail was recorded twice, one individual perching near the Griffeen River and a second individual flying over the Grand Canal towards north and the proposed development site. Meadow pipit was recorded on three occasions: one individual foraging on the ground in the grasslands adjacent to the Griffeen River, a second individual in song flight and a pair foraging and flying in the grasslands towards north-east of the proposed development site.

Breeding birds use various habitats, including trees, structures, grasslands and scrub, for nesting. The presence of several bird species with territories and with young within the proposed development site indicate that it is likely to be used for breeding by various species. No nests were observed during the surveys; however, they are usually camouflaged and therefore well hidden.

Barn swallows *Hirundo rustica*, house martins *Delichon urbicum* and swifts *Apus apus* frequently use eaves and crevices on buildings as nesting places. There was no evidence of them nesting within the buildings onsite, nor were they present at the time of the surveys.

Due to the aforementioned facts and the presence of suitable habitat within and directly adjacent to the proposed development site, the local breeding bird populations are considered to be of local importance (higher value)".

In relation specifically to breeding raptors, the following results were reported: "Four raptor species were recorded within the proposed development site during the raptor surveys undertaken in June 2020. These included buzzard, long-eared owl *Asio otus*, peregrine and sparrowhawk *Accipiter nisus*. In addition, barn owl *Tyto alba* and long-eared owl were recorded during bat activity surveys. Of these species, barn owl is Red-listed (a species of High Conservation Concern) and sparrowhawk is Amber-listed (a species of Moderate Conservation Concern) by Colhoun & Cummins (2013). Peregrine is listed under Annex I of the EU Birds Directive and the nearest designated site for this species is the Wicklow Mountains SPA, located c.12.3km south of the proposed development site.

Barn owl was recorded twice: once flying around near the (mixed) broadleaved woodland area within the proposed development planning boundary to the west and once perching in the hedgerows adjacent to the grassland adjacent to the Grand Canal to the east. The buildings within the proposed development site are unsuitable for nesting barn owls due to lack of optimal nesting sites (i.e., quiet barns and large tree cavities), however there is suitable foraging habitat within and adjacent to the proposed development site.

Sparrowhawk was recorded within and/or adjacent to the proposed development on five occasions. Four of these records were of individuals of flying to the south of the proposed development site over the habitats along the Grand Canal; along the northern side of the railway, near the Clondalkin/Fonthill station; or flying across the railway either towards north or south in the same location. One sparrowhawk was seen in the (mixed) broadleaved woodland area within the proposed development planning boundary to the west. As the surveyor approached the area, it started alarm calling, indicating of a potential presence of nest and/or young birds.

Peregrine was only recorded on one occasion. One individual was seen soaring over the grasslands adjacent to the R120 outside the proposed development site. Long-eared owl was confirmed to be breeding within the proposed development site, based on the presence of fledglings during surveys. A pair of buzzards is likely to breed within the site based on territorial displays observed during the surveys, however, their nest was not located. Environmental Impact Assessment Report – EIAR Volume II Clonburris SDZ Phase 1A 4-52.

Due to the aforementioned facts and the presence of suitable habitat within and directly adjacent to the proposed development site, the local raptor populations (excluding peregrine) are considered to be of local importance (higher value). Local peregrine populations are considered separately due to their Annex I status and are of county importance."

4.6.2.4 Bats

No buildings are present within the T2 Site. No trees within the T2 site were judged to be suitable for roosting bats (see also Section 3.1 and 5.1 of the Bat Assessment (Appendix C 1 Volume III of this EIAR).

Habitat for commuting and foraging within and around the site for bats was relatively limited; the grassland within the Site was species poor and dominated by grasses, and therefore likely attracts relatively few flying insects but is nonetheless likely to be utilised to at least some degree for foraging by bats.

The hedgerows within the Site and at its northern boundary represented the best commuting features, being largely continuous. The hedgerows provide connectivity for bats to the surrounding landscape. As such, they were assessed overall as having *Moderate* suitability for foraging and commuting i.e. continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens (Collins, 2016).

A detailed bat assessment of the proposed development was carried out by Dr Tina Aughney of Bat Eco Services (see Appendix C 1 Volume III of this EIAR). A summary of the results of the bat surveys carried out as part of this assessment are provided below.

A total of five bat species were recorded during the detailed bat survey work undertaken at the site; these were Leisler's bat, common pipistrelle, soprano pipistrelle, brown long-eared bat and Daubenton's bat. The bat species most commonly recorded were soprano pipistrelle then Leisler's bat and common pipistrelle and these are the three most common bat species in Ireland. No Annex II species were recorded.

The following is a summary from the Bat Assessment report (see Appendix C 1 Volume III of this EIAR) for overall activity levels within the wider Clonburris SDZ between 2018 and 2022:

“Five bat species were recorded in total by the array of bat surveys completed for the greater survey site. The proposed development site is a much smaller area than what was surveyed for bats. Extracting the data for this proposed development indicates that three of these species of bat were recorded in T2 proposed development area: common pipistrelle, soprano pipistrelle and Leisler's bat.

Three of the bat species recorded were common pipistrelle, Leisler's bat and soprano pipistrelle and these are the three most common bat species in Ireland.

Soprano pipistrelles were recorded during all walking transects and static surveillance surveys. While this species was recorded foraging and commuting throughout the survey area, the majority of the bat encounters were in vicinity of the treeline along the Grand Canal. In relation to static surveillance a Low level of bat activity was recorded for this species of bat.

Common pipistrelles were recorded during all walking transects and static surveillance surveys. This species was recorded foraging throughout the survey area with records distributed along the hedgerows, treelines and located along the treeline adjacent to the canal. In relation to static surveillance a Low to Medium level of bat activity was recorded for this species of bat.

Leisler's bats were recorded during all walking transects and static surveillance surveys. This species was recorded foraging throughout the survey area with the majority of the records located along the mature treelines within the internal linear habitat network and along treelines adjacent to the canal. In relation to static surveillance a Low level of bat activity was recorded for this species of bat.

The remaining three bat species are considered to be less common in Ireland.

Brown long-eared bats were only recorded during static surveillance during 2020 and on static units located along hedgerows within the internal linear habitat network of the survey area. A single bat pass of this bat species was recorded on the static units on the same night (16/7/2020) and therefore it is likely that it was one individual bat commuting and foraging through the survey area.

Daubenton's bats were recorded during the 2018 walking transects and during static surveillance surveys completed in 2018 (one static unit, 3 bat passes), 2020 (one static unit, 3 bat passes) and 2022. The location of the static units relating to the 2018 and 2020 static surveillance was at the same grid reference point: hedgerow along the eastern section of the survey area while the static unit that recorded Daubenton's bats in 2022 was position adjacent to the canal. This species was only recorded during the 2018 and 2022 walking transects and this was on the water surface of the canal.”

4.6.2.5 Amphibians and Reptiles

No amphibians or reptiles were recorded during the survey. Some suitable terrestrial and aquatic habitat for amphibians was present in the form of the vegetated drainage ditches and the longer grassland within the Site.

4.6.2.6 Other Fauna

Fox paths, scat and foraging evidence was recorded throughout the Site but no earths were present. No evidence of badger (i.e. setts, prints, foraging signs etc) or Irish hare (*Lepus timidus*) i.e. droppings, were recorded within the study area. These mammal species are likely to be common in the wider landscape and are likely to use parts of the site, at least on occasion. In general, given the nature of the habitats recorded on site, limited suitable habitat occurs for protected faunal species. It is noted also that no signs of badger were found during dedicated non-avian fauna surveys carried out (see Appendix C 4 Volume III of this EIAR).

The Grand Canal to the south of the site is known to be used by otter (see non-avian fauna survey in Appendix C 4 Volume III of this EIAR), and otters may occasionally pass through the wider site via the drainage ditch network. However no evidence of otter was recorded during the ecological survey of T2, and the ditch running adjacent to the railway line immediately to the north of the T2 site is very much suboptimal for the species.

No areas of devil's-bit scabious *Succisa pratensis* were recorded within the proposed footprint and therefore no suitable habitat for marsh fritillary *Euphydryas aurinia* exists.

Common frogs (*Rana temporaria*) were recorded within the T2 Site during surveys carried out by Dr.Chris Smal in spring 2021 and 2022 (see Non-avian fauna survey report, Appendix C 4 Volume III of this EIAR). Standing water was present within some parts of drains within the T2 site which may represent suitable breeding habitat for this species.

No signs of any additional protected fauna were recorded within the study area during the field survey.

4.6.2.7 Invasive Species

No invasive species listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. 477/2011 were recorded during the site visit.

4.6.2.8 Importance of Ecological Receptors

Table 4.12 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts on National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are key Ecological Receptors.

Table 4.12 – Ecological Receptors

Ecological Receptor	KER (Y/N)	Rationale
Designated Sites		
EU sites – International importance	No	No potential pathway for significant effects has been identified (see also the Appropriate Assessment Screening Report that accompanies the application). No potential for significant effects on European Sites has been identified, and these sites will therefore not be considered further within this EIAR Chapter.
National Sites – National Importance	No	The proposed development site is located approximately 200m from the nearest pNHA (Grand Canal) at its closest point; no pathway for significant effect has been identified (see Section 4.6.1.1) National Sites are therefore not considered as KERs.

Ecological Receptor	KER (Y/N)	Rationale
Habitats, Flora and Fauna		
Habitats of Local importance (higher value): <ul style="list-style-type: none"> ➤ Hedgerow (WL1) ➤ Treelines (WL2) ➤ Drainage Ditches (FW4) – associated with above features 	Yes	<p>Hedgerow and the associated trees within the Site act as a commuting and foraging corridor for wildlife, and this habitat is essential in maintaining connectivity to the wider landscape and to features of higher ecological value. There will be a loss of approximately 252 linear metres of hedgerow (and associated drainage ditches) associated with the proposed development.</p> <p>Therefore, these habitats are considered to be KERs.</p>
Habitats of local importance (lower value): <ul style="list-style-type: none"> ➤ Dry meadows and grassy verges (GS2) ➤ Spoil and bare ground (ED2) ➤ Recolonising bare ground (ED3) 	No	<p>The grassland habitat within the Site, as well as the areas of disturbed ground and temporary track for vehicular use, was highly modified, species poor and is common and widespread in the local area and wider landscape. Therefore, these habitats are not considered to be a KERs, but the grassland and areas of recolonising bare ground are nevertheless of some local value.</p>
Water Quality and Aquatic Species Local Importance (Higher value)	Yes	<p>Drainage ditches within the site provide suitable habitat for aquatic species such as common frog as well as aquatic invertebrate species.</p> <p>The proposed development site is located approximately 200m from the Grand Canal pNHA, as noted above, with potential hydrologically connectivity present.</p> <p>Taking a precautionary approach, a potential pathway for indirect effects to water quality and aquatic species was identified in the form of deterioration in water quality due to surface water pollution during the construction and operational phases of the development via the release of polluting materials including sediment, cement, fuels and hydrocarbons.</p>
Birds – Local Importance (Higher value)	Yes	<p>Bird species recorded using the habitats within the site were mostly an assemblage of common birds that are typical of the grassland and urban habitats in the wider area. Single records of gull species (common, herring and lesser black-backed gull) were also noted during the surveys carried out by Scott Cawley.</p> <p>Birds have therefore been assigned a value of Local Importance (higher value). Due to the nature of the proposed development, there will be some loss of/disturbance to habitat within the site that birds may use for foraging/nesting. From a precautionary perspective, if undertaken during the nesting bird season, such vegetation clearance could adversely impact on bird species that utilise the T2 site.</p>
Bats – Local Importance (Higher value)	Yes	<p>The habitats within and surrounding the Proposed Development site 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 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 the development footprint; a</p>

Ecological Receptor	KER (Y/N)	Rationale
		bat roost of Local Importance was identified within the wider Survey Area. The Proposed Development has the potential to result in direct and indirect effects on the receptor. Therefore, bats are included as a KER for further assessment.
Badgers	Yes	No evidence of badger was recorded anywhere within the T2 site or the wider SDZ lands (see also the Non-avian Fauna report – Appendix C 4 Volume III of this EIAR) and it is therefore considered that the species is not resident within site. However the habitat of the site is suitable for foraging and it is likely that badgers forage within the site at least on occasion. Due to the fact that new setts may be constructed in a short period of time, badgers are considered as A KER on a precautionary basis.
Otters	No	Otters are known to utilise the Grand Canal the banks of the canal provide a refuge and foraging habitat for the species (see Section 2.1.1 of the Non-avian Fauna Survey Report – Appendix C 4 Volume III of this EIAR). No evidence of the species was recorded within the T2 site, and the drainage ditch to the north is sub-optimal for the species. Otters are therefore not considered to be a Key Ecological Receptor and will not be considered further in this report.
Frogs	Yes	Evidence of frog breeding was recorded within the T2 site in March 2021 and April 2022, associated with drainage ditches, as part of the non-avian fauna surveys. Frogs have therefore been identified as a KER warranting further consideration.
Other Fauna – Local Importance (Lower value)	No	Given the absence of notable additional faunal species occurring within the development footprint, no significant direct or indirect impacts on other faunal species, in addition to those listed above, are considered likely as a result of the proposed development. Other faunal species that may utilise the site on occasion, such as otter are not considered to be KERs, as no evidence of these species was recorded during the T2 site and no suitable habitat was present for otter within the T2 site itself.

4.7 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of a mixed-use development on a site of c. 3.96 hectares comprising 594 no. apartments (255 no. 1 bedroom apartments, 307 no. 2 bedroom apartments and 32 no. 3 bedroom apartments), as well as commercial office development in Block C, c. 5,195 sq.m), 1 no. retail unit at ground floor of Block B (c.147.5 sq. m) and 3 no. retail units at ground floor of Block E as follows (c.106.2 sq.m, c.141.6 sq.m and c.492.2 sq.m respectively) a creche (c. 600 sq. m) at ground floor and first floor of Block A. Car parking (396 no. spaces in a mixture of undercroft spaces Block A, Block B&D and Block E&F) and bicycle parking (1,232 no. spaces at undercroft and surface levels) along with all site development and landscaping works including public open space (see Chapter 2 of this EIA for a detailed description of the proposed development).

4.8 POTENTIAL IMPACTS/EFFECTS OF THE PROPOSED DEVELOPMENT

4.8.1 Do Nothing Impact

If the proposed works were not to go ahead the development site would remain under its current usage, with grassland remaining unmanaged and ruderal vegetation and scrub continuing to encroach.

4.8.2 Effects on Designated Sites

None of the elements of the Proposed Development are located within the boundaries of any Nationally or European designated sites. There will be no direct effects on any designated site as a result of the construction, operation and decommissioning the Proposed Development.

No Nationally Designated sites have been identified as being within the likely zone of influence due to potential for indirect impacts and these site have not been identified as KERs.

Nationally designated sites that are also designated as European Sites have been assessed as those designations within the Appropriate Assessment Screening Report, with the relevant conclusions are recorded and referenced in this chapter (see Section 4.5.1).

In relation to European sites, an Appropriate Assessment Screening Report has been prepared to provide the competent authority with the information necessary to complete an Appropriate Assessment Screening (AA Stage 1) for the Proposed Development in compliance with Article 6(3) of the Habitats Directive.

The Screening for Appropriate Assessment concluded as follows:

“Following an examination, analysis and evaluation of the relevant data and information set out within this Screening Report, it can be concluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Development, individually or in combination with other plans and projects, will not have any significant effect on any European Designated Sites.

Given that no potential pathway for significant effects on European Sites has been identified, there is no requirement for Appropriate Assessment or the preparation of a Natura Impact Statement (NIS).”

4.8.3 Likely Significant Effects During the Construction Phase

4.8.3.1 Effects on Habitats During Construction

The proposed works will take place within areas of the site that comprise existing fields that comprise **Dry meadow and grassy verge (GS2)** grassland, **Hedgerow (WL1)** and **Treelines (WL2)** with associated **Drainage Ditches (FW4)** and areas of **Recolonising bare ground (ED3)** and **Spoil and bare ground (ED2)**; these habitats will be lost to facilitate the development. Hedgerow features and trees at the site boundaries are to be retained.

None of the habitats within the works areas correspond to habitats listed on Annex I of the EU Habitats Directive.

The species poor **Dry meadow and grassy verge (GS2)**, **Recolonising bare ground (ED3)** and **Spoil and bare ground (ED2)** habitats within the proposed project site were assigned *Local Importance (Lower Value)* as they are of low ecological significance and widespread and abundant in the wider area.

The **Hedgerow (WL1)** and **Treeline (WL2)** habitats and associates **Drainage ditches (FW4)** were assigned *Local Importance (Higher Value)* as they have inherent biodiversity benefits, help maintain links and ecological corridors between features of higher ecological value and are likely to be utilized by commuting and foraging bats and provide nesting and foraging habitat for Birds.

4.8.3.2 Habitats of Local Importance (Lower Value)

Habitats of Local Importance (lower value) lost to the footprint of the proposed development include; **Dry meadows and grassy verges (GS2)**, **Spoil and bare ground (ED2)** small patches of encroaching **Scrub (WS1)** associated with field boundaries and **Recolonising bare ground (ED3)**.

The effect is assessed a permanent not-significant negative impact on receptors of Local Importance (Lower Value). Loss of these habitats to the footprint of the proposed development is not considered to be significant at any geographic scale. These habitats are common and widespread in the locality and have a low biodiversity value. The loss of these habitats is considered not significant and therefore no mitigation is required.

4.8.3.3 Habitats of Local Importance (Higher Value)

Assessment of the Potential Impacts on the loss of hedgerow

Table 4.13 – Assessment of the Potential Impacts on the loss of Hedgerow (WL1) during the construction phase

Description of Effect	Approximately 276m (linear distance) of hedgerow will be permanently removed to facilitate the proposed development. Hedgerow features present along the northern and eastern boundaries of the Site are being retained.
Characterisation of unmitigated effect	The loss of approximately 276m of hedgerow habitat would constitute a permanent negative effect. This would not be reversible as it is within the construction footprint. The magnitude of this impact is judged to be Slight at the local scale.
Assessment of Significance prior to mitigation	The permanent loss of the proposed 276m of hedgerow is not considered to be a significant effect at any greater than the local geographical scale, as this habitat is widespread and common within the wider area to the west. Removal of the proposed sections of unmanaged hedgerow, to accommodate the proposed development would nonetheless have the potential to lead to a significant reduction in this habitat within the Site.
Mitigation	Full details of the proposed mitigation in relation to loss of hedgerow are provided in Section 4.12.1.1 below.
Residual Effect following Mitigation	Following implementation of mitigation as set out in Section 4.12.1.1, no potential for significant effect exists at any geographic scale. The planting of new native hedgerow and shrub habitat will serve to enhance and increase species diversity within the site, will benefit wildlife and will result in a net gain in overall tree and shrub habitat within the site.

4.8.3.4 Potential Impacts on Water Quality and Associated Aquatic Fauna

Table 4.14 – Impacts on Water Quality and Associated Aquatic Fauna

Description of Effect	<p>The construction phase of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery.</p> <p>A network of drainage ditches were identified on-site, and the construction phase of the proposed development may potentially result in pollution of watercourses connected to these.</p> <p>Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on water quality through pollutants including hydrocarbons, fuel and cement.</p>
Characterisation of unmitigated effect	<p>Deterioration in downstream surface water quality would constitute a <i>Slight</i>, reversible negative effect. Surface water pollution via drainage ditches has the potential for significant downstream effects on sensitive ecological receptors downstream i.e. those associated with the Grand Canal.</p>
Assessment of Significance prior to mitigation	<p>In the absence of mitigation and following the precautionary principle, there is potential for the proposed development to result in indirect effects on the identified aquatic habitats and species within and bordering the site, and the canal to the south, at a local geographic scale in the form of pollution during the construction phase. These effects on the latter feature are unlikely to be significant given the distance (approximately 280m) between the T3 site boundary and the Grand canal to the south, and the lack of a direct hydrological connection to this feature, however following a highly precautionary approach, robust mitigation has been implemented to safeguard aquatic features during the construction phase (see below).</p>
Mitigation	<p>Full details of the proposed mitigation in relation to impacts on water quality and associated aquatic fauna are provided in Section 4.12.1.2 below.</p>
Residual Effect following Mitigation	<p>No significant effect on water quality, within the site or within the Grand Canal to the south, are anticipated during construction following the implementation of the measures and best practice as set out in Section 4.12.1.2.</p>

4.8.5 Impacts to Fauna

Faunal species recorded within the proposed development boundary have widespread and favourable ranges in Ireland, and alternative suitable habitat is widespread in the wider area. Therefore, impacts on fauna as a result of disturbance/ displacement are short-term non-significant negative impacts.

From a precautionary perspective, the following faunal species have been identified as KERs for further assessment in the following subsections:

- Bats
- Badger
- Otter
- Birds
- Frogs

4.8.5.1 Assessment of the Potential Impacts on Bats

Table 4.15 – Potential impacts on bats associated with the construction phase of the proposed development.

<p>Description of Effect</p>	<p>Habitat Loss/Fragmentation</p> <p>The proposed development will result in the loss of grassland and linear hedgerow/treeline habitat within the site that is likely to be used by commuting and foraging bat species locally. No buildings occur within the T2 site, and no trees with potential roosting features for bats were recorded within the site; there will therefore be no loss of bat roosts or potential roosting habitat lost as part of this development. here will be no bat roosting habitat lost as part of this development (see also Section 5.1 of the Bat Assessment provided within Appendix C 1 Volume III of this EIAR).</p> <p>Field boundary features are to be retained. However, there will be removal of sections of hedgerow and treeline within the site boundary, which provides suitable commuting habitat.</p> <p>Increased artificial lighting as a result of the development has the potential to fragment commuting routes in the absence of appropriate lighting design considerations.</p> <p>Disturbance/ Displacement Effects</p> <p>No buildings occur within the T2 site, and no trees with suitable Potential Roosting Features (PRFs) were recorded within the site; therefore no potential direct disturbance of bats in roosts is anticipated.</p> <p>An increase in artificial lighting as a result of the development has the potential to cause some degree of displacement to bats.</p>
<p>Characterisation of unmitigated effect</p>	<p>Habitat Loss/Fragmentation</p> <p>Loss of existing, sub-optimal, foraging resource as a result of clearance of existing grassland is considered to be an Imperceptible negative effect at the local geographic scale.</p> <p>Boundary hedgerow features are to be retained, and connectivity for bats to the surrounding landscape will therefore be preserved. Loss of commuting and foraging habitat within the site itself, and some fragmentation of the existing commuting habitat that will occur as a result of the proposed development and associated artificial lighting has the potential to result in Permanent, slight, negative effects in the absence of mitigation (see also Section 5.5 of the Bat Assessment report – Appendix C 1 Volume III of this EIAR).</p> <p>Disturbance/ Displacement Effects</p> <p>Disturbance and/or displacement effects on all bat species during the construction phase are assessed as Short-term Slight Negative Effect. This is in relation to increased artificial lighting associated with the construction phase of the proposed development (see also Section 5.5 of the Bat Assessment report – Appendix C 1 Volume III of this EIAR). .</p>
<p>Assessment of Significance</p>	<p>Habitat Loss/Fragmentation</p> <p>Loss of bat commuting and foraging habitat will take place at the Local scale.</p>

prior to mitigation	Removal of hedgerow within the site would constitute a significant impact at the site level in the absence of mitigation; the wider boundary hedgerow network will continue to provide connectivity for bats across to the surrounding landscape.
	Disturbance No significant direct disturbance to bats is anticipated at any geographic scale. Potential displacement as a result of an increase in artificial lighting during the construction phase represents a potential short-term significant effect on local bat populations.
Mitigation and habitat enhancement	Full details of the proposed mitigation in relation to impacts on bats are provided in Section 4.12.1.3 below.
Residual Effect following Mitigation	Habitat Loss/Fragmentation Following the incorporation of mitigation measures as set out in Section 4.12.3, no potential for significant residual loss of bat habitat, including commuting and foraging habitat, is anticipated at any geographic scale.
	Disturbance/ Displacement Effects Following the incorporation of mitigation measures as set out in Section 4.12.3, no potential for significant disturbance/displacement impacts of bats has been identified at any geographic scale.

4.8.5.2 Assessment of the Potential Impacts on Birds

Table 4.16 – Assessment of impacts on birds associated with the construction phase of the proposed development.

Description of Effect	Habitat Loss The footprint of the proposal will result in the loss hedgerow and encroaching scrub habitat within the Site. Such habitat provides some suitable nesting habitat for a range of common and widespread bird species locally.
	Disturbance/ Displacement Should site clearance or hedgerow removal be undertaken during the bird nesting season (March to August inclusive), it could lead to the destruction or disturbance/displacement of nesting birds.
Characterisation of unmitigated effect	Habitat Loss The loss of scrub and hedgerow habitat constitutes a permanent slight negative effect as these habitats are common and widespread in the wider area. Foraging and nesting opportunities for the common species identified as using the site will not be significantly affected as a result of the works.
	Disturbance In the absence of mitigation, there is potential for slight temporary negative effect on local bird species associated with the construction phase of the proposed development as the site does not provide significant habitat for bird species of conservation concern.
Assessment of significance prior to mitigation	Habitat Loss The unmitigated impact resulting in the loss of foraging and commuting habitat for bird species is not significant, as the habitats to be lost are common and widespread in the local area and do not support significant habitat for protected bird species.
	Disturbance In the absence of mitigation, there is potential for loss of individual bird nests within the site of the proposed development. Whilst this would be a significant effect on the individual nests involved, it would not result on a significant effect on the populations of the species involved in terms of their conservation status.
Mitigation	Full details of the proposed mitigation in relation to impacts on birds are provided in Section 4.12.1.4 below.

Residual Effect following Mitigation	Habitat Loss Following the incorporation of mitigation as set out in Section 4.12.1.4, habitat loss is not considered to be significant at any geographic scale.
	Disturbance/Displacement Following the implementation of the mitigation as set out in Section 4.12.1.4, there will be no significant residual effect at any geographic scale.

4.8.5.3 Assessment of the Potential Impacts on Badgers

Table 4.17 – Assessment of impacts on badgers associated with the construction phase of the proposed development.

Description of Effect	Habitat Loss/Fragmentation No evidence of badgers was recorded during the ecological survey; however the species is assumed to use the site at least on occasion. Given the nature of the Proposed Development, there will be some minimal loss of suitable badger foraging habitat i.e., grassland, scrub and hedgerow associated with the footprint of the proposed development.
	Disturbance No disturbance of badgers is anticipated as a result of the proposed development, given that no setts or other evidence of the species was recorded within the site.
Characterisation of unmitigated effect	Habitat Loss/Fragmentation The loss of existing grassland, encroaching patches of scrub and hedgerow within the Site is not considered to constitute a significant effect on local badger populations, especially given the lack of evidence of badgers within the Site.
	Disturbance Noise and earth movement during construction works have the potential to disturb badgers occupying setts in close proximity to proposed infrastructure during construction. Badger tunnel systems can extend some distance from sett entrances (over 20m in some cases ¹³) and therefore any excavation by heavy machinery in close proximity to sett entrances risks causing damage to setts and/or direct harm to badgers in the absence of mitigation. The access route for the development has been located specifically to avoid impacts on setts recorded during site surveys as far as possible, being located approximately 35m away from the closest sett. This scenario is not currently anticipated, as no badger setts have been recorded within the Site.
Assessment of Significance prior to mitigation	Habitat Loss/Fragmentation No significant overall loss or fragmentation of badger foraging habitat is anticipated at any geographic scale.
	Disturbance No setts have been recorded within the Site of the proposed development. Potential for disturbance to badgers has therefore been assessed as imperceptible at the local geographic scale in the absence of mitigation. However given that badgers are assumed to be present in the surrounding area, and likely use the site on occasion, it is possible that new setts may be excavated in the intervening period prior to any construction commencing within the Site.
Mitigation	Full details of the proposed mitigation in relation to impacts on bats are provided in Section 4.12.1.5 below.
Residual Effect following Mitigation	Habitat Loss/Fragmentation No significant fragmentation to or loss of badger foraging habitat is anticipated at any geographic scale.

¹³ National Roads Authority (2009) Guidelines for the treatment of badgers prior to the construction of National Road Schemes.

	<p>Disturbance Following the incorporation of the mitigation measures as set out in Section 4.12.1.5, no significant negative impacts to badgers is anticipated at any geographic scale.</p>
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4.8.5.4 Assessment of Potential Impacts on Frogs

Table 4.18 – Assessment of impacts on frogs associated with the construction phase of the proposed development.

Description of Effect	<p>Habitat Loss/Fragmentation Suitable frog habitat was present in the form of the wet ditches within the T2 site, and several frog breeding sites were identified within the wider Clonburris SDZ in March 2021 and 2022 as part of dedicated fauna surveys (see Appendix C 4 Volume III of this EIAR). The wet ditch at the northern boundary of the site will be retained in full; however, the ditch within the western portion of the site will be lost, where there was a breeding site recorded as part of the non-avian fauna survey work in March 2021 (but not in April 2022). Development on site will therefore remove some potential breeding habitat for frogs, as well as reducing or removing frog foraging habitat (grassland, and cover associated with hedgerow).</p>
Characterisation of unmitigated effect	<p>Habitat Loss/ Fragmentation Loss of the previously confirmed breeding site and sheltering habitat for frogs that is proposed (the northern wet ditch which also provided suitable habitat is to be retained in full) represents a slight effect on frog populations at the local scale.</p>
Assessment of Significance prior to mitigation	<p>Habitat Loss/Fragmentation Loss of the previously confirmed breeding site for common frog represents a potentially significant effect at the site level.</p>
Mitigation	<p>Full details of the proposed mitigation in relation to impacts on frogs are provided in Section 4.12.1.6 below.</p>
Residual Effect following Mitigation	<p>Following the implementation of mitigation as set out in Section 4.12.1.6, there will be no significant residual effect on frogs as a result of the proposed development.</p>

4.8.7 Likely significant effects during the Operational Phase

4.8.7.1 Impacts on Habitats

There will be no loss or fragmentation of habitats during the operational phase of the proposed development. All habitat loss will occur during construction. As such, no negative effects on habitats are predicted during the operation of this proposed residential development. In addition, the habitat compensation measures incorporated into the construction phase of the proposed development, outlined in Section 4.8.3 of this report, will also establish on site to provide biodiversity benefits in terms of plant species variety and biodiversity generally. The landscaping plan includes for the creation of two main open green spaces within the T2 site; this includes the Local Park space (0.52ha) and a portion of the linear park (0.72ha), totalling 1.24ha. In addition, planting proposals are aimed at gaining the maximum possible benefit for biodiversity and pollinators in accordance with the All-Ireland Pollinator Plan, and the proposal includes for additional tree and shrub planting throughout the scheme and for biodiverse green roofs on buildings.

4.8.7.2 Impacts on Water Quality

Table 4.19 – Impacts on Water Quality and Aquatic Fauna

Description of Effect	The operational phase of the proposed project will result in the production of foul sewage and surface water runoff. If not adequately treated, there is potential for impacts on water quality in the form of deterioration of surface water.
Characterisation of unmitigated effect	The deterioration in downstream surface water quality would constitute a long term, reversible negative effect on downstream water quality. Given the nature of the development, and the presence of the grand Canal watercourse approximately 200m to the south, any effects are likely to be at worst moderate.
Assessment of Significance prior to mitigation	The operational phase of the proposed project will result in the production of foul sewage and surface water runoff. As described in Chapter 2 and Chapter 6 of this EIA, the proposed development will be connected to the local public sewer. There is therefore no potential for significant effect at any geographic scale.
Mitigation	Full details of the proposed mitigation in relation to impacts on frogs are provided in Section 4.12.2.2 below.
Residual Effect following Mitigation	Given the proposed treatment of wastewater and storm water during the operational phase of the development as set out in Section 4.12.2.2, no significant effects on water quality are anticipated.

4.8.7.3 Impact on Fauna

As the operation of the proposed development will not result in any additional loss of habitat and will actually include measures to improve the biodiversity value of the site (as described in the previous section). No significant effects in terms of habitat loss and fragmentation are anticipated. The biodiversity management plan provides for additional habitat for bird and bat species in the form of bird and bat boxes along with the planting of trees and creation of a “Biodiversity garden”.

Bats

The proposed development will include implementation of artificial lighting with the potential to significantly affect bats (see Section 5.8 of the Bat Assessment report – Appendix C 1 Volume III of this EIAR). Full details of the proposed mitigation in relation to such potential impacts on bats during the operational phase are provided in Section 4.12.2.3 below.

Provided the mitigation measures as set out in Section 4.12.2.3 are successfully implemented, no significant negative effects on any faunal receptors are anticipated as a result of the development.

4.9 DECOMMISSIONING PHASE

The proposed development is considered to be permanent and thus there will be no decommissioning works associated with the proposed development. Any demolition or maintenance works on the site would be likely to have similar impacts in terms of disturbance to those associated with the construction phase of the project as detailed in previous sections.

4.10 ‘WORST CASE’ SCENARIO

4.10.1 Construction Phase

Under an anticipated ‘worst case’ scenario, and as described within Section 6.8 Chapter 6 of this EIAR, the accidental release of fuel, oil, paints or other hazardous material occurs on site during the construction phase, through the failure of secondary containment or a materials handling accident on the site. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the groundwater or flow overland and contaminate surface water receptors.

4.10.2 Operational Phase

Under an anticipated ‘worst case’ scenario, and as described within Section 6.8 Chapter 6 of this EIAR, worst case scenarios envisioned are extreme occurrences of the potential effects identified above in conjunction with failure of mitigation measures during the operational phase including:

- Significant contamination event
- Flood Event Flooding due to extreme event or unsuitable drainage measures

Given the scale of the site and relatively standard nature of the works involved the likelihood of a “worst case” event has been judged to be extremely low (see Section 6.8.2, Chapter 6 of this EIAR).

4.11 MITIGATION MEASURES

Details of the mitigation proposed to ensure that no residual impacts will occur upon any Key Ecological Receptors as a result of the proposed development is provided below; a summary of all mitigation is also provided within Chapter 16 of this EIAR.

4.11.1 Construction Phase

4.11.1.1 Loss of Hedgerow

As compensation for the loss of hedgerow associated with the proposed development, the following is proposed within the landscape plan to offset the loss:

- Additional native hedgerow planting along the existing fence and hedgerow at the northern boundary of the T2 site to strengthen and enhance this feature
- Approximately 1256m² of new native shrub planting to include the following indicative species: *Viburnum opulus**, *Euonymus europaeus**, *Cornus sanguinea**, *Lonicera periclymenum**, *Hedera helix**, *Crataegus monogyna**, *Prunus spinosa**
- Approximately 460m² structural shrub and hedge planting (to include the following species planted at approx. 4no. per sq.m: *Sarcococca humilis*, *Hypericum 'Hidcote'*, *Mahonia aquifolium*, *Rosmarinus officinalis*, *Viburnum davidii*, *Viburnum opulus*, *Salix aurita*, *Salix caprea*, *Rosa canina*, *Rosa pimpinellifolia*, *Euonymus europaeus*. To include species and varieties within the All-Ireland Pollinator Plan);
- Approximately 74m² Native woodland planting (to include the following species: *Alnus glutinosa*, *Betula pendula*, *Betula pubescens*, *Crataegus monogyna*, *Malus sylvestris*, *Quercus robur*, *Prunus avium*, *Acer campestre*, *Prunus spinosa*, *Salix spp.* *Prunus padus*, *Corylus avellana*, *Pinus sylvestris*);
- Approximately 500 linear metres of native privet (*Ligustrum vulgare*) residential hedge.

See the Landscape Masterplan (Murray & Associates Drawing 1868_PL_P_01, included as Appendix C 5 Volume III of this EIAR) for further details of the proposed landscaping for T2.

The proposed tree, shrub and hedge planting will provide compensation for loss of tree and shrubs within the T2 site, and retention and strengthening of the northern boundary hedgerow will serve to maintain connectivity around the site for wildlife.

In addition, the landscaping plan specifies the planting of tree lined avenues throughout the site which will result in a significant increase in overall tree cover within the site. In addition to the tree lined avenue bisecting the proposed scheme, extensive additional tree planting will take place within green space areas and throughout the scheme. These amenity tree areas will be a mixture of semi-mature native trees and adopted species.

All tree and shrub cover at the northern and eastern site boundaries will be retained. The northern Retained trees along the site boundary of the site will be protected during construction in full accordance with BS:5837 (Trees in Relation to Construction) and the Arboricultural Method Statement and Tree Protection Plan, as provided in Appendix 1 of the Arboricultural Report, prepared by The Tree File, included with the application.

*Note: Species native to Ireland

4.11.1.2 Impacts on Water Quality and Associated Aquatic Fauna

The following best practice mitigation and environmental control measures will be adhered to throughout the construction phase to ensure the avoidance of impacts on water quality:

Site Set-up

- 2.4m high hoarding will be erected around the boundaries of the development site. All works will be located within the confines of this fencing
- A site compound will be established within the site boundary. The exact location of the site compound will be established by the contractor.
- Access routes will be clearly marked / identified. Access during construction to any working areas will be restricted to land within the outlined works area.

Pollution Prevention

- Any requirement for temporary fills or stockpiles will be sown with grass or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall.
- Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered;
- In the event of encountering groundwaters during excavation, the excavation will be de-watered using a pump equipped with a silt bag on the outlet if necessary, to capture any silty material prior to subsequent natural percolation to ground. Alternatively, this water will be tankered off site if required.
- As construction advances there may be a small requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into silt bags prior to overland discharge allowing water to percolate naturally to ground.
- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing.

- The design, construction and maintenance of an on-site drainage system can prevent sediment related pollution of nearby surface waters. Ground disturbance should be kept to a minimum, water from excavations should be filtered, other sediment trapping technologies such as silt fences or “wheel wash” tanks can prevent sediment leaving the site. Exposed surfaces should be re-vegetated as soon as possible following construction.
- The minimum amount of soil/subsoils and bedrock material should be removed from site. Soil may be reused for landscaping elsewhere on the site.

Refuelling, Fuel and Hazardous Materials Storage

- Storage/refueling in a designated area of the construction site, located a suitable distance from excavation works. This area should be underlain by concrete hard standing and tanks should be inspected for leaks regularly. Spill kits should be supplied at these stations and staff should be trained in their use and in spill control. Drainage from these areas shall be diverted for collection and not discharged into waterbodies without treatment and other best management practices.
- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station;
- On-site refuelling will take place by direct refuelling from the delivery truck or using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site as required. The fuel bowser will be parked on a level area in the construction compound when not in use. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations.
- Vehicles will never be left unattended during refuelling. Only dedicated trained and competent personnel will carry out refuelling operations and plant refuelling procedures shall be detailed in the contractor's method statements.
- All fuels, lubricants and hydraulic fluids will be stored at the site compound. The storage area will contain a small bund lined with an impermeable membrane in order to prevent any contamination of the surrounding soils and vegetation.
- Fuels volumes stored on site will be minimised. Any fuel storage areas will be bunded appropriately for the volume of fuel stored for the time period of the construction. The bunded area will be roofed to prevent the ingress of rainwater.
- Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment.
- All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. All major repair and maintenance operations will take place off site.
- Potential impacts caused by spillages etc. during the construction phase will be reduced by keeping spill kits and other appropriate equipment on-site.
- Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner. Where on site fuelling facilities are used, there shall be a bunded filling area using a double bunded steel tank at a minimum.

Measures to avoid the release of cement-based material during construction

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and pre-cast elements for culverts and concrete works will be used.
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
- Use weather forecasting to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

Measures to avoid effects associated with the disposal of wastewater

- A self-contained port-a-loo with an integrated waste holding tank will be used at the site compounds, maintained by the providing contractor, and removed from site on completion of the construction works;
- No wastewater will be discharged on-site during either the construction or operational phase.

Waste Management

- All waste will be collected in skips and the site will be kept tidy and free of debris at all times.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.
- All construction waste materials will be stored within the confines of the site, prior to removal from the site to a licenced waste facility.

Environmental Monitoring

The contractor will assign a member of the site staff as the environmental officer with the responsibility for ensuring the environmental measures prescribed in this document are adhered to. Any environmental incidents or non-compliance issues will immediately be reported to the project team.

Vegetation Clearance

Any scrub clearance will be undertaken in line with the Wildlife Act 1976-2019.

The following additional measures are as set out in the DBFL Construction Environmental Management Plan (CEMP) that accompanies this application:

Erosion and Sediment Control

- Measures shall be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around specific exclusion zones and earth bunding adjacent to open drainage ditches) prior to discharge of surface water at a controlled rate.
- Groundwater pumped from excavations shall be directed to on-site settlement ponds.
- Discharge from any vehicle wheel wash areas shall be directed to on-site settlement ponds.
- On-site settlement ponds shall include geotextile liners and rippapped inlets and outlets to prevent scour and erosion.
- Weather conditions and seasonal weather variations shall be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- The duration that bedrock layers are exposed to the effects of weather shall be minimized by back filling excavations as soon as practicable after construction of the drainage and pumping station.

Accidental Spills and Leaks

- In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery shall take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- An Emergency Response Plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.
- Pouring of concrete including wash down and washout of concrete from delivery vehicles shall be controlled in an appropriate facility to prevent contamination.
- Regular samples shall be taken from soils affected by earthworks which shall be analysed for contamination

Concrete

- Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site
- Pumped concrete will be monitored to ensure there is no accidental discharge
- Mixer washings are not to be discharged into surface water drains

Wheel Wash Areas

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

4.11.1.3 Potential Impacts on Bats

Habitat Loss/Fragmentation

The proposed retention and enhancement of the northern hedgerow and scrub associated with the northern site boundary will retain existing connectivity along Site boundaries for commuting and foraging bats. The northern site boundary hedgerow/scrub will be enhanced with supplementary planting as shown in the landscaping plan and will develop over the lifetime/operational phase of the development, and retention of tree cover where possible along the eastern boundary and planting of compensatory tree here will maintain connectivity to the south along this eastern boundary for bats.

Retention of tree cover along the southern boundary of the wider Clonburris SDZ site, and enhancement of the Grand Canal Park, extensive planting of native tree and shrub species throughout the scheme and provision of new treelines and hedgerow in carefully considered locations in order to ensure that habitat connectivity is maintained across the wider Clonburris scheme from the northern boundary (and the proposed new park to the north of the railway line) to the Grand Canal to the south.

The lighting associated with the proposed development will be designed to avoid light disturbance to nocturnal wildlife, and will not be focussed onto areas of ecological sensitivity such as boundary hedgerows of development tiles or tree planting areas. The “Dark Sky” principle should be followed – i.e. no upward lighting to reduce light

pollution. Lighting should also be designed in accordance with the BCT/ ILP guidance document: Bats and artificial Lighting in the UK¹⁴. Recommendations to accord with this guidance is prescribed as follows:

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible. Ballard lighting should be considered for pedestrian and greenway areas, if deemed necessary.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers. The intensity of external lighting should be limited to ensure that skyglow does not occur in order to reduce light pollution.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

As part of the proposed project, it is recommended that a bat box scheme should be erected within the landscaping plan for the proposed development (see Section 5.6.3 of the Bat Assessment Report). This will be in the form of three rocket bat boxes to be erected within the boundary habitats and parks.

Precise locations for bat boxes should be specified by a bat specialist. The rocket bat boxes are to be erected on a 5m pole fixed in 1m³ of 40 newton strength concrete (Please see appendices of the Bat Assessment Report for details) and these should be located in parks proposed along the Grand Canal and linear park.

Monitoring mitigation measures for bats is proposed to ensure that they are implemented successfully; this will comprise inspection of bat boxes within one year of erection and for a minimum of 2 years. All other mitigation will be checked following implementation by a suitably experienced ecologist and a full summer bat survey carried out post-construction to ascertain bat activity levels within the Clonburris scheme (see Section 5.6.4 of the Bat Assessment Report).

Disturbance/ Displacement

No disturbance of bats will occur; therefore, no specific mitigation is proposed in relation to direct disturbance of bats. Potential displacement as a result of an increase in artificial lighting will be mitigated through the measures relating to artificial lighting as described above.

4.11.1.4 Potential Impacts on Birds

Habitat Loss

The design of the proposed development includes measures for compensatory hedgerow and tree planting which will provide compensation for loss of nesting habitat. In addition, it is proposed to incorporate 5 bird boxes throughout the T2 site (integrated within buildings or on suitable retained trees) to provide additional nesting features for local bird species.

Disturbance

Site clearance will be undertaken under the provisions of the Wildlife Act and outside of the nesting bird season (1st March – 31st August). If vegetation clearance is required during the nesting bird season, this will be preceded by a nesting bird survey and all clearance works supervised by an appropriately qualified ecologist.

An ecologist will be on site during site clearance to minimise impact on foraging/roosting bird species. The ecologist will have the ability to cease works on site that could cause disturbance, in the event of significant disturbance impacts being possible.

¹⁴ Bat Conservation Trust / Institute of Lighting Professionals

4.11.1.5 Potential Impacts on Badgers

Habitat Loss/Fragmentation

No specific mitigation is required.

Disturbance/Displacement

In order to fully assess the potential for disturbance related effects on badgers during construction, given the time that can elapse between the original surveys and any future planning consent and construction, a pre-construction badger survey will be carried out in order to identify any sett entrances that may have been excavated in the intervening period. Any requirement for additional mitigation will be assessed following the pre-construction survey. All badger survey work will be undertaken in line with current best practice guidance¹⁵.

Should any setts within 50m of the proposed works be found to be in active use by badgers during the pre-construction badger monitoring, it would be necessary to ensure that the risk of disturbance to badgers is mitigated appropriately. Any badger mitigation required would be undertaken following published best practice guidelines for the treatment of badgers (NRW, 2006) and in consultation with NPWS.

4.11.1.6 Potential Impacts of Frogs

The following measures will be implemented as mitigation for frogs within the wider SDZ site, as specified in the Non-avian Fauna Survey report:

- The period of construction at or near affected breeding sites should exclude the breeding period wherever possible.
- If this is not possible then a licence will be required to remove frogs, spawn and tadpoles from affected pools and ponds, and the frogs etc. translocated to other suitable habitat in the locality. Such translocations require licence from NPWS.
- 3) The proposed development(s) will lead to significant loss of frog foraging habitat and frog breeding sites in channels, drains and pools. These losses will be ameliorated by provision of artificial ponds or pools (or wet ditches) within the SDZ lands, and these should preferably be created at early stages of site development.
- 4) Bioretention areas within the streetscape and additional frog breeding pools are to be created as part of landscaping measures within the wider Clonburris SDZ. Frog breeding pools will be integrated into the ecological corridor along the railway.
- 5) The creation of breeding pools etc. within the SDZ lands should be conducted outside of the frog breeding season (to avoid mortality within existing pools and drains on site) and with due care to minimise impacts on both frog foraging habitats and frog breeding sites during their construction. Frog ponds should be created in advance of the frog translocation measures.

4.11.2 Operational Phase

The specific mitigation measures are set out in the relevant Tables 4.19 and Section 4.8.3.11 above, and within Chapter 16 of this EIAR for both the construction and operational phases.

4.11.2.1 Impacts on Habitats

There will be no loss or fragmentation of habitats during the operational phase of the proposed development. All habitat loss will occur during construction. As such, no negative effects on habitats are predicted during the operation of this proposed residential development. In addition, the habitat compensation measures incorporated into the construction phase of the proposed development, outlined in Section 4.8.3 of this report, will also establish on site to provide biodiversity benefits in terms of plant species variety and biodiversity generally. The landscaping plan includes for the creation of two main open green spaces within the T2 site; this includes the Local Park space (0.52ha) and a portion of the linear park (0.72ha), totalling 1.24ha. In addition, planting proposals are aimed at gaining the maximum possible benefit for biodiversity and pollinators in accordance with the All-Ireland Pollinator Plan, and the proposal includes for additional tree and shrub planting throughout the scheme and for biodiverse green roofs on buildings.

¹⁵ National Roads Authority (2006) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.

4.11.2.2 Impacts on Water Quality

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapters 2, 6 and 12 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Section 2 and within the DBFL Consulting Engineers Infrastructure Design Report for T2. The measures ensure that the operation of the proposed development does not adversely affect the water quality of downstream watercourses.

As outlined in the DBFL Consulting Engineers (2022) in relation to foul water generation on site “The proposed site will benefit from foul infrastructure proposed as part of the CSLS. Trunk Foul sewer network has been designed as part of the CSLS to serve the subject based on the average net density for catchment X, ranging from the “Low margin” to a “High Margin”

The overall SDZ lands are relatively flat therefore the pumping of wastewater is required. It is proposed that the wastewater generated from the new apartments for this application will be collected by new gravity sewers that discharge to the trunk sewer within the new Link Road via the adjacent Clonburris T1 development. This in turn discharges to a future Irish Water pumping station (Pumping Station #1 as shown in Figure 4.2) adjacent to the R113 Fonthill Road. This future pumping station and its rising main connection to the existing 9B trunk sewer on Fonthill Road is being delivered by Irish Water as part of the Irish Water Clonburris Local Infrastructure Housing Activation Fund (LIHAF) Scheme. The pump station is currently at planning application stage with SDCC under planning reference SDZ21A/0006.

Foul sewers have been designed in accordance with the Building Regulations and specifically in accordance with the principles and methods set out in the Irish Water Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2) and the recommendations of the ‘Greater Dublin Strategic Drainage Study’, (GDSDS). All foul sewers and manholes will be constructed in accordance with the Irish Water Standard Details and the Irish Water Code of Practice for Wastewater. The proposed foul sewer design and layout is in accordance with the Irish Water Code of Practice for Wastewater Infrastructure and The Irish Water Wastewater Infrastructure Standard Details. The proposed foul sewer design and layout complies with the Clonburris Water and Wastewater Report as agreed with SDCC and Irish Water.

In relation to the receiving surface water network (i.e. Clonburris T1 (Phase 1A SDZ21A/0022), “certain portions of Stormwater infrastructure installed as part of the adjacent Clonburris T1 have been upsized so that they are suitable to receive surface water runoff from future development phases, including the subject development. The urban centre area will have its own local attenuation as per the SWMP and the restricted outflow has been allowed for” - see Section 3.11 of the DBFL Infrastructure Design Report for T2).

These design measures will ensure that there is no potential for deterioration in water quality associated with the operational phase of the proposed development.

4.11.2.3 Impacts on Fauna

Bats

The proposed development will include implementation of artificial lighting with the potential to significantly affect bats (see Section 5.8 of the Bat Assessment report – Appendix C 1 Volume III of this EIAR). The lighting associated with the proposed development will therefore be designed to avoid light disturbance to nocturnal wildlife, and will not be focussed onto areas of ecological sensitivity such as boundary hedgerows the T3 development or tree planting areas. The “Dark Sky” principle should be followed – i.e. no upward lighting to reduce light pollution. Lighting should also be designed in accordance with the BCT/ ILP guidance document: Bats and artificial Lighting in the UK¹⁶. Recommendations to accord with this guidance is prescribed as follows:

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.

¹⁶ Bat Conservation Trust / Institute of Lighting Professionals

- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible. Ballard lighting should be considered for pedestrian and greenway areas, if deemed necessary.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers. The intensity of external lighting should be limited to ensure that skyglow does not occur in order to reduce light pollution.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Monitoring for bats has been specified during the operational phase of the works (see Section 5.8.4 of the Bat Assessment Report). This monitoring is to comprise the following aspects:

- Inspection of bat boxes within one year of erection of bat box scheme/rocket box and alternative roosts for Natterer's bat and brown long-eared bats. Register bat box scheme, rocket bat boxes and supplementary roosts with Bat Conservation Ireland. This should be undertaken for a minimum of 2 years in relation to bat boxes/rocket bat boxes.
- Monitoring of any bat mitigation measures. All mitigation measures should be checked to determine that they were successful. A full summer bat survey is recommended post-works.

Provided the above mitigation measures are successfully implemented, no significant negative effects on any faunal receptors are anticipated as a result of the development.

4.12 MONITORING

4.12.1 Construction Phase

Proposed monitoring during the construction phase in relation to the water environment are as follows (see also Section 6.9, Chapter 6 of this EIAR:

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of drainage installation etc, inspections of works adjacent to existing watercourses).
- Monitoring in relation to the surface water. Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content).

4.12.2 Operational Phase

Proposed monitoring during the operational phase in relation to aquatic receptors are as follows:

- Regular inspection and maintenance of the drainage and attenuation systems

4.13 CUMULATIVE IMPACT ASSESSMENT

The Proposed Development was considered in combination with other plans and projects in the area that could result in cumulative impacts on the Key Ecological Receptors (KERs) identified in Section 4.8 of this report, including designated sites. This included a review of online Planning Registers and served to identify past and present plans and projects, their activities and their predicted environmental effects.

4.13.1 Assessment of Plans

The following development plans have been reviewed and taken into consideration as part of this assessment:

- South Dublin County Council Development Plan 2022-2028
- Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031 (RSES)
- National Biodiversity Action Plan 2017-2021

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of peatlands and sustainable land use were

also reviewed, particularly where the policies relate to the preservation of surface water quality. An overview of the search results with regard to plans is provided in Table 4-20.

Potential for in-combination effects in relation to European Sites are considered within the AA Screening Report that accompanies this application.

Table 4.20 – Plans reviewed as part of the assessment.

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on Ecological Receptors and Designated Sites
<p>South Dublin County Council Development Plan 2022 - 2028</p>	<p>Policy NCBH2: Biodiversity</p> <ul style="list-style-type: none"> • NCBH2 Objective 1: To support the implementation of the National Biodiversity Action Plan (2017- 2021) and the All-Ireland Pollinator Plan (2021-2025) and to support the adoption and implementation of the South Dublin County Biodiversity Action Plan (2020-2026) and Pollinator Action Plan (2021-2025) and any superseding plans. • NCBH2 Objective 2: To ensure the protection of designated sites in compliance with relevant EU Directives and applicable national legislation. • NCBH2 Objective 3: To protect and conserve the natural heritage of the County, and to conserve and manage EU and nationally designated sites and non-designated locally important areas which act as ‘stepping stones’ for the purposes of green infrastructure and Article 10 of the Habitats Directive. • NCBH2 Objective 4: To protect our rivers and in particular to avoid overdevelopment which could have an adverse effect on the biodiversity and ecosystems of the river. <p>Policy NCBH3: Natura 2000 Sites</p> <ul style="list-style-type: none"> • NCBH3 Objective 1: To prevent development and activities that would adversely affect the integrity of any Natura 2000 site located within or adjacent to the County and promote the favourable conservation status of the habitats and species integral to these sites. • NCBH3 Objective 2: To ensure that plans, including land use plans, will only be adopted, if they either individually or in combination with existing and / or proposed plans or projects, will not have a significant adverse effect on a European Site, or where such a plan is likely or might have such a significant adverse effect (either alone or in combination), South Dublin County Council will, as required by law, carry out an appropriate assessment as per requirements of Article 6(3) of the Habitats Directive 92 / 43 / EEC of the 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, as transposed into Irish legislation. Only after having ascertained that the plan will not adversely affect the integrity of any European site, will South Dublin County Council adopt the plan, incorporating any necessary mitigation measures. A plan which could adversely affect the integrity of a European site may only be adopted in exceptional circumstances, as provided for in Article 6(4) of the Habitats Directive as transposed into Irish legislation. 	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. A comprehensive Screening for Appropriate Assessment has been submitted along with this application; no pathways for significant effects on European Sites have been identified.</p> <p>The Proposed Development has been designed in order to avoid loss of sensitive habitats where possible and where some loss has been identified; appropriate mitigation and enhancement measures have been incorporated into the Proposed Development.</p> <p>The Proposed Development is located outside of any European or Nationally designated sites, as described in Section 4.5.1. and no significant residual effects have been identified in relation to sites of this nature.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified. No projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on Ecological Receptors and Designated Sites
	<ul style="list-style-type: none"> • NCBH3 Objective 3: To ensure that planning permission will only be granted for a development proposal that, either individually or in combination with existing and / or proposed plans or projects, will not have a significant adverse effect on a European Site, or where such a development proposal is likely or might have such a significant adverse effect (either alone or in combination), the planning authority will, as required by law, carry out an appropriate assessment as per requirements of Article 6(3) of the Habitats Directive 92 / 43 / EEC of the 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, as transposed into Irish legislation. Only after having ascertained that the development proposal will not adversely affect the integrity of any European site, will the planning authority agree to the development and impose appropriate mitigation measures in the form of planning conditions. A development proposal which could adversely affect the integrity of a European site may only be permitted in exceptional circumstances, as provided for in Article 6(4) of the Habitats Directive as transposed into Irish legislation. <p>Policy NCBH4: Proposed Natural Heritage Areas</p> <ul style="list-style-type: none"> • NCBH4 Objective 1: To ensure that any proposal for development within or adjacent to a proposed Natural Heritage Area (pNHA) is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the pNHA particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats. • NCBH4 Objective 2: To restrict development within or adjacent to a proposed Natural Heritage Area to development that is directly related to the area’s amenity potential subject to the protection and enhancement of natural heritage and visual amenities including biodiversity and landscapes. Such developments will be required to submit an Ecological Impact Assessment prepared by a suitably qualified professional. • NCBH4 SL01: To promote opportunities to improve the habitat relating to the Lugmore Glen pNHA and to ensure that any proposals for development have full regard to the sensitivities of the area within the pNHA and along the Tallaght Stream. <p>Policy NCBH5: Protection of Habitats and Species Outside of Designated Areas</p>	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on Ecological Receptors and Designated Sites
	<p>Protect and promote the conservation of biodiversity outside of designated areas and ensure that species and habitats that are protected under the Wildlife Acts 1976 to 2018, the Birds Directive 1979 and the Habitats Directive 1992, the Flora (Protection) Order 2015, and wildlife corridors are adequately protected.</p> <ul style="list-style-type: none"> • NCBH5 Objective 1: To ensure that development does not have a significant adverse impact on biodiversity, including known rare and threatened species, and that biodiversity enhancement measures are included in all development proposals. • NCBH5 Objective 2: To ensure that an Ecological Impact Assessment is undertaken for developments proposed in areas that support, or have the potential to support, protected species or features of biodiversity importance, and that appropriate avoidance and mitigation measures are incorporated into all development proposals. <p>Policy NCBH9: Grand Canal</p> <p>Protect and promote the Grand Canal as a key component of the County’s Green Infrastructure and ecosystem services network, and protect and enhance the visual, recreational, environmental, ecological, industrial heritage and amenity value of the Grand Canal, recognising its sensitivities as a proposed Natural Heritage Area with adjacent wetlands and associated habitats.</p> <ul style="list-style-type: none"> • NCBH9 Objective 1: To protect and enhance the important biodiversity resource offered by the Grand Canal, recognising and protecting the vital function that the Canal provides as a key corridor for habitats and wildlife from the River Shannon to Dublin Bay. • NCBH9 Objective 2: To facilitate the appropriate development of the Grand Canal as a recreational route for walking, cycling, nature study and water-based activities including fishing, canal boating, rowing, paddle boarding and canoeing / kayaking, subject to environmental safeguards and assessments. • NCBH9 Objective 3: To ensure that development along or adjacent to the Grand Canal contributes to the creation of an integrated network of appropriately designed walking and cycling routes connecting with the Grand Canal Way Green Route and which takes due cognisance of the sensitive nature of this national ecological corridor. • NCB9 Objective 4: To ensure that development along and adjacent to the Grand Canal protects and incorporates natural heritage features including watercourses, wetlands, grasslands, woodlands, mature trees, hedgerows 	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on Ecological Receptors and Designated Sites
	<p>and ditches and includes an appropriate set-back distance or buffer area from the pNHA boundary to facilitate protected species and biodiversity and a fully functioning Green Infrastructure network.</p> <ul style="list-style-type: none"> • NCBH9 Objective 5: To ensure that development along or adjacent to the Grand Canal protects, incorporates and enhances built and industrial heritage features, particularly historic canal and mill buildings, and also sets out to protect the setting of such built heritage features. • NCBH9 Objective 6: To seek the extension of the Grand Canal Way Green Route from the 12th Lock to Hazelhatch in partnership with Waterways Ireland and Kildare County Council, as one of the priority projects of the Cycle South Dublin programme, ensuring the safeguarding and enhancement of the ecological sensitivities as identified along this section of the Canal. • NCBH9 Objective 7: To ensure that all development proposals along the Grand Canal are accompanied by an EclA (ecological impact assessment) prepared by a qualified ecologist and that the recommendations of the EclA are incorporated into any development proposals including a landscape plan prepared by a qualified landscape architect. Where new canal crossings (that is, footbridges / cycle bridges) are proposed, they should be designed so as to avoid fragmentation of linear habitat associated with the Grand Canal. <p>Policy NCBH10: Invasive Species</p> <p>Protect against and prevent the introduction and spread of invasive species within the County and require landowners and developers to adhere to best practice guidance in relation to the control of invasive species.</p> <ul style="list-style-type: none"> • NCBH10 Objective 1: To ensure that development proposals do not lead to the spread or introduction of invasive species. If developments are proposed on sites where invasive species are or were previously present, applicants should submit a control and management programme with measures to prevent, control and / or eradicate the particular invasive species as part of the planning process and to comply with the provisions of the European Communities Birds and Habitats Regulations 2011 (S.I. 477 / 2011). • NCBH10 Objective 2: To ensure that the Council promptly and appropriately treats invasive species such as Japanese Knotweed, including where notified by members of the public that such species, located on public lands, pose a potential threat to property. <p>Policy NCBH11: Tree Preservation Orders and Other Tree / Hedgerow Protections</p>	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on Ecological Receptors and Designated Sites
	<p>Review Tree Preservation Orders (TPO) within the County and maintain the conservation value of trees and groups of trees that are the subject of a Tree Preservation Order while also recognising the value of and protecting trees and hedgerows which are not subject to a TPO.</p> <ul style="list-style-type: none"> • NCBH11 Objective 1: To review Tree Preservation Orders within the County and maintain the conservation value of trees and groups of trees that are the subject of any Tree Preservation Order. • NCBH11 Objective 2: To regularly evaluate and identify trees of amenity value within the County with a view to making them the subject of Tree Preservation Orders or otherwise protecting them and to furnish information to the public in this regard. • NCBH11 Objective 3: To protect and retain existing trees, hedgerows, and woodlands which are of amenity and / or biodiversity and / or carbon sequestration value and / or contribute to landscape character and ensure that proper provision is made for their protection and management taking into account Living with Trees: South Dublin County Council’s Tree Management Policy (2015-2020) or any superseding document and to ensure that where retention is not possible that a high value biodiversity provision is secured as part of the phasing of any development to protect the amenity of the area. • NCBH11 Objective 4: To protect the hedgerows of the County, acknowledging their role as wildlife habitats, biodiversity corridors, links within the County’s green infrastructure network, their visual amenity and landscape character value and their significance as demarcations of historic field patterns and townland boundaries. (Refer also to Chapter 4: Green Infrastructure). • NCBH11 Objective 5: To ensure that intact hedgerows / trees will be maintained above the 120m contour line within the County ensuring that the strong rural character will not be diluted and that important heritage features and potential wildlife corridors are protected. 	
<p>Regional Spatial and Economic Strategy 2019 - 2031</p>	<p>Biodiversity and Natural Heritage RPO 7.16: Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans. RPO 7.17: Facilitate cross boundary co-ordination between local authorities and the relevant agencies in the Region to provide clear governance arrangements and coordination mechanisms to support the development of ecological networks and</p>	<p>There will be no adverse effects on biodiversity as a result of the Proposed Development, and no cumulative impacts in this regard.</p> <p>The Proposed Development has been designed to avoid any effects on water</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on Ecological Receptors and Designated Sites
	<p>enhanced connectivity between protected sites whilst also addressing the need for management of alien invasive species and the conservation of native species.</p> <p>RPO 7.18: Work with local authorities and state agencies to promote the development of all aspects of park management in the Wicklow National Park and the Slieve Bloom Mountains.</p> <p>RPO 7.19: Support the consideration of designating a National Park for the peatlands area in the Midlands.</p> <p>RPO 7.20: Promote the development of improved visitor experiences, nature conservation and sustainable development activities within the Dublin Bay Biosphere in cooperation with the Dublin Bay UNESCO Biosphere Partnership.</p>	<p>quality and/or designated sites outside the site.</p> <p>The Proposed Development has been subject to a full environmental assessment i.e. EIA and AA.</p>
<p>National Biodiversity Action Plan 2017-2021</p>	<p>Target 6.2 - Sufficiency, coherence, connectivity and resilience of the protected areas network substantially enhanced by 2020.</p>	<p>There will be no adverse effects on designated sites or biodiversity as a result of the Proposed Development.</p> <p>The Proposed Development will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the development site in good condition.</p>
<p>Draft 4th National Biodiversity Action Plan 2023-2027</p>	<p>Objective 2 - Meet Urgent Conservation and Restoration Needs</p> <p>Outcome 2A: The protection of existing designated areas and species is strengthened and conservation and restoration within the existing protected area network are enhanced 29</p> <p>Outcome 2B: Biodiversity and ecosystem services in the wider countryside are conserved 32 18 27 Navigation</p> <p>Outcome 2C: All freshwater bodies are of at least 'Good Ecological Status' as defined under the EU Water Framework Directive 36</p> <p>Outcome 2D: Genetic diversity of wild and domesticated species is safeguarded 39</p> <p>Outcome 2E: A National Restoration Plan is in place to meet EU Biodiversity Strategy 2030 nature restoration targets 41</p> <p>Outcome 2F: Biodiversity and ecosystem services in the marine environment are conserved and restored 42</p> <p>Outcome 2G: Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment</p>	<p>There will be no adverse effects on designated sites or biodiversity as a result of the Proposed Development.</p> <p>The Proposed Development will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the development site in good condition.</p> <p>No Invasive species were present within the T2 site, and the proposed development will not contribute to the spread of invasive species.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on Ecological Receptors and Designated Sites
<p>Clonburris SDZ Planning Scheme 2019</p>	<p>Key Principles in relation to Biodiversity</p> <ul style="list-style-type: none"> • To seek to protect and enhance natural, built and cultural heritage features, where appropriate, such as the Grand Canal, streams, Protected Structures and barony and townland boundary hedgerows; • To improve the quality, character and continuity of the Grand Canal (pNHA); • To avoid or minimise the impact on protected species and their habitats; • To promote local heritage, the naming of any new residential development should reflect the local and historical context of its siting, and may include the use of the Irish language; and <p>Incorporate biodiversity and heritage into new developments.</p>	<p>There will be no adverse effects on designated sites or biodiversity as a result of the Proposed Development.</p> <p>The Proposed Development has been designed in order to avoid loss of sensitive habitats where possible and where some loss has been identified; appropriate mitigation and enhancement measures have been incorporated into the Proposed Development.</p> <p>The Proposed Development will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the development site in good condition.</p>

4.13.2 Other Projects

The potential for the proposed works to contribute to a cumulative impact on European Sites was considered. The National Planning Application Database was consulted on the 24/11/2022 for granted planning applications located in the immediate vicinity of the proposed development site. Granted and pending projects identified within an approximately 500m radius of the site from the last 5 years include:

4.13.2.1 Clonburris Phase 1A (Tile 1) - (Planning ref. SDZ21A/0022).

Description of Project

South Dublin County Council granted permission to Cairn Homes Properties Ltd. on the 23rd of August 2022 for the construction of 569 no. dwellings, a childcare facility, an innovation hub, open space and all associated site development works in the Clonburris South-West Development Area of the Clonburris SDZ Planning Scheme.

The development was comprised of 173 no. 2-storey houses that included 8 no. 2-bedroom, 153 no. 3-bedroom and 12 no. 4-bedroom houses, 148 no. duplex units comprised of 74 no. 2-bedroom and 74 no. 3-bedroom units in 16 no. 3-storey buildings, 248 no. apartments comprised of 108 no. 1-bedroom, 135 no. 2-bedroom and 5 no. 3-bedroom units in 3 no. blocks ranging in height from 4 to 6 no. storeys. The development also included for the provision of an innovation hub, a childcare facility, vehicular access routes and all associated site development works including footpaths, landscaping boundary treatments, public and private open space areas, 656 no. car parking spaces, 672 no. bicycle parking spaces, single storey ESB sub-stations/bike/bin stores, 2 no. 'Gateway' entrance signage (2), solar panels at roof level of apartments and all ancillary site development/construction works.

Identification of Potential for Cumulative Effects

The Environmental Impact Assessment¹⁷ report for the project was consulted. The assessment of residual impacts concludes that *'The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on the sensitive receptors. The overall impact on the ecology of the proposed development will result in a not significant low adverse impact on the ecology of the area and locality overall, with not significant adverse impact on birds in the long term. This is primarily as a result of the loss of terrestrial habitats on site, supported by strong construction and operational phase mitigation and the creation of additional biodiversity features and complexity within a strong biodiversity targeted landscaping strategy'*. Given that no significant residual impacts were identified associated with this development, no additional cumulative effects are anticipated in combination with the proposed development. Nor has any potential for different (new) effects resulting from the combination of the project in association with the proposed development been identified. Significant in-combination impacts are therefore not anticipated in combination with the proposed development.

4.13.2.2 Clonburris SDZ Infrastructure - (Planning ref. SDZ20A/0021).

Description of Project

On the 12th of August 2021, South Dublin County Council granted permission for development comprising *inter alia*:

- roads and drainage infrastructure works for the future development of the southern half of the overall Strategic Development Zone (SDZ) lands; the roads infrastructure works are for:
 - the construction of c.4.0km of a new road, known as Clonburris Southern Link Street,
 - a number of vehicular access spurs to facilitate future development of adjoining lands, a total of 8 new junctions (including 3 junctions to facilitate future road developments within the SDZ;
 - the drainage infrastructure works include 8 attenuation systems (with outfalls to Griffeen River, Kilmahuddrick Stream and existing storm sewers) including 4 ponds, 2 modular underground storage systems and 2 detention basins combined with modular underground storage systems all adjacent to proposed Clonburris Southern Link Street; surface water drainage culverts to existing watercourses;
 - ducting for public electrical services and utilities and the diversion of existing utilities is provided for within the proposed road corridor.

¹⁷ John Spain Associates (2021). Environmental Impact Assessment Report. Proposed Residential Development at Phase 1A Clonburris SDZ (SDZ21A/0022).

Identification of Potential for Cumulative Effects

The Environmental Impact Assessment Report¹⁸ for the project was consulted. The assessment of residual impacts concludes that *'Following the implementation of the mitigation measures outlined in Section above, the proposed development will not result in any significant residual effect on the Key Ecological Receptors identified on its own, or cumulatively together with other proposed developments.'* Given that no significant residual impacts were identified associated with this development, and that different (new) effects resulting from the combination of the projects in association with the proposed development. Significant cumulative impacts are therefore not anticipated in combination with the proposed development.

4.13.2.3 SDZ22A/0010 (Lands to the east)

Description of Project

On the 4th of July 2022, Kelland Homes Ltd. applied for a proposed development within the SDZ on a 6.3Ha site within the townland of Cappagh, Dublin 22. The proposed development is located to the west of the Ninth Lock Road, south of the Dublin-Cork railway line, north of Cappaghmore housing estate and Whitton Avenue, and east of an existing carpark / park & ride facility at the Clondalkin Fonthill train station and the R113 (Fonthill Road).

The proposed development consists of the construction of 294 no. dwellings, creche and retail / commercial unit, which are comprised of 118 no. 2, 3 and 4-bedroom, 2 storey semi-detached and terraced houses, 104 no. 2 and 3-bedroom duplex units accommodated in 10 no. 3-storey buildings, 72 no. 1 and 2-bedroom apartments in 2 no. 4 and 6 storey buildings, 1 no. 2-storey creche and 1 no. 2-storey retail /commercial unit. The proposed development also provides for all associated site development works above and below ground, public & communal open spaces, hard & soft landscaping and boundary treatments, surface car parking (401 no. spaces), bicycle parking (797 no. spaces), bin & bicycle storage, public lighting, plant (M&E), utility services & 4 no. ESB sub-stations.

The application is currently under consideration by South Dublin County Council. On the 29th of August 2022 the Planning Authority requested additional information.

Identification of Potential for Cumulative Effects

The planning file for the development was reviewed on the South Dublin County Council Planning Portal and no specific information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed T2 development when considered on its own.

Given that no potential for significant residual effects on ecological receptors were identified associated with this development, no additional cumulative effects are anticipated in combination with the proposed development. Nor has any potential for different (new) effects resulting from the combination of the project in association with the proposed development been identified. Significant cumulative impacts are therefore not anticipated in combination with the proposed development.

4.13.2.4 SD228/0001 Part 8 Development (Canal Extension Area)

Description of the Project

On the 13th of June 2022, South Dublin County Council approved a Part 8 residential development comprising 118 residential units made up of houses, duplexes, triplexes, an apartment building, landscape works, total site area approx. 2.5 ha at Bawnogue Road/Ashwood Drive, Clonburris, Clondalkin, Dublin 22.

Identification of Potential for Cumulative Effects

The EIA¹⁹ for the project was consulted. This assessment concludes that *'The proposed development footprint is an area of low to moderate ecological value and as such predicted to have a neutral imperceptible effect on biodiversity. Given the inclusion of Best Practice Measures with regard to lighting and bats to be included and enforced by design, the proposed development will have no predicted impacts on local ecology and biodiversity. There is no requirement for monitoring with regard to Biodiversity.'*

¹⁸ Stephen Little & Associates (2020) Environmental Impact Assessment Report, Clonburris Infrastructure.

¹⁹

Given that no potential significant residual effects on ecological receptors were identified associated with this development, no additional cumulative effects are anticipated in combination with the proposed development. Nor has any potential for different (new) effects resulting from the combination of the project in association with the proposed development been identified. Significant cumulative impacts are therefore not anticipated in combination with the proposed development.

4.13.2.5 Part 8 Development (Kishogue Southwest) - (SD228/0003)

Description of the Project

The development of a Social, Affordable Rental and Affordable Purchase Housing project consisting of 263 new homes, new community facilities, three landscaped open spaces and associated site works was approved at the Council meeting held on the 11th of July 2022 on a site located on lands within Clonburris SDZ, primarily in the subsector known as Kishogue Southwest which is located on Lynches Lane to the West of the R136 Outer Ring Road.

Identification of Potential for Cumulative Effects

The EclAR²⁰ for the project was consulted. The impact assessment concludes that *'Following implementation of the general and specific mitigation and/or enhancement measures proposed above, residual impacts for habitat loss and loss of habitat breeding birds are permanent adverse of Site (local lower) significance, and all residuals are no effect or negligible.'*

Given that no potential significant residual effects on ecological receptors were identified associated with this development, no additional cumulative effects are anticipated in combination with the proposed development. Nor has any potential for different (new) effects resulting from the combination of the project in association with the proposed development been identified. Significant cumulative impacts are therefore not anticipated in combination with the proposed development.

4.13.2.6 SDZ21A/0006 - Wastewater pumping station, Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore

Description of the Project

Wastewater pumping station comprising of (a) below ground 24-hour emergency storage tank; (b) below ground inlet, wet well, flow meter and valve chambers; (c) control and welfare building with green roof and 2 odour control units; (d) boundary wall, fencing, entrance gate and landscaping; € site drainage system including a swale; (f) all associated ancillary and enabling works including hardstanding and access, located within the Clonburris Strategic Development Zone.

Identification of Potential for Cumulative Effects

The planning file for the development was reviewed on the South Dublin County Council Planning Portal and no specific information regarding potential residual effects on ecological receptors was available. The AA Screening Report included with the application concludes that *'there is no potential for any effects on European Sites from the proposed works, either alone or in-combination with other plans and/or projects due the distance separating the Sites from the Project and the dispersal and dilution of any sediment/ pollutants that could be released to connected waterbodies before reaching European Sites.'* The following factors also limit the potential for significant cumulative effects on ecological receptors to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed T2 development when considered on its own.

Given that no potential for significant residual effects on ecological receptors were identified associated with this development, no additional cumulative effects are anticipated in combination with the proposed development. Nor has any potential for different (new) effects resulting from the combination of the project in association with the proposed development been identified. Significant cumulative impacts are therefore not anticipated in combination with the proposed development.

²⁰ Altermar Ecology (2022) Ecological Impact Assessment, Clonburris Phase 1 (SDZ21A/0022)

4.1.1.1 Clonburris T3 – Submitted December 2022

Description of the Project

The development will consist of the construction of 157 no. dwellings on a site of c.3.45 hectares in the Clonburris South-West Development Area of the Clonburris Strategic Development Zone (SDZ) Planning Scheme 2019 as follows:

- 81 no. houses comprising 4 no. 2-bedroom houses, 65 no. 3-bedroom houses and 12 no. 4-bedroom houses (all 2-no. storey with associated private open space and car parking);
- 76 no. apartment units consisting of 26 no. 1-bedroom and 50 no. 2-bedroom units within Block 1 (4 no. storeys);
- Vehicular access will be provided from the permitted street under SDZ21A/0022 and the permitted Clonburris Southern Link Street (SDZ20A/0021) and R113 (Fonthill Road) to the east;
- All ancillary site development works including footpaths, landscaping boundary treatments, public and private open space areas, car parking (170 no. spaces) and bicycle parking (170 no. spaces), single-storey ESB sub-stations, bin and bicycle stores and all ancillary site development/construction works.

Identification of Potential for Cumulative Effects

The EclAR²¹ for the project concludes that *'Taking the above information and detailed assessment set out in the preceding sections of this EclA into consideration, and having regard to the precautionary principle, it is considered that the proposed development will not result in the loss of habitats or species of high ecological significance and will not have any significant effects on the ecology of the Site or the wider area.'*

The potential residual impacts on ecological receptors will not be significant and no potential for the proposed development to contribute to any cumulative impacts on biodiversity when considered in-combination with other plans and projects was identified.

Provided that the development is constructed in accordance with the design and best practice that is described within this application, significant effects on biodiversity are not anticipated at any geographic scale.'

Given that no potential significant residual effects on ecological receptors were identified associated with this development, no additional cumulative effects are anticipated in combination with the proposed development. Nor has any potential for different (new) effects resulting from the combination of the project in association with the proposed development been identified. Significant cumulative impacts are therefore not anticipated in combination with the proposed development.

4.13.2.7 Other Small-scale developments

The majority of other granted or pending planning applications in the immediate vicinity of the proposed development site are related to the provision and/or alteration of one-off housing or amenity developments:

- Wastewater pumping station comprising of (a) below ground 24-hour emergency storage tank; (b) below ground inlet, wet well, flow meter and valve chambers; (c) control and welfare building with green roof and 2 odour control units; (d) boundary wall, fencing, entrance gate and landscaping; (e) site drainage system including a swale; (f) all associated ancillary and enabling works including hardstanding and access, located within the Clonburris Strategic Development Zone. (Planning ref. SDZ21A/0006)
- Internal separation of the house and associated granny flat to provide for 2 permanent houses and extension of rear garden. Part of the development site is located within the Clonburris Strategic Development Zone. (Planning ref. SDZ22A/0004)
- Retention of construction of: (1) single storey extension to front; (2) single storey kitchen/dining room extension to side and rear of dwelling and associated site works.(Planning ref. SD18B/0460)
- Single storey extension to front and rear; conversion of garage to habitable room and a first-floor extension on the side. (Planning ref. SD18B/0475)

²¹ MKO (2022) Ecological Impact Assessment Report, Clonburris T3.

- Ground floor garage conversion & porch extension with lean-to roof; first floor extension to side (above existing flat roof) with extended main hipped roof & new roof windows to side and rear; two off street car parking spaces and associated site works. (Planning ref. SD18B/0507)
- First floor extension to side over converted garage, with projecting bay window to rear; ground floor extension to front incorporating porch and extended living and play rooms; attic conversion to utility/storage incorporating 'Velux' type rooflights to all aspects with solar panels to rear; external insulation to all elevations; demolition of garden shed replacing with new shed; all associated site works and drainage. (Planning ref. SD19B/0207)
- Attic conversion with dormer window to rear consisting of wet room and sensory playroom area for family use and all associated site works. (Planning ref. SD18B/0393)
- 59sq.m single-storey extension to the side and rear of existing dwelling. (Planning ref. SD18B/0260)
- Single storey extension at side. (Planning ref. SD20B/0420)
- Removal of single storey outbuilding to side of dwelling and construction of new single storey extension (36.68sq.m) to front and side of dwelling and associated site works. (planning ref. SD18B/0094)
- Retention of a single storey extension to rear and existing storey garage to front side and rear; erect a first floor extension to front side and rear above existing garage and all ancillary site works. (Planning ref. SD20B/0010)
- Two storey side extension to existing two storey semi-detached house, permission to widen the existing vehicular entrance and all associated site works. (Planning ref. SD18B/0267)
- Permission to sub-divide site; construct a two storey family home to incorporate existing garage and extend over portion of the living room of the existing dwelling house, also a new entrance to front of site, opening a new pedestrian side access and all necessary and ancillary site works and services to side of existing house. (Planning ref. SD18A/0252)

Due the relatively small-scale nature of many of the above developments, the separation in distance, the absence of effects identified as a result of the Proposed Development and absence of in-combination impact pathways identified, the above developments are do not represent any potential for in-combination impacts.

4.13.3 Conclusion of Cumulative Assessment

The Proposed Development has been considered cumulatively with other plans and projects as described in Sections 4.14.1 and 4.14.2. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Development and those that could be potentially affected via downstream surface water.

Following the detailed surveys undertaken and impact assessment provided in Section 4.8, it is concluded that there will be no significant residual habitat loss, disturbance, deterioration of water quality etc., associated with the Proposed Development and therefore it cannot contribute to any cumulative effect when considered in combination with other plans and projects. Following implementation of mitigation there will be no significant residual impacts on ecological receptors associated with the Proposed Development and therefore no potential for individual or cumulative negative effects on biodiversity.

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 and plans 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.

4.14 RESIDUAL EFFECTS CONCLUSION

Taking the above information into consideration and having regard to the precautionary principle, it is considered that the proposed development will not result in the loss of habitats or species of high ecological significance and will not have any significant effects on the ecology of the wider area.

The potential residual impacts on ecological receptors will not be significant and no potential for the proposed development to contribute to any cumulative impacts on biodiversity when considered in-combination with other plans and projects was identified.

Provided that the development is constructed in accordance with the design and best practice that is described within this application, significant residual effects on biodiversity are not anticipated at any geographic scale.

4.15 REINSTATEMENT

While not applicable to every aspect of the environment considered within the EIAR, certain measures may be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.

There are no reinstatement works proposed specifically with respect to biodiversity.

4.16 INTERACTIONS

The identified interactions between the management of waste arisings during both the construction and operational stages are as follows:

- Land and Soils (see Chapter 5)
- Water (see Chapter 6)
- Landscape (see Chapter 9)

Principle interactions between these disciplines and biodiversity have been referred to in this chapter.

4.17 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant difficulties were encountered during the assessment.

5.0 LAND AND SOILS

5.1 INTRODUCTION

This chapter was prepared by DBFL Consulting Engineers and assesses and evaluates the effect of the proposed development on the subject site's geology, soil and land during the construction and operation of the proposed development. It also identifies the characteristics, potential effects, mitigation measures and residual effects arising from the proposed development.

This chapter was prepared by Dieter Bester, Chartered Civil Engineer [B.Eng CEng].

This report also addresses earthworks proposed on the subject site including cut and fill works required.

5.2 METHODOLOGY

5.2.1 Guidelines

The assessment of the potential effect of the activity on geology, soil and land was carried out according to best practice and the methodology specified in the available guidance documents. Various bodies including; Transport Infrastructure Ireland (TII, formally National Roads Authority); the Institute of Geologists Ireland (IGI); and the Environmental Protection Agency (EPA) provide detailed guidance to the preparation and content required for an EIA in relation to the geological environment as listed in **Table 5.1** below.

Table 5.1 – Guidance Documents

Body	Guidance
Transport Infrastructure Ireland (TII)	Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009)
	Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008)
	Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan
	The Management of Waste from National Road Construction Projects
	Design of Earthworks Drainage, Network Drainage, Attenuation & Pollution Control (DN-DNG-03066)
Environmental Protection Agency (EPA)	Guidelines on The Information to Be Contained In Environmental Impact Assessment Reports (May 2022)
	EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) Sept. 2003
	Geo Portal (https://gis.epa.ie/EPAMaps/)
Construction Industry Research and Information Association (CIRIA)	The SUDS Manual (CIRIA C753)
	Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA C532)
	Control of Water Pollution from Linear Construction Sites (CIRIA C648)
	Environmental Good Practice on Site (C692) (2010)
South Dublin County Council (SDCC)	South Dublin County Council Planning (https://www.sdcc.ie/en/services/planning/)
Institute of Geologists of Ireland (IGI)	Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements. (2013)

Body	Guidance
Dept of the Environment Heritage and Local Government	Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects
Department for Environment, Food and Rural Affairs (UK)	Construction Code of Practice for the Sustainable Use of Soils on Construction Sites

5.2.2 Consultation

Baseline information was gathered from relevant statutory bodies as per **Table 5.1**.

5.2.3 Desktop Study

The desktop study involved collation and assessment of the relevant information from the following information sources.

- Acquisition and compilation of all available regional information on the geology, soil, and land aspects of the study area.
- Interrogation of the Geological Survey of Ireland's (GSI) online mapping service, including:
 - GSI Teagasc Soils mapping
 - GSI Teagasc Subsoils mapping
 - GSI Bedrock Geology mapping
 - GSI Landslide Events
 - GSI Mineral Localities
 - GSI Mineral Active Quarries
- Acquisition and examination of the Ordnance Survey of Ireland's (OSI) mapping and aerial photography.
- Examination of topographical survey of the site.
- Findings of ground investigation carried out by Ground Investigation Ireland at the proposed site. This detailed investigation included the following. The Ground Investigation Report is included In Appendix E of Volume III of the EIAR.
 - 21 No. Trial Pits to a maximum depth of 3.0m BGL
 - 9 No. Plate Bearing Test to ascertain constrained modulus and equivalent CBR
 - 9 No. Soakaways to determine a soil infiltration value to BRE digest 365
 - 21 No. Dynamic Probes to determine soil strength/density characteristics
 - 22 No. Rotary Core Boreholes to a maximum depth of 8.3m BGL
 - 10 No. Groundwater monitoring wells
 - Geotechnical & Environmental Laboratory testing

5.2.4 Application of Methodology

This chapter has been prepared in accordance with the following best practice methodology; "Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports (May 2022)" & the TII "Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes".

5.2.5 Study Methodology

The assessment of the potential effect of the activity on geology, soil and land was carried out according to best practice and the methodology specified in the available guidance documents. Various bodies including; Transport Infrastructure Ireland (TII, formally National Roads Authority); the Institute of Geologist Ireland (IGI); and the

Environmental Protection Agency (EPA) provide detailed guidance to the preparation and content required for an EIAR in relation to the geological environment.

5.2.6 Study Area

The proposed development site is located in the Local Authority area of South Dublin County Council (SDCC) and is part of the Clonburris Strategic Development Zone (SDZ). The subject site for this development is situated in the eastern area of the Clonburris SDZ lands to the south of the Kildare/Cork railway adjacent to the R113. The proposed Link Road as part of the CSLS (SDZ20A/0021) forms the southern boundary of the site.

Figure 5.1 – Site Location



5.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

5.3.1 Topography and Land Use

The existing site is predominately greenfield. Overall, the topography of the site is relatively flat. Much of the primary road network bounding the site is situated at a significantly higher level. A number of drainage ditches are located throughout the site. There are 2no. local high points on site. One located to the southwest and another to the north west of the subject site as shown below.

Figure 5.2 – Application Site Topography

(Site Boundary Indicative)

5.3.2 Topsoil

Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.30m BGL. The results showed a brown slightly sandy gravelly topsoil.

5.3.3 Bedrock Geology

The 1:100,000 Geological Survey of Ireland bedrock Geology Map from the GSI online mapping service indicates that the subject site is underlain in its entirety by limestone. The bedrock is described in geological mapping as a dark limestone and shale and is part of a formation known as the Lucan Formation. The rock description is a dark limestone and shale. An extract from GSI mapping is presented in Figure 5.3.

No rock outcrops were visible during the site visit. The rotary core boreholes recovered Weak to Medium strong to very strong dark grey fine to medium grained laminated Limestone interbedded with weak black fine grained laminated Mudstone. This is typical of the Calp Formation, which is noted on the geological mapping to the east 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 1.40m BGL in to a maximum of 3.10m BGL

Figure 5.3 – Bedrock Geology (Geological Survey Ireland)

(Application Site Boundary Indicative)

5.3.4 Quaternary & Soil

The Geological Survey of Ireland online mapping service indicates the quaternary deposits underlying the subject site are comprised of Tills derived from limestones. The Teagasc Soils and Subsoils Map from the online Geological Survey of Ireland mapping service shows that the majority of the site is underlain with “mineral poorly drained soils” with intermittent areas of the site underlain with “deep well drained mineral” soils. Refer to Figure 5.4 and Figure 5.5 below.

The ground investigation carried out by Ground Investigations Ireland summarises the soils as follows:

- **Topsoil:** Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.3m BGL.
- **Made Ground:** Made Ground deposits were encountered beneath the Topsoil and were present to a relatively consistent depth of between 0.50m and 0.90m BGL. These deposits were described generally as brown slightly sandy slightly gravelly CLAY with frequent cobbles and boulders and contained occasional fragments of concrete, red brick, glass, metal and plastic.
- **Cohesive deposits** were encountered beneath the Made Ground and were described typically as brown slightly sandy slightly gravelly CLAY or grey mottled brown slightly sandy slightly gravelly CLAY with occasional cobbles overlying a grey slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the cohesive till matrix. The strength of the cohesive deposits typically increased with depth and was firm to stiff or stiff below 1.30m BGL in the majority of the exploratory holes. These deposits had some, occasional or frequent cobble and boulder content were noted on the exploratory hole logs.
- **Granular Deposits:** Granular deposits were encountered below of the cohesive deposits and were typically described as Grey brown clayey sandy angular to sub angular fine to coarse GRAVEL with occasional cobbles and rare boulders. At location TP21 a grey slightly clayey slightly gravelly fine to coarse SAND with rare cobbles was encountered. The secondary sand/gravel and silt/clay constituents varied across the site and with depth while occasional or frequent cobble and boulder content also present where noted on the exploratory hole logs.

- The rotary core boreholes recovered Weak to Medium strong to very strong dark grey fine to medium grained laminated LIMESTONE interbedded with weak black fine grained laminated Mudstone. This is typical of the Calp Formation, which is noted on the geological mapping to the east 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 1.40m BGL in BH16 to a maximum of 3.10m BGL in BH22. The total core recovery is good, typically 100% with some of the uppermost runs dropping to 70% or 92%. 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.

Figure 5.4 – Quaternary Deposits (Geological Survey Ireland)

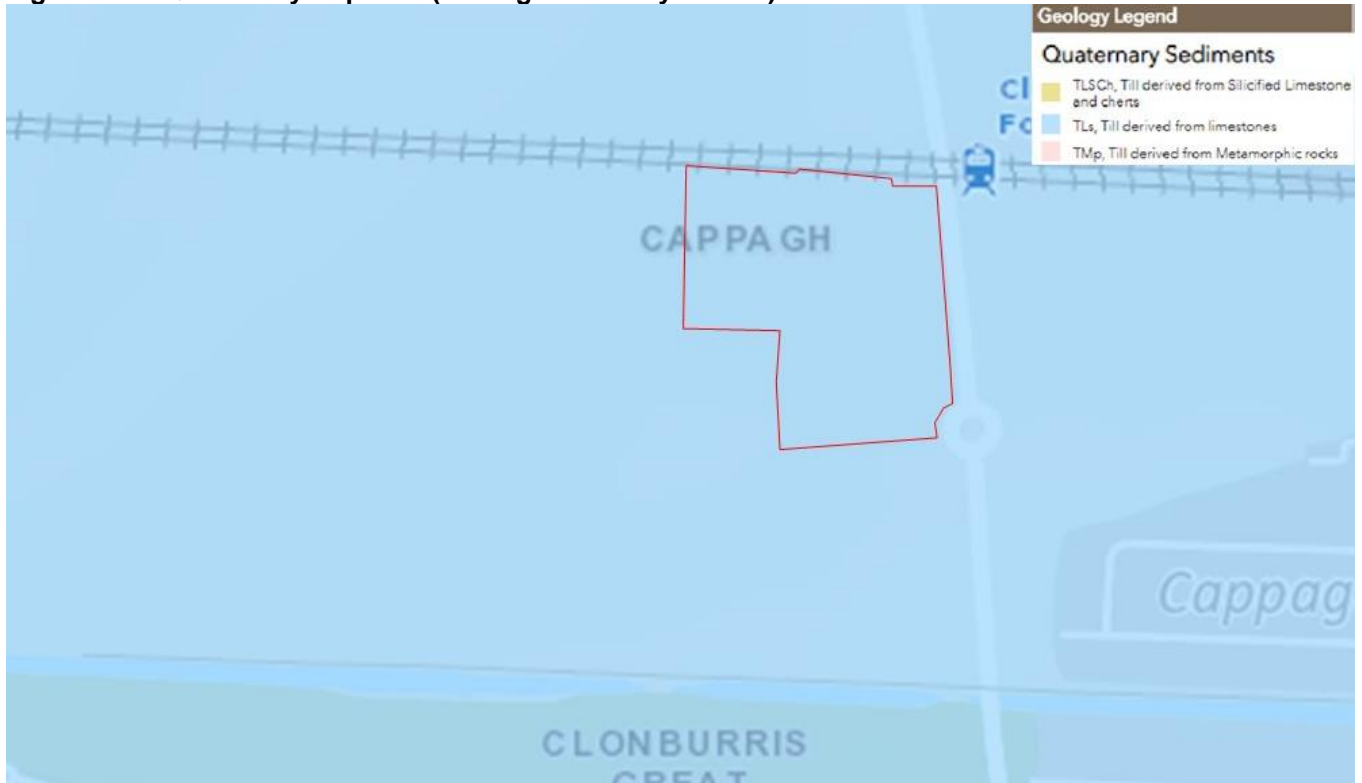
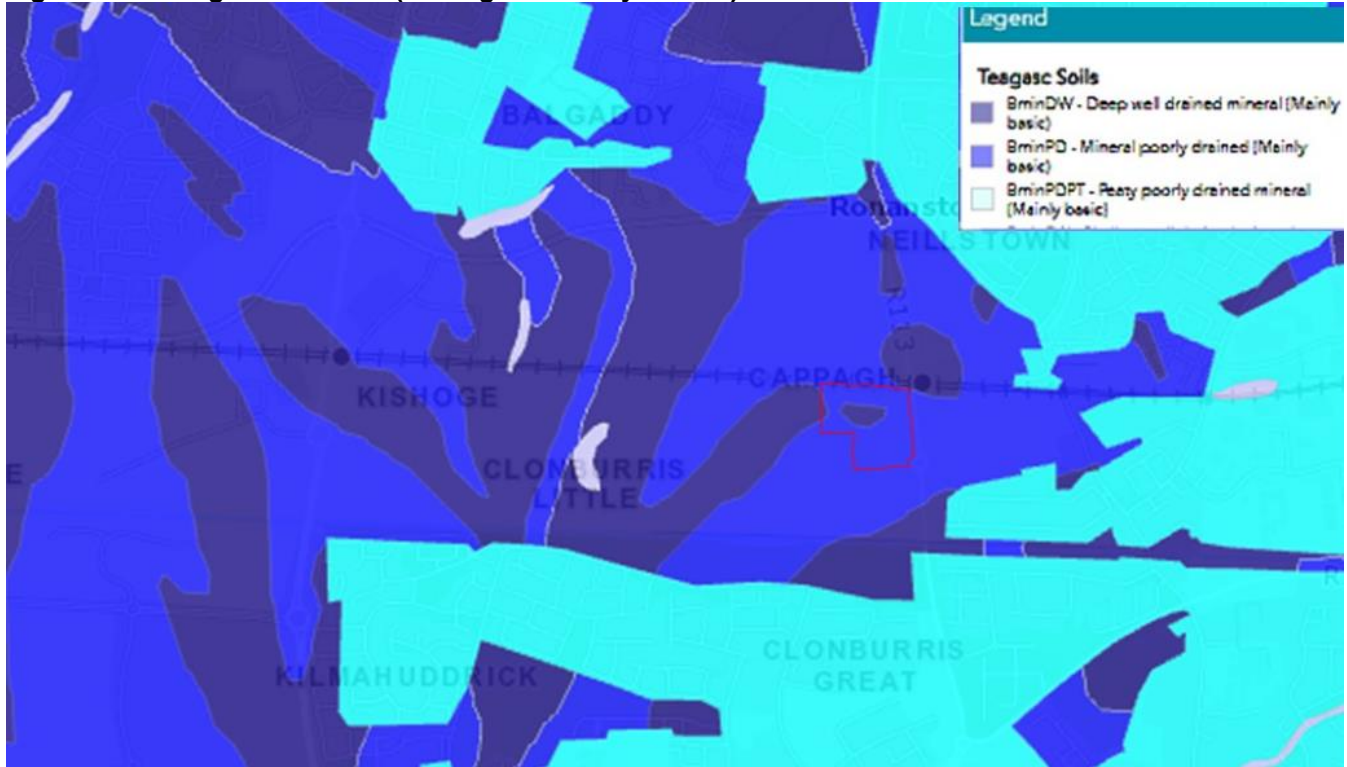


Figure 5.5 – Teagasc Subsoils (Geological Survey Ireland)



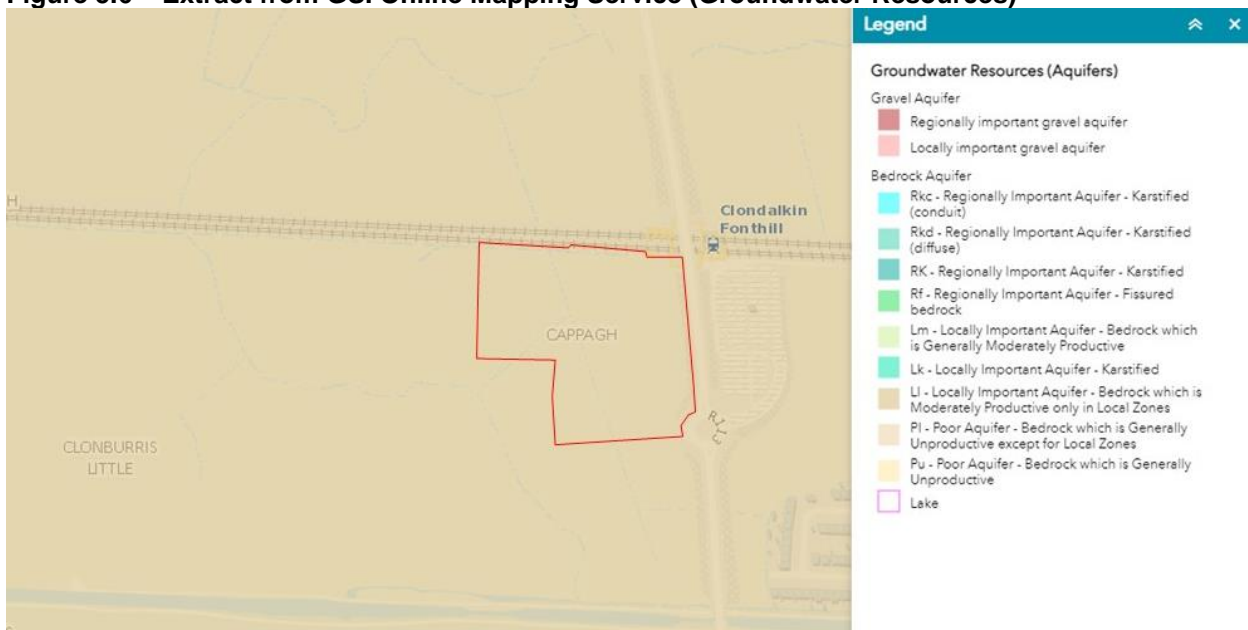
5.3.5 Hydrogeological aspects

Limestone bedrock underlies the entire site. The bedrock is described in geological mapping as a Dark Limestone & Shale and is part of a formation known as the Lucan Formation.

The bedrock aquifer underlying the entire site is classified by Geological Survey Ireland as a “*Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones*”.

Refer to Figure 5.6 for the extent of these zones.

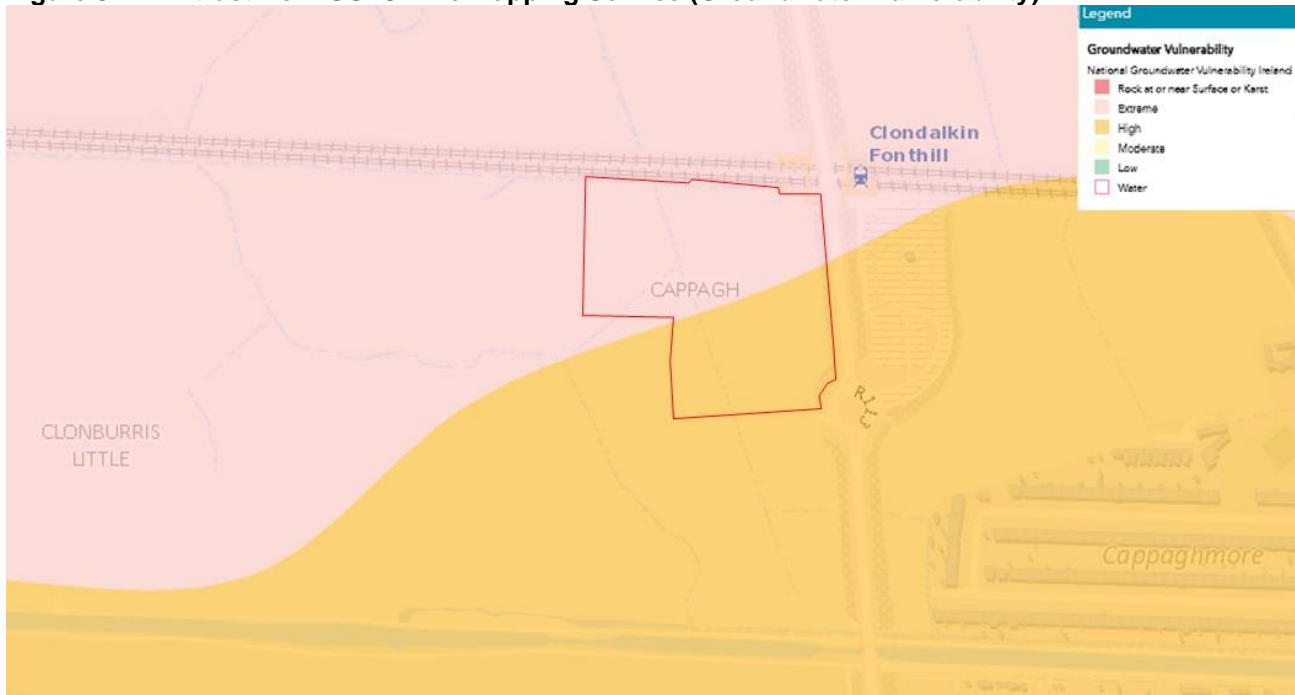
Figure 5.6 – Extract from GSI Online Mapping Service (Groundwater Resources)



Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability is classed as “High” or greater on the proposed site due to the shallow depth to bedrock as shown below. Areas of highest vulnerability correspond to areas of near surface bedrock and thin soil depths. It is noted that the aquifer vulnerability classification does not consider the nature of the underlying ‘receiving’ aquifer with respect to resource value or significance of pollution occurring and is only a reflection on the protection afforded to the aquifer by overlying deposits.

Infiltration testing in accordance with BRE digest 365 methodologies was carried out as part of site investigations. Infiltration testing indicating that infiltration rates are typically quite low on the subject site.

Figure 5.7 – Extract from GSI Online Mapping Service (Groundwater Vulnerability)



5.3.6 Contaminated land

No existing areas of contaminated ground have been identified within the subject site. Environmental testing carried out as part of ground investigations indicate that soils would be classed as inert under the EPA Waste acceptance Criteria.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Consideration of the Characteristics of the Proposed Development allows for a projection of the ‘*level of impact*’ on any particular aspect of the proposed environment that could arise. For this chapter the potential impact on land and soils is discussed.

The proposed development comprises a mixed-use development comprising of 594 no. apartments, retail and office space with associated infrastructure including an urban square. Refer to Chapter 2 of this EIAR for detailed project description

It is anticipated that the main construction activities impacting soils and geology will comprise the following:

- Removal of topsoil and subsoil to allow road construction, foundation excavation, services installation.
- Construction of the main access routes into the development.
- Installation of main underground services and utilities to serve the site.
- Construction of the surface water storage systems (underground and overground).
- Construction of podiums for the apartment buildings.

Excavated topsoil and subsoil material will be reused where possible to ensure no unnecessary disposal of excavated materials occurs as detailed in section 5.5.

5.5 POTENTIAL IMPACT (EFFECTS) OF THE PROPOSED DEVELOPMENT

5.5.1 Construction Phase

It is anticipated that the main construction activity impacting geology, soils and land will comprise the following:

- Stripping, storage and transportation of topsoil, storage of topsoil and removal of topsoil from site to allow the development construction to proceed.
- Excavation, storage and transportation of subsoil layers for construction of the roads, building foundations and services.

5.5.2 Stripping of Topsoil

Removal of the existing topsoil layer will be required across the site. Stripping of topsoil will result in a negative effect from the exposure of the underlying subsoil layers to the effects of weather and construction traffic which may result in subsoil erosion and generation of sediment laden runoff.

It is anticipated that topsoil will be stripped over the full development area to facilitate construction. It is anticipated topsoil strip will be to an approximate depth of 0.3m and will be phased in line with the overall development phasing. Topsoil will be stored on site in carefully managed stockpiles and will generally be reused within gardens and other landscaped areas within the site. Site levels have been designed to be slightly above existing levels in order to minimize the requirement for offsite disposal of soil and to ensure adequate drainage gradients can be applied. Therefore, it is anticipated that there is significant capacity to accommodate soil volumes within gardens and landscape areas. Refer to **Table 5.2** for topsoil strip volumes.

Table 5.2 – Preliminary Topsoil Volumes (Estimated)

	Volume (m ³)
Topsoil Strip (0.3m Thick Layer)	15,539
Topsoil reused on-site	14,762
Topsoil disposed off-site	777

5.5.3 Excavation of Subsoil Layers

Excavation of existing subsoil layers will be required in order to allow foundation construction, road structure and drainage and utility installation. Excavation of sub-soil layers will result in a negative effect from the exposure of the

underlying subsoil layers and rock to the effects of weather and construction traffic which may result in subsoil erosion and generation of sediment laden runoff. Foundations for houses are anticipated to be shallow strip foundations and foundations for apartment buildings are expected to consist of pad excavations for columns which would be founded on the shallow bedrock. Based on available information subsoil is expected to be generally suitable for reuse as non-structural fill (e.g., build-up of back gardens areas or build-up of open space).

The estimated cut/fill volumes are given in **Table 5.3** below. It is estimated that subsoil excavated will be reused on site

Table 5.3 – Preliminary Cut/Fill Volumes (Estimated)

	Volume (m ³)
Subsoil Excavation (podiums & attenuation pond)	45,880
Subsoil re-used on site as fill (Roads and buildings without basements)	23,412
Excess cut volume (Stockpiled for re-use on future development phase)	20,174

5.5.4 Construction Traffic

Earthwork plant (e.g., dump trucks) and vehicles delivering construction materials to site (e.g., road aggregates, concrete deliveries etc.) have potential to cause negative effects from rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff. This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network). Dust generation can also occur during extended dry weather periods as a result of construction traffic.

5.5.5 Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in negative effects from contamination of the soils underlying the site.

- Storage of oils and fuels on site.
- Oils and fuels leaking from construction machinery.
- Spillage during refuelling and maintenance of construction machinery.
- Use of cement and concrete during construction works.

5.5.6 Geological Environment

It is expected that the installation of the drainage networks and building podiums will require excavation of bedrock in some locations. Excavations associated with development of the site have been designed as shallow as possible. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works. Excavation of rock will have negative effects from the exposure of the bedrock to adverse weather conditions resulting in erosion of the rock layers.

5.5.7 Human Health

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. Refer to for a summary of summary of unmitigated significance.

Table 5.4 – Summary of Unmitigated Significance - Construction Phase

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (pre mitigation)
Soils/Subsoils	Chemical Pollution of soils/subsoils	Negative	Low – Potential for local effects to soil value and distribution	Slight

Limestone Bedrock	Chemical Pollution of bedrock	Negative	Low – Potential for local effects to rock value and distribution	Slight
Soils/Subsoils	Loss of soil value	Negative	Low – Potential for local effects to soil value and distribution	Slight
Soils/Subsoils	Material Generation	Negative	Low – Potential for local effects to soil value and distribution	Slight
Limestone Bedrock	Material Generation	Negative	Low – Potential for local effects to rock value and distribution.	Not Significant

5.5.8 “Do-Nothing” Scenario

Should no development be proposed for the site and the site remains as open undeveloped land this would remove any potential for contamination issues over the operational or post development phase. Notwithstanding this, the land is zoned for the type of development applied for. There will be no effect on geology, soil and land if the development does not proceed.

5.5.9 Operational Phase

The operational effects are those associated with the completed development including final surface treatments, conveyance of traffic flows, occupation of buildings and all operation and maintenance activities. The main effects arising from construction activities include:

- Any exposed soils or those which remain unplanted have potential to be eroded by wind and water which may result in soil erosion and generation of sediment laden runoff.
- During the operational phase there is a risk of accidental spills from development users which may result in negative effects from contamination of the soils underlying the site.

Once the development is completed the operational impacts on the land and soils would be minimal. The biggest risk item is cross contamination of ground water from the operational phase of the development from accidental oil spillages, refer to the Mitigation section below for proposed remedial issues.

Table 5.5 – Summary Significance – Operational Phase (Prior to Mitigation)

Receptor	Quality of Effects	Quality of Effects	Magnitude of Effect	Significance of Effects (pre mitigation)
Soils/Subsoils	Loss of soil value	Negative	Low – Potential for local effects to soil value and distribution	Slight
Soils/Subsoils	Pollution of soils/subsoils from spills	Negative	Low – Potential for local effects to soil value and distribution	Slight

5.6 MITIGATION MEASURES

5.6.1 Incorporated Design Mitigation

The site layout has been designed to minimise impact on the land and soil environment. The design has evolved to minimise environmental impact throughout the various design stages.

The vertical and horizontal alignment of the road and development levels have been optimized to minimize cut and fill requirements and seek to obtain a balance of cut and fill materials (within constraints of road design criteria and landscape considerations). However, the flat topography of the site forced the raising of site levels to allow for enough slope from north to south to drain the site.

Sufficient space has been provided within the works area for segregated spoil storage.

Preconstruction soils testing has been carried out to determine if any contamination exists.

5.6.2 Construction Phase Mitigation

A Preliminary Construction Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A Construction & Environmental Management Plan will be put in place by the Contractor to implement the mitigation measures from the EIAR. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction phase. The Preliminary Outline Construction Management Plan includes a range of site-specific measures which will include the following mitigation measures in relation to geology, soils, and land:

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stripping will not take place during inclement weather.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. Topsoil stockpiles will also be located so as not to necessitate double handling.
- The design of site levels have been carried out in such a way as to minimize the interaction with rock. Rock will likely be encountered during the installation of drainage due to topography of the subject site and levels of drainage outfalls.
- The duration that rock layers are exposed to the effects of weather will be minimized by back filling excavations as soon as practicable after construction.
- Stockpiles of excavated and crushed rock will be protected for the duration of the works.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to water bodies).
- Earthwork's plant and vehicles exporting soil and delivering construction materials to site will be confined to predetermined haul routes around the site.
- Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.
- In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- An Emergency Response Plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.
- Pouring of concrete including wash down and washout of concrete from delivery vehicles will be controlled in an appropriate facility to prevent contamination.
- Regular samples will be taken from soils affected by earthworks which shall be analysed for contamination
- All materials exported from site to be in accordance with the Waste Management Acts.
- Imported materials to be suitably separated to avoid contamination or mixing.
- For imported materials, the use of local quarries or locally available material should be prioritised.
- Any potential for use of surplus material within local sites shall be pursued at construction and detailed design stage (subject to compliance with Waste Management Acts). If any material is to be reused on another site as a by-product (and not as waste), this will be done in accordance with Article 27 of the Waste Directive Regulations.

5.6.3 Operational Phase

Once the development is completed, risks to the geology, soil and land will be from loss of soil value and pollution of soils/subsoils due to accidental spills. The following mitigation measures will be implemented:

- A detailed landscape plan will be prepared and constructed for the development to ensure all areas are planted and established.
- Earthworks will be designed and constructed in accordance with good practice and design standards to ensure slope stability.
- All new drainage on site will be pressure tested and have a CCTV survey carried out prior to being made operational to ensure it is adequately constructed.

- Oil interceptors will be installed on all surface water drainage networks.
- Vegetated Sustainable urban drainage systems will be installed to treat run-off.

5.7 PREDICTED IMPACT FOLLOWING MITIGATION (RESIDUAL IMPACT)

The proposed development will alter the current land use from vacant land to residential development, creche and public open space and landscape areas. The impact on land, soil, geology, and hydrogeology from accidental spillages of fuel and lubricants used during the construction phase of the development is predicted to be minimal when stored and used in a responsible manner. After implementation of the mitigation measures recommended above for the construction phase, the proposed development will not give rise to any significant long term adverse impact.

Implementation of the measures outlined in Section 5.6 will ensure that the potential impacts of the development on soils and the geological environment are minimised during the construction phase and that any residual impacts will be short term, and imperceptible.

Residual Impacts from earthworks haulage and the risk of contamination of groundwater are deemed to be of minor risk. The residual impacts for a residential housing development, creche and open space are deemed to be imperceptible post construction (during the operational phase).

Implementation of the mitigation measures outlined above will ensure that potential significant effects of the proposed development on land, soils and geology do not occur during the construction phase and that any residual effects will be short term and not significant.

Table 5.6 –Significance – Construction Phase Post Mitigation

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (post mitigation)
Soils/Subsoils	Chemical Pollution of soils/subsoils	Negative	Low / Negligible: Implementation of best practice measures to control hazardous substances mitigates effect. Measures include controls on use and storage of hazardous materials, controls on construction works.	Not Significant
Limestone Bedrock	Chemical Pollution of bedrock	Negative	Low / Negligible: Implementation of best practice measures to control hazardous substances mitigates effect. Measures include controls on use and storage of hazardous materials, controls on construction works.	Not Significant
Soils/Subsoils	Loss of soil value	Negative	Low / Negligible: Implementation of best practice measures to protect soil value mitigates effect. Measures include best practice soil handling and construction practices and reinstatement of affected areas.	Not Significant
Soils/Subsoils	Material Generation	Negative	Low / Negligible: Implementation of best practice measures for material generation mitigates effect. Measures include optimisation of site levels, reuse of materials and use of local quarries/waste receivers.	Not Significant
Limestone Bedrock	Material Generation	Negative	Low / Negligible: Implementation of best practice measures for material generation mitigates effect. Measures include optimisation of road levels, reuse of materials and use of local quarries/waste receivers.	Not Significant

Table 5.7 –Significance – Operational Phase Post Mitigation

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (post mitigation)
Soils/Subsoils	Loss of soil value	Negative	Low / Negligible: Implementation of best practice measures to protect soil value mitigates effect. Measures include design and constructed of detailed earthworks and landscaping proposals.	Not Significant
Soils/Subsoils	Pollution of soils/subsoils	Negative	Low / Negligible: Implementation of best practice measures to control chemical pollution mitigates effect. Measures include testing of drainage networks, oil interceptors and sustainable urban drainage systems.	Not Significant

5.8 “WORST-CASE” SCENARIO

5.8.1 Construction Phase

Under a ‘worst case’ scenario, the accidental release of fuel, oil, paints or other hazardous material occurs on site during the construction phase, through the failure of secondary containment or a materials handling accident on the site. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the soil zone. If the materials were not recovered promptly, then the contaminants may contaminate the down gradient groundwater and surface water receptors causing a significant contamination event.

If the materials were not recovered promptly, then the contaminants may contaminate the down gradient groundwater and surface water receptors and the ground water could become poisonous, undrinkable, and unusable for general agricultural methods. The impacts from such an accident, would be negative and long-term. Given the likely small quantity in any spillage, the effects will be localised and imperceptible.

The contractor must adhere to the CEMP and the mitigation measures contained in this EIAR to ensure that all containment is kept in working order which should result in this worst case scenario being unlikely to occur.

5.8.2 Operational Phase

As noted from an operational viewpoint, the worst-case scenario would be an accidental spill of oils from cars or effluent from or a leak in the foul drainage system or damage to the oil separator serving the roads for the proposed scheme.

The worst case impact relates to the potential for oil or effluent entering the ground. There is a potential risk for local residents to come in contact with the contaminated ground. Due to the expected low volume of oil run-off, this impact would be negative, short term and imperceptible. However, the mitigation measures outlined above in section 5.6 should ensure that this does not occur.

Under a ‘worst case’ scenario, soil slippage due to poorly constructed earthworks site during the construction phase causes ground instability in the surrounding areas. If this were to occur the surrounding lands could become unstable adversely affecting any potential future development in the area.

5.9 MONITORING

5.9.1 Monitoring measures – construction

Proposed monitoring during the construction phase in relation to the geology, soil and land are as follows:

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).

- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)

5.10 INTERACTIONS

Please refer to Chapter 15 of the EIAR.

5.11 REINSTATEMENT

There are no reinstatement works considered to be necessary in this case.

5.11.1 Monitoring measures – operational phase

Proposed monitoring during the operational phase in relation to the geology, soil and land are as follows:

- Regular inspection and maintenance of the drainage system and oil interceptors.

5.12 DIFFICULTIES ENCOUNTERED

No particular difficulties were encountered in completing this section.

5.13 CUMULATIVE IMPACTS

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented. A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently underway. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development. Should this scheme be granted it is anticipated that construction phase of the Link Street may overlap with construction of the proposed development. The CSLS application included an EIAR as part of its planning application and has identified similar mitigation measures therefore no significant potential cumulative impacts are not anticipated.

Other projects in the wider Clonburris SDZ comprise:

SDZ21A/0022 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.
SDZ228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
SDZ228/0003 Part 8 Development 263 no. units within Kishogue South West
SDZ22A/0010 – 294 dwellings, creche and retail unit
SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements.
SDZ21A/0006 - Wastewater pumping station
Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)
SDZ22A/0017 - Tile 3 application of 157 no. dwellings (lodged December 2022)

Cumulative impacts to land and soil, during construction and demolition processes are associated with spillage and leakage of oils and fuels and disturbance of land. Individual impacts from the Proposed Development are generally considered to be negligible to medium impacts to a low to medium sensitivity environment and the significance of the impacts has been assessed as imperceptible to moderate. As outlined above, mitigation measures proposed to manage and control potential impacts during construction of the Proposed Development will reduce the magnitude and significance of impacts from these developments to a minimum.

Taking account of mitigation measures proposed during the construction of the Proposed Development the potential impact is considered to be a low impact to a low / medium sensitivity environment and the significance of the impacts has been assessed as slight.

6.0 WATER AND HYDROLOGY

6.1 INTRODUCTION

This chapter was prepared by DBFL Consulting Engineers and addresses all natural water bodies including surface freshwater (streams, bogs, ponds, rivers and lakes) and groundwater (shallow and deep) which may be affected by the proposed development. This chapter also addresses the issues of hydrogeology and the interaction between water bodies and the surface water drainage, foul water drainage, and water supply. This chapter of the EIA comprises of an assessment of the likely effects of the proposed development on the surrounding surface water and hydrogeological environments, as well as identifying proposed mitigation measures to minimize any effects.

This chapter was prepared by Dieter Bester, Chartered Civil Engineer [B.Eng CEng].

6.2 METHODOLOGY

6.2.1 Guidelines

Key guidance documents considered as part of EIA preparation are listed below.

Table 6.1 – Guidance Documents

Body	Guidance
Transport Infrastructure Ireland (TII)	Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009)
	Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008)
	Guidelines for The Crossing of Watercourses During the Construction of National Road Schemes (NRA, 2008)
	Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (NRA 2007)
	Road Drainage and the Water Environment (DN-DNG-03065)
	Design of Earthworks Drainage, Network Drainage, Attenuation & Pollution Control (DN-DNG-03066)
	Drainage Design For National Road Schemes - Sustainable Drainage Options (RE-CPI-07001)
	Drainage Systems For National Roads [DN-DNG--03022]
Office of Public Works (OPW)	The Planning System and Flood Risk Management (OPW, 2009)
	OPW Flood Maps (http://www.floodinfo.ie/)
Environmental Protection Agency (EPA)	Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports (EPA, May 2022)
	EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, Sept. 2003)
	Geo Portal (https://gis.epa.ie/EPAMaps/)
Department of Housing Planning and Local Government	River Basin Management Plan for Ireland 2018 – 2021
Inland Fisheries Ireland (IFI)	Guidelines on protection of fisheries during construction works in and adjacent to waters (Inland Fisheries Ireland 2016)
Construction Industry Research and Information Association (CIRIA)	The SUDS Manual (CIRIA C753)
	Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA C532)
	Control of Water Pollution from Linear Construction Sites (CIRIA C648)
	Development and Flood Risk – Guidance for the Construction Industry (CIRIA 624)
	The Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) (2001)

Body	Guidance
	Environmental Good Practice on Site Guide (C741) (2015)
Dublin City Council (DCC)	The Greater Dublin Strategic Drainage Study [GDSDS] (Dublin City Council et al., 2005)
South Dublin County Council (SDCC)	South Dublin County Council Planning (https://www.sdcc.ie/en/services/planning/)
Institute of Geologists Ireland (IGI)	Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements (2013)
Environment Agency (UK) EA	PPG1: General Guide to the Prevention of Pollution (UK Guidance Note)

6.2.2 Consultation

Baseline information was gathered from relevant statutory bodies as per Table 6.1

6.2.3 Desktop Study

In addition to the guidance documents listed in section 6.2.1 the desktop study involved collation and assessment of the relevant information from the following information sources:

- Review of existing topographical survey information.
- Review of the preliminary Ground Investigation carried out by Ground Investigations Ireland Limited between July and September 2022.
- Review of Irish Water wastewater (foul drainage) and watermain records
- Submission of a Pre-Connection Enquiry Application to Irish Water and consultation with Irish Water
- Review of South Dublin County Council surface water drainage records
- Consultation with South Dublin County Council.
- Review of information available on the Environmental Protection Agency (EPA) online mapping service.
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service.
- Review of Office of Public Works (OPW) National Flood Hazard Mapping and Catchment Flood Risk Assessment and Management Studies (CFRAM Studies).
- Review of the Clonburris Strategic Development Zone (SDZ) Scheme and accompanying Strategic Flood Risk Assessment and Surface Water Strategy prepared by JBA Consulting.
- Review of Clonburris SDZ Surface Water Management Plan by DBFL Consulting Engineers
- Review of documents and drawings submitted as part of the Clonburris Southern Link Street under planning reference SDZ20A/0021 and approved on 16th August 2021

6.2.4 Assessment Methodology

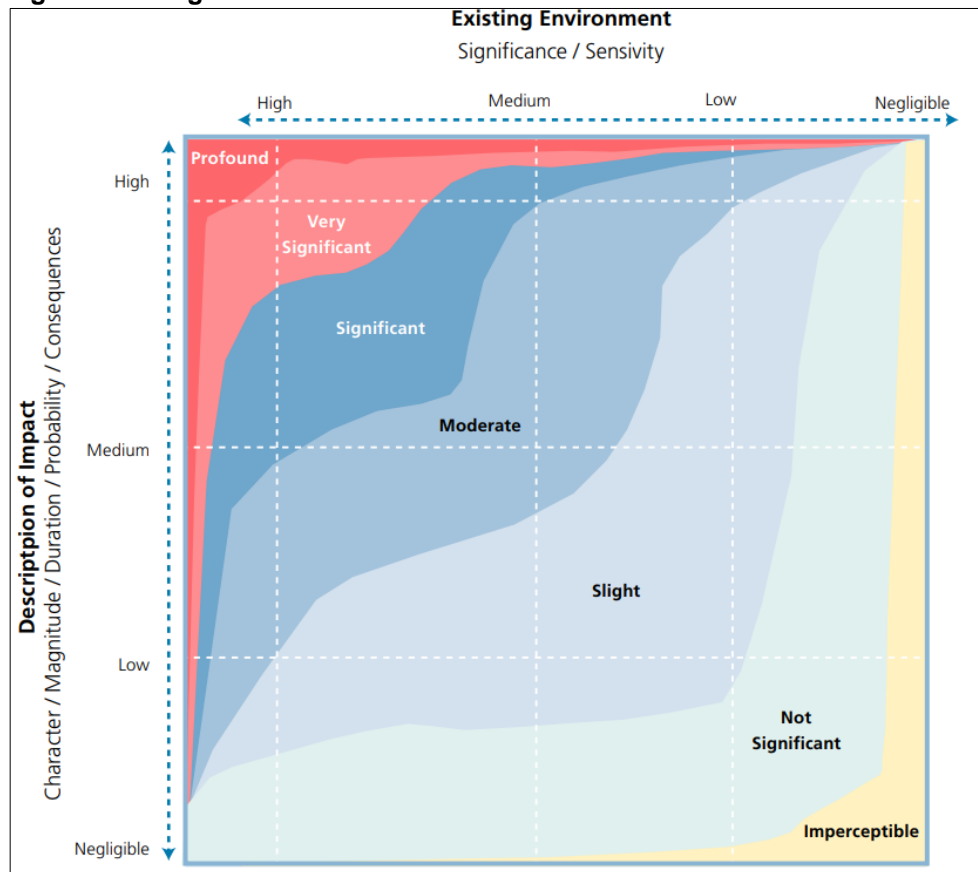
The assessment of the potential effect of the proposed development on the water environment was carried out according to best practice and the methodology specified in the available guidance documents. Various bodies including; Transport Infrastructure Ireland (TII, formally National Roads Authority); the Office of Public Works (OPW) and the Environmental Protection Agency (EPA) provide detailed guidance to the preparation and content required for an EIAR in relation to the water environment.

6.2.5 Application of Methodology

This chapter has been prepared in accordance with the following best practice methodology; “Guidelines on The Information to Be Contained In Environmental Impact Assessment Reports (May 2022)” & the TII “Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes”.

The significance of the identified potential impacts is acknowledged by the combination of the sensitivity of the receptor and the magnitude of the potential impact. The generalised significance terms used in this assessment is in line with the EPA guidance reproduced below.

Figure 6.1 – Significant Effect Matrix



6.2.6 Study Area

The proposed development site is located in the Local Authority area of South Dublin County Council (SDCC) and is part of the Clonburris Strategic Development Zone (SDZ). The subject site for this development is situated in the eastern area of the Clonburris SDZ lands to the south of the Kildare/Cork railway adjacent to the R113. The proposed Link Road as part of the CSLS (SDZ20A/0021) forms the southern boundary of the site.

The study area consists of the development site and all local and downstream hydrological/hydrogeological receptors.

6.3 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

6.3.1 Topography & Land Use

The existing site is predominately greenfield. Overall, the topography of the site is relatively flat. Much of the primary road network bounding the site is situated at a significantly higher level. A number of drainage ditches are located throughout the site. There are 2no. local high points on site. One located to the southwest and another to the north west of the subject site. Refer to **Figure 6.2** for the pre-development site topography.

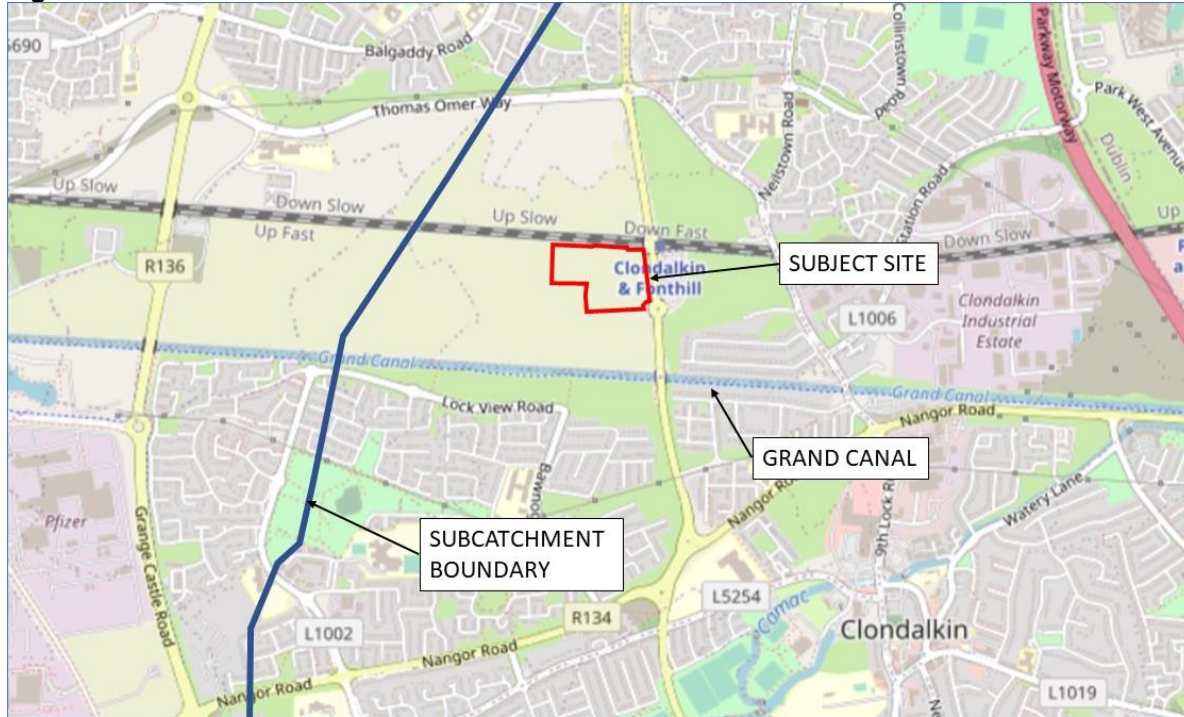
Figure 6.2 – Site Topography



6.3.2 Existing Surface Water Features & Hydrology

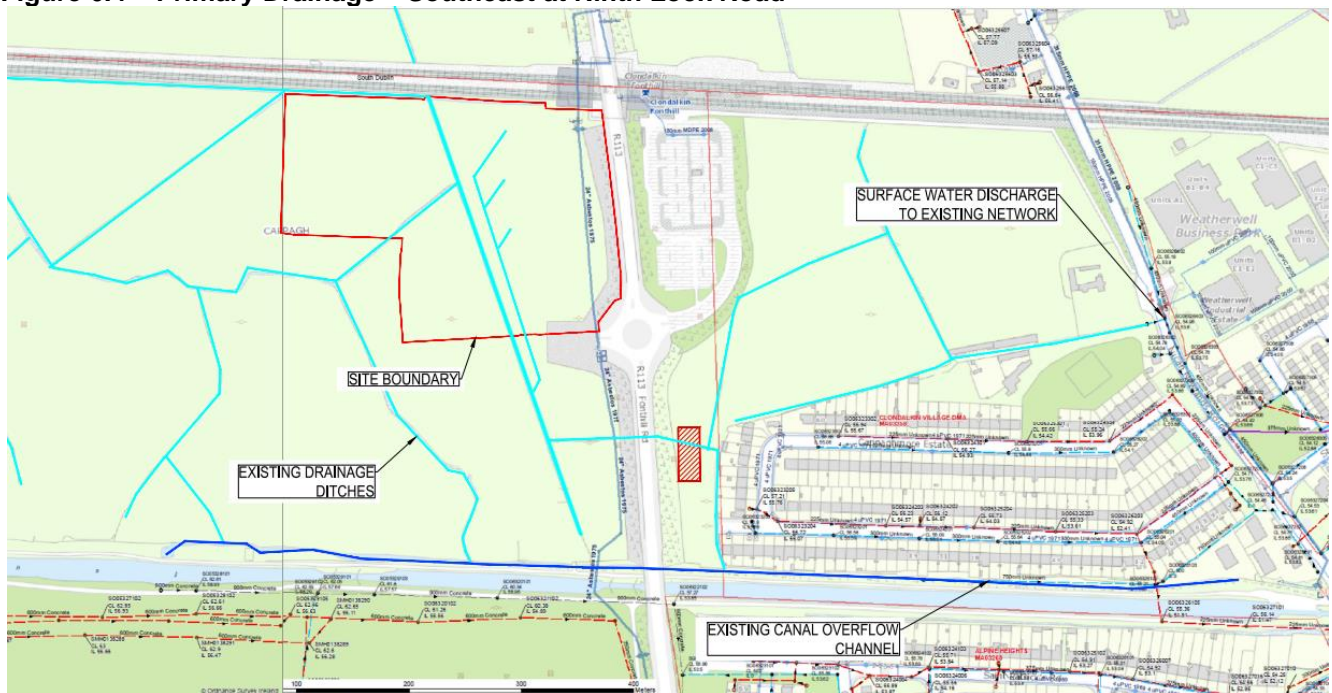
The overall Clonburris SDZ is within the River Liffey Catchment. The study area affects two primary hydrological sub-catchments, the Griffeen & the Camac. The subject site for this development is located within the “Camac” sub catchment (*EPA Ref: IE_EA_09C020500*). The Grand Canal is located to the south of the subject site. An extract from the EPA online mapping service with the catchment split shown is provided in Figure 6.3 below.

Figure 6.3 – EPA Watercourses



The River Liffey is approximately 3.8km to the north of the subject site. The Grand Canal is approximately 200m to the south of the subject site.

Figure 6.4 – Primary Drainage – Southeast at Ninth Lock Road



There are a number of existing drainage ditches located throughout the site. These ditches are noted to generally have extremely flat or inconsistent gradients and are poorly maintained and appear to discharge beneath the R113 to the east.

The lands east of the R113 and south of the railway, drain to the south-east to existing stormwater networks on Ninth Lock Road, as per Figure 6.4 below. The drainage run continues south on Ninth Lock Road where it splits into parallel runs along Station Road which later merge and discharge to an open watercourse within the industrial estate and eventually discharge to the Camac River.

6.3.3 Regional Hydrogeology

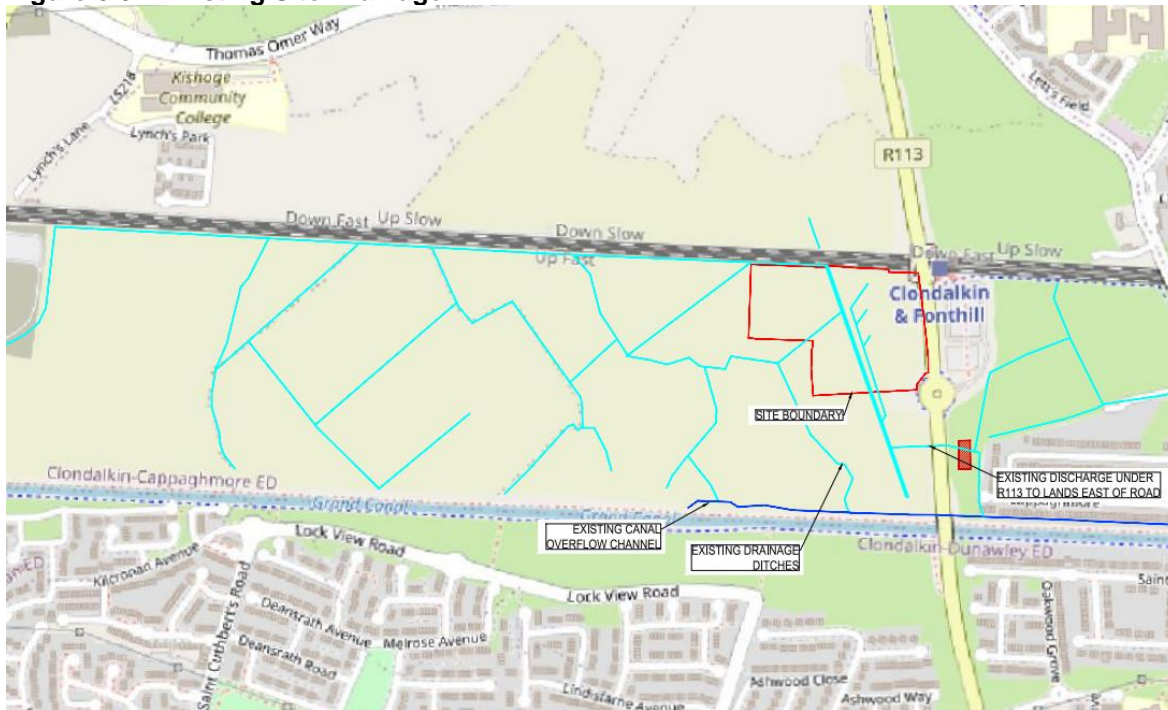
Limestone bedrock underlies the entire site. The bedrock is described in geological mapping as a Dark Limestone & Shale and is part of a formation known as the Lucan Formation. The bedrock aquifer underlying the entire site is classified by Geological Survey Ireland as a “*Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones*”.

Figure 6.5 – Extract from GSI Online Mapping Service (Groundwater Resources)



6.3.4 Site Hydrology and Groundwater

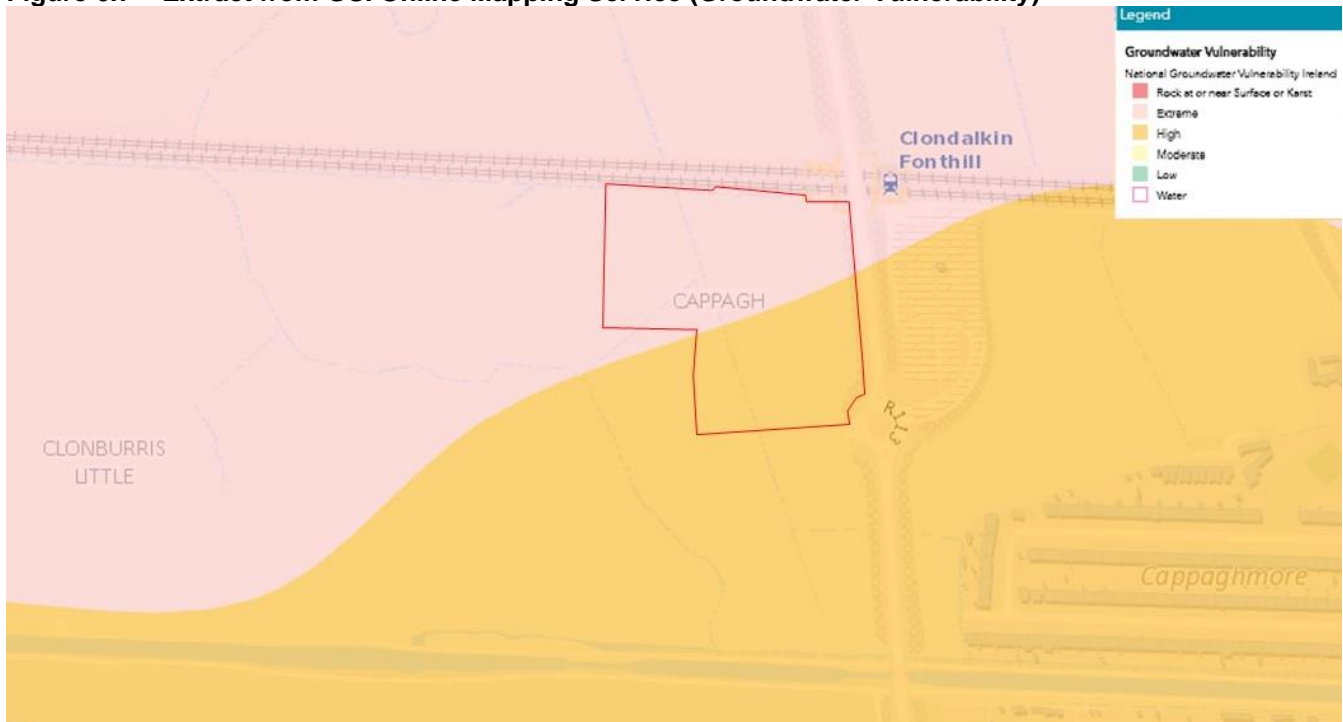
Figure 6.6 – Existing Site Drainage



The existing site is greenfield. It appears that surface water run-off drains via infiltration and to the existing drainage ditches dispersed across the site. As stated in Section 6.3.2 above, these appear to drain under the R113 to the lands east and into the drainage networks that discharge into to existing stormwater networks on Ninth Lock Road as shown in Figure 6.6.

Groundwater was encountered at a depth of 2m during the Preliminary Ground Investigations for the overall Clonburris SDZ. Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability is classed as “High” or greater on the proposed site due to the shallow depth to bedrock. Areas of highest vulnerability correspond to areas of near surface bedrock and thin soil depths. It is noted that the aquifer vulnerability classification does not consider the nature of the underlying ‘receiving’ aquifer with respect to resource value or significance of pollution occurring and is only a reflection on the protection afforded to the aquifer by overlying deposits.

Figure 6.7 – Extract from GSI Online Mapping Service (Groundwater Vulnerability)



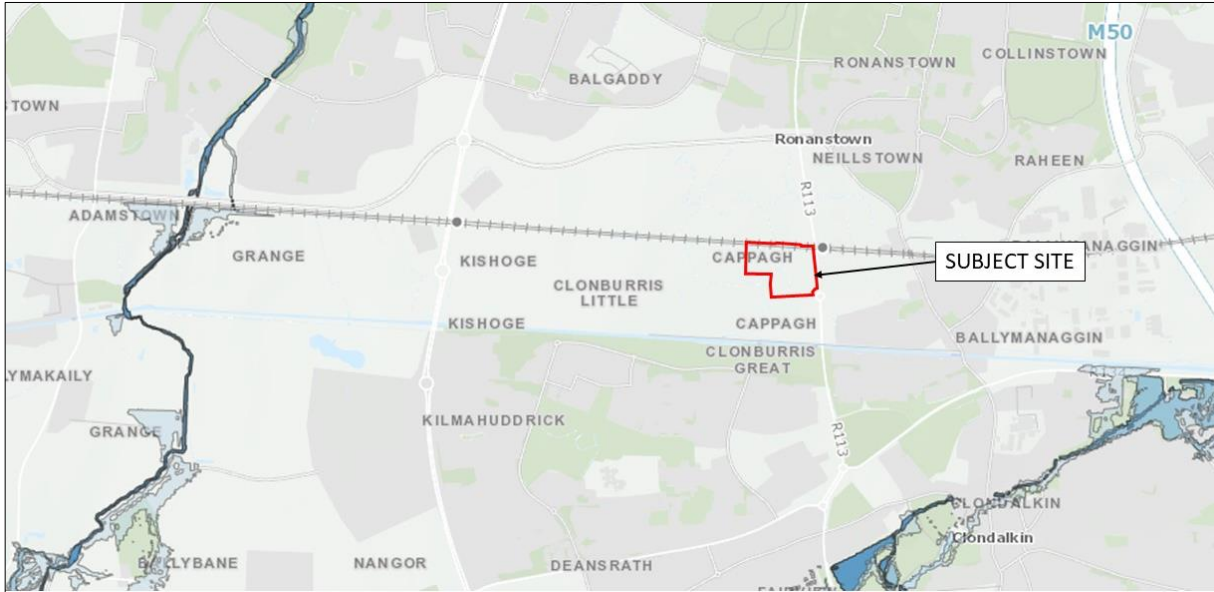
6.3.5 Flooding and Flood Risk

As part of the desktop study, historic and predicted flood risk mapping published by the OPW on the Flood Hazard Mapping Website <http://www.floodinfo.ie/> was reviewed.

Historical flood maps/data indicate there are no recorded flood events within the proposed site boundary. There are to recorded recurring flood events within 1km of the proposed site. The first is a recurring flood event at the Cappaghmore Culvert located approximately 500m to the east of the site. The Second is located at the Beech Row Bungalows approximately 380m to the east of the site.

The Eastern CFRAM (Catchment Flood Risk Assessment and Management) study details the predicted risk for a variety of fluvial and coastal flood scenarios. The mapping does not include the watercourse reaches affected by the proposed scheme and only maps downstream flooding. The proposed development is therefore outside of the Q100 and Q1000 flood extents and is therefore in within Flood Zone C (low risk of flooding).

Figure 6.8 – Extract of CFRAMS Data from OPW FloodInfo.ie



The OPW undertook an Irish Coastal Protection Strategy Study (ICPSS) which produced coastal/tidal flood extents maps for the Irish coastline for a 0.5% AEP tidal flood level. This map indicates that the Site is far outside the extents of the coastal/tidal flood zone.

Figure 6.9 – Extract of ICPSS Data from OPW FloodInfo.ie



6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

6.4.1 Topography & Land Use

The proposed development comprises a mixed-use development comprising 594 no. apartments, retail and office space with associated infrastructure, including an urban square. Refer to Chapter 2 of this EIAR for detailed project description.

The site layout has been designed to minimise impact on the existing topography. The vertical and horizontal alignment of the roads and footpaths has been optimized with the finished floor levels of the proposed buildings seeking to minimize cut and fill requirements and seek to obtain a balance of cut and fill materials (within constraints of road and building design criteria and landscape consideration). The finished development will allow for over ground flood routes in the event of storms exceeding the 100-year storm.

6.4.2 Existing Surface Water Features & Hydrology

Existing surface water run-off generated on site discharges towards the east via the existing drainage ditches. The function of these ditches by the new surface water network for the development. Surface water run-off from the new roads, footpaths and buildings will be collected in a new gravity network within the roads and footpaths of the new development.

The Clonburris SDZ Planning Scheme included a pre-construction requirement to prepare a Surface Water Management Plan (SWMP) to implement the SDZ Surface Water Strategy for the overall SDZ lands. DBFL prepared this SWMP to provide robust, effective and economic measures for the management of surface water quality and quantity in the SDZ. This plan has been agreed with South Dublin County Council’s Drainage Department.

The proposed surface water drainage strategy for this planning application has been developed in accordance with the agreed measures in this SWMP.

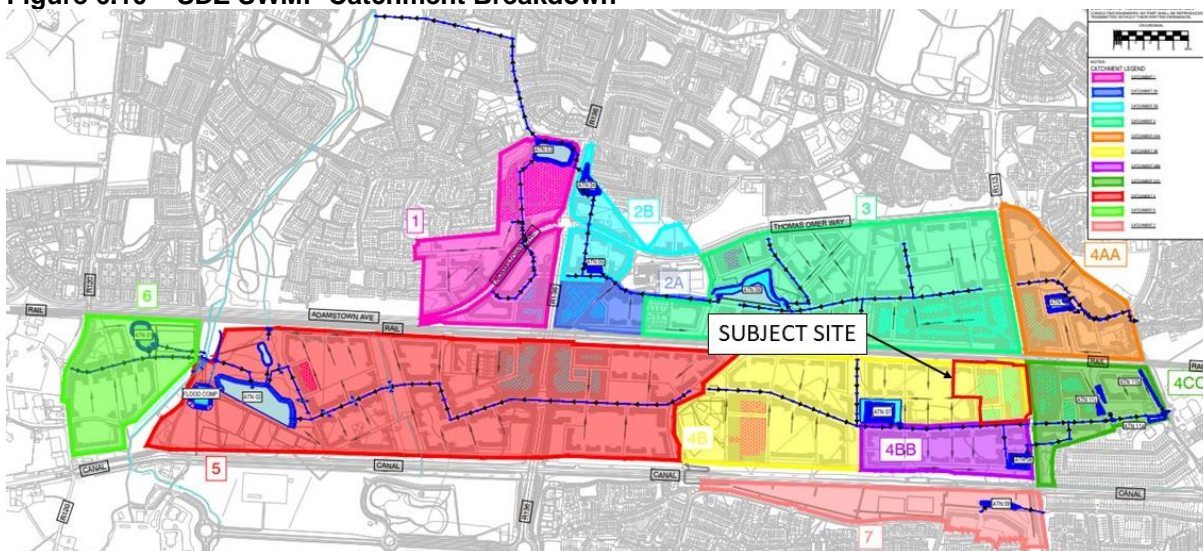
The key objectives of the drainage strategy are as follows:

- Provide adequate infrastructure to discharge surface water generated on site to the trunk surface water sewer constructed as part of the greater SDZ.
- Minimise the risk of flooding of the development and avoid a flood risk increase upstream or downstream of the site.
- Provide an allowance for the effects of climate change.
- Implement a treatment train of Sustainable Drainage Systems (SuDS) measures within the drainage network to improve water quality prior to discharge to receiving watercourses.
- Establish the key infrastructural requirements required to implement the surface water management measures set out by the SWMP.

The Surface Water Management Plan intends for the proposed development to discharge east under the R113 via a new drainage network within a new gravity sewer to be constructed as part of the Clonburris Southern Link Street (CSLS), subject to a planning application SDZ20A/0021 granted on the 16th of August 2021. Trunk surface water sewers and regional attenuation are to be constructed as part of the CSLS to serve all lands in the southern portion of the SDZ including the proposed development.

The subject site is classified as an urban core within the Planning Scheme for the SDZ and attenuation for surface water runoff from the site is required before discharging to the CSLS surface water infrastructure via the adjacent Clonburris T3 development. Surface water discharged from the subject site’s attenuation pond at a controlled rate will be attenuated in regional attenuation basins downstream.

Figure 6.10 – SDZ SWMP Catchment Breakdown



Refer to the Infrastructure Design Report for additional details on proposed drainage.

6.4.3 Regional Hydrogeology

The Ground Investigations carried out for the subject site indicates that the bedrock in the area is quite shallow. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant. Podium and associated excavations are proposed as part of the proposed scheme which will require excavation of approximately 4.0m BGL. By monitoring the groundwater levels at multiple points within the subject site, it was determined that the groundwater level ranges between 1 and 2m depth. The hydrogeology for the site would generally be unaffected, apart from the localised areas where the podiums are proposed.

6.4.4 Site Hydrology and Groundwater

The Ground Investigation carried out as part of the subject development indicates that the groundwater level is approximately 2m below the ground. Therefore, it is possible that there may be infiltration of groundwater into excavations on site. Short term dewatering of excavations may be required, particularly where 4m deep podiums/excavations are proposed for the apartment buildings.

6.4.5 Flooding and Flood Risk

As noted in Section 6.4.2 above, the runoff rates from new infrastructure will likely exceed greenfield rates, therefore an attenuation pond within the subject site is proposed and surface water generated from the new roads, footpaths and buildings will be released at pre-development flow rates (Q_{bar}). Downstream, regional systems installed as part of the CSLS attenuation will be provided to further manage runoff rates as per the measures in the SWMP and will then discharge to the trunk surface water network within the Southern Link Street. The surface water infrastructure for this development has been designed with an allowance for additional flows from future developments and a 20% increase in rainfall intensities due to climate change.

6.5 POTENTIAL IMPACT (EFFECTS) OF THE PROPOSED DEVELOPMENT

6.5.1 Construction Phase

This section identifies a list of potential and significant effects to the water environment within the subject site caused by the construction of the proposed development in the absence of mitigation measures.

Potential effects that may arise during the construction phase include:

- Contamination of surface water runoff to local watercourses due to weathering and erosion of the surface soils during construction activities.
- Improper discharge of foul drainage from contractor's compound to local watercourses.
- Cross contamination of potable water supply to construction compound and associated risk to human health.
- Surface water runoff to local watercourses during the construction phase may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities.
- Discharge of rainwater pumped from excavations.
- Accidental spills and leaks associated with storage of oils and fuels, leaks from construction machinery and spillage during refuelling and maintenance contaminating the surrounding surface water and local hydrogeological environments.
- Concrete runoff, particularly discharge of wash water from concrete trucks.
- Discharge of vehicle wheel wash water to local watercourses.
- Infiltration of groundwater into excavations.
- Construction of culverts can disturb stream sediments and increase turbidity locally within the watercourse.
- Concrete, bentonite and other cement-based products would be used during construction activities. These materials are highly alkaline and corrosive and can have significant negative effects on local watercourses surface water quality if improperly handled. Cement based products can also be detrimental to waterbody environs by altering the waters pH.
- Changes in surfacing caused by vegetation stripping or gravel placement may also affect runoff or rates in local watercourses.
- Changes in surfacing or drainage approach may affect groundwater recharge patterns.

6.5.2 Operational Phase

Potential operational phase effects on water are listed below:

- Increased impermeable surface area may potentially increase surface water runoff to local watercourses.
- Accidental hydrocarbon leaks on the proposed road and subsequent discharge into local drainage networks.
- Contamination of surface water from foul sewer leaks.

6.5.3 Risks to Human Health

There are not understood to be any potable abstractions from surface water or groundwater downstream of the site. Therefore, there is not considered to be any significant risk to human health associated with impact to water receptors.

6.5.4 “Do-Nothing” Scenario

There are no predicted effects to the water environment should the proposed development not proceed.

6.6 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

6.6.1 Incorporated Design Mitigation

The project layout has evolved in order that the design avoids conflict with the water environment. Design evolution to minimise environmental impact has been prioritised throughout the various design stages to prevent significant adverse impacts on the local water environment/hydrology. These measures will seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

All new foul drainage lines will be constructed in accordance with Irish Water Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational. The design of proposed site levels (roads, buildings etc.) has been carried out in such a way as to replicate existing surface gradients where possible, therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as required for urban centres in the SDZ as outlined in the SWMP prepared for the overall Clonburris SDZ. Surface water discharge rates will be controlled by a Hydrobrake flow control device in conjunction with attenuation storage.

SuDS features such as swales, bioretention areas and green roofs to provide additional storage and promote infiltration of and treatment of surface water run-off have been provided in landscaped areas.

All new surface water drainage on site will be pressure tested and will have a CCTV survey carried out prior to being made operational. The site is attenuated to mimic the greenfield scenario as part of the overall Clonburris SDZ.

Due to the inter-relationship between surface water and soils, hydrogeology and ecology the mitigation measures discussed will also be considered applicable to these sections and this chapter should be read in conjunction with Chapter 4 Biodiversity and Chapter 5 Land and Soils.

6.6.2 Construction Phase Mitigation

The nature of the proposed development dictates that the greatest potential impact on surface waters associated with the development will be in the construction phase. In order to prevent / minimise potential impacts, it is necessary to devise mitigation measures to be adopted as part of the construction works on site.

A Preliminary Construction Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A Construction & Environmental Management Plan will be put in place by the Contractor to implement the mitigation measures from the EIA. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction phase. The Preliminary Construction Management Plan includes a range of site-specific measures which will include the following mitigation measures:

6.6.2.1 Erosion and Sediment Control

The following measures are proposed for erosion and sediment control:

- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around specific exclusion zones and earth bunding adjacent to open drainage ditches) prior to discharge of surface water at a controlled rate.
- Groundwater pumped from excavations will be directed to on-site settlement ponds.
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds.
- On-site settlement ponds will include geotextile liners and rippapped inlets and outlets to prevent scour and erosion.
- Surface water discharge points during the construction phase will be agreed with South Dublin County Council's Environment Section prior to commencing works on site
- Weather conditions and seasonal weather variations will be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.

6.6.2.2 Accidental Spills and Leaks

The following measures are proposed for accidental spills and leaks:

- In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- An Emergency Response Plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.
- Pouring of concrete including wash down and washout of concrete from delivery vehicles will be controlled in an appropriate facility to prevent contamination.
- Regular samples will be taken from soils affected by earthworks which shall be analysed for contamination.

6.6.2.3 Human Health

An Emergency Response Plan prepared by the contractor will contain measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events. Spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.

6.6.3 Operational Phase

The operational phase of this development is unlikely to have any significant adverse impacts on the local water environment/hydrology due to the environmental design considerations incorporated into the development. These measures will seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

6.7 PREDICTED IMPACT FOLLOWING MITIGATION (RESIDUAL IMPACT)

6.7.1 Impact on Climate

It is considered that by implementing the proposed construction and operational phase mitigation measures above, that the significance of the identified impacts will be reduce to a "Not significant" residual impact on the identified hydrological/ hydrogeological receptors.

6.8 WORST CASE SCENARIO

6.8.1 Construction Phase

Under a 'worst case' scenario, the accidental release of fuel, oil, paints or other hazardous material occurs on site during the construction phase, through the failure of secondary containment or a materials handling accident on the site. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the groundwater or flow overland and contaminate surface water receptors.

6.8.2 Operational Phase

Worst case scenarios envisioned are extreme occurrences of the potential effects identified above in conjunction with failure of mitigation measures during the operational phase including:

- Significant contamination event
- Flood Event Flooding due to extreme event or unsuitable drainage measures

Given the scale of the site and relatively standard nature of the works involved the likelihood of a “worst case” event is extremely low.

6.9 MONITORING

6.9.1 Construction Phase

Proposed monitoring during the construction phase in relation to the water environment are as follows:

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of drainage installation etc, inspections of works adjacent to existing watercourses).
- Monitoring in relation to the surface water. Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content).

6.9.2 Operational Phase

Proposed monitoring during the operational phase in relation to the water environment are as follows:

- Regular inspection and maintenance of the drainage, attenuation systems and SuDS features.

6.10 INTERACTIONS

Please refer to chapter 15.

6.11 CUMULATIVE IMPACTS

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented. A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently underway. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development. Should this scheme be granted it is anticipated that construction phase of the Link Street may overlap with construction of the proposed development. The CSLS application included an EIAR as part of its planning application and has identified similar mitigation measures therefore no significant potential cumulative impacts are not anticipated.

Other projects in the wider Clonburris SDZ comprise:

SDZ21A/0022 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.
SDZ228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
SDZ228/0003 Part 8 Development 263 no. units within Kishogue South West
SDZ22A/0010 – 294 dwellings, creche and retail unit
SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements.
SDZ21A/0006 - Wastewater pumping station
Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)
SDZ22A/0017 Tile 3 application of 157 no. dwellings (lodged December 2022)

The proposed surface water drainage infrastructure has been designed in accordance with the relevant guidelines. Any other developments currently under construction or other committed development in the vicinity of the site would have to be similarly designed in relation to permitted surface water discharge, surface water attenuation and SuDS.

All proposed developments in the area are to follow the Surface Water Management Plan for the Clonburris SDZ which accounts for the wider development of the SDZ. Therefore no potential cumulative impacts are anticipated in relation to surface water drainage and flooding.

6.12 DIFFICULTIES ENCOUNTERED

No significant difficulties were encountered during the assessment.

7.0 AIR QUALITY AND CLIMATE

7.1 INTRODUCTION

Byrne Environmental Consulting Ltd have assessed the potential air quality and climatic impacts that the proposed Clonburris SDZ T2 development may have on the receiving environment during the construction and operational phases of the project. The assessment includes a comprehensive description of the existing air quality in the vicinity of the subject site; a description and assessment of how construction activities and the operation of the development may impact existing air quality; the mitigation measures that will be implemented to control and minimise the impact that the development may have on local ambient air quality and reduce the impact on the local micro climate; and, finally, a description as to how the development will be constructed and operated in an environmentally sustainable manner.

Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd and prepared all aspects of this EIAR Chapter. Ian Byrne has over 25 years-experience in the monitoring and assessment of the air quality and climatic impacts that residential, commercial and industrial developments may have on the receiving environment.

7.2 STUDY METHODOLOGY

The general assessment methodology of the potential impact of the proposed development on has been conducted in accordance with:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, August 2018)
- Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EPA 2015).
- Planning and Development Regulations 2001, as amended, in particular by the European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018).
- Environmental Impact Assessment of Projects – Guidance on the preparation of the EIAR, European Commission, 2017.
- Climate Action and Low Carbon Development Act 2015
- The Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011)
- Institute of Environmental Management and Assessment (IEMA) guidance note on ‘Assessing Greenhouse Gas Emissions and Evaluating their Significance’ (IEMA, 2022)
- Climate Action and Low Carbon Development Act 2015
- The Climate Action Plan 2019

7.2.1 Air Quality Assessment Methodology

7.2.1.1 Receiving Environment (baseline Scenario)

The existing ambient air quality in the vicinity of the site has been characterised with information obtained from the Environmental Protection Agency’s Annual Air Quality in Ireland 2021 Report (Published September 2022).

The ambient air quality data collected and reviewed for the purpose of this study focused on the principal substances (dust, vehicle exhaust emissions and boiler emissions) which may be released from the site during the construction and operation phases, and which may exert an influence on local air quality.

7.2.2 Impact Assessment Methodology

7.2.2.1 Legislation and guidance

Air quality standards and guidelines are available from a number of sources. The guidelines and standards referenced in this report include those from Ireland and the European Union.

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 (Ref Table 7.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the National Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), which implement European Commission Directive 2008/50/EC which has set limit values for the pollutants SO₂, NO₂, PM₁₀, benzene and CO. Council Directive 2008/50/EC replaces the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC). Provisions are also made for the inclusion of new ambient limit values relating to PM_{2.5}. The European 2008/50/EC Clean Air for Europe (CAFÉ) Directive is the current air quality directive for Europe which supersedes the European Directives 1999/30/EC and 2000/69/EC. The Directive is implemented by the Air Quality Standards Regulations 2011 which replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

In order to assess a wider range of air pollutants in the development area it is necessary to review current air quality monitoring data from published sources such as the most recent EPA’s Annual Air Quality in Ireland 2021 Report. This EPA report provides detailed monitoring data collected from a number of monitoring locations throughout Ireland on an annual basis to assess national compliance with National Air Quality Regulations. Given the location of the site in Dublin it is characterised as a Zone A area as defined by the EPA.

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality. The zones in place in Ireland in 2022 are as follows:

- Zone A is the Dublin conurbation,
- Zone B is the Cork conurbation
- Zone C comprising 23 large towns in Ireland with a population >15,000.
- Zone D is the remaining area of Ireland.

The air quality in each zone is assessed and classified with respect to upper and lower assessment thresholds based on measurements over the previous five years. Upper and lower assessment thresholds are prescribed in the legislation for each pollutant. The number of monitoring locations required is dependent on population size and whether ambient air quality concentrations exceed the upper assessment threshold, are between the upper and lower assessment thresholds, or are below the lower assessment threshold. A summary of the EPA’s Annual Air Quality in Ireland 2021 Report is detailed below in Table 7.2.

Table 7.1 – Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

Pollutant	Regulation	Limit Criteria	Tolerance	Limit Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for the protection of human health – not to be exceeded more than 18 times/year	40% until 2003 reducing linearly to 0% by 2010	200 µg/m ³
		Annual limit for the protection of human health	40% until 2003 reducing linearly to 0% by 2010	40 µg/m ³
		Annual limit for the protection of vegetation	None	400 µg/m ³ NO & NO ₂
Lead	2008/50/EC	Annual limit for the protection of human health	100%	0.5 µg/m ³
Sulphur Dioxide	2008/50/EC	Hourly limit for protection of human health – not to be exceeded more than 24 times/year	150 µg/m ³	350 µg/m ³
			None	125 µg/m ³
		Daily limit for protection of human health – not to be exceeded more than 3 times/year	None	20 µg/m ³

Pollutant	Regulation	Limit Criteria	Tolerance	Limit Value
		Annual and Winter limit for the protection of ecosystems		
Particulate Matter PM10	2008/50/EC	24-hour limit for protection of human health – not to be exceeded more than 35 times/year Annual limit for the protection of human health	50% 20%	50 µg/m ³ 40 µg/m ³
Particulate Matter PM2.5 Stage 1	2008/50/EC	Annual limit for the protection of human health	20% from June 2008. Decreasing linearly to 0% by 2015	25 µg/m ³
Particulate Matter PM2.5 Stage 2	2008/50/EC	Annual limit for the protection of human health	None	20 µg/m ³
Benzene	2008/50/EC	Annual limit for the protection of human health	20% until 2006. Decreasing linearly to 0% by 2010	5 µg/m ³
Carbon Monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10 mg/m ³
Dust Deposition	German TA Luft Air Quality Standard Note 1	30 Day Average	None	350 mg/m ² /day

Note 1 Dust levels in urban atmospheres can be influenced by industrial activities and transport sources. There are currently no national or **European** Union air quality standards with which these levels of dust deposition can be compared. However, a figure of 350 mg/m²-day (as measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, *VDI 2129*) is commonly applied to ensure that no nuisance effects will result from industrial or construction activities.

7.2.3 Construction Impact Assessment Criteria

The Institute of Air Quality Management – Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014) classifies demolition and construction sites according to the risk of impacts and to identify mitigation measures appropriate to the risk. The main air quality impacts that may arise are:

- Dust Deposition resulting in the soiling of surfaces
- Visible dust plumes, which are evidence of dust emissions
- Elevated PM₁₀ concentrations as a result of dust generating activities on site
- Increase in airborne particles and NO₂ from diesel fuelled site vehicles and plant

The risk assessment considers the following site activities and their associated potential impacts:

- Earthworks;
- Construction works;
- Trackout (vehicle movements).

The risk assessment considers the following dust related impacts:

- Annoyance due to dust soiling;
- The risk to health from exposure to PM₁₀;
- Harm to Ecological receptors.

The magnitude of the potential dust emission requires the scale of the works to be classified as Small, Medium or Large which are defined as follows:

Earthworks

Large Site Area >10,000m²
 potentially dusty soil prone to suspension (eg clays)
 >10 earth moving vehicles operating simultaneously

Medium Site Area 2500m² – 10,000m²
 moderately dusty soil (eg silts)
 5- 10 earth moving vehicles operating simultaneously

Small Site Area <2500m²
 Large grain size (eg sands)
 <5 earth moving vehicles operating simultaneously

Site Area Large Volume >10,000m²

Table 7.2 – Risk of Dust Impacts Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Low Risk

Construction Works

Large Total Building Volume >100,000m³
 Medium Total Building Volume 25,000m³ - 100,000m³
 Small Total Building Volume <25,000m³

Building Volume Medium Volume 24,000 - 100,000m²

Table 7.3 – Risk of Dust Impacts - Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Low Risk

Trackout

Large >50 HGV outward movements per day
 of potentially dusty clays on unsealed road >100m
 Medium 10 - 50 HGV outward movements per day
 of potentially dusty clays on unsealed road 50 - 100m
 Small <10 HGV outward movements per day
 of potentially dusty clays on unsealed road >50m

Trackout Movements Large Volume <50 HGV/day

Table 7.4 – Risk of Dust Impacts - Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Low Risk

The dust risk assessment for soiling, health and ecology completed for each of the four aspects of dust emissions has been determined from the characteristics of the development as detailed above. Table 7.7 presents the dust risk for each aspect.

Table 7.5 – Dust Risk Assessment to Define Site-Specific Mitigation Measures

Sensitivity of Area High	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Soiling	NA	Medium Risk	Low Risk	High Risk
Human Health	NA	Medium Risk	Low Risk	Medium Risk
Ecology	NA	Medium Risk	Low Risk	Medium Risk

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/(m²*day) averaged over a one month period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Health & Local Government (DOEHLG, 2004) apply the Bergerhoff limit value of 350 mg/(m²*day) to the site boundary of quarries. This limit value can also be implemented with regard to potential dust impacts from construction of the proposed development. In relation to construction related traffic, air quality significance criteria are assessed on the basis of compliance with the appropriate standards air limit values. The Air Quality Standards Regulations 2011 replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

7.2.3.1 Ecological Assessment

For routes that pass within 2 km of a designated area of conservation (either Irish or European designation) the TII requires consultation with an Ecologist (2011). However, the TII guidance (2011) states that in practice the potential for impact to an ecological site is highest within 200 m of the proposed scheme and when significant changes in AADT (>5%) occur.

Transport Infrastructure Ireland's Guidelines for Assessment of Ecological Impacts of National Road Schemes (2009) and Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

If both of the following assessment criteria are met, an assessment of the potential for impact due to nitrogen deposition shall be conducted:

- A European designated area of conservation is located within 200 m of the proposed development; and
- A significant change in AADT flows (>5%) will occur.

Further to a review of the Ecology Chapter of the EIAR, it may be concluded that the subject Clonburris development site does not meet the assessment criteria, thus an ecological assessment is not required.

7.2.4 Operational Impact Assessment Criteria

Once operational, the proposed residential development may impact on air quality as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

Air quality significance criteria are assessed on the basis of compliance with the national air quality limit values. The Air Quality Standards Regulations 2011 replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

7.2.5 Climate Assessment Methodology

Climate has implications for many aspects of the environment from soils to biodiversity and land use practices. The proposed development may impact on both the macro-climate and micro-climate. The macro-climate is the climate of a large geographic area such as Ireland. The micro-climate refers to the climate in the immediate area.

With respect to microclimate, green areas are considered to be sensitive to development. Development of any green area is generally associated with a reduction in the abundance of vegetation including trees and a reduction in the

amount of open, undeveloped space. The removal of vegetation or the development of man-made structures in these areas can intensify the temperature gradient.

To assess the impacts of converting vegetative surfaces to hard-standing with residential buildings and its significance, the amount of vegetative surfaces associated with the proposed development that will be converted to residential buildings and hard-standing has been considered.

The impact of the proposed scheme upon the macro-climate is assessed through the consideration of the change in CO₂ emissions that will occur due to the changes in traffic flow that occur in response to the proposed scheme.

The Conference of the Parties to the Convention (COP26) occurred in November 2021 with the following outcomes.

Emissions

One of the key aims of COP26 was to create a timetable for agreeing to more ambitious National Determined Contributions (NDCs), as the current NDCs are inadequate to limit temperature rises to 1.5C and, prior to COP26, nations were only required to set new NDCs every five years. While only one major emitter - India - produced a new NDC at COP26, the aim of the summit was not for numerous countries to produce new NDCs, but to agree to the faster roadmap. The Glasgow Climate Pact ensures that the question of revising NDCs will be discussed at COP27 in Egypt in 2022 and again for the following COP in 2023, providing a lever for more ambitious countries to ensure slower countries make the step up.

Fossil Fuels

The use of coal provided the most contentious moment of the negotiations, as India and China insisted on changing the wording of the final text from a commitment to “phase out” coal power to “phase down” coal power, which the EU and US both accepted, angering the UK and smaller island nations. However, it is notable that this is the first COP agreement that has made a direct reference to phasing down fossil fuels, including a statement that inefficient subsidies for all fossil fuels should be removed and an acknowledgement of the need for a “just transition” to a clean energy system. Nations are also “invited” to reduce methane emissions this decade, again the first-time methane has been mentioned in a COP final agreement.

Climate Finance and Adaption

In 2009, it was agreed that developing nations would receive at least \$100bn a year from public and private sources to help them cut emissions and cope with the impacts of the climate crisis. However, in 2019, it was found that only \$80bn had been made available, and the Glasgow Climate Pact urges developed countries to “fully deliver” the \$100bn goal through to 2025. The Glasgow Climate Pact also agrees to double the proportion of climate finance going towards adaptation following pressure from developing nations who argue that too much of climate finance is spent on funding emissions-cutting projects in middle-income countries that don’t need the funding.

Loss and Damage

The EU and the US reportedly managed to veto the expansion of the loss and damage finance facility from the final agreement. The facility originated at the Paris Agreement and was designed to provide financial assistance for developing countries to deal with environmental damage incurred as a result of climate change. Going into the negotiations, nations including China and the G77, which represents 134 developing and emerging economies, expressed frustration that no further financial commitments to combatting loss and damage had been made. Despite this lack of progress, the Pact does confirm that a “technical assistance facility” will be introduced to support loss and damage in relation to climate change in developing countries and will fall under the Santiago Network from the UNFCCC.

Carbon Markets

The Glasgow Climate Pact also resolves some key issues in Article 6 of the Paris Agreement, the section pertaining to carbon markets and how emissions reductions under NDCs can and should be accounted for. The final text states that carbon offsetting should rely on “real, verified and additional” emissions removal taking place from 2021 onward and there is a requirement for co-benefits in terms of adaptation and the economy, and for nations to put at least 5% of the proceeds into adaptation. Plans for a potential two-tier system, and to transfer existing forest credits into Article 6, were deleted from drafts, in a move most green groups have praised.

Reaffirming the Paris Agreement

Prior to the summit, some nations opposed to stronger action had criticised the focus at COP26 on 1.5C as “reopening the Paris agreement”, the main goal of which is to hold temperature rises “well below” 2C above pre-industrial levels while “pursuing efforts” to limit rises to 1.5C.

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD) (2014), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005 (DEHLG, 2007a; 2004). Data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO₂, VOCs and NH₃ but failed to comply with the ceiling for NO_x (EEA, 2012). Directive (EU) 2016/2284 “On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC” was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO₂, NO_x, NMVOC, NH₃, PM_{2.5} and CH₄. In relation to Ireland, 2020-29 emission targets are for SO₂ (65% below 2005 levels), for NO_x (49% reduction), for VOCs (25% reduction), for NH₃ (1% reduction) and for PM_{2.5} (18% reduction). In relation to 2030, Ireland’s emission targets are for SO₂ (85% below 2005 levels), for NO_x (69% reduction), for VOCs (32% reduction), for NH₃ (5% reduction) and for PM_{2.5} (41% reduction).

The following guidelines and EU Directives relating to Climate Change aspects of EIA reports have been applied to this assessment in order to determine the potential impacts that the proposed development may have on climate change.

- EPA Guidelines on information to be contained in Environmental Impact Assessment Reports (2022);
- European Union (Planning & Development)(Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018);
- European EIA Directive 2014/52/EU;
- The Irish Building Regulations Technical Guidance Document L – Conservation of Fuel & Energy – Dwellings amended in 2017 includes requirements for all residential dwellings to be “Nearly Zero Energy Buildings” (NZEB’s) by 31st December 2020;
- Ireland’s National Energy and Climate Plan 2021 - 2030.

7.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

7.3.1 Description of the baseline environment

The proposed development site is located in the administrative area of South Dublin County Council (SDCC) and is part of the Clonburris Strategic Development Zone (SDZ). The subject site for this development is situated in the southern area of the Clonburris SDZ lands to the south of the Kildare/Cork railway adjacent to the R113.

The development area is located within a zone which includes sources of existing transportation related air emissions principally from local road and rail infrastructure and sources of domestic building heating. The Grange Castle Business Park is located c. 2km west of the site.

The general area surrounding the subject site is currently comprised of undeveloped lands and residential estates and local transport infrastructure.

7.3.2 Description of Existing Climate

The nearest representative synoptic meteorological station to the subject site at Clonburris is at Casement Aerodrome which is located approximately 3km south of the site and as such, long-term measurements of wind speed/direction, rainfall and air temperature for this location are representative of prevailing conditions experienced at the subject site.

Rainfall

Precipitation data from the Casement Aerodrome meteorological station for the period 2018-2021 indicates a mean annual total of about 754 mm. This is within the expected range for most of the eastern half of the Ireland which has between 750 mm and 1000 mm of rainfall in the year.

Temperature

The annual mean temperature at Casement Aerodrome meteorological station for the period 2018-2021 is 9.6°C.

Wind

Wind is of key importance for both the generation and dispersal of air pollutants. Meteorological data for Casement Aerodrome indicates that the prevailing wind direction is from the West and Southwest. The mean annual wind speed in the local area between 2015-2021 is 5.5 m/s.

7.3.3 Description of existing air quality

The existing ambient air quality at and in the vicinity of the site is typical of an urbanised location and as such, domestic and commercial heating sources and road traffic are identified as the dominant contributors of hydrocarbon, combustion gases and particulate emissions to ambient air quality.

7.3.3 Trends in air quality

Annual air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality “*Air Quality in Ireland 2021*” details the range and scope of monitoring undertaken throughout Ireland. Clonburris which is in the Dublin conurbation is categorised as Zone A.

The most recent 2021 EPA publication includes a number of Zone A monitoring locations which would be broadly comparable to the expected air quality at the subject site. The various Zone A air quality monitoring stations within Ireland provide a comprehensive range of air quality monitoring data sets which have been selected as part of this assessment to describe the existing ambient air quality at the subject site.

Nitrogen Dioxide

The Air Quality Standards Regulations 2011 specify a limit value of 40 µg/m³, for the protection of human health, over a calendar year. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term NO₂ monitoring was carried out at 13 Zone A locations in 2021. The NO₂ annual mean for these sites ranged from 1.4 – 36.1 µg/m³ compared against the annual average limit of 40 µg/m³.

Sulphur Dioxide

The Air Quality Standards Regulations 2011 specify a daily limit value of 125 µg/m³ for the protection of human health. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term SO₂ monitoring was carried out at 5 Zone A locations in 2021. The daily SO₂ daily means for these sites ranged from 1.1 – 4.6 µg/m³. Therefore, long term averages were below the daily limit of 125 µg/m³.

The annual mean SO₂ concentrations in Ireland have been declining since 2003. This trend is reflective in the shift in fuel choice across Ireland in both residential heating and the energy production sector.

Carbon Monoxide

The Air Quality Standards Regulations 2011 specify an 8-hour limit value (on a rolling basis) for the protection of human health of 10,000 µg/m³. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term CO monitoring was carried out at 2 Zone A locations in 2021. The 8-hour CO concentrations was 0.3 – 0.4mg/m³ which is below the 8-hour limit value (on a rolling basis) of 10 mg/m³.

Particulate Matter PM₁₀

The Air Quality Standards Regulations 2011 specify a PM₁₀ limit value of 40 µg/m³ over a calendar year. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term PM₁₀ monitoring was carried out at 16 Zone A locations in 2019. The PM₁₀ annual mean in 2021 for these sites ranged from 9.8 – 15.7µg/m³. Therefore, long term averages were below the annual average limit of 40 µg/m³.

Particulate Matter PM_{2.5}

The Air Quality Standards Regulations 2011 specify a PM_{2.5} limit value of 25 µg/m³ over a calendar year.

Long term PM_{2.5} monitoring was carried out at 16 Zone A locations in 2019. The PM_{2.5} average in 2021 for these sites ranged from 6.4 – 9.3µg/m³. Therefore, long term averages were below the target value 25 µg/m³.

Table 7.6 below presents a summary of the 2021 EPA Air Quality data obtained from the Zone D locations which may be considered to be broadly representative to that of the subject site.

Table 7.6 – Summary of the 2019 Air Quality data obtained from Zone A

Pollutant	Regulation	Limit type	Limit value	EPA monitoring data 2021
Nitrogen dioxide	2008/50/EC	Annual limit for protection of human health	40 µg/m ³	15 – 43* µg/m ³
Sulphur dioxide	2008/50/EC	Daily limit for protection of human health (not to be exceeded more than 3 times per year)	125 µg/m ³	0.8 – 2.5 µg/m ³
Carbon monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health (Zone C)	10,000 µg/m ³	300 µg/m ³
Particulate matter (as PM ₁₀)	2008/50/EC	Annual limit for protection of human health	40 µg/m ³	11 – 19 µg/m ³
Particulate matter (as PM _{2.5})	2008/50/EC	Annual limit for protection of human health	25 µg/m ³	8 - 11 µg/m ³
Benzene	2008/50/EC	Annual limit for protection of human health	5 µg/m ³	< 0.21µg/m ³

7.3.4 Significance

Based on published EPA air quality data for the Zone A area in which the subject site is located together with site specific monitoring data, it may be concluded that the existing baseline air quality at the subject site may be characterised as being good with no exceedances of the National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011) limit values of individual pollutants. There is therefore currently sufficient atmospheric budget to accommodate the development without adversely impacting existing ambient air quality. The quality of existing air quality at the subject site must be maintained and improved where possible as a result of the proposed development to ensure that local human health and the ecological environment is not adversely affected.

7.3.5 Sensitivity

The subject site shall be developed by ground clearance and site preparation works and the subsequent construction of residential buildings and open landscaped areas. The principal local receptors that may be impacted by the development are the existing residential areas in the local vicinity of the site.

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of a mixed-use development on a site of c. 3.96 hectares comprising 594 no. apartments (255 no. 1 bedroom apartments, 307 no. 2 bedroom apartments and 32 no. 3 bedroom apartments), as well as commercial office development in Block C, c. 5,195 sq.m), 1 no. retail unit at ground floor of Block B (c.147.5 sq. m) and 3 no. retail units at ground floor of Block E as follows (c.106.2 sq.m, c.141.6 sq.m and c.492.2 sq.m respectively) a creche (c. 600 sq. m) at ground floor and first floor of Block A. Car parking (396 no. spaces in a mixture of undercroft spaces Block A, Block B&D and Block E&F) and bicycle parking (1,232 no. spaces at undercroft and surface levels) along with all site development and landscaping works including public open space.

When considering a development of this nature, the potential impact on air quality and climate must be considered for each distinct stage. The Construction Phase will be of a Short Duration (1-7years). The overall construction phase will be undertaken over a c.2-3 year period. The Operational Phase will be Long-Term Duration (15-60 years). It is important that there are no unacceptable decreases in ambient air quality levels during the construction phase and during the operational phase.

7.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The construction phase of the development has the potential to generate short term fugitive dust emissions during ground preparation and enabling works and from general site construction activities, however, these emissions will be controlled by appropriate mitigation techniques and through the implementation of a construction phase air quality

management and monitoring plan throughout the duration of the construction phase to ensure that existing adjacent residential properties and lands will not be adversely impacted by a deterioration in air quality associated with the construction phase.

The operational phase of the development will see the operation of modern, well insulated thermally efficient buildings in which energy efficiency shall be achieved by implementing sustainable features into the building design.

National air quality standards shall not be adversely affected as a result of the short-term construction phase or the operational phase, thus ensuring that the potential for adverse impacts on human health is negligible.

Road traffic and residential heating are the typical sources of greenhouse gas emissions associated with a residential or mixed-use development. EPA guidance states that a development may have an influence on global climate where it represents “a significant proportion of the national contribution to greenhouse gases”.

7.5.1 Potential Impacts – Construction & Operational Phases

Various elements of both the construction and operational phases of the proposed development have the potential to impact on the local receiving environment, on adjacent residential properties and on human health which are considered with regard to National Air Quality Standards designed to protect human health. The likely potential impacts for both construction and operation of the proposed scheme prior to mitigation are described in this section of the EIAR.

7.5.2 Potential Construction Phase Impacts

7.5.2.1 Air quality

Construction impacts associated with these phased stages are discussed below.

7.5.2.2 Enabling works - Site Set Up and Clearance

Works activities associated with the ‘Site set up’ will be undertaken prior to construction works commencing in each sub-phase. The setting up of the site shall involve the construction of site security hoarding and site compounds, site offices, materials and waste storage areas and staff welfare facilities. These temporary activities will have a minimal potential to generate fugitive dust emissions or combustion gas emissions.

Site clearance and ground excavation works will be undertaken in separate phases and these activities have the potential to generate fugitive windblown dust emissions during dry and windy weather arising from the operation of mechanical plant such as dozers, excavators and tipper trucks and the movement of these vehicles on exposed surfaces at the site.

With regard to the volume of waste material (top and sub soils) generated during site clearance, there will be a requirement for HGV trucks to remove the material from the site. Trucks shall be loaded with material on-site by mechanical excavators and loading shovels which will generate fugitive dust emissions as a result of the transfer of the excavated materials comprised principally of soils and stones from stockpile to truck.

The movements of construction vehicles on the site shall also generate windblown dust emissions. Where dusty material is loaded onto exposed open trucks, fine dusts may be released as the truck travels along public roads.

7.5.2.3 Building and Site Infrastructure Construction Works

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site which have the potential to generate fugitive windblown dust emissions.

Construction equipment including generators and compressors will also give rise to diesel and petrol engine exhaust emissions.

Construction traffic to and from the site shall result in a short-term increase in the volume of diesel fueled HGV's along the local road network which will generate additional hydrocarbon and particulate emissions from the vehicle exhausts.

Site activities during the construction phase in the absence of mitigation have the potential to impact local air quality, human health, the local ecological environment and cause the soiling of property and vegetation resulting in a short-term-transient, negative, minor impact.

7.5.2.4 Climate

During the construction phase NO₂ and CO₂ will be released into the atmosphere as a result of the movement of construction vehicles and the use of construction plant, vehicles and generators.

7.5.2.5 Human Health

With regard to the Institute of Air Quality Management – Guidance on the assessment of dust from demolition and construction, 2014, the sensitivities of local population to dust soiling and PM₁₀ and PM_{2.5} exposure in the local area may be classified as a High.

7.5.3 Potential Operational Phase Impacts

7.5.3.1 Air quality

The operational phase of the proposed development has the potential to result in a slight negative impact for the lifetime of the development on local air quality primarily as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

7.5.3.2 Traffic Emissions

The Traffic and Transportation Assessment Report prepared by DBFL Consulting Engineers includes a detailed assessment of the traffic impact associated with the proposed development. As part of this assessment, detailed traffic flow information as Annual Average Daily Traffic (AADT) has been derived for the existing road network for the “No development” and the “With development” scenarios.

The percentage traffic increase associated with the development has considered existing junctions on the local road network and the entrance to the development as detailed in Table 7.7.

Table 7.7 – % Increase in traffic at junctions

Junction	Do Something Scenario Generated Traffic	Percentage Increase
	AADT 2040 AM/PM	AADT 2040 AM/PM
Ninth Lock/CSLS	1734/1740	1.6/1.5
R113 Fonthill Rd/CLCS	2599/2747	2.5/2.0
CSLS/ New link road	972/913	5.1/5.3
CNLS/New Link Road	1102/896	1.3/1.6
R113 Fonthill Rd/CNLS	2588/2354	1.2/1.2

The UK DMRB guidance (UK Highways Agency, 2020), on which the TII Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes is based, 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:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HDV flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

There will be a negligible impact on local air quality as a result of increased traffic movements associated with the proposed development as none of the above criteria will be reached or exceeded.

7.5.3.3 Building Emissions

The design and construction of all buildings shall be in accordance with National Building Regulations (*The Irish Building Regulations Technical Guidance Document L – Conservation of Fuel & Energy – Dwellings and buildings other than dwellings*).

A range of heat sources and renewable energy options for the residential and non-residential buildings will be considered at the detailed design stage and will include Combined Heat and Power Units, Exhaust Air Heat Pumps, Solar Photovoltaics, Air Source Heat Pumps and Variable Refrigerant Flow Systems.

The Applicant will explore all alternative power sources subject to supply availability including the use of bio-diesel for CHP units.

7.5.3.4 Climate

The overall area of the development lands will include open space and landscaped areas. The overall development includes the construction of buildings and roadways which will have the effect of marginally raising localised air temperatures, especially in summer. It is predicted that the proposed development will have a negligible impact on the local micro-climate.

The development of open areas on the site will continue to contribute albeit in a minor way to the adsorption of Carbon Dioxide from the atmosphere and the release of Oxygen to the atmosphere.

The proposed development includes apartment structures which will have a minor impact on the local micro-climate by means of wind shear effects. There will however be no long-term negative impact within or beyond the overall site.

Greenhouse gases occur naturally in the atmosphere (e.g., carbon dioxide, water vapour, methane, nitrous oxide and ozone) and in the correct balance, are responsible for keeping the lower part of the atmosphere warmer than it would otherwise be. These gases permit incoming solar radiation to pass through the Earth's atmosphere but prevent most of the outgoing infrared radiation from escaping from the surface and lower atmosphere into the upper levels. However, human activities are now contributing to an upward trend in the levels of these gases, along with other pollutants with the net result of an increase in temperature near the surface.

Motor vehicles are a major source of atmospheric emissions which contribute to climate change, however, vehicle exhaust emissions generated from vehicles associated with the development will have a negligible impact on the macro-climate given modern technological developments in cleaner and more efficient vehicle engines together with the low volume of traffic movements that will be associated with the development at local road junctions as detailed in Table 7.5 above.

7.6 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

This section provides the measures that shall be implemented during the construction and operational phase and into the design of the development to minimise the impacts on the receiving environment, local population and human health, livestock and agricultural lands, local flora and fauna, local businesses and on climate.

7.6.1 Construction Phase

In order to ensure that adverse air quality impacts are minimised during the construction phase and that the potential for soiling of property and amenity and local public roads is minimised, the following mitigation measures shall be implemented during the course of all construction activities:

AQ CONST 1: Air Quality Mitigation Measures

- Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust.
- Use of rubble chutes and receptor skips during construction activities.

- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including top soils shall be managed locally.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used locally to prevent unnecessary dust emissions. . All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM₁₀ are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall be reviewed and altered as required. .
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.
- Site hoarding shall be installed along the north, south, east and western site boundaries to minimise fugitive windblown dust emissions falling on third party lands and existing residential areas.

7.6.2 Operational Phase

The Operational Phase of the Clonburris development site will not generate air emissions that would have an adverse impact on local ambient air quality or local human health and as such there are no mitigation measures specified for the Operational Phase.

The elements of the development designed to minimise the impact of the operational phase of the development on air quality and climate are as follows:

AQ OP1: Climate Impact Mitigation Measures

- Energy Efficiency - All proposals for development shall seek to meet the highest standards of sustainable design and construction with regard to the optimum use of sustainable building design criteria such as passive solar principles and also green building materials.
- All residential units shall be designed and constructed in accordance with The Irish Building Regulations *Technical Guidance Document L – Conservation of Fuel & Energy – Dwellings* amended in 2017 includes requirements for all residential dwellings to be “Nearly Zero Energy Buildings” (NZEB’s) by 31st December 2020. In order to reduce energy consumption, the following key design features have been considered in the design process and will be incorporated into the construction of the residential units:

- Passive solar design including the orientation, location and sizing of windows
- The use of green building materials: low embodied energy & recycled materials
- Energy efficient window units and frames with certified thermal insulation properties
- Building envelope air tightness

- Thermal insulation of walls and roof voids of all units

AQ OP2: Air Quality Mitigation Measures

A range of heat sources and renewable energy options for the residential and non-residential buildings will be considered at the detailed design stage and will include Combined Heat and Power Units, Exhaust Air Heat Pumps, Solar Photovoltaics, Air Source Heat Pumps and Variable Refrigerant Flow Systems. The minimum renewable energy contributions as required by Part L 2019 of the Building Regulations is the Renewable Energy Ratio (RER) with a minimum of 20%

- Inclusion of electric car charging points to encourage electric vehicle ownership
- Proximity of Irish Rail, Bus Eireann and private bus operator’s commuter services
- Bicycle parking and cycle routes
- Provision of open landscaped areas, to encourage residents to avail of active lifestyle options

7.7 PREDICTED RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

7.7.1 Construction Phase

Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, human health and climate. However, the potential construction phase impacts shall be mitigated as detailed above to ensure there is no adverse impact on ambient air quality for the duration of all construction phase works. It is predicted that the construction phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or on local human health or on the local micro-climate or the wider macro-climate.

Table 7.8 – Summary of Construction Phase Likely Significant Effects without Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Phase Air Quality	Negative	Moderate	Local	Likely	Short-Term	Worst Case
Construction Phase Climate	Negative	Not Significant	Local	Likely	Short-Term	Worst Case

7.7.2 Operational Phase

The sustainable features that are incorporated into the design of all residential units will ensure that the operational phase of the development will not have an adverse impact on human health, local air quality or on local or global climate patterns. The residential units will be designed to ensure that they can withstand the potential changes in climate which may generate more extreme and prolonged meteorological events in the future.

Motor vehicles are a major source of atmospheric emissions which contribute to climate change, however, vehicle exhaust emissions generated from vehicles associated with the development will have a negligible impact on the macro-climate given modern technological developments in cleaner and more efficient vehicle engines. Current trends suggest that vehicle manufacturers are ceasing the manufacture of large diesel engines for private cars and instead adopting hybrid engine and all electric technologies which will contribute to the reduction of engine exhaust emissions including particulate matter, Nitrogen Oxides, Sulphur Dioxide, Carbon Dioxide and Carbon Monoxide. To further reduce the climatic impact of the operational phase of the development, electric vehicle charging points shall be installed in dedicated parking spaces and cycle parking shall be provided to facilitate residents who own electric vehicles and to encourage other residents to purchase electric vehicles.

The thermal efficiency of the buildings will ensure that the development will be sustainable and will be protected against the impacts of future climate change which may include storm events and prolonged colder periods during the winter season. These factors will contribute to reducing the impact the operational development has on the local and global climate which will ultimately contribute in a positive manner in reducing the impact on local and further afield human health.

Table 7.9 – Summary of Operational Phase Likely Significant Effects without Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Phase Air Quality	Negative	Not Significant	Local	Likely	Long-Term	Worst Case
Operational Phase Climate	Negative	Not Significant	Global	Likely	Long-Term	Worst Case

7.7.3 Summary of residual impacts

The Tables below summaries the identified likely significant effects of the proposed development during the construction phase post application of mitigation measures.

Table 7.10 – Summary of Construction Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Phase Air Quality	Negative	Slight	Local	Likely	Short-Term	Residual
Construction Phase Climate	Neutral	Imperceptible	Local	Likely	Short-Term	Residual

The Table below summarises the identified likely significant effects of the proposed development during the operational phase post application of mitigation measures.

Table 7.11 – Summary of Operational Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Phase Air Quality	Neutral	Imperceptible	Local	Likely	Long-Term	Residual
Operational Phase Climate	Neutral	Imperceptible	Global	Likely	Long-Term	Residual

7.8 CUMULATIVE IMPACTS

In accordance with *The Planning and Development Regulations 2001 as amended*, this section has considered the cumulative impact of the proposed development in conjunction with future and current development in the vicinity of the subject site. This section relates to the cumulative impact on the subject site itself and on surrounding sites.

The proposed Clonburris T2 development will one of a number of planning applications in the Clonburris SDZ and there will be subsequent future applications as the Clonburris SDZ is built out. It is considered that, in the absence of mitigation measures, there will be the potential for a short term slight negative cumulative impact associated with the construction phase of the subject development and other local developments on ambient air quality and climate.

A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently under construction. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development. Should this scheme be granted it is anticipated that construction phase of the Link Street may overlap with construction of the proposed development. The CSLS application included an EIA as part of its planning application and has identified similar mitigation measures therefore no significant potential cumulative impacts are not anticipated.

Other projects in the wider Clonburris SDZ comprise:

SDZ21/0021 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.

SD228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
Part 8 Development 263 no. units within Kishogue South West
SDZ21A/0006 - Wastewater pumping station comprising of (a) below ground 24-hour emergency storage

Should the construction phase of the proposed development coincide with the construction phase of other local construction developments, there is the potential for cumulative dust emissions to impact the nearby sensitive receptors during the construction phases. The dust and air quality mitigation measures outlined above will be applied throughout the construction phase of the proposed development and similar best practice mitigation measures are also required for the construction phase of other developments which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality and climate associated with the construction phase of the proposed development are predicted to be short-term and slight.

The operational phases of the subject development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and National published air quality data confirm that the existing air quality is good and that the operational phases of the subject development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

7.9 INTERACTIONS

The principal interactions between Air Quality and Climate, Human Beings, Biodiversity and Traffic have been addressed in this chapter.

7.9.1 Construction Phase

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active 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 of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

7.9.2 Operational Phase

Operational traffic emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values which are set for the protection of human health and therefore, will not result in an adverse or harmful impact on human health.

7.10 'DO NOTHING' IMPACT

The subject site is currently comprised of undeveloped lands and if they remain undeveloped the site will continue to have no adverse impact long-term impact on existing ambient air quality or on the local micro-climate.

Based on the projected increase in traffic up to the reference year of 2040, the increase in traffic related emissions, based on projected Traffic Impact Assessment figures without the subject development would be insignificant. This increase above the existing situation would be minor and would not result in a perceptible change in the existing local air quality environment.

7.11 RISK TO HUMAN HEALTH

7.11.1 Construction Phase

Mitigation measures are proposed for the construction phase and focus on the pro-active 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 of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

7.11.2 Operational Phase

Operational traffic emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values which are designed for the protection of human health and therefore, will not result in an adverse or harmful impact on human health.

The impact of the proposed development during both construction and operational phases together with other proposed residential developments in the local area will not result in an adverse risk to human health in the local area

7.12 MONITORING

7.12.1 Construction Phase Monitoring

This section describes the dust monitoring methodologies that shall be implemented at the site during the construction phases to ensure that the principal pollutant, dust generated by site activities does not cause nuisance or cause adverse health effects to residential areas and other receptors located in the vicinity of the site boundaries.

7.12.2 Dust Deposition Monitoring Methodology

Dust deposition levels will be monitored at the construction site boundaries, (North and East) to assess the impact that site construction site activities may have on the local ambient air quality and to demonstrate that the environmental control measures in place at the site are effective in minimising the impact of construction site activities on the local receiving environment including the Fonthill Road and the Irish Rail lands bordering the site. The following procedure shall be implemented at the site on commencement of site activities:

The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 +-2 days. Monitoring shall be conducted on a monthly basis during the construction phase.

The selection of sampling point locations will be completed after consideration of the requirements of *Method VDI 2119* with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert to ensure that the dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of the site boundaries and existing on-site buildings.

After each (30 +-2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m²-day in accordance with the relevant standards.

Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager. Monitoring reports shall be made available to the Local Authority as requested.

A dust deposition limit value of 350 mg/m²-day (measured as per German Standard Method VDI 2119 – Measurement of Particulate Precipitations – Determination of Dust Precipitation with Collecting Pots Made of Glass (Bergerhoff Method) or Plastic) is commonly specified by Local Authorities and by the EPA to ensure that no nuisance effects will result from specified activities and it is to this Best Practice standard method that this programme of dust monitoring and control has been prepared.

The *German Federal Government Technical Instructions on Air Quality Control - TA Luft* specifies an emission value for the protection against significant nuisances or significant disadvantages due to dustfall. This limit value is 350 mg/m²-day and it is to this limit value that all measured dust deposition levels shall be assessed. This limit value is commonly specified by Local Authorities at construction sites.

7.12.3 Operational Phase Monitoring

Monitoring will not be required during the operational phase of the development.

7.13 REINSTATEMENT

Reinstatement issued are not relevant to this Chapter of the EIA, with regard to the construction and operational phases.

7.14 DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION

There were no difficulties encountered in compiling this Chapter of the EIA.

8.0 NOISE AND VIBRATION

8.1 INTRODUCTION

This section of the EIAR has been prepared by Byrne Environmental Consulting Ltd to identify and assess the potential noise and vibrational impacts associated with the proposed residential development within the Clonburris SDZ, County Dublin during both the Construction and Operational Phases of the development.

This document includes a comprehensive description of the receiving ambient noise climate in the vicinity of the subject site; a description of how the construction and operational phases may impact the existing ambient noise climate, the mitigation measures that shall be implemented to control and minimise the impact that the development may have on ambient noise levels and the proposed acoustic design features required to minimise the impact of external noise sources on the residential units.

The mitigation measures designed for the development shall demonstrate how the development shall be constructed and operated in an environmentally sustainable manner to ensure its minimal impact on the receiving noise climate and to provide adequate sound insulation in residential units from external sound sources and adjoining residential properties.

Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, Member of the Institute of Acoustics, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd and prepared all aspects of this EIAR Chapter. Ian Byrne has over 25 years experience in the monitoring and assessment of noise and vibration impacts that the construction and operation of residential, commercial and industrial developments may have on the receiving environment.

Based on academic qualifications and professional experience, Ian Byrne is defined as a “Competent Person” as defined in the EPA’s 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

8.2 STUDY METHODOLOGY

The general assessment methodology of the potential noise and vibrational impacts that the proposed development will have on the receiving environment has been prepared in accordance with:

- Planning and Development Act 2000 (as amended);
- Planning and Development Regulations 2001(as amended);
- Directive 2011/92/EU;
- Directive 2014/52/EU;
- Preparation of guidance documents for the implementation of EIA directive (Directive 2011/92/EU as amended by 2014/52/EU) – Annex I to the Final Report (COWI, Milieu; April 2017);
- Guidelines on the information to be contained in environmental impact assessment reports, EPA, 2017 (Draft);
- Environmental Impact Assessment – Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018; DoHPLG); and
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)

8.2.1 Noise Assessment Methodology

8.2.1.1 Baseline Environment

The baseline noise environment in the vicinity of the proposed development site has been defined by field surveys conducted during September 2022. Sound level measurements were conducted in appropriate weather conditions when there was no precipitation and when mean windspeeds were <5m/sec and when Irish Rail timetable were operating normally.

The existing ambient noise climate in the vicinity of the site has been characterised with information obtained from site specific baseline noise surveys conducted in the vicinity of the closest noise sensitive receptors to the subject site. Baseline noise surveys were conducted in accordance with *ISO 1996-1: 2017: Acoustics – Description, measurement and assessment of environmental noise* and with regard to the EPA's 2016 *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*.

8.2.1.2 Impact Assessment Methodology

The impact of the proposed development has been determined through prediction of future noise levels associated with the scheme using established calculation techniques.

Construction noise and vibration impacts have been assessed in accordance with Transport Infrastructure Ireland's (TII) guidance document *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes* (March 2014). Indicative construction noise calculations have been undertaken using the methodology set out in BS 5228 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise 2009+A1 2014.

Impacts associated with road traffic movements on the development when operational have been assessed with regard to the NRA's *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes* (March 2014). UK Department of Transport (Welsh Office) - *Calculation of Road Traffic Noise [CRTN]* and the Highways Agency *Design Manual for Roads and Bridges Part 7 HD 213/11 – Revision 1 Noise and Vibration*.

The operational phase of the development has been assessed with regard to the Department of the Environment, *Building Regulations 2014, Technical Guidance Document E – Sound*. Acoustic design of apartments refers to the 2018 Ministerial Guidelines *“Sustainable Urban Housing – Design Standards for New Apartments*. Paragraph 1.18 of the document refers specifically to the *Building Regulations Technical Guidance Documents* and states that the construction of the apartment building shall comply with all relevant requirements.

The inward noise impact that the external environment has been assessed with regard to *Professional Guidance on Planning & Noise (ProPG)*, (IOA/ANC, 2017).

The *Professional Guidance on Planning & Noise (ProPG)* document May 2017 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) has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

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

Stage 1 - Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and,

Stage 2 – Involves a full detailed appraisal of the proposed development covering four “key elements” that include:

Element 1 - Good Acoustic Design Process;

Element 2 - Noise Level Guidelines;

Element 3 - External Amenity Area Noise Assessment

Element 4 - Other Relevant Issues

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment. Figure 8.1 presents the basis of the initial noise risk assessment. It provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

A site should not be considered a negligible risk if more than 10dB(A) LAFmax events exceed 60 dB during the night period and the site should be considered a high risk if the LAFmax events exceed 80 dB more than 20 times a night.

With regard to the ProPG risk assessment conducted based on the baseline noise assessment, the development site may be classified as having a low risk in terms of the existing low-noise climate at the site, that is, there are no

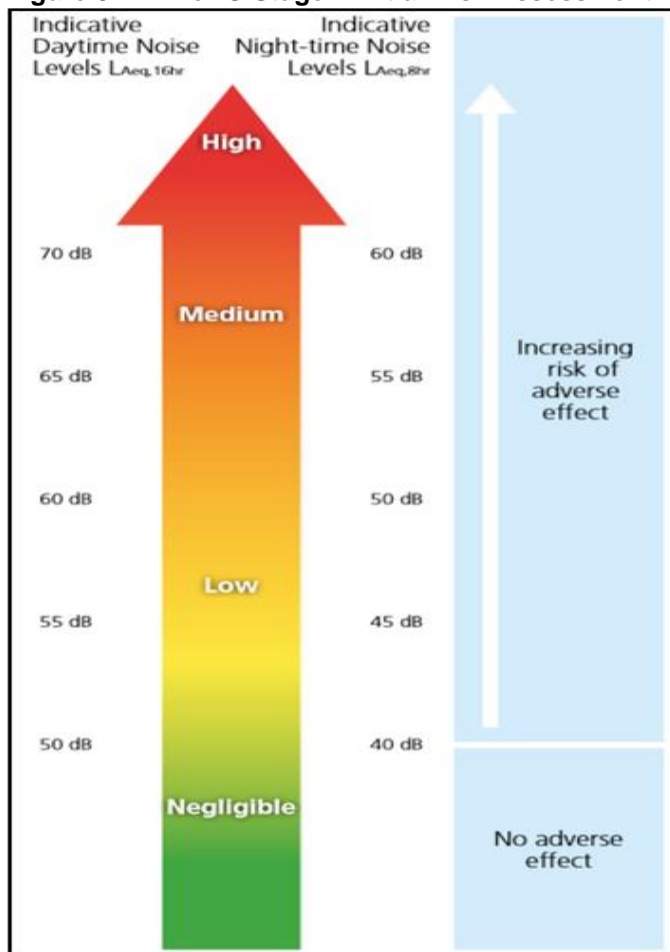
adverse pre-existing noise sources in proximity to the development site which may impact the residential units once developed and occupied by residents.

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 81 and are based on annual average data levels.

Table 8.1 – ProPG Internal Noise Levels

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living Room	35 dB LAeq, 16hr	-
Dining	Dining Room/Area	40 dB LAeq, 16hr	-
Sleeping (Daytime Resting)	Bedroom	35 dB LAeq, 16hr	30 dB LAeq, 8hr 45 dB LAFmax

Figure 8.1 – ProPG Stage 1 Initial Risk Assessment



8.2.1.3 Construction Noise Impact Assessment Criteria

This section describes the methodologies used to assess the outward noise impact that the construction and operational phases of the proposed development may have on the receiving environment including local receptors.

The construction noise limits which are presented in Table 8.2 are specified in British Standard BS 5228 – 1:2009+A1 2014 Code of practice for noise and vibration control on open sites: Part 1 Noise and are based on the noise measured at the external façade of a receptor.

BS5228 states that noise sensitive receptors (houses) are designated a category based on existing ambient noise levels. Each category is then assigned with a noise limit value.

Category A Threshold values when ambient noise levels are less than these values.

Category B Threshold values when ambient noise levels are the same as the Category A values.

Category C Threshold values when ambient noise levels are higher than the Category A values.

Table 8.2 – Threshold of Potential Significant Effect at Dwelling

Category and Threshold Value Period LAeq dB(A)	Category A	Category B	Category C
Night 23:00 – 07:00	45	50	55
Evening 19:00 - 23:00 & Weekends	55	60	65
Day 07:00 – 19:00 & Sat 07:00 – 13:00	65	70	75

8.2.2 Operational Noise Impact Assessment Criteria

A change in traffic noise of less than 2dBA is generally not noticeable to the human ear whilst a change of 3dBA is generally considered to be just perceptible. Changes in noise levels of 3 to 5 dBA would however be noticeable and, depending on the final noise level, there may be a slight or moderate noise impact. Changes in noise level in excess of 6dBA would be clearly noticeable, and depending on the final noise level, the impact may be moderate or significant. However, a significant change in traffic volumes or traffic category i.e. increase in the use of a road by HGVs, would be required to result in such increases.

The UK Design Manual for Roads and Bridges (DMRB, Volume 11, Section 3, Part 7) states that a change in noise level of 1dB LA10,18h is equivalent to a 25% increase or a 20% decrease in traffic flow, assuming other factors remain unchanged and a change in noise level of 3dB LA10,18h is equivalent to a 100% increase or a 50% decrease in traffic flow.

The relative impact assessment criteria associated with road traffic noise is set out in Table 8.3 below.

Table 8.3 – Likely impact associated with change in traffic noise level

Change in sound level (L10)	Subjective reaction	Impact
<3	Inaudible	Imperceptible
3-5	Perceptible	Slight
6-10	Up to a doubling of loudness	Moderate
11-15	Over a doubling of loudness	Significant
>15		Profound

Traffic noise levels in excess of 60dBA (LDEN) are considered to be potentially intrusive. LDEN is the day-evening-night composite noise indicator for assessing overall noise annoyance. For new roads projects the National Roads Authority design goal is to mitigate when predicted levels exceed 60dB Lden. However, for existing roads the Dublin Agglomeration, within the Noise Action Plan, have set a level of 70dB (LDay) and 55dB (LNight) above which mitigation measures should be considered.

The World Health Organisation (WHO) in their 2018 publication entitled *Environmental Noise Guidelines for the European Region* has proposed new guidelines for community noise. In this guidance, a LDEN threshold daytime noise limit of 53dB is suggested to protect against adverse health effects. LNIGHT Levels of 45dB or less are proposed at night-time to protect against adverse effects on sleep.

Professional Practice Guidance on Planning & Noise: New Residential Developments (2017)(ProPG), is considered in the assessment of the operational phase of the residential development in terms of ensuring that the development will not be adversely impacted by external transport related noise sources.

8.2.3 Construction Vibration Assessment Methodology

8.2.3.1 Impact Assessment Methodology

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

Construction impacts have been assessed in accordance with BS 7385-2:1993 – Evaluation and Measurement for Vibration in Buildings: Part 2 – Guide to Damage Levels from Groundborne Vibration and BS 5228 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration 2009+A1 2014.

Operational impacts have been assessed in accordance with the Transport Infrastructure Ireland, TII (formerly NRA) Guidelines for the Treatment of Noise & Vibration in National Road Schemes.

8.2.4 Construction Impact Assessment Methodology

Table 8.4 details the limits above which cosmetic damage could occur for transient vibration. Minor damage is possible at vibration magnitudes which are greater than twice those shown in Table 8.3, and major damage to a building structure would only generally occur at values greater than four times the tabulated values. These values only relate to transient vibration. If there is a continuous vibration, the guide values shown in Table 8.3 shall be reduced by up to 50%.

This guidance is reproduced from BS 5228-2:2009+A1 2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites: Part 2 – Vibration and BS 7385-2:1993 – Evaluation and Measurement for Vibration in Buildings: Part 2 – Guide to Damage Levels from Ground borne Vibration.

Table 8.4 – Transient vibration guide values for cosmetic damage

Type of building	PPV (mm/s) in frequency range of predominant pulse	
	4-15Hz	15Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50mm/s at 4Hz and above.	50mm/s at 4Hz and above.
Unreinforced or light framed structures. Residential or light commercial buildings.	15mm/s at 4Hz increasing to 20mm/s at 15Hz.	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above.

Table 8.5, reproduced from *BS 5228 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration 2009+A1 2014* outlines the vibration levels (in terms of PPV) from construction activities and their likely effect on humans.

Table 8.5 – Guidance on the effect of construction vibration levels on humans

Vibration Level (PPV)	Effect
0.14mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.30mm/s	Vibration might be just perceptible in residential environments.
1.0mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

8.2.5 Operational Impact Assessment Methodology

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes.

Ground vibrations produced by road traffic are unlikely to cause perceptible structural vibration in properties located near to well-maintained and smooth road surfaces. Vibration impacts associated with road traffic can therefore be largely avoided by good maintenance of the road surface.

8.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

8.3.1 Description of the baseline environment - Environmental Noise Context

The subject site is located within the Clonburris SDZ in Co. Dublin. The subject site is currently undeveloped and is bordered to the North by the Dublin-Cork Railway Line and the Grand Canal to the South. Lands further to the south and east are comprised of residential areas. The Clondalkin/Fonthill Railway Station is located East of the site and the Fonthill Road (R113) runs along the Eastern site boundary.

The Cork-Dublin Rail Line and the Fonthill Road are the principal existing ambient noise sources that impact the subject site.

Rail traffic noise associated with the Dublin Cork Rail Line which runs along the northern site boundary has been assessed with regard to the EPA's Round 3 Rail Noise Mapping of this line. Rail noise dominates the northern site boundary during the daytime and nighttime periods albeit on a non-continuous basis.

This is further confirmed by attended noise surveys conducted at the northern site boundary.

Local road traffic noise associated with the Fonthill Road which runs adjacent to the eastern site boundary has been assessed with regard to the EPA's Round 3 Road Noise Mapping of this road. Road traffic noise dominates the eastern site boundary during the daytime and nighttime periods.

This is further confirmed by attended noise surveys conducted at the eastern site boundary.

8.3.2 Baseline environmental noise survey

Baseline noise data at the proposed development site boundaries has been obtained from noise monitoring surveys conducted by Byrne Environmental Consulting Ltd on 19th – 21st October 2022 when normal traffic levels and Irish Rail Services were operating at normal capacity. The baseline monitoring locations were selected in accordance with *ISO 1996,2, 2017: Acoustics – Description, Measurement and Assessment of environmental noise* and the 2016 EPA publication, *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* and included locations in proximity to existing residential dwellings adjacent to the development areas and within the site itself to assess the inward impact of road and rail traffic noise within the site.

8.3.3 Measurement locations

Free-field noise measurements at a height of c. 6m (to represent 1st floor bedroom level) were conducted at location N1 opposite Dublin-Cork Rail Line at the closest building façade footprint facing towards the rail line at a distance of c. 40m from the closest rail track as indicated as N1 in Figure 3 below. Noise measurements were also conducted at the closest building façade footprint facing towards the Fonthill Road N2 at a height of c. 6m (to represent 1st floor bedroom level) at a distance of c. 45m from the Fonthill Road as shown in Figure 8.2. The baseline noise data recorded included the following acoustic parameters.

L_{Aeq}: 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}: The sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

L_{A90}: The sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

L_{Amax}: The instantaneous maximum sound level measured during the sample period.

L_{Aeq, 16-hr} is the equivalent continuous sound level between 07:00hrs – 23:00hrs

L_{Aeq, 8-hr} is the equivalent continuous sound level between 23:00hrs – 07:00hrs

Figure 8.2 – Baseline Noise Monitoring Locations N1 – N2



8.3.4 Baseline noise measurement results

Table 8.6 – Location N1 Northern Site opposite Dublin-Cork Rail Line

Parameter	Measured sound pressure levels dBA (re 20µPa)	
	Daytime LAeq, 16hr	Nighttime LAeq, 8hr
Measured Value	60	48
ProPG Risk Assessment	Low	Low

Table 8.7 – Location N2 Eastern Site opposite Fonthill Road

Parameter	Measured sound pressure levels dBA (re 20µPa)	
	Daytime LAeq, 16hr	Nighttime LAeq, 8hr
Measured Value	56	42
ProPG Risk Assessment	Low	Low

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of a mixed-use development on a site of c. 3.96 hectares comprising 594 no. apartments (255 no. 1 bedroom apartments, 307 no. 2 bedroom apartments and 32 no. 3 bedroom apartments), as well as commercial office development in Block C, c. 5,195 sq.m), 1 no. retail unit at ground floor of Block B (c.147.5 sq. m) and 3 no. retail units at ground floor of Block E as follows (c.106.2 sq.m, c.141.6 sq.m and c.492.2 sq.m respectively) a creche (c. 600 sq. m) at ground floor and first floor of Block A. Car parking (396 no. spaces in a mixture of undercroft spaces Block A, Block B&D and Block E&F) and bicycle parking (1,232 no. spaces at undercroft and surface levels) along with all site development and landscaping works including public open space.

Short term noise exposure during the construction phase must be managed and controlled to acceptable levels. There are a number of existing residential noise sensitive receptors located in proximity to the development site boundaries. It is fundamental that the proposed development or any aspect of the proposed development must not adversely impact the existing noise levels experienced at these receptors over the long term.

The operation of the proposed development will not include any commercial or retail activities and noise associated with its operation will be limited to normal domestic activities.

8.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

Various elements of both the construction and operational phases of the proposed development have the potential to impact on the receiving on the local receiving noise environment, on adjacent residential properties and on human health. The potential effects of the proposed development are considered for the short-term construction phase (effects lasting between 1 -7 years) and permanent operational phase (effects lasting 15- 60+ years).

8.5.1 Potential Construction Noise Impact

Works activities associated with the 'Site set up' will be undertaken prior to construction works commencing. The setting up of the site shall involve the construction of site security hoarding and site compounds, site offices, materials and waste storage areas and staff welfare facilities. These short-term activities will have a minimal potential to generate excessive noise levels.

The proposed development involves the ground clearance of the existing site to facilitate the proposed development including buildings, internal roads and hard standing areas, services and landscaped areas.

Site clearance, levelling and an element of ground excavation shall also occur at this stage. A variety of items of plant will be in use during site clearance and ground excavation. These will include excavators, dump trucks, compressors and generators and pneumatic breakers. The operation of these items of plant has the potential to generate short term elevated noise levels beyond the site boundary.

During the site clearance works and the basement bulk dig, the movement of trucks to and from the site shall result in an increase in the volume of HGV's within the immediate area and along the proposed haul routes which will generate additional noise levels.

In the absence of mitigation, the impacts arising from the enabling works in terms of noise have the potential to propagate beyond the site boundaries.

8.5.1.1 Main Construction Works

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site, and construction traffic, which will all generate noise. The highest noise levels will be generated during the general construction activities. The construction noise levels will be of relatively short-term duration and will only occur during daytime hours which will serve to minimise the noise impacts at local existing receptors.

There is potential that the construction phases shall result in a short-term moderate increase in noise levels in the area as well as introducing tonal and impulsive noise as a result of typical construction activities.

The proposed construction phase noise mitigation measures shall ensure that all construction activities are controlled and managed and audited by an independent acoustic consultant to confirm that the mitigation measures are implemented throughout the construction phase.

The predicted construction noise levels that will be experienced at the nearest residential receptors as a result of construction activities have been calculated using the activity LAeq method outlined in *BS 5228 1:2009+A1 2014 – Code of Practice for noise and vibration control on construction and open sites – Part 1 Noise*.

Table 8.8 details the assumed plant items during the key phases of construction with the associated source reference from BS 5228: 2009+A1 2014. The closest residential areas to the proposed development site are located at NSR1 Cappaghmore estate c. 170m southeast of the site and NSR2 Lindsfarne estate c. 330m south of the site.

Table 8.8 – Predicted construction noise predictions associated with building construction works

Plant Item	BS 5228 Reference	Construction Noise Level LAeq dB
Generator (enclosed)	C.4 Ref 76	61
Dumper truck	c.4 Ref 4	76
Tracked Excavator	C.2 Ref 29	79
Lorry	C.2 Ref 34	80
Telescopic handler	C.4 Ref 54	79
Cement mixer truck pumping concrete	C.4 Ref.25	82
Tower Crane	C.4 Ref.48	76
Combined level with all plant operating 87 LAeq dB		
Calculated sound pressure levels LAeq dB at distances from receptors		
LAeq,1hr at NSR1 @ 170m		42
LAeq,1hr at NSR2 @ 330m		37

The results of the assessment conclude that the daytime construction noise limit of 70dB LAeq, 1hr as measured at the closest houses at Cappaghmore southeast and the Linsdfarne estates can be complied with during construction works. It is also important to note that the impact due to construction activities will be transient in nature and the noise levels detailed in Table 8.8 represent worst case scenarios when all items of plant are operating simultaneously at the closest point to the Cappaghmore and the Linsdfarne estates.

8.5.2 Construction Traffic Noise Impact

The maximum volume of construction traffic will be associated with the bulk excavation which will generate up to 70 HGV movements per day on the haul routes to and from the site along public roads, the resulting average predicted traffic noise level at the closest receptors is calculated as follows:

The predicted noise levels at any receptor located within 5m of the haul route road has been calculated using a standard international acoustical formula as described below.

$$LA_{eq, T} = SEL + 10\log_{10}(N) - 10\log_{10}(T) + 20\log_{10}(r_1/r_2) \text{ dB}$$

where

- LAeq, T is the equivalent continuous sound level over time period (T) (3600 sec);
- SEL is the A weighted Sound Exposure Level of the noise event (77dB);
- N is the number of events over the time period T (70);
- r1 is the distance at which SEL is assessed (5m)
- r2 is the closest distance to the receptor from the road (10m)

The calculations are based on a 10-hour working day a maximum, a Sound Exposure Level of 77dBA for the trucks and the minimum distance between the local road passing by each of the nearest noise sensitive receptors to the public road (10m). No attenuation, above geometric spreading, has been considered within these calculations may be considered the worst-case scenario.

The maximum predicted LAeq, period values as a result of the HGV traffic movements at the nearest noise sensitive receptors located along the haul route roads is predicted to be 54dBA, LAeq, period.

It is not expected that the predicted short-term increase in HGV movements associated with the construction phase of the development will have an adverse impact on the existing noise climate of the wider area or on local receptors.

8.5.3 Construction Vibration

The most significant potential sources of ground borne vibrations that may be generated during the construction phase of the development will be generated by the following practices:

- Movement of site vehicles bulldozers, tracked excavators and dump trucks on ground surfaces
- Hard core surfaces and haul road compaction with vibro-rolling vehicles
- Road construction surface vibro-rolling

Vibration impacts have been considered from any particular plant items that have the potential to generate perceptible levels of vibration.

Depending on the methods of construction, there is the possibility of construction related vibration impacts on human beings as a result of ground preparation and concrete foundation excavation activities. However, such sources of vibration shall be temporary and intermittent.

It is predicted that vibration levels associated with construction activities at the closest receptors to the site will not exceed 0.500mm/sec PPV.

Human response to groundbourne vibrations will be perceptible at levels between 0.14 to 1.0 mm/sec PPV.

8.5.4 Potential Operational Noise Impact

8.5.3.1 Potential Outward Traffic Noise Impact

The operational noise aspects associated with the completed development can be classified as follows:

- Outward noise impacts on the receiving environment and existing receptors
- Inward noise impacts on the development from other external noise sources

The main potential for altering the noise environment once the development is operational, and thus impacting neighbouring residential receptors, will be associated with increased traffic movement in the area.

The Traffic and Transportation Assessment Report prepared by DBFL Consulting Engineers includes a detailed assessment of the traffic impact associated with the proposed development. As part of this assessment, detailed traffic flow information as Annual Average Daily Traffic (AADT) has been derived for the existing road network for the “No development” and the “With development” scenarios.

The percentage traffic increase associated with the development has considered existing junctions on the local road network and the entrance to the development as detailed in Table 8.9.

Table 8.9 – % Increase in traffic at junctions

Junction	Do Something Scenario Generated Traffic	Percentage Increase
	AADT 2040 AM/PM	AADT 2040 AM/PM
Ninth Lock/CSLS	1734/1740	1.6/1.5
R113 Fonthill Rd/CLCS	2599/2747	2.5/2.0
CSLS/ New link road	972/913	5.1/5.3
CNLS/New Link Road	1102/896	1.3/1.6
R113 Fonthill Rd/CNLS	2588/2354	1.2/1.2

The UK Design Manual for Roads and Bridges (DMRB, Volume 11, Section 3, Part 7) states that it takes a 25% increase or a 20% decrease in traffic flows in order to get a 1dBA change in traffic noise levels. On this basis, the traffic flow increases associated with the fully completed development to the design year of 2040 will result in an increase of <1dB(A) over existing traffic noise levels which will be imperceptible.

8.5.3.2 Potential Inward Noise Impact

The impact of the dominant noise sources in the vicinity of the development site have been identified to be associated with train movements on the Dublin-Cork rail line north of the site and the road traffic noise associated with the Fonthill Road to the East of the site.

If the development is not designed to ensure that external noise at the facades of the closest building to the identified noise sources is not considered, there is the potential that the inward noise impact may not achieve the internal acoustic design criteria specified in *British Standard BS 8233: 2014: Guidance on Sound Insulation and Noise Reduction for Buildings* as detailed in Table 8.10 below.

Table 8.10 – BS8233:2014 Internal noise criteria

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living Room	35 dB LAeq, 16hr	-
Dining	Dining Room/Area	40 dB LAeq, 16hr	-
Sleeping (Daytime Resting)	Bedroom	35 dB LAeq, 16hr	30 dB LAeq, 8hr 45 dB LAfmax

Table 8.11 – Summary of Construction Phase Likely Significant Effects without Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Phase Noise	Negative	Moderate	Local	Likely	Short-Term	Worst Case
Construction Phase Vibration	Negative	Not Significant	Local	Likely	Short-Term	Worst Case

8.5.5 'Do Nothing' Scenario

If the site remains undeveloped it shall continue to have no noise or vibrational impact on the receiving environment. Based on the projected increase in traffic the increase in traffic noise levels in the area without the subject development would be < 3dB. This increase above the existing situation would be minor and would not result in a perceptible change in the existing noise climate at any local receptor.

8.6 CUMULATIVE NOISE IMPACTS

In accordance with *Schedule 6, Part 2(c) of the Planning and Development Regulations 2001-2018*, this section has considered the cumulative impact of the proposed development in conjunction with existing adjacent development and future development in the vicinity of the subject site. This section relates to the cumulative impact on the subject site itself and on surrounding sites.

The potential and predicted impacts of the operational phases of the proposed development have been individually assessed. Other lands to the west of the subject site are likely to be developed in the future as part of the Clonburris SDZ and future development applications will be subject to similar impact assessment to ensure the construction and operation phases to not have an adverse impact on the receiving environment or on local noise sensitive receptors.

A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently underway. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development. Should this scheme be granted it is anticipated that construction phase of the Link Street may overlap with construction of the proposed development. The CSLS application included

an EIA as part of its planning application and has identified similar mitigation measures therefore no significant potential cumulative impacts are not anticipated.

Other projects in the wider Clonburris SDZ comprise:

SDZ21/0021 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.
SD228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
Part 8 Development 263 no. units within Kishogue South West
SDZ21A/0006 - Wastewater pumping station comprising of (a) below ground 24-hour emergency storage

The noise impacts associated with future adjacent residential developments will be similar to the noise generated by the subject residential development in that the construction phases will generate short term slight to moderate impacts and the impact of the operational phase will be long-term and not significant.

It is considered that there will be short-term slight to moderate negative cumulative impacts in terms of noise associated with the construction phase of the subject development and the adjoining permitted development should construction activities at each site occur at the same time. However, it is predicted that there will be an overall long term positive cumulative impact as a result of the proposed development, due to the modern residential buildings, significant public open spaces and amenity areas and facilities that are being provided for existing and new residents of the area.

Once the subject development is completed and if the lands to the west are developed there will be no adverse residual adverse noise impact on the receiving environment associated with their operation. Increased traffic movements associated with all developments will generate a long-term not significant impact on the local noise climate during peak hour times.

8.7 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

8.7.1 Construction Phase Noise & Vibration mitigation

The following noise management measures shall be implemented at the site from the outset of site activities to control and manage noise levels during the construction phase of the proposed development:

Noise complaints shall be investigated by site management.

N&V CONST 1 Construction Works Noise Control & Mitigation

Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include:

- no plant used on-site will be permitted to cause an ongoing public nuisance due to noise;
- the best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on-site operations;
- all vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- during construction, the appointed Contractor will manage the works to comply with noise limits outlined in *BS 5228-1:2009+A1 2014. Part 1 – Noise*;
- all items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures;
- monitoring noise and vibration levels at sensitive locations.
- selection of plant with low inherent potential for generation of noise and/or vibration;
- erection of good quality site hoarding to the site perimeters which will act as a noise barrier to general construction activity at ground level;

N&V CONST 2 Vibration Mitigation Measures

The following specific vibration mitigation and control measures shall be implemented during the construction phase:

- Choosing alternative, lower-impact equipment or methods wherever possible
- Sequencing operations so that vibration causing activities do not occur simultaneously
- Isolating the equipment causing the vibration on resilient mounts
- Keeping equipment well maintained.

8.7.1 Operational Phase Noise & Vibration Mitigation

The inward noise impact shall be mitigated by the following design measures.

N&V OPERA 1: Inward Noise Mitigation Measures

- Residential Units fronting onto the Northern (Dublin-Cork Rail Line) and Eastern (Fonthill Road) site boundaries will include acoustically rated glazing with to achieve the required *BS8233* internal noise criteria.
- Ventilation installations are to be acoustically treated, in the form of suitably approved and tested acoustic attenuation systems if required to maintain the acoustic integrity of the façades.

8.7.2 'Worst-case' scenario

The worst-case scenario would arise where the mitigation measures are not implemented. Should noise mitigation measures not be implemented during the construction phase, the potential for noise nuisance will increase.

8.8 RESIDUAL IMPACT ASSESSMENT

8.8.1 Construction Phase

8.8.1.1 Residual Noise Impact

The impact of the construction phase will result in an increase in daytime noise levels at the closest receptors to the site. With mitigation measures in place and with regard to the extended distances between the site and the closest residential receptors, it is predicted that the guideline construction noise limit of 70dB(A) $L_{Aeq, 1-hour}$ will be complied with.

8.8.1.2 Residual Vibration Impact

Site activities, in particular ground clearance will not generate perceptible vibration at the closest residential receptors located to the south or southeast of the site. It is predicted that vibration levels associated with construction activities at the closest receptors to the site will not exceed 15 mm/sec PPV. Human response to groundbourne vibrations will be perceptible at levels between 0.14 to 1.0 mm/sec PPV. With regard to the extended distances between the site and the closest residential receptors it is predicted that ground vibration will be imperceptible at the receptors.

8.8.2 Operational Phase

8.8.2.1 Residual Noise Impact

The operational phase of the development will not adversely impact the existing noise climate at local receptors.

8.8.2.2 Residual Vibration Impact

The operational phase of the development will not generate ground borne vibration levels.

8.8.3 Cumulative

The cumulative noise and vibration impacts associated with the proposed development and future local developments will not result in an increased impact on the closest receptors to the proposed development site.

8.8.4 Summary

Table 8.12 below summarises the identified likely significant effects of the proposed development during the construction phase post application of mitigation measures.

Table 8.12 – Summary of Construction Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Phase Noise	Negative	Not Significant	Local	Likely	Temporary to Short-Term	Residual
Construction Phase Vibration	Negative	Not Significant	Local	Likely	Short-Term	Residual

Table 8.13 below summarises the identified likely significant effects of the proposed development during the operational phase post application of mitigation measures.

Table 8.13 – Summary of Operational Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Phase Noise	Neutral	Not Significant	Local	Likely	Long-Term	Residual

8.9 RISKS TO HUMAN HEALTH

Construction phase noise and vibration emissions will be temporary and transient and will be managed so as to minimise impact to population and human health by complying with all relevant guidance, as such the impact will be short-term and have a slight impact overall.

Operational phase noise will also be managed to achieve relevant noise limit values and is predicted to meet all such requirements. No operational phase vibration impacts are predicted. Therefore, the operational phase noise impacts will be neutral for the life of the development. It has been predicted that the exposure of humans to the cumulative noise associated with increased traffic levels from all developments will be low and the impact will be long-term and not significant with and will not result in an adverse noise impact on the existing or the future population in the local area.

8.10 INTERACTIONS

The principal interactions between Noise & Vibration impacts and Human Beings have been addressed in this chapter. The mitigation measures described shall be implemented to ensure that human health and residential amenity are not adversely impacted by any aspect of the construction or operational phases of the development.

8.11 MONITORING

8.11.1 Construction Phase Noise Monitoring

Quarterly noise monitoring surveys shall be conducted at NSR1 Cappaghmore estate c. 170m southeast of the site and NSR2 Lindsfarne estate c. 330m south of the site to assess the impact that site construction activities may have on ambient noise levels at these local noise sensitive receptors.

The environmental noise measurements will be completed in accordance with the requirements of *ISO 1996-1: 2017: Acoustics – Description, measurement and assessment of environmental noise and with regard to the EPA’s 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*. The measurement parameters to be recorded include L_{Aeq} , L_{A90} , L_{A10} and L_{Amax} , 1/3 Octave Frequency analysis and tonal noise analysis.

8.11.2 Construction Phase Vibration Monitoring

In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, it is proposed that vibration monitoring shall be conducted during the course construction works in proximity to the Irish Rail line north of the site. It is proposed that vibration monitoring will be conducted using live data logging vibration monitors and geophones with live text and email alert functionality to ensure that if vibration levels approach or exceed the specified warning and limit values, nominated construction staff shall be instantly alerted to cease at the earliest instance and appropriate mitigation measures may then be implemented to minimise the ongoing impact on the monitored structures.

Table 8.13 below summarises the proposed construction phase mitigation and monitoring measures.

Table 8.14 – Summary of Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Additional Noise in Local Area	Best Practice Noise Mitigation in accordance with BS5228 Part 1	Quarterly attended noise surveys at closest residential receptors during the construction phase
Vibrational impact on Irish Rail infrastructure	Best Practice Noise Mitigation in accordance with BS5228 Part 2	Continuous live vibration surveys for duration of construction phase

8.11.3 Operational Phase Monitoring

There is no monitoring required for the operational phase of the development.

8.12 REINSTATEMENT

Reinstatement issues are not relevant to this Chapter of the EIA, with reference to the construction and operational phase.

8.12 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered in compiling this Chapter of the EIA.

8.13 REFERENCES & SOURCES

- Dublin Agglomeration Noise Action Plan 2018 – 2023 (NAP).
- Design Manual for Roads & Bridges – Volume 11 Section 3.
- Professional Guidance on Planning & Noise (ProPG), (IoA, 2017).
- 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.
- British Standard BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings.
- British Standard BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound
- Calculation of Road Traffic Noise, Department of Transport Welsh Office, HMSO, 1988.
- ISO 1996-2: 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.

9.0 LANDSCAPE AND VISUAL IMPACT

9.1 INTRODUCTION

This landscape and visual impact assessment has been prepared by Cunnane Stratton Reynolds Ltd (CSR), Landscape Architects and Planners on behalf of Cairn Homes Properties Ltd. Declan O’Leary, Landscape Architect and Director and Thorsten Peters, Architect and Urban Design Team Leader who have produced this document demonstrate the following qualifications:

Declan O’Leary B.Agr Sc. Land. Hort., Dip LA., CLI, MILI, of Cunnane Stratton Reynolds Ltd. Declan has over 30 years’ experience in the design and analysis of landscape and the impacts of change, and the preparation of assessments for inclusion in EIA.

Thorsten Peters Dipl Ing Arch, MSc Sust Dev, MRAI of Cunnane Stratton Reynolds Ltd. Thorsten has over 26 years’ experience in the fields of architecture, urban design and sustainable development.

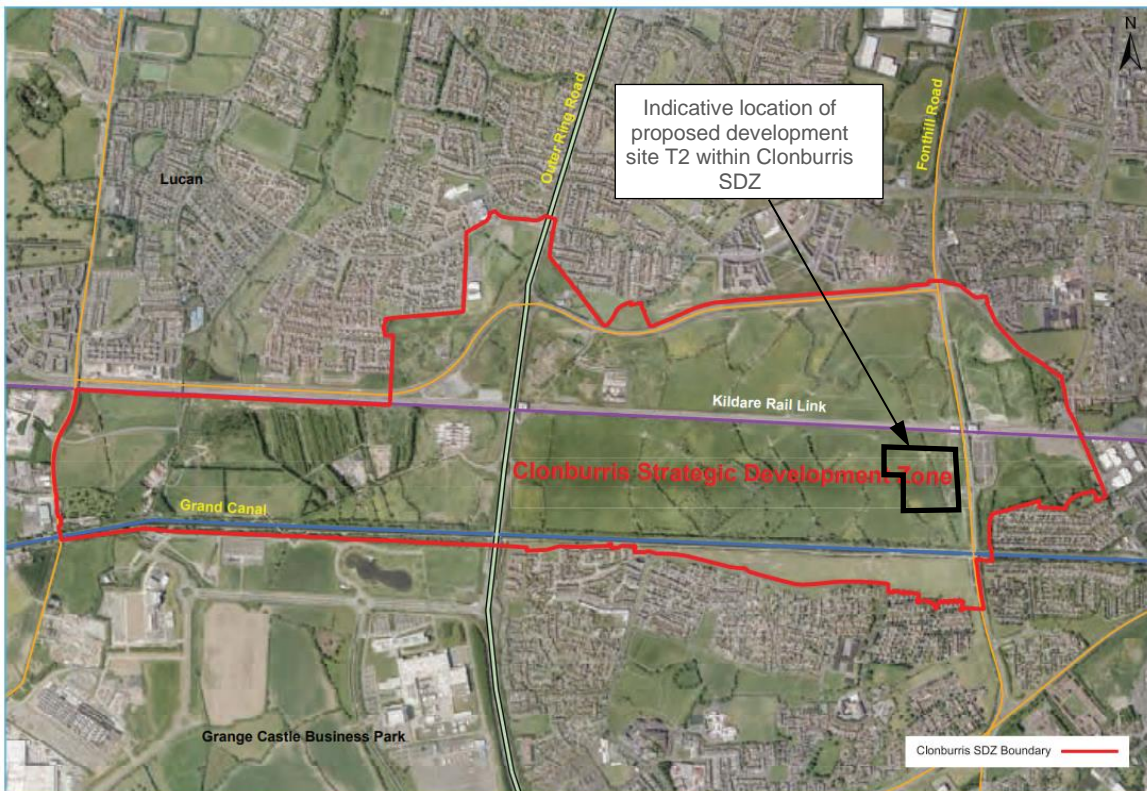
The Landscape and Visual Impact Assessment (LVIA) chapter was informed by a desktop study and a survey of the site and receiving environment in July 2022. This assessment document identifies and discusses the landscape and the receiving environment in relation to proposed development in development area CUC-S3 & CSW S3/ T2.

9.2 CHARACTERISTICS OF PROPOSED DEVELOPMENT

9.2.1 9.2.1 Clonburris SDZ Planning Scheme

The Clonburris Strategic Development Zone Planning Scheme, May 2019 (*hereafter referred to as the Planning Scheme*) is an overarching document covering the Clonburris Strategic Development Zone (SDZ) lands.

Figure 9.1 – SDZ map (Source: Clonburris SDZ Planning Scheme 2019)



The SDZ lands, as shown in the above figure, covers approx. 280 hectares of South Dublin lands. The SDZ is located to the west of Dublin City Centre and the M50 – within the triangle between Lucan, Clondalkin and Liffey Valley. The SDZ lands are bisected east to west by the Dublin-Kildare Railway line and south of it by the Grand Canal.

The proposed development site is located in the south-east section of the SDZ lands, within development area CUC-S3 & CSW S3/ T2 as defined within the Clonburris SDZ Planning Scheme 2019 (Planning Scheme) and illustrated

in Figure 9.1. The site consists of an undeveloped, greenfield site of approx. 5.18 hectares and is situated immediately to the south of the Dublin-Cork railway line and immediately to the west of the Fonthill Road (R113).

9.2.2 Proposed Development

The development will consist of the construction of a mixed-use development comprising 594 apartments, office floorspace, four retail units, a creche and urban square in the Clonburris Development Areas CUCS3 & CSW-S3 of the Clonburris SDZ Planning Scheme 2019 as follows:

- 594 no. apartments (255 one-bedroom apartments, 307 two-bedroom apartments and 32 three-bedroom apartments (all apartments to have terrace or balcony; ancillary communal amenity spaces in Block D and Block F for residents) as follows; Block A (4 and 6 storeys with undercroft) comprises 96 apartments consisting of 36 one-bedroom apartments, 48 two-bedroom apartments and 12 three-bedroom apartments (with creche c. 609m² at ground and first floor as well as play area; Block B (6 storeys) comprises 77 apartments consisting of 44 one-bedroom apartments, 28 two-bedroom apartments and 5 three-bedroom apartments; Block D (5 and 7 storeys) comprises 71 apartments consisting of 39 one-bedroom apartments and 32 two-bedroom apartments; Block E (6 storeys) comprises 100 apartments consisting of 47 one-bedroom apartments, 48 two-bedroom apartments and 5 three-bedroom apartments; Block F (5 and 7 storeys) comprises 124 apartments consisting of 57 one-bedroom apartments, 61 two-bedroom apartments and 6 three-bedroom apartments; Block G (1, 2 and 4 storeys) comprises 65 apartments consisting of 16 one-bedroom apartments, 45 two-bedroom apartments and 4 three-bedroom apartments; Block H (4 storeys) comprises 61 apartments consisting of 16 one-bedroom apartments and 45 two-bedroom apartments
- Mixed use development comprising, commercial office development in Block C of 7 storeys (c. 4,516m²), one retail unit at ground floor of Block B (c.148m²) and three retail units at ground floor of Block E as follows (c.106m², c.142m² and c.492m² respectively) as well as a creche (c. 609m²) at ground floor and first floor of Block A
- Vehicular access will be from the permitted Clonburris Southern Link Street (SDZ20A/0021) and R113 to the east
- Public Open Space/landscaping of c. 0.51 hectares (to include urban square) as well as a series of communal open spaces to serve apartments over undercroft level and surface level
- The development will also provide for all associated works and infrastructure to facilitate the development to include all ancillary site development works including footpaths, landscaping boundary treatments, public, private open space areas, car parking (396 spaces in a mixture of undercroft spaces Block A, Block B&D and Block E&F) and bicycle parking (1,232 spaces at undercroft and surface levels), single storey ESB substations/bike/bin stores, green roofs, solar panels at roof level of apartments, plant areas within blocks and all ancillary site development/construction works
- Permission is also sought for connection to water supply, and provision of foul drainage infrastructure

Figure 9.2 – Site Layout Plan T2 (Source: ALTU Architects)



The key issues relating to landscape and visual impact include:

- The impact on the existing landscape resource
- Interactions between the site and adjoining boundaries
- Change in the character of lands from agricultural to predominantly residential and mixed-use
- The height and massing of proposed development

9.3 ASSESSMENT METHODOLOGY

9.3.1 Definition of Landscape

Ireland is a signatory of the European Landscape Convention (ELC). The ELC defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”. This definition is important in that it expands beyond the idea that landscape is only a matter of aesthetics and visual amenity. It encourages a focus on landscape as a resource in its own right – a shared resource providing a complex range of cultural, environmental and economic benefits to individuals and society.

As a cultural resource, the landscape functions as the setting for our day-to-day lives, also providing opportunities for recreation and aesthetic enjoyment and inspiration. It contributes to the sense of place experienced by individuals and communities and provides a link to the past as a record of historic socio-economic and environmental conditions.

As an environmental resource, the landscape provides habitat for fauna and flora. It receives, stores, conveys and cleans water and vegetation in the landscape stores carbon and produces oxygen. As an economic resource, the landscape provides the raw materials and space for the production of food, materials (e.g. timber and aggregates) and energy (e.g. carbon-based fuels, wind, solar), living space and for recreation and tourist activities.

9.3.2 Forces for Landscape Change

Landscape is not unchanging. Many different pressures have progressively altered familiar landscapes over time and will continue to do so in the future, creating new landscapes. For example, within the receiving environment, the environs of the proposed development have altered over the last thousand years, from wilderness to agriculture and settlement or townscape.

Many of the drives for change arise from the requirement for development to meet the needs of a growing population and economy. The concept of sustainable development recognises that change must and will occur to meet the needs of the present, but that it should not compromise the ability of future generation to meet their needs. This involves finding an appropriate balance between economic, social and environmental forces and values.

Climate change is one of the major factors likely to bring about future change in the landscape and it is accepted to be the most serious long-term threat to the natural environment, as well as economic activity, (particularly primary production) and society. The need for climate change mitigation and adaptation, which includes the management of water and more extreme weather and rainfall patterns, is part of this.

9.3.3 Guidance

Landscape and Visual Impact Assessment (LVIA) is a tool used to identify the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity.

The methodology for assessment of the landscape and visual effects is informed by the following key guidance documents:

- Guidelines for Landscape and Visual Impact Assessment (hereafter referred to as the GLVIA), 3rd Edition 2013, UK Landscape Institute and the Institute of Environmental Management and Assessment
- Guidelines on the information to be contained in Environmental Impact Assessment Reports 2022, published by the Environmental Protection Agency
- TGN 06/19 Visual Representation of Development Proposals, UK Landscape Institute, 2019
- South Dublin Development Plan 2022 – 2028
- Clonburris Strategic Development Zone Planning Scheme, May 2019

The GLVIA (3rd Edition) outlines the assessment process, which combines judgements on the sensitivity of the resource and the magnitude of the change which it will undergo as a result of the proposed development. These are then combined to reach an assessment of the importance (or significance) of the effect. This guidance is authored by the Landscape Institute in the UK and the IEMA which contains a network of members in UK and Ireland and internationally. The guidance was prepared within the parameters of relevant EU directives at the time and is updated where necessary by Landscape Institute bulletins online. The GLVIA 3rd edition is used internationally and is the industry standard for LVIA in Ireland.

The Guidelines on the information to be contained in Environmental Impact Assessment Reports 2022 refer to the use of topic specific guidance and specifically references the GLVIA 3 in relation to professional judgement. 3.7.2 *Documenting the Process* recognises that:

“Some uncertainty is unavoidable in EIA, especially about matters that involve an element of judgement, such as assigning a level of significance to an effect. Such judgements should be explicit and substantiated rather than presented as objective fact. This is best done using agreed referable approaches, e.g. the Guidelines on Landscape and Visual Impacts Assessment provide guidance on what constitutes a severe visual effect”.

9.3.4 Key Principles of the GLVIA

Use of the Terms **Impact** vs **Effect**

The GLVIA advises that the terms **Impact** and **Effect** should be clearly distinguished and consistently used in the preparation of a Landscape and Visual Impact Assessment (LVIA).

Impact is defined as the action being taken. In the case of the proposed development, the impact would include the construction of the buildings and associated infrastructure.

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.

Assessment of both Landscape and Visual Effects

Another key distinction to make in an LVIA is that between landscape effects and the visual effects of development.

Landscape results from the interplay between the physical, natural and cultural components of our surroundings, whether urban or rural. Different combinations of these elements and their spatial distribution create distinctive character of landscape in different places. ‘Landscape character assessment’ is the method used in LVIA to describe landscape, and by which to understand the potential effects of a development on the landscape as ‘a resource’. Character is not just about the physical elements and features that make up a landscape, but also embraces the aesthetic, perceptual and experiential aspects of landscape that make a place distinctive.

Visual amenity and views refer to the interrelationship between people and the landscape. The GLVIA prescribes that effects on views and visual amenity should be assessed separately from landscape, although the two topics are inherently linked. Visual assessment is concerned with 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.

This baseline and scoping study identifies the key landscape values and characteristics in the study area including key views and vistas and comments in terms of their capacity as constraints on development and their capacity to accommodate the proposed development.

9.3.5 Methodology for Landscape Assessment

In Section 9.5 the potential landscape effects of the development are assessed. The nature and scale of changes to the landscape elements and characteristics are identified, and the consequential effect on landscape character and value are discussed. Trends of change in the landscape are taken into account. The assessment of significance of the effects takes account of the sensitivity of the landscape resource and the magnitude of change to the landscape which resulted from the development.

Definitions and descriptions of sensitivity, magnitude of change and quality and longevity of effects are derived from the GLVIA. The GLVIA does not set out specific definitions of descriptions used but contains key widely used principles and case studies / examples that are intended to inform a professionals methodology, supported by their experience and judgements in relation to landscape and landscape change. These descriptions expand and complement the EPA guidelines as intended in relation to topic specific guidance.

9.3.5.1 Sensitivity of the Landscape Resource

Landscape sensitivity is a function of its land use, landscape patterns and scale, visual enclosure and distribution of visual receptors, scope for mitigation, and the value placed on the landscape. It also relates to the nature and scale of development proposed. It includes consideration of landscape values as well as the susceptibility of the landscape to change.

Landscape values can be identified by the presence of landscape designations or policies which indicate particular values, either on a national or local level. In addition, a number of criteria are used to assess the value of a landscape.

Landscape susceptibility is defined in the GLVIA as the ability of the landscape receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline scenario and/or the achievement of landscape planning policies and strategies. Susceptibility also relates to the type of development – a landscape may be highly susceptible to certain types of development but have a low susceptibility to other types of development.

Sensitivity is therefore a combination of Landscape Value and Susceptibility. For the purpose of this assessment, five categories are used to classify the landscape sensitivity of the receiving environment as presented in Table 9.1 below.

Table 9.1 – Categories of Landscape Sensitivity

Sensitivity	Description
Very High	Areas where the landscape exhibits a very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The character of the landscape is such that its capacity for accommodating

	change in the form of development is very low. These attributes are recognised in landscape policy or designations as being of national or international value and the principle 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 character of the landscape is such that it has limited/low capacity for accommodating change in the form of development. These attributes are recognised in landscape policy or designations as being of national, regional or county value and the principle management objective for the area is conservation of the 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 to / degradation / erosion of elements and characteristics. The character of the landscape is such that there is some capacity for change in the form of development. These areas may be recognised in landscape policy at local or county level and the principle 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 of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principle management objective is 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 of the landscape is such that its capacity for accommodating change is high; where development would make no significant change or would make a positive change. Such landscapes include derelict industrial lands or extraction sites, as well as sites or areas that are designated for a particular type of development. The principle management objective for the area is to facilitate change in the landscape through development, repair or restoration.

Visual Effects relate solely to changes in available views of the landscape and the effects of those changes on people viewing the landscape. They include the direct effect on views of the development, the potential reaction of viewers, their location and number and the effect on visual amenity. The intensity of the visual effects is assessed by professional evaluation using methodology and terminology as per tables 9.4 and 9.5.

9.3.5.2 Magnitude of Landscape Change

The Magnitude of Change is a factor of the scale, extent and degree of change imposed on the landscape with reference to its key elements, features and characteristics (also known as ‘landscape receptors’). Five categories are used to classify magnitude of landscape change.

Table 9.2 – Categories 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 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.

9.3.5.3 Significance of Effects

In order to classify the Significance of Effects (both landscape and visual), the predicted magnitude of change is measured against the sensitivity of the landscape/viewpoint, using the following guide). There are seven classifications of significance, namely: **Imperceptible / Not Significant / Slight / Moderate / Significant / Very Significant / Profound**. Table 9.3 expands the number of classifications to a total of 25 classifications providing for more accuracy in describing the significance of effects and their relative or comparative value.

Table 9.3 – Guide to Classification of Significance of Landscape Effects

Sensitivity of the Landscape Resource

	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-Very Significant	Very Significant-Significant	Moderate	Slight
High	Profound-Very Significant	Very Significant	Significant	Moderate-Slight	Slight-Not Significant
Medium	Very Significant-Significant	Significant	Moderate	Slight	Not Significant
Low	Moderate	Moderate-Slight	Slight	Not significant	Imperceptible
Negligible	Slight	Slight-Not Significant	Not significant	Imperceptible	Imperceptible

The matrix above is used as a guide only. The assessor also uses professional judgement informed by their expertise, experience and common sense, to arrive at a classification of significance that is reasonable and justifiable.

Landscape effects are also classified as positive, neutral or negative/adverse (See definitions under 9.6 Quality of Impacts/Effects). Development has the potential to improve the environment as well as damage it. In certain situations, there might be policy encouraging a type of change in the landscape, and if a development achieves the objective of the policy the resulting effect might be positive, even if the landscape character is profoundly changed.

9.3.6 Methodology for Visual Assessment

In Section 9.6 of this Chapter the visual effects of the development are assessed. Visual assessment considers the changes to the composition of views, the character of the views, and the visual amenity experienced by visual receptors. The assessment is made for a number of viewpoints selected to represent the range of visual receptors in the receiving environment. The significance of the visual effects experienced at these locations is assessed by measuring the viewpoint sensitivity against the magnitude of change to the view resulting from the development.

Definitions and descriptions of sensitivity, magnitude of change and quality and longevity of effects are derived from the GLVIA. The GLVIA does not set out specific definitions of descriptions used but contains key widely used principles and case studies / examples that are intended to inform a professionals methodology, supported by their experience and judgements in relation to visual effects and landscape change. These descriptions expand and complement the EPA guidelines as intended in relation to topic specific guidance.

9.3.6.1 Sensitivity of the Visual Receptor / Resource

Visual Receptor / Resource sensitivity is a function of two main considerations:

- 1) *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 or interest is focussed on the views or visual amenity they experience at that location.

Visual receptors most susceptible to change include 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 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.

- 2) *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 (e.g. by appearing in arts). The presence of visitor facilities is also a sign of a valued viewpoint.

Table 9.4 – Categories of Viewpoint Sensitivity

Sensitivity	Description
Very High	Viewers at iconic viewpoints – towards or from a landscape feature or area – that are recognised in policy or otherwise designated as being of high value or national value. This may also include residential viewers who are focused to a large extent on the view.
High	Viewers at viewpoints that 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) and views which are highly valued by the local community. This may also include tourist attractions, and heritage features of regional or county value, and viewers travelling on scenic routes.
Medium	Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape, or where the landscape has some valued views. The views are generally not designated, but which include panoramic views or views judged to be of some scenic quality, which demonstrate some sense of naturalness, tranquillity or some rare element in the view.
Low	Viewers at viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping, etc. The view may present an attractive backdrop to these activities but there is no evidence that the view is valued, and not regarded as an important element of these activities. Viewers travelling at high speeds (e.g. motorways) may also be generally considered of low susceptibility.
Negligible	Viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping where the view has no relevance or is of poor quality and not valued.

9.3.6.2 Magnitude of Change to a View

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, or glimpses). It also takes into account the geographical extent of the change, the duration and the reversibility of the visual effects.

The following five categories are used to classify *Magnitude of Change to a View*:

Table 9.5 – Categories 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 the dominant 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.

9.3.6.3 Significance of Visual Effects

As for landscape effects, in order to classify the significance of visual effects, the magnitude of change to the view is measured against the sensitivity of the viewpoint, using the guide in Table 9.3 above.

9.3.7 Quality and Timescale

The predicted impacts are also classified as **Beneficial / Neutral / Adverse**. This is not an absolute exercise; in particular, visual receptors' attitudes to development, and thus their response to the impact of a development, will vary. However, the methodology applied is designed to provide robust justification for the conclusions drawn. These qualitative impacts/effects are defined as per Table 9.6.

Table 9.6 – Quality of Impacts / Effects

Impact	Described Perception
Beneficial (Positive)	Scheme improves landscape or townscape view / quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features or repairs / removes damage caused by existing land uses
Neutral	Scheme complements the scale, landform and pattern of the landscape(townscape)/view and maintains landscape quality
Adverse (Negative)	Scheme at variance with landform, scale, pattern. Would degrade, diminish or destroy the integrity of valued features, elements or their setting or cause the quality of the landscape(townscape)/view to be diminished

Impacts/ Effects are also categorised according to their longevity or timescale as per Table 9.7.

Table 9.7 – Duration Description of Impacts / Effects

Description	Duration
Temporary	Lasting 1 year or less
Short Term	Lasting 1 - 7 years

Medium Term	Lasting 7 - 15 years
Long Term	Lasting 15 - 60 years
Permanent	Lasting over 60 years

A summary of the combined assessment of the predicted landscape and visual effects is provided.

9.3.8 Photomontage Methodology

The photomontage and presentation is summarised in the method statement issued by 3D Design Bureau which includes the photomontage methodology and details of composition of each individual photomontage.

9.4 RECEIVING ENVIRONMENT

This section sets out a review of landscape related Planning Policy as set out in the South Dublin Development Plan 2022-2028, Clonburris Strategic Development Planning Scheme 2019 and associated documents, and a description of the study area informed by desktop assessment.

The local planning and other policy in the South Dublin Development Plan is reviewed which identify development objectives and trends and also constraints on development in terms of protections and sensitivities. Precedent and associated planning decisions may be described if appropriate.

The receiving environment is described in terms of its character, physical characteristics and the various elements that make up the landscape, including cultural, recreational, residential and other amenity values.

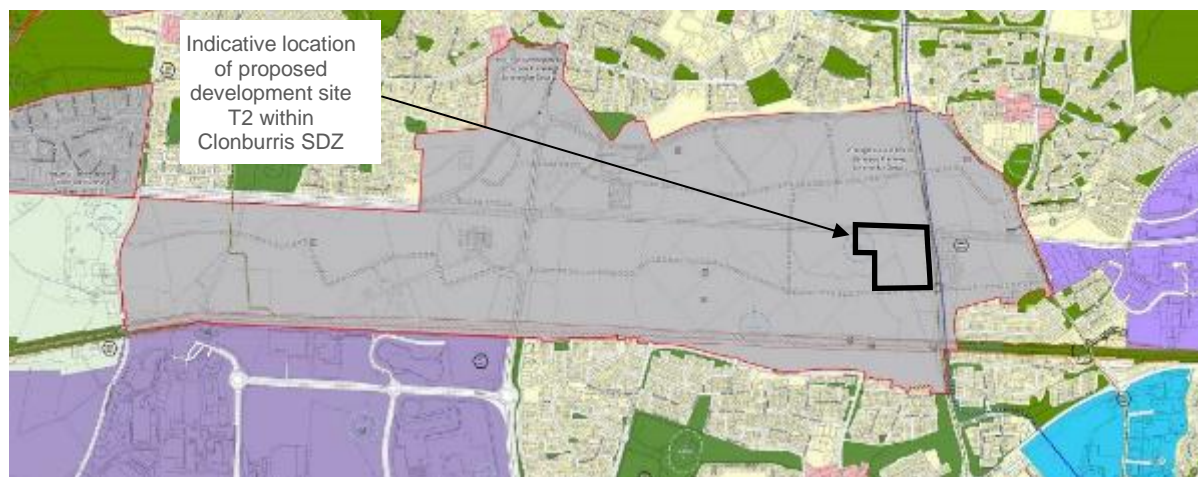
Cumulatively this analysis informs a description of the landscape in terms of values that support its protection and conservation and/or its enhancement or change. This reflects best practice guidance under the GLVIA.

9.4.1 Planning Context

9.4.1.1 South Dublin Development Plan 2022-2028

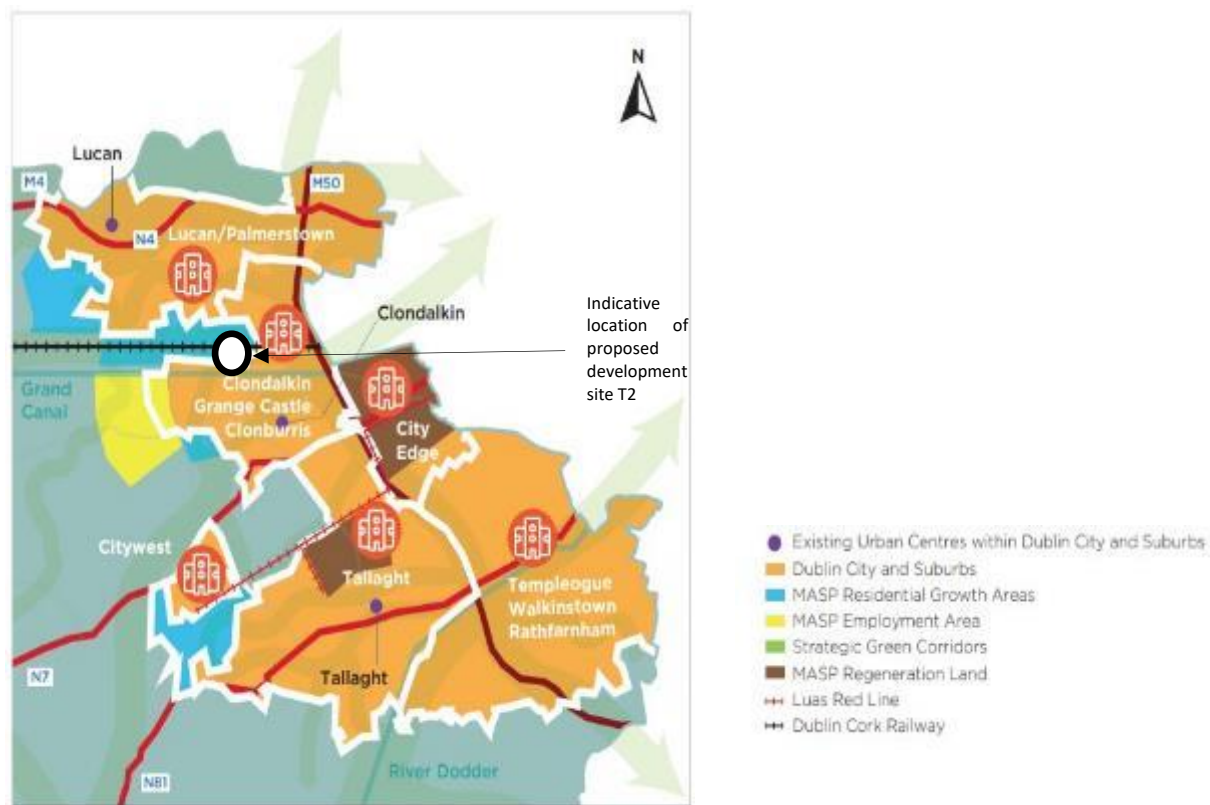
The South Dublin Development Plan 2022-2028, adopted on 03rd August 2022 (hereafter referred to as adopted SDDP) contains a range of policies relevant to establishing the landscape and visual values and sensitivities for the site and site environs, guiding the appropriate design and mitigation of impacts for the proposed development.

Figure 9.3 – Extract of Land Use Zoning Map (Source: SDDP)



The lands on which the proposed development is to take place have zoned under the South Dublin Development Pan 2022-2028 as ‘Strategic Development Zone’ (SDZ) with the objective “To provide for strategic development in accordance with approved planning schemes”.

Figure 9.4 – South Dublin County Core Strategy Map 2022-2028 (Source: SDDP)



Chapter 2 – Core Strategy and Settlement Strategy

The recently adopted Development Plan outlines a continuous population growth in South Dublin County and an associated housing need. At the same time, the average household size is shrinking, consistent with the downward national trend:

- 2.6.1 Land Capacity Study states that *“The Development Plan is tasked with ensuring that sufficient and suitable land is zoned for residential use, or for a mixture of residential and other uses, to meet the requirements of the projected population and to ensure that a scarcity of such land does not occur at any time during the period of the Development Plan.”*
- 2.7.1 Dublin City and Suburbs states that *“Lands at Clonburris have an approved SDZ Planning Scheme (2019) and represent a major expansion of the footprint of Clondalkin along the Dublin-Cork rail corridor. The Council will continue to actively promote the delivery of sufficient public transport and road capacity, in tandem with future development of the SDZ. Planning Schemes form part of the County Development Plan for the area and any contrary provisions of the Development Plan are superseded by the Planning Scheme.”*

The following map clearly illustrates the Clonburris SDZ within a MASP (Metropolitan Area Strategic Plan) Residential Growth Area.

Chapter 3 – Natural, Cultural and Built Heritage

According to the adopted SDDP *“Our cultural heritage assets are not static. However, Cultural heritage is a growing, ever-changing concept from generation to generation. Not everything can, or should be, preserved and what we retain, create, and build now will be our legacy for future generations, shaping their cultural identity. The changes that are likely as a result of biodiversity loss and climate change will also bring challenges to our heritage assets, potentially altering our landscapes and affecting the integrity of our built and our historic features. The challenge therefore is to manage the varied, inter-linking elements of our important cultural heritage resource in a truly sustainable manner, so that we can protect our heritage assets while promoting a quality of life and a sense of identity and pride in a vibrant, thriving County.”*

Natural Heritage

Section 3.3 of the Plan covers Natural Heritage. The site does not fall within any Natura 2000 sites, such as Special Areas of Conservation (SAC) and Special Protection Areas (SPAs).

The closest Natura 2000 Sites *Glenasmole Valley (SAC)* and *Wicklow Mountains (SAC & SPA)* are more than 5km distance from the proposed development.

The site does not fall within a Natural Heritage Areas (NHA) or proposed Natural Heritage Areas (pNHA) which are designated to conserve and protect species and habitats of national importance. The Plan identifies the Grand Canal as a pNHA and the proposed development site boundary is about approx. 220m north of the Grand Canal.

The Grand Canal is listed as one of seven proposed Natural Heritage Areas (pNHA) in South Dublin County. While the Grand Canal is not yet a designated Natural Heritage Area (NHA), adoption is in process and a certain degree of protection is afforded to pNHA under the Development Plan, which states the protection of the canal landscape and its environment as a priority. The Grand Canal is also an important industrial heritage of the county as noted in 3.4.5 Industrial Heritage and states the following:

“The Grand Canal (pNHA) is an artificial linear waterway that hosts a rich variety of habitats and plant and animal species, including protected species. It acts as a direct national link and an ecological corridor between the River Shannon and Dublin Bay and is a key element in South Dublin County’s ecological and green infrastructure network. The Grand Canal is recognised as a proposed Natural Heritage Area.”

The following policies are relevant in this context:

“Policy NCBH1: Overarching - Protect, conserve and enhance the County’s natural, cultural and built heritage, supporting its sensitive integration into the development of the County for the benefit of present and future generations.”

“Policy NCBH2: Biodiversity - Protect, conserve, and enhance the County’s biodiversity and ecological connectivity having regard to national and EU legislation and Strategies.” A separate Biodiversity Plan has been produced specifically for the development of the Clonburris SDZ Planning Scheme in order to appropriately address this policy.

“Policy NCBH4: Proposed Natural Heritage Areas - Protect the ecological, visual, recreational, environmental and amenity value of the County’s proposed Natural Heritage Areas and associated habitats and species.”

“Policy NCBH5: Protection of Habitats and Species Outside of Designated Areas - Protect and promote the conservation of biodiversity outside of designated areas and ensure that species and habitats that are protected under the Wildlife Acts 1976 to 2018, the Birds Directive 1979 and the Habitats Directive 1992, the Flora (Protection) Order 2015, and wildlife corridors are adequately protected.”

Areas of Significant Amenity Value

Dublin Mountains and Grand Canal among others are identified as key natural assets and offer important heritage and significant amenity value. These are also identified as green corridor and landscape features within the South Dublin Green Infrastructure (GI) Strategy. Section 3.3.4 Areas of Significant Amenity Values has the following policies;

“Policy NCBH6: Dublin Mountains - Protect and enhance the visual, environmental, ecological, geological, archaeological, recreational and amenity value of the Dublin Mountains, as a key element of the County’s Green Infrastructure network.”

“Policy NCBH9: Grand Canal Protect and promote the Grand Canal as a key component of the County’s Green Infrastructure and ecosystem services network, and protect and enhance the visual, recreational, environmental, ecological, industrial heritage and amenity value of the Grand Canal, recognising its sensitivities as a proposed Natural Heritage Area with adjacent wetlands and associated habitats.”

Tree and Hedgerow Protection

According to Section 3.3.6 Protection of Trees and Hedgerows of the Plan, the application lands are not subject to any tree preservation orders. However, it is advised to protect and retain existing trees, hedgerows, and woodlands which are of amenity and / or biodiversity and / or landscape value. Relevant Policy;

“Policy NCBH11: Tree Preservation Orders and Other Tree / Hedgerow Protections - Review Tree Preservation Orders (TPO) within the County and maintain the conservation value of trees and groups of trees that are the subject of a Tree Preservation Order while also recognising the value of and protecting trees and hedgerows which are not subject to a TPO.”

Cultural Heritage and Built Heritage

Archaeology

Section 3.4 of the Plan covers Cultural Heritage and Built Heritage. Cultural Heritage is considered as the link between natural and built heritage; comprising the human influence on the natural environment, including our landscapes with their field patterns, our industrial heritage of mill buildings, canal locks and weirs.

Chapter 13 of this EIAR covers Cultural Heritage, Architectural Heritage and Archaeology prepared by IAC Archaeology.

The proposed development site has one archaeological feature recorded as Sites and Monuments Record (SMR). This is an enclosure with the ref no: DU017-036 with the description *“Situated in rough pasture on fairly level ground N of a stream. An aerial photograph taken in 1971 (FSI 206/5/4) shows a cropmark of an elongated oval enclosure (est. dims. NE-SW c. 34m; NW-SE c. 22m). Not visible at ground level.”* Relevant Policies:

“Policy NCBH13: Archaeological Heritage - Manage development in a manner that protects and conserves the Archaeological Heritage of the County and avoids adverse impacts on sites, monuments, features or objects of significant historical or archaeological interest.”

Architectural

The site does not lie within an Architectural Conservation Areas (ACA). The nearest ACA is Clondalkin Village, approx. 1.6km from the proposed development.

There are a number of protected monuments, archaeology or built heritage that are not directly affected by the proposed development, namely; Omer Lock House(Reg no. 11205011), 11th Lock (Reg no. 11205012) and 10th Lock (Reg no. 11205013).

Grange Castle is an archaeological, architectural and historical monument of regional quality and lies about 1.8km south-west of the proposed development site boundary. This historic castle / fortified house is listed under NIAH ref: 11208013 and Record of Protected Structures (RPS) for South Dublin under the number 132 as ruins of a stone tower house.

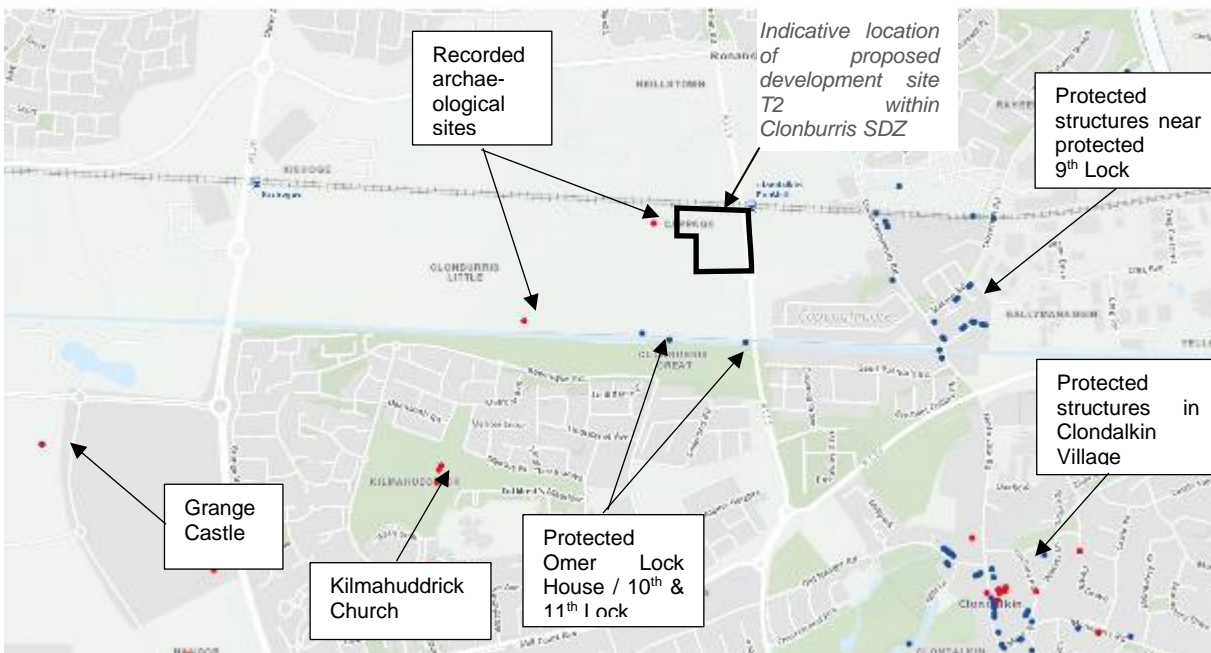
Omer Lock House is an architectural monument of regional quality. This historic lock keeper’s house is listed under NIAH ref: 11205011 and under South Dublin RPS no.122. These remains of a house are located inside the Clonburris SDZ, approx. 280m distance from the proposed development site boundary. It was observed during site visits that the visual connection between the Omer Lock House and the proposed development would be low due to intact and dense vegetation to be retained along the Grand Canal.

The 10th Lock (of the Grand Canal) is listed under South Dublin RPS no. number 123 as a single-stage canal lock, approx. 280m from the proposed development site boundary. The 11th dock (of the Grand Canal) is listed in the RPS for South Dublin under the number 128 as a single-stage canal lock, approx. 450m from the proposed development’s site boundary.

The following policy is relevant in this context:

“Policy NCBH19: Protected Structures - Conserve and protect buildings, structures and sites contained in the Record of Protected Structures and carefully consider any proposals for development that would affect the setting, special character or appearance of a Protected Structure including its historic curtilage, both directly and indirectly.”

Figure 9.5 – Mapped Monuments / Protected Structures (Source: NIAH Historic Viewer)



Chapter 4 – Green Infrastructure

South Dublin County contains a wide range of biodiversity-rich areas. Hence, biodiversity is expressed as a key strategic theme to provide Green Infrastructure in the county. The Development Plan notes that the County’s Green Infrastructure network comprises an interconnected network of green spaces that possess a broad range of ecological elements including inter alia: core areas such as the County’s three Natura 2000 sites; proposed Natural Heritage Areas (pNHA), the Liffey Valley, Dodder River Valleys and the Grand Canal; and individual elements such as watercourses, parks, hedgerows/ tree-lines and sustainable drainage features in park lands.

Section 4.2.1 Biodiversity sets out the following Policy and Objectives:

“Policy GI2: Biodiversity Strengthen the existing Green Infrastructure (GI) network and ensure all new developments contribute towards GI, in order to protect and enhance biodiversity across the County as part of South Dublin County

Council's commitment to the National Biodiversity Action Plan 2021-2025 and the South Dublin County Council Biodiversity Action Plan, 2020-2026, the National Planning Framework (NPF) and the Eastern and Midlands Region Spatial and Economic Strategy (RSES)."

"GI2 Objective 1: To reduce fragmentation and enhance South Dublin County's GI network by strengthening ecological links between urban areas, Natura 2000 sites, proposed Natural Heritage Areas, parks and open spaces and the wider regional network by connecting all new developments into the wider GI Network."

"GI2 Objective 2: To protect and enhance the biodiversity and ecological value of the existing GI network by protecting where feasible (and mitigating where removal is unavoidable) existing ecological features including tree stands, woodlands, hedgerows and watercourses in all new developments as an essential part of the design and construction process, such proactive approach to include provision to inspect development sites post construction to ensure hedgerow coverage has been protected as per the plan."

Section 4.2.5 Landscape, Natural, Cultural and Built Heritage of the Plan is concerned with the range of natural and man-made assets of heritage value in the County. These include areas of importance for biodiversity, such as watercourses, woodlands and cultural assets such as important monuments, buildings and landscapes. Natural heritage plays an important role in defining the character of South Dublin.

The County contains a diverse range of landscapes that are both important ecological habitats as well as areas of natural beauty. Natural, cultural and built heritage also contribute to placemaking at the local level, where people develop a cultural and sensual attachment to their natural environment. A key challenge for the Plan is to balance the protection of our heritage and landscapes with the management of change in a manner that enhances rather than diminishes heritage and landscape features, structures, buildings, sites and places of special interest. The following policy and its objectives are relevant:

"Policy GI7: Landscape, Natural, Cultural and Built Heritage Protect, conserve and enhance landscape, natural, cultural and built heritage features, and support the objectives and actions of the County Heritage Plan."

"GI7 Objective 1: To protect, conserve and enhance natural, built and cultural heritage features and restrict development that would have a negative impact on these assets in accordance with the provisions of Chapter 3: Natural, Cultural and Built Heritage of this Development Plan."

"GI7 Objective 2: To protect and enhance the landscape character of the County by ensuring that development retains, protects and, where necessary, enhances the appearance and character of the landscape, in accordance with the provisions of South Dublin's Landscape Character Assessment and the provisions of Chapter 3: Natural, Cultural and Built Heritage of this Development Plan."

Further to Chapter 3 Natural, Cultural and Built Heritage, Section 4.3.2 Strategic Corridor Objectives identifies the Grand Canal as Strategic Corridor 3. The Canal offers significant opportunities for recreation and amenity which must be appropriate to its status, at a time of biodiversity loss, as a key biodiversity corridor.

Chapter 5 – Quality Design and Healthy Placemaking

Section 5.2.2 Context refers to the character and setting of the area in which a proposed development will be located. This includes the natural as much as the human heritage of the area:

"In facilitating growth over the last two decades, Adamstown has been developed as a sustainable neighbourhood within a strategic growth area. Clonburris and Tallaght Town Centre alongside regeneration lands within the wider Tallaght Neighbourhood have been identified as areas capable of accommodating significant future growth over the lifetime of this and future plans."

Section 5.2.5 Public Realm notes the importance of high-quality public realm provision in order to achieve successful and sustainable neighbourhoods. How effectively and efficiently the public realm works is a vital component of the day-to-day life and experience within a neighbourhood and local area.

Section 5.4.2 Strategic Development Zones clearly sets out the direction to implement the approved planning scheme for Clonburris as stated in *"Policy QDP15: Strategic Development Zones (SDZS) Continue to implement the approved Planning Schemes for Adamstown and Clonburris SDZs."* and *"QDP15 Objective 1: To support the delivery of the identified infrastructure to facilitate sustainable development in South Dublin's Strategic Development Zones."*

Chapter 6 – Housing

Section 6.0.2 Housing, Healthy Placemaking and Climate Action states that *“Housing should be delivered in a manner which facilitates the needs of a diverse range of people, providing a balance in terms of unit mix and tenure types. The design, function and layout of housing schemes, when done well, contributes significantly towards the delivery of healthy placemaking. Locating new housing in the right location ensures ease of movement by active modes to existing amenities, services and places of work. This facilitates a move away from car-based and unsustainable travel patterns thereby reducing emissions.”*

Section 6.7.2 Private and Communal / Semi-Private and Public Space states *“Policy H8: Public Open Space Ensure that all residential development is served by a clear hierarchy and network of high quality public open spaces that provide for active and passive recreation and enhances the visual character, identity and amenity of the area.”*

Chapter 7 – Sustainable Movement

According to this chapter the development of sustainable towns and cities should involve the ‘10-minute neighbourhood’ or the ‘connected neighbourhood’ concept, whereby the services people need in their daily lives are located a short walking or cycling distance from their home and work. This concept facilitates active travel modes, essentially walking and cycling and the use of public transport to create compact, vibrant and walkable urban areas. Sustainable movement, in tandem with compact growth and connected neighbourhoods sits at the core of the County’s placemaking approach. This results in the design of new development for active travel modes, near public transport routes and nodes, and at increased density and building height, while decreasing private car use.

Section 7.7.1 Strategic Road Network lists the Newlands-Fonthill Road (R113) and the Outer Ring Road (R136) as key orbital routes traversing the area of the application lands. These will be subject to *“Policy SM4: Strategic Road Network - Improve and, where necessary, expand the County-wide strategic road network to support economic development and provide access to new communities and new development areas.”*

Section 7.7.2 New Street and Road Proposals are to include the Clonburris / Kishogue Street Network for various streets within the Clonburris SDZ lands to form a strategic network providing optimised access.’

Chapter 8 – Community Infrastructure and Open Space

Section 8.7 Parks and Public Open Space notes that public open space is one of the County’s most important and valued resources. It plays a particular role in relation to the setting and function of the urban neighbourhoods of the County and is central to the delivery of sustainable communities and the promotion / protection of biodiversity.

Section 8.7.1 Principles Guiding Public Open Space Provision states *“Policy COS5: Parks and Public Open Space – Overarching Provide a well-connected, inclusive and integrated public open space network through a multi-functional high-quality open space hierarchy that is accessible to all who live, work and visit the County.”*

Section 8.7.5 Quality of Public Open Space states *“COS5 Objective 8: To ensure the design of parks and public open space areas is of high quality; to provide a pleasant setting, accommodate use by people of all ages and abilities, to support life-long activity and good health and well-being by the provision of a balanced mix of active and passive recreation and access to, or view of, nature, ensuring that the design considers: Provision of an appropriate mix of hard and soft surfaced areas / Enhancement of biodiversity and existing trees and hedgerows / Incorporation of water courses, other natural features and existing built heritage into the design of parks and open spaces as appropriate / Provision of new planting, landscape features and appropriate site furniture including a variety of accessible, well located and designed seating.”*

Landscape Character Assessment of South Dublin County 2022 (Appendix 9)

Policies and objectives related to Landscape, Views and Prospects are covered under Chapter 3 of the development plan. Appendix 9 Landscape Character Assessment of South Dublin County Council designates Landscape Character Areas, its value and sensitivity for the county lands.

South Dublin has a particular responsibility for landscape management by providing the western and southern backdrop to the greater Dublin area and bay. The Dublin foothills and mountains frame the large metropolitan area and provide an important natural and recreational area for thousands of inhabitants and visitors to the city.

The proposed development site lies within the defined Landscape Character Area LCA 5 Suburban South Dublin. This LCA shows the following key characteristics:

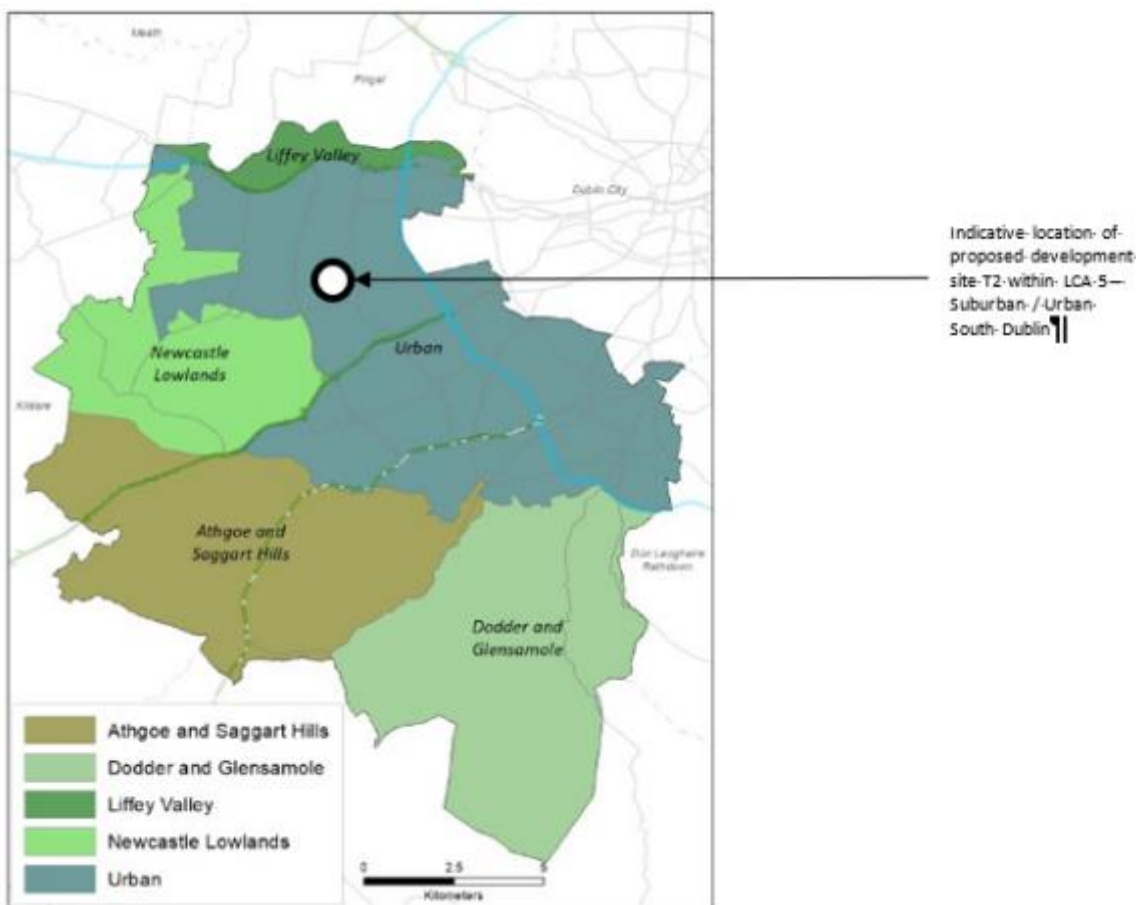
- Suburban area with extensive housing estates and industrial /commercial parks. Variety of house styles and layouts dating from the late 19th century to late 20th century
- Settlements of Rathfarnham, Templeogue and Clondalkin with important historical legacy and remnants
- Major traffic corridors with M50 traversing in a north-south direction through the area, and the Red Luas line travelling from Tallaght north, parallel to the M50, to city centre
- Corridors of natural and semi-natural vegetation, notably along the River Dodder (a linear park), the River Camac and the Grand Canal
- Grassed open spaces in gardens, industrial parks, golf courses, school playing fields, and miscellaneous spaces in housing areas
- Street trees planting
- Recreational facilities – public parks and golf courses - provide amenities and ecological resources

The landscape values of public parks with recreational and ecological resources, industrial heritage and views to the Dublin Mountains and agricultural hinterland are exposed to forces of change such as:

- West boundary is set against agricultural and mountain hinterlands. Untidy urban developments can adversely impact on the character of the hinterlands
- Urban developments can impact on open views to the hinterlands
- Continuous urban infrastructure developments notably road improvements generate increasing volumes of traffic and detract from opportunities to create or maintain tranquil settings
- New infill or other built developments can be insensitive to remnant historical or vernacular features

The Landscape Character Area 2 - Newcastle-Lowlands is approx. 2.0km south-west of the proposed development site. The built-up nature of the area is noted and the presence of major roads, railway, the Grand Canal, housing areas, grassy spaces, industrial areas and parks, as well as the backdrop of rural and upland views. In general, prospects of the Dublin Mountains are to be preserved however specific viewpoints or scenic routes are not identified in close proximity to or relevant to the site.

Figure 9.6 – Landscape Character Areas (Source: SDDP)



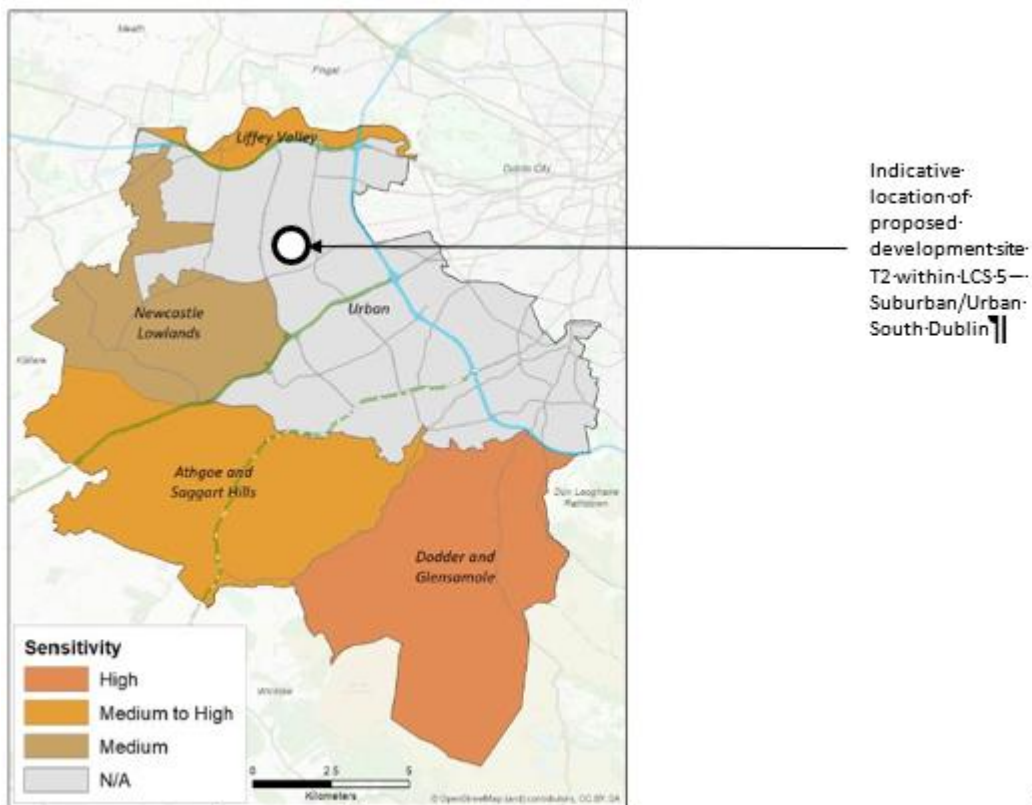
The proposed development site itself is located approx. 6.5km from the foothills of the Dublin Mountains. The views out to the Dublin Mountains and to the rural hinterland are of particular importance here. The following principles for development within LCA 5 have been identified:

- “Grassland and other amenity area open spaces should be managed for the dual benefits of public access and biodiversity
- Tree and shrub planting should be an integral component of amenity grasslands (schools recreational grounds, golf courses and playing fields)
- The development of green infrastructure to connect different habitats within the urban context.
- Tree planting on streets and open spaces – particularly on ‘miscellaneous’ open space in housing areas - to improve their character
- Enhance connectivity between open spaces as a means of enhancing biodiversity while providing off road connections for pedestrians and cyclists.
- Proposed developments should be audited for their impact on views particularly those to the rural hinterland of the county.”

Landscape Character Sensitivity, Visual Sensitivity and Landscape Values inform the Landscape Capacity of an area. However, the Grand Canal as a Landscape Character Type, approx. 220m distance from the proposed development site boundary is categorised in a *Low to Medium Sensitivity*, and described as:

“Artificial watercourses of historic importance. Embankments are a feature and frequently alignment is closely associated with the railway lines. Woodlands and habitats associated with the canal are important ecological features. Offers an accessible recreational area for urban dwellers.”

Figure 9.7 – Landscape Character Areas and Sensitivity (Source: SDDP)



The following Policy is relevant in context:

“Policy NCBH14: Landscapes - Preserve and enhance the character of the County’s landscapes, particularly areas that have been deemed to have a medium to high Landscape Value or medium to high Landscape Sensitivity and to ensure that landscape considerations are an important factor in the management of development.”

Views and Prospects

The Plan contains many scenic views and prospects of places of natural beauty of interest. However, there are none in close proximity of the site and none oriented towards the site. Relevant Policy;

“Policy NCBH15: Views and Prospects Preserve Views and Prospects and the amenities of places and features of natural beauty or interest including those located within and outside the County.”

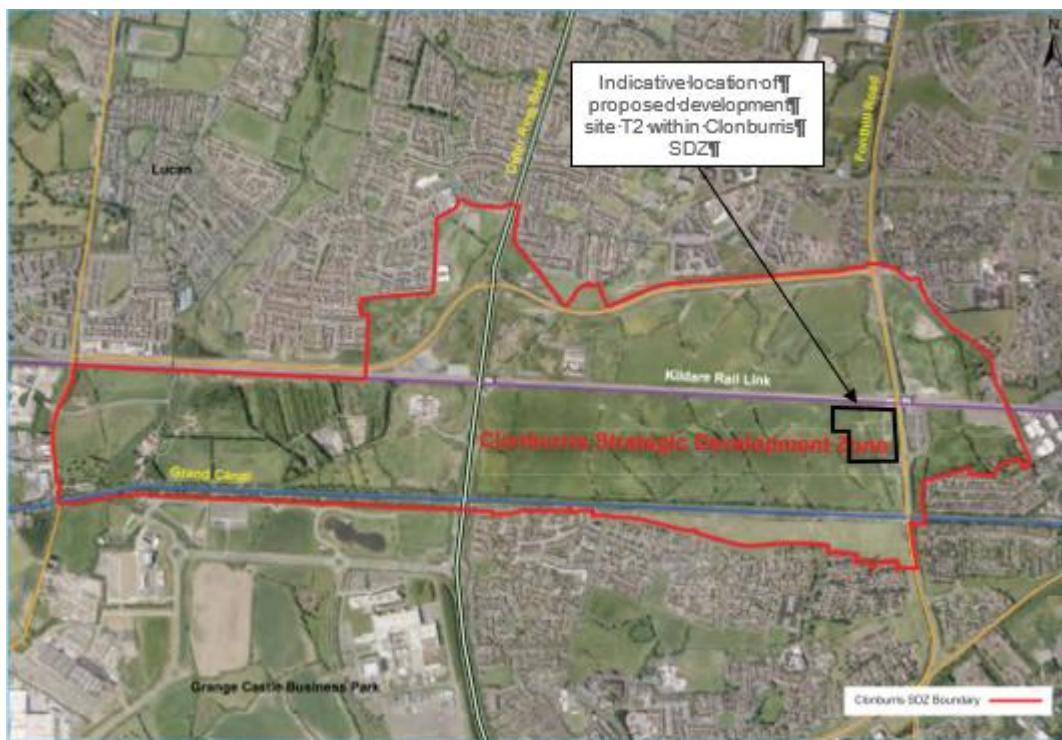
Clonburris Strategic Development Zone Planning Scheme 2019

The Clonburris Strategic Development Planning Scheme 2019 (*hereafter referred to as the Planning Scheme*) is an overarching document covering the SDZ lands. As identified before, the proposed development site lies within the boundary of Clonburris Strategic Development Zone (SDZ).

The SDZ lands, as shown in the below figure, covers approx. 280 hectares of South Dublin lands. The SDZ is located to the west of Dublin City Centre and the M50 – within the triangle between Lucan, Clondalkin and Liffey Valley. The SDZ lands are bisected east to west by the Dublin-Cork Railway line and by the Grand Canal to the south.

There are two train stations within the SDZ lands, the Clondalkin-Fonthill station to the East which is operational and the Kishoge station in the central section of the SDZ lands which is constructed but not operational yet.

Figure 9.8: SDZ map (Source: Clonburris SDZ Planning Scheme 2019)



Some of the key overarching principles for the delivery of the Planning Scheme are:

- The sustainable development of the SDZ lands as detailed in the accompanying Strategic Environmental Assessment Report, and that associated environmental assessments (which includes this EIAR document) are applied and adhered to in the Planning Scheme implementation
- The direction of land-uses and densities across the SDZ lands in a way that creates a sustainable urban district, based on the integration of land-use and transport planning.
- Optimising appropriate access to and use of the Grand Canal, in an ecologically sensitive way, thereby offering unique selling points to the SDZ Planning Scheme
- Delivering a network of high quality green and blue infrastructure spaces and public parks while protecting, enhancing and upgrading the natural, built and cultural assets in a sensitive manner.
- Using the latest urban design principles to provide attractive, interesting and well used outdoor spaces, that create a pedestrian-centred environment with active, inviting public space, parks and private gardens
- Retaining and enhancing architectural heritage within the SDZ lands by encouraging conservation and incorporation including adaptive re-use, where appropriate

For the entity of the SDZ lands, the Planning Scheme states:

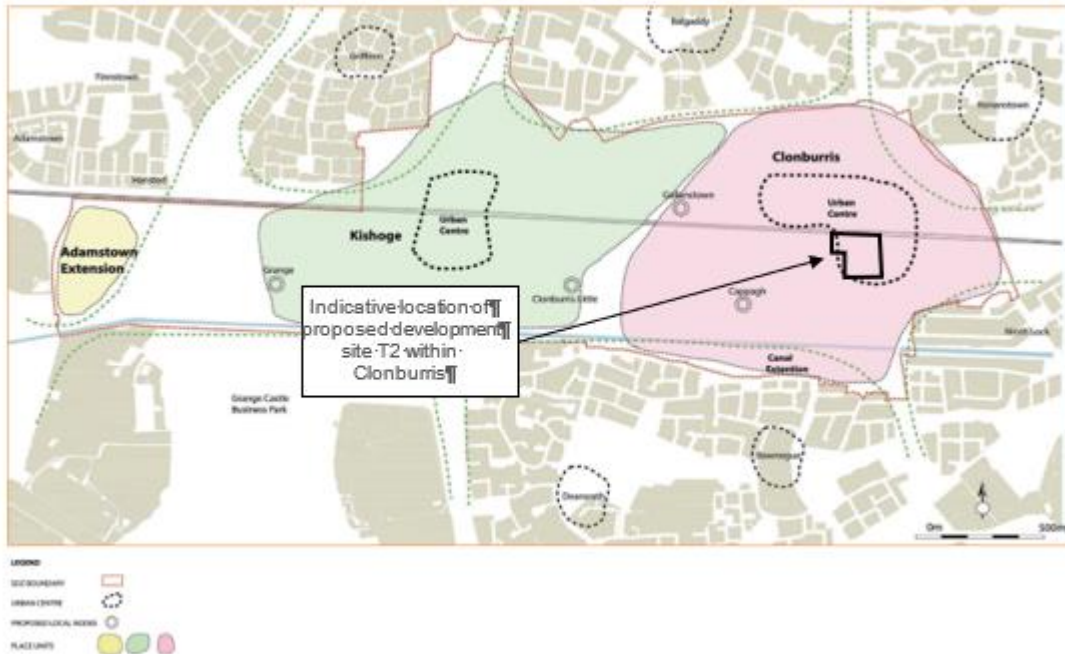
“The scale and potential of the site, together with the extent of existing and planned public transport opportunities, services and infrastructure, and showcasing sensitive use of key site assets such as the Grand Canal, Griffeen Valley Park and other natural features, provide an excellent basis for the development of a forward thinking and vibrant new community in South Dublin County.”

Character Areas and Development Areas

The Planning Scheme establishes three broad Character Areas namely, a) Clonburris; b) Kishoge and c) Adamstown Extension. Further to the above, there are three basic land use areas; residential areas, mixed-use areas and open spaces areas.

Each character area is divided into development areas with two centres, one at Kishoge and one at Clonburris focused around the existing railway stations.

Figure 9.9 – Character Areas (Clonburris SDZ Planning Scheme 2019)



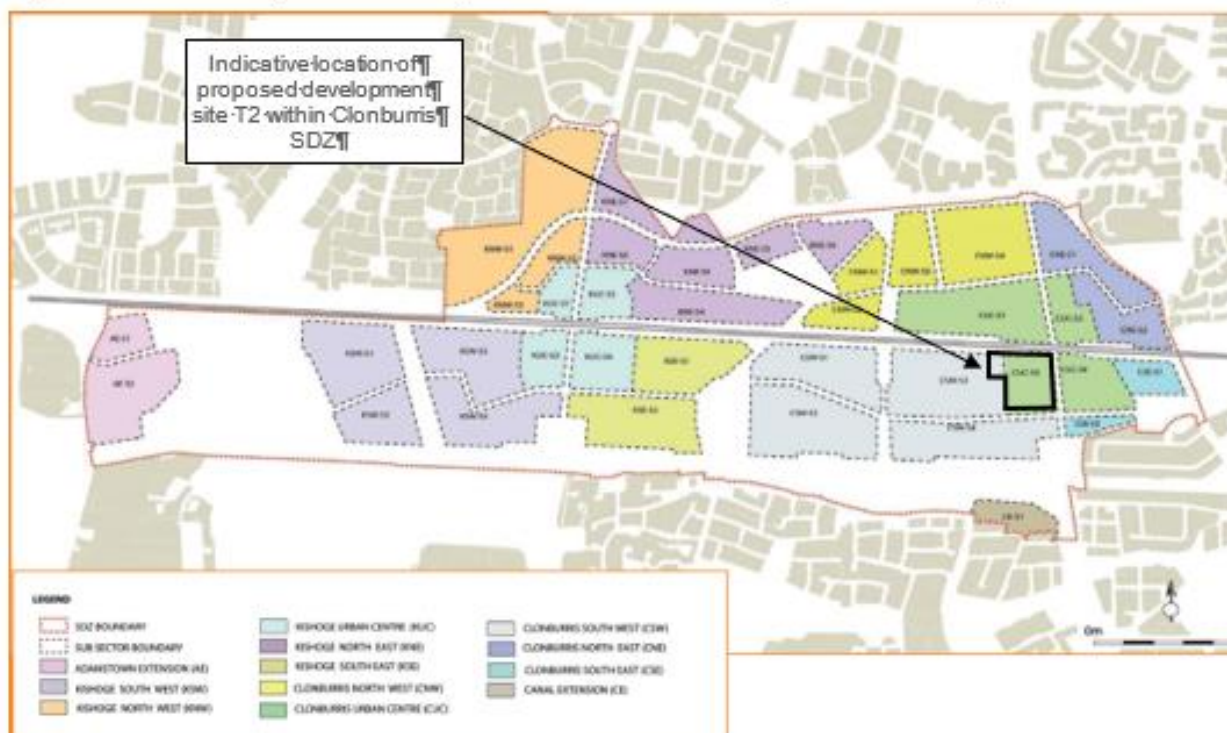
The proposed development site for T2 is on the lands of CUC-S3, Clonburris Urban Centre S3, and a portion of Clonburris South West S3,. The majority of the site will form part of the Clonburris Urban Centre within the Clonburris Character Area. The Clonburris Urban Centre will be developed to provide a high quality mixed use district centre that serves the community of Clonburris and surrounding communities. The Clonburris Character Area is described as:

“The Clonburris Character Area will comprise clustering of residential, retail and commercial uses to form a centre located around the Clondalkin Fonthill Railway Station. The centre will comprise medium to high density development located close to the public transport hub of heavy rail and planned Core Orbital bus services. Civic and community uses will also locate at the Clonburris centre and will contribute to the creation of an active and busy centre organised around a high quality designed Urban Square at its retail core. Development will transition outwards from the centre to medium and lower density residential development with local nodes, community floorspace, schools and high quality open spaces. Development will benefit from park and canal frontage to the south and west.”

Some of the Key Objectives for Development Area 1 - Clonburris Urban Centre that are relevant are:

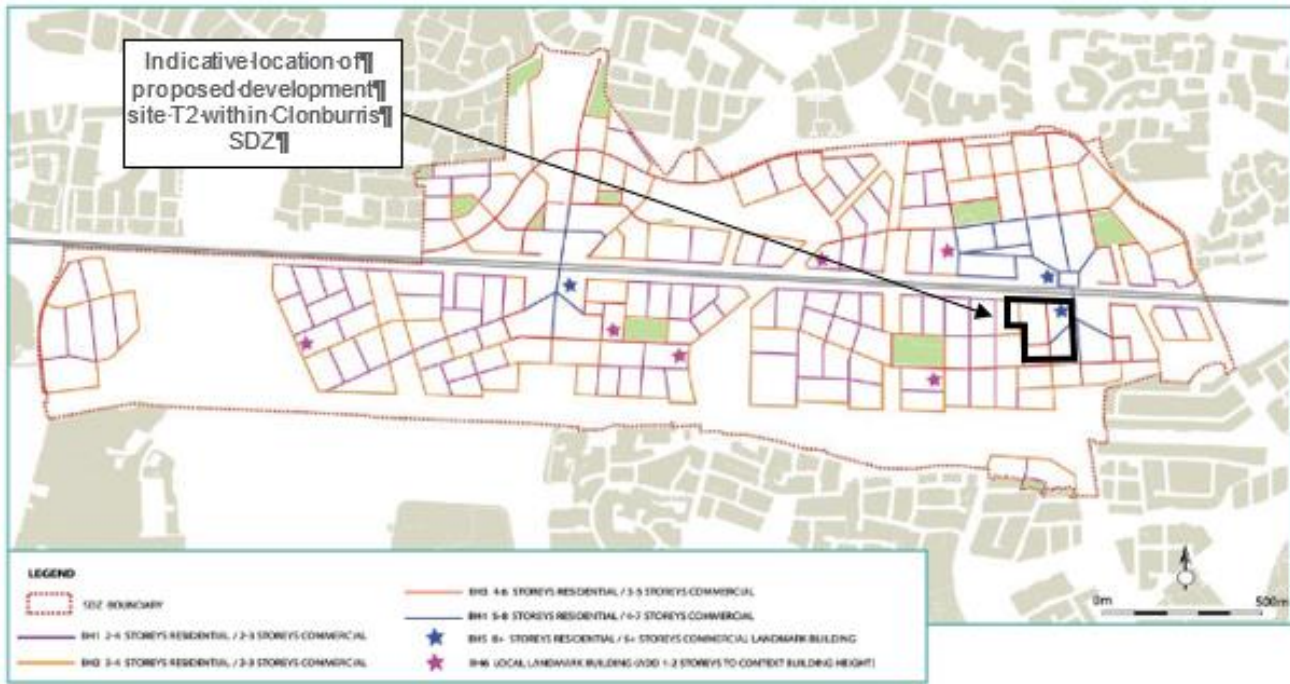
- To develop a high quality mixed use District Centre to serve the community of Clonburris and surrounding communities
- To develop a significant multi-purpose civic building for the entire SDZ area and surrounding communities
- To ensure high levels of legibility and ease of orientation
- To achieve high levels of permeability, particularly for pedestrians and cyclists
- To provide for transport interchange at the railway station, in particular, connecting rail, bus and cyclists
- To provide a new civic space for Clonburris, which will serve as multifunctional business and social focal space
- To achieve good levels of continuity and enclosure along the arterial streets, link streets / avenues and the urban spaces, including Clonburris South West S3

Figure 9.10 – Development Areas (Clonburris SDZ Planning Scheme 2019)



The Clonburris Urban Centre Character type has the description; *“The area will contain a diverse, mixed use development, containing the main retail, commercial and civic uses for the new urban centre based around a public plaza and a transport interchange on Fonthill Road North. A major public plaza; Clonburris Square will be located in the north-west section of the Urban Centre, to form a dynamic, vibrant place which will form part of the urban identity of the lands as a whole.”*

Figure 9.11 – Building Height Strategy (Source: Clonburris SDZ Planning Scheme 2019)



Section 2.8.6 of the Planning Scheme, Building Heights and Street Widths states that varied building heights are supported across the SDZ lands to promote place making, urban legibility and visual diversity. Appropriate building height to street width ratios shall be incorporated across the SDZ lands so that a sense of enclosure along streetscapes is promoted and maintained.

“Building heights have been designated under this Planning Scheme in a manner that recognises the importance of place making and also reflects other aspects of this scheme including density and urban structure requirements such as the primacy of Urban Centres, Link Streets and Arterial Streets. Designated building heights along Arterial and Link Streets have been determined by street width and proximity to the urban centres. Lower building heights are therefore required along Local Streets to provide a more intimate scale with the exception of park frontages where a modest increase in scale shall be utilised to provide adequate enclosure.”

Of particular importance is the following objective for Landmark Buildings:

“In the interest of place making and improving legibility, Local Landmark Buildings and Landmark Buildings are permissible at key locations that will punctuate both urban centres and designated local nodes.

Buildings that exceed the prescribed general buildings heights shall only be provided at these designated landmark locations, An additional 1-2 storeys is permissible for Local Landmark Buildings and 8+ storeys in the case of residential buildings are permissible for Landmark Buildings, subject to a maximum height of 42 metres (above street level) in the case of the Clonburris Landmark Building.

Landmark buildings shall be vertically proportioned as towers. Building design as opposed to building height is the key determinant in producing an acceptable Landmark Building and such buildings should be subject to architectural design competition prior to planning application.

Landmark Buildings should therefore be designed in a manner that is distinctive from surrounding buildings both in terms of architectural treatment and use of materials. To further emphasise their place-making function, Landmark Buildings shall incorporate high quality public realm treatment in terms of surrounding street planting, furniture, lighting and materials etc. The design of such buildings shall therefore be based on a coherent design concept that is clearly communicated via a Design Statement and Landscape Plan. In addition to the above Design Statements for Landmark Buildings shall also analyse and illustrate the impact of the proposed development in relation to its immediate and wider context including views/vistas within and beyond the SDZ lands and in terms of sunlight and daylight effects.”

Section 2.10 Landscape and Open Space of the Planning Scheme notes the provision of approx. 90ha of open space, in the form of strategic open space (such as Grand Canal Park), local parks and squares and urban spaces.

A Parks and Landscape Strategy (incorporating a Biodiversity Management Plan) will be provided comprising the entire SDZ area and informing the design of the application lands within.

Section 2.10.4 Strategic Routes and Local Links of the Planning Scheme, in particular identifies the Railway Ecological Corridor and the Grand Canal Ecological Corridor as critical routes within the SDZ lands in order to provide uninterrupted passes throughout a vast swathe of countryside, through an array of habitats and to be used by a number of species for commuting between various habitats.

In addition to the identified primary ecological corridors, more than 30km of hedgerow/treeline habitat exist within the SDZ lands. This habitat linking the Grand Canal Corridor and the Railway Corridor should be retained where possible. Where these hedgerows cannot be retained, a new hedgerow network composed of the same species shall be planted along proposed routes within the development. Equally, where possible, trees along the SDZ lands boundaries should be protected and retained.

9.4.1.2 Summary of Planning Context

The following points summarise key issues from the planning system relevant to the landscape assessment process:

- Extensive policy supportive of major land use and landscape change – greenfield to urban - throughout the SDZ lands
- Guidance on development layout, scale grain and typology from the SDZ and Development Plan policy, Land Use / Urban Form, Design and Placemaking / Housing / Movement / Community Infrastructure and Open Space
- The SDZ sets out a masterplan and high quality design criteria for individual development sites to comply with and deliver
- Limited sensitive Built and Cultural Heritage in the immediate receiving environment – one Archaeological feature within the site and the Grand Canal and associated protected structures (including Omer Lock House) to the south. The potential for a heritage centre at Omer Lock House is identified
- Key Green Infrastructure identified including the Grand Canal (pNHA) and general protection of trees, hedgerows and natural heritage
- Site location within LCA 5 Suburban South Dublin – no sensitivity identified and varied and developing urban character acknowledged
- Grand Canal corridor categorised as Low to Medium sensitivity
- No protected views however prospects of the Dublin Mountains valued

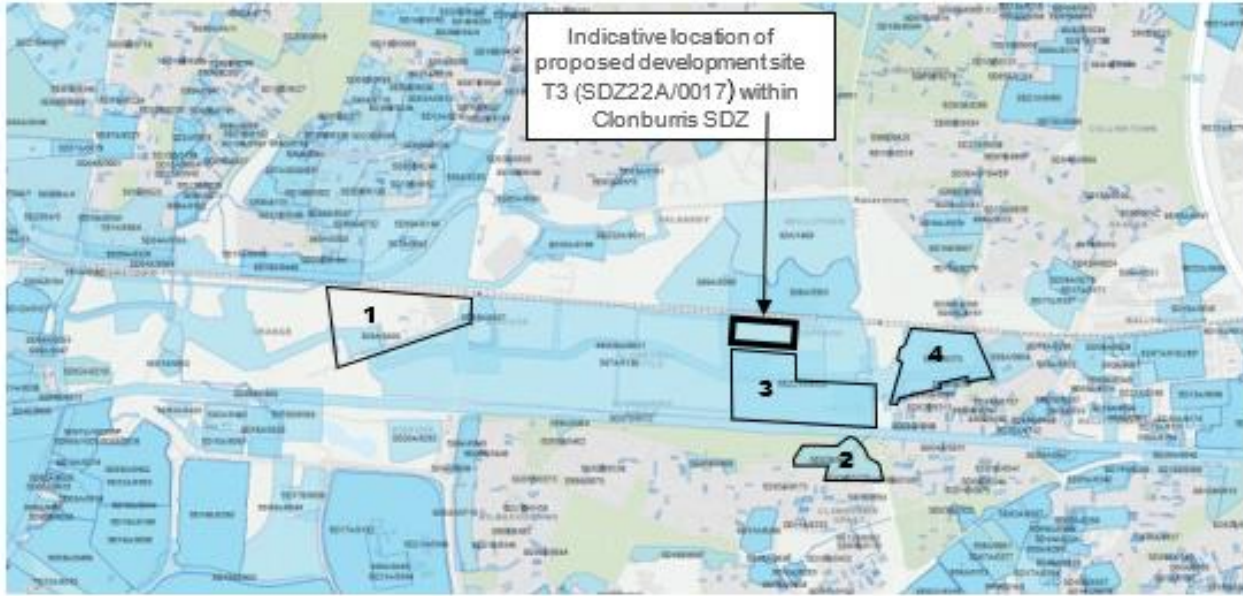
9.4.2 Relevant Planning History / Decisions

The SDZ Planning Scheme was approved in 2019. The majority of the Planning Scheme lands are not developed yet however many tiles or development areas are under design development or under planning process.

Relevant projects currently in the planning process are:

1. SD228/0003 SDCC Part 8 Approval for Social and Affordable Housing development comprising of 263 residential units.
2. SD228/0001 SDCC Approved Part 8 for 118 residential units made up of houses, duplexes, triplexes, an apartment build.
3. Tile 1 (T1) SDZ21A/0022 – Grant permission for Phase 1A Cairn of 569 dwellings, a creche, innovation hub and open space.
4. SDZ22A/0010 – Decision Due for Kelland Homes of 294 no. dwellings, creche and ritual / commercial unit. Further Information lodged on the 28th of November 2022.
5. SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements – granted 26th September 2022.
6. SDZ21A/0006 - Wastewater pumping station granted permission 8th November 2022.
7. SDZ22A/0017 Tile 3 (T3) application 158 no. dwellings lodged 2nd December 2022.

Figure 9.12 – Planning Applications in Process (SDCC Planning Maps Online)



Therefore, the transition of the area has already begun and is reflective of the zoning use, objectives and policies relating to the SDZ lands.

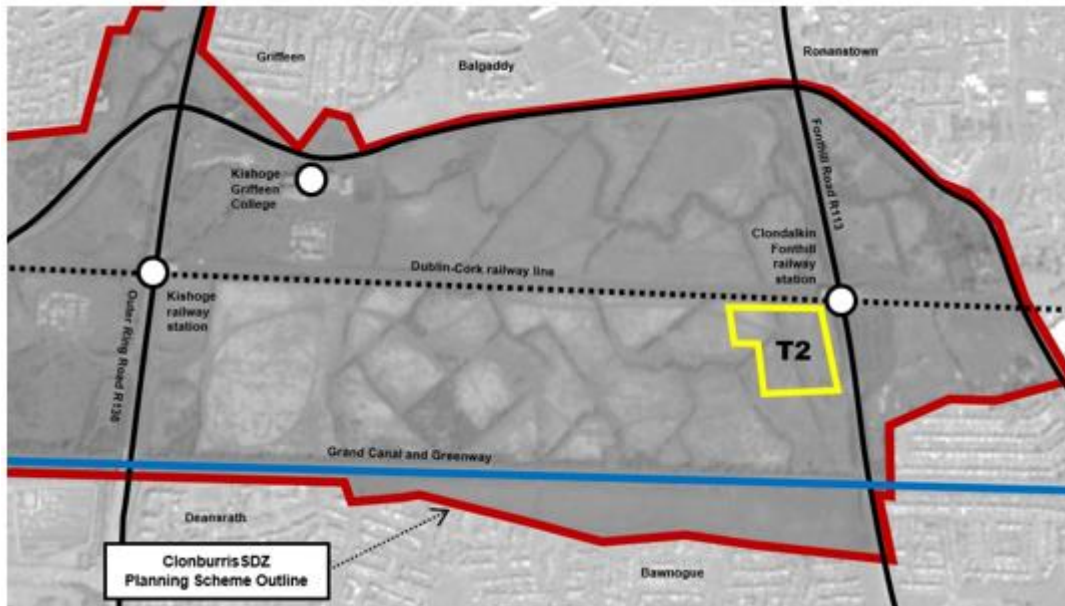
9.4.3 Landscape Baseline: Description of the Site and Environs

9.4.3.1 Site Location and immediate Context

The proposed development site consists of approx. 5.18 hectares of former agricultural lands with associated hedgerow and drainage features within the wider SDZ lands described in Section 9.4.1 above. The boundaries of the site itself are clearly defined by the Fonthill Road R113 to the east and by the Dublin-Cork railway line to the north while the south and the west site boundary lines are arbitrary and not defined by existing field patterns. The not yet operational Clondalkin Fonthill Railway station building west of the Fonthill Road R113 is located on the north-east corner, immediately outside the proposed development site.

This south-east area of the SDZ in which the site is located has a very similar setting and character than the entire SDZ lands which consists of former agricultural fields and hedgerows in a traditional pattern albeit now disused.

The defining features of the proposed development site are the Dublin-Cork railway line to the immediate north and the Fonthill Road R133 to the immediate east. A public car parking area of approx. 1 hectare size is located directly opposite to the proposed development site, east of the R113. A round-about provides access to the car park and forms the south-east corner of the proposed development site. The proposed development site boundary is approx. 220m north of the Grand Canal and approx. 1.40km east of the Outer Ring Road R136.

Figure 9.13 – Site Location

Landform - Topography and drainage

The site is relatively flat overall, with gentle undulations over the extent of the entire SDZ lands within which the application lands sit. Level differences are marginal and occur naturally along the hedgerow lines. Drainage ditches are associated with the hedgerows. The SDZ lands fall slightly along drainage lines parallel to the railway corridor.

Landcover – Built Form, Vegetation and Cultural Heritage

The fields between the hedgerows formerly in pasture / agricultural use have become partially overgrown by native shrubs and vegetation spreading from the adjacent hedgerows. The hedgerows are mature and full generally with few taller individual or tree groups. Newer tree and shrub planting occurs near new transport infrastructure works along the railway line and along the R113 and R136 roads.

In general the SDZ lands and the site itself are clear of any intact buildings and structures at this location. The few historic features are associated with the Grand Canal including the former Lock Keepers House, Omer Lock House dating to 1790 and a protected structure. The building is named after Thomas Omer who was responsible for starting the construction of the Grand Canal in 1757. This historic manmade watercourse is an important part of the cultural heritage in the area. As well as the Omer Lock House and the waterway itself the 10th and 11th Locks add built heritage interest to the Grand Canal.

The Grand Canal is a proposed Natural Heritage Area (pNHA) forming an important ecological corridor identified by local planning policy as a significant element of blue and green infrastructure characterised by an intact local habitat host to a relatively rich/healthy biodiversity. The canal is lined by established vegetated zones with mature trees along the north and south sides of its banks.

The historic towpaths that run parallel to the canal still exist and are legible. The southern towpath has been converted to a walking and cycling Greenway, while the northern towpath is used as an informal trail, although is, in many sections, inaccessible.

It should be noted that the current modern railway line to the north of the site and SDZ is also a historic feature and corridor, a railway existing at this location dating back to the mid-19th century.

Figure 9.14 – Historic 6 inch OSI first edition map approx. 1832 (Source: OSI Maps)

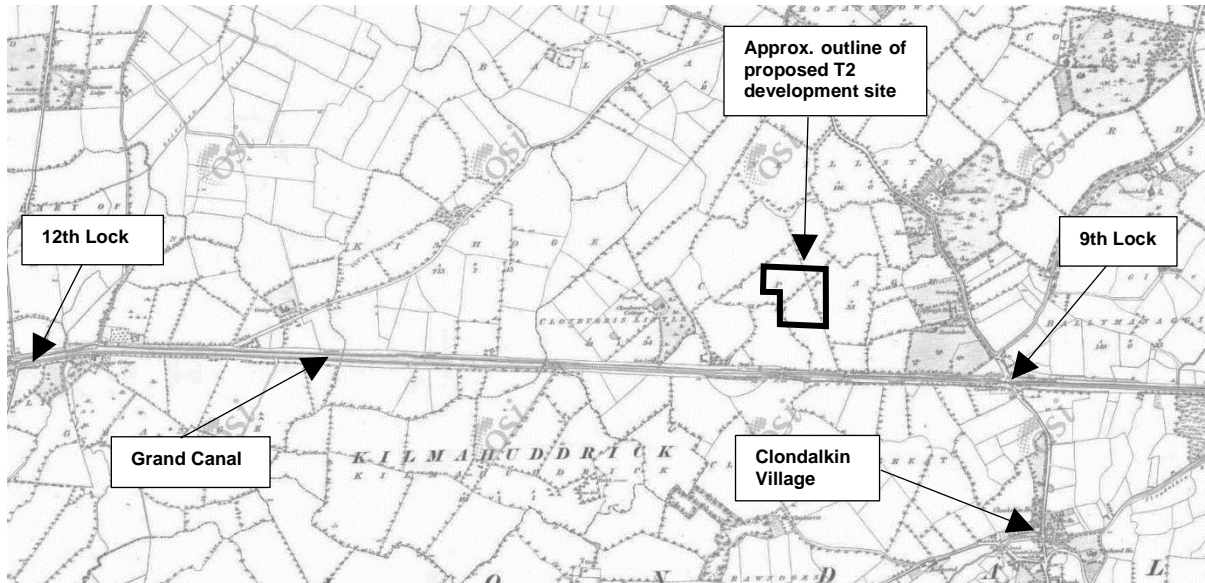
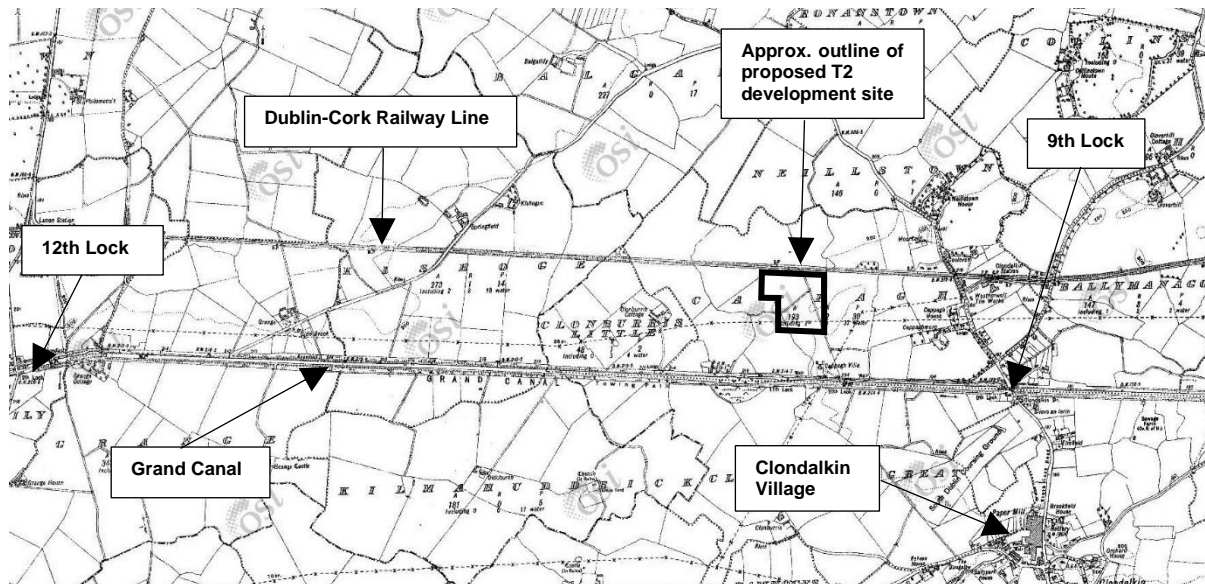


Figure 9.15 – Historic 6 inch OSI last edition map approx. 1846 (Source: OSI Maps)



Access

There is currently no direct access to the site. New roads and access will be created as part of the SDZ planning scheme.

Landscape Character and Visual Amenity

The site and wider SDZ lands are now a collection of neglected and partly overgrown agricultural fields defined by surrounding roads / transport routes and existing suburbs. They have little amenity or visual value. Their character is really urban fringe and lands in transition and their future value set out in the SDZ as high quality urban/ residential areas.

9.4.3.2 Wider Environs

Overview

The site is located within the Clonburris SDZ lands which cover currently vacant and unused pasture lands between the western Clondalkin suburbs and the Ronanstown area of Liffey Valley / Lucan to the north. The site and SDZ lands are served by the existing Clondalkin Fonthill railway station and potential future Kishoge railway station giving easy access to Dublin City Centre less than 10km to the east. The nearby historic village of Clondalkin with its 8th

century round tower and its associated suburbs lie between the N7 Naas Road to the south, and the M50 to the east. The once rural village of Clondalkin expanded rapidly in the latter part of the twentieth century and is now a significant suburb of Dublin and the second largest urban concentration in South Dublin, after Tallaght. The SDZ and proposed site is part of this ongoing consolidation of the suburb taking advantage of location and infrastructure present.

Figure 9.16 – Clondalkin Village (left) and Griffeen Centre (right)



Land use, Transport and Settlement Pattern

The SDZ lands extend beyond the railway line to the north and the Grand Canal to the South, and west of the Outer Ring Road R136 and a short distance east of the Fonthill Road R113. The character of the SDZ remains much the same – disused urban fringe fields. Agricultural use has ceased here some time ago and the lands have not been managed since whilst awaiting long term development and anti-social activity including by motor vehicles - however in each direction the SDZ gradually merges with existing land-uses and established development.

To the north, beyond Thomas Omer Way lie the predominantly residential areas of Ronanstown and Balgaddy. The Kishoge and Griffeen Community College are key community focal points here. To the east the SDZ extends to the Ninth Lock Road which bounds the longer established suburbs and residential areas of Clondalkin. Travelling south along the Ninth Lock Road will lead to the village centre of Clondalkin and its historic round tower.

Figure 9.17 – Balgaddy residential area (left) and Ronanstown residential area (right)



South of the Grand Canal a linear park lies between the Canal and the residential areas of Bawnogue. The park is relatively undeveloped consisting of grass and some scattered trees. To the south-west (west of the R136) lies the Grange Castle Business Park containing large industrial uses as well as the historic Grange Castle and its small park setting. West of the R136 the SDZ lands extend for another approx. 1.5km.

Figure 9.18 – Bawnogue residential area (left) and Deansrath residential area (right)



The main transport infrastructure features in the area are the Dublin-Cork railway line and the Grand Canal (and its Greenway), both running in an east-west direction, and the three intersecting regional roads R113, R136 and R120, running in a north-south direction. This grid of infrastructure defines the core SDZ area within which the site sits, as well as the surrounding receiving environment.

Figure 9.19 – Grand Canal (left) and Dublin-Cork railway line (right)



The Clondalkin Fonthill railway station forms the junction of the railway line with the Fonthill Road R113. The currently non-operational Kishoge railway station forms the junction of the railway line with the Outer Ring Road R136. These stations are critical transport and economic nodes in the SDZ scheme and will define its future connectivity, attractiveness and success. A network of link and local roads spans the wider area and connects to the various residential neighbourhoods of Clondalkin, Ronanstown, Bawnogue, Deansrath, Griffeen, Hansted, Finnstown, Adamstown, and the Grange Castle Business Park.

Figure 9.20 – Lindisfarne Park along Grand Canal (left) and Kishoge and Griffeen College (right)



Landscape Character and Visual Amenity

The surrounding residential suburbs, making up the receiving environment, have developed over a period of 60 years with varying character and quality. In general they are laid out around new road infrastructure that is often wide, lacks scale and context, and is to a low density. Design of the buildings is functional and the associated streetscapes and landscapes underdeveloped although maturing.

Bawnogue to the south of the SDZ dates from the 1970s and is typical of public housing of this period – low rise and low density, functional with limited services and amenities including landscape quality.

The public open space in form of a linear green between Lindisfarne Park and the Grand Canal is a characteristic amenity of the area. Balgaddy to the north is similar to Bawnogue dating from the 1980s but with more variety of architecture and some private housing. However it also suffers from poor quality amenity and character. Both Balgaddy and Bawnogue exhibit a poor sense of place.

By contrast Grange Castle Business Park further west is an exemplary business campus in terms of architecture and landscape. It is likely to be unaffected by the proposed development due to distance.

East of the R113 and along the Ninth Lock Road are more established, mature, private housing areas with heritage walls and trees of old Clondalkin and a strong sense of place.

The overall character and visual amenity of adjacent residential areas ranges from high towards Clondalkin Village in an easterly direction, to low towards the north and south of the development site and SDZ lands.

Summary of Landscape Characteristics and Values

The values and characteristics of the site are listed below and can be categorised in two ways – values which should be conserved, and those that provide opportunity for enhancement. The conservation and enhancement values of the site are set out in this section.

Conservation values

The values to be conserved indicate those aspects of the receiving environment which are valued and sensitive and could be negatively impacted on by the proposed development. These are summarised below from the analysis in the previous sections. These include:

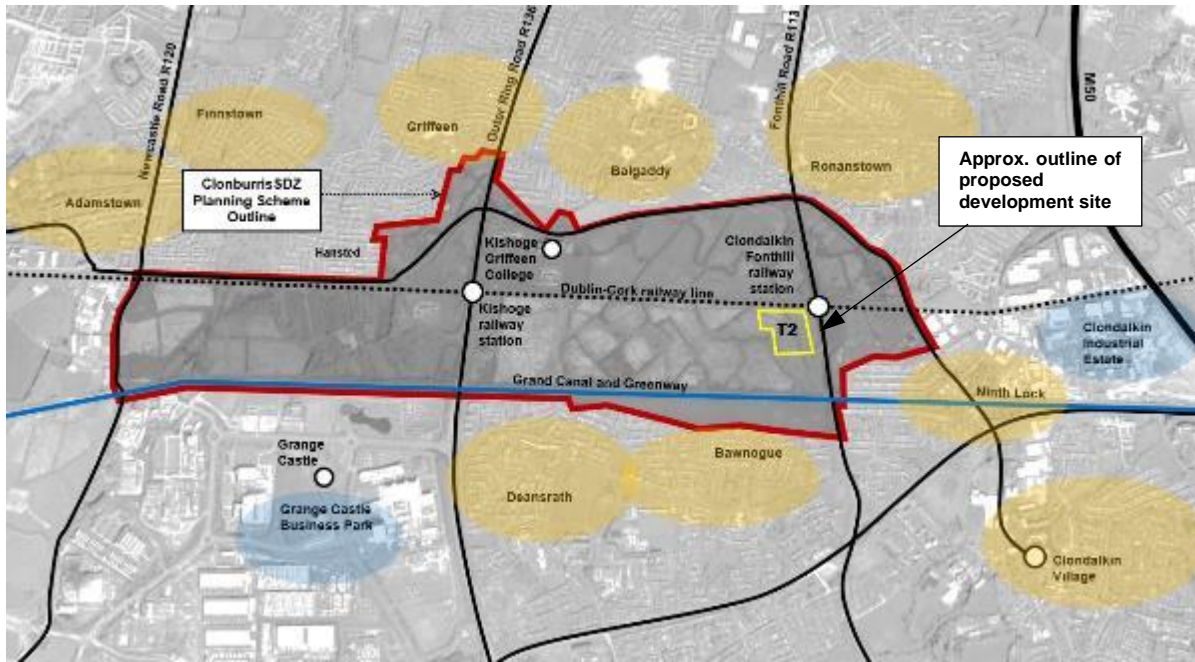
- Grand Canal corridor and associated natural (pNHA) and cultural heritage and Greenway
- Archaeological site features
- Mature, established character and built heritage of Clondalkin Village and older residential areas.

Enhancement values

The values to be enhanced represent the site's capacity to accommodate change and therefore reflect landscape susceptibility. These include:

- Extensive policy supporting and guiding development and major landscape change.
- Change underway through new developments in the planning process
- Extensive transport infrastructure already in place – roads and rail
- Underused nature of the Grand Canal and Greenway
- No protected views
- Neglected character of site and wider SDZ lands – lands in transition
- Limited sensitivities of the lands in terms of visual amenity, landscape structure other than hedgerows / field pattern
- Weak character of the built environment / receiving environment to the north and south of the SDZ lands

Figure 9.21 – Context



9.5 PREDICTED LANDSCAPE IMPACTS

9.5.1 Landscape Sensitivity

The proposed development site falls within the *LCA 5 – Urban South Dublin* where the landscape value and landscape sensitivity are not specified. The character of these lands is highly variable from sensitive heritage landscapes and villages to old style industrial and urban sprawl and fringe urban areas.

The Clonburris Planning Scheme lands (in which the proposed development site is located) is an area of and south of the SDZ boundaries, with more mature residential areas of Clondalkin to the east. The SDZ lands have been in neglect for a number of years and with the surrounding areas very much reflect an urban fringe environment in transition.

The proposed development site and its receiving environment were described in Section 9.4 above. They contain few valued elements, features or characteristics with the exception of the archaeological feature identified on site, local hedgerows and trees and the nearby Grand Canal pNHA and corridor.

The land is zoned as part of the Clonburris SDZ lands. The SDZ Planning Scheme provides a vision for the immediate environs and site. The Planning Scheme lands have a mix of residential, mixed-use, educational and open space land use. Presently, most of the SDZ lands are undeveloped however many tiles / development areas are either under design development and/ or in the planning process. Therefore, the area as whole is in transition.

Therefore, the **landscape sensitivity** of the receiving environment is classified as '**Low**' - *Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principle management objective is to facilitate change through development, repair, restoration or enhancement.*

9.5.2 Construction Stage Impacts and Effects on the Landscape

Construction Stage will be programmed over four years resulting in ongoing infrastructure, building and related works for that period of time. These are generally destructive and visually adverse in nature.

The landscape sensitivity is described above as **Low**. The magnitude of change would affect the receiving environment and would also affect the wider landscape setting at construction stage.

The **Magnitude of Change** is assessed as **Medium**.

Therefore, the landscape change is assessed to be of **Slight** significance and **Adverse** quality during Construction Stage.

9.5.3 Operational Stage Impacts and Effects on the Landscape

The impact of the development is the change of the site from open (neglected) fields to a new residential area. Locally some trees and hedgerows will be affected, however the proposals reflect the guidance of SDZ Planning Scheme.

The **Effect** of this in terms of alteration of the landscape character is assessed for the site as;

The **Magnitude of Change** is assessed as **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.*

(This reflects the Development Plan zoning and current nature of the site and the lands within the wider Clonburris SDZ Planning Scheme).

The effect is of **Slight** significance.

Qualitatively the landscape effect is **Neutral in the Short, Medium and Long Term**. - *Scheme complements the scale, landform and pattern of the landscape / townscape / view and maintains landscape quality.*

This recognises that the change in character from open field site in the urban fringes of South Dublin to urban is complementary to the existing land uses, reflects land use policy for the site and the SDZ guidance. Overtime the

new development will be part of urban place-making at this location consolidating the wider suburbs and repairing links and connectivity with new built development.

9.5.4 Cumulative Impact on the Landscape

As nearby approved and in planning areas of the SDZ are implemented the cumulative change would increase as the wider SDZ vision is realised.

The cumulative **Magnitude of Change** is assessed as **High** – *Change that is moderate to large in extent, resulting in major alteration to key elements features or characteristics of the landscape Such development results in change to the character of the landscape.*

The effect is of **Moderate** significance.

Qualitatively the **Landscape Impact** is assessed as **Beneficial** – *Scheme improves landscape or townscape view / quality and character, fits with the scale, landform and pattern and .repairs / removes damage caused by existing land uses.*

9.6 PREDICTED VISUAL IMPACTS

9.6.1 Zone of Visual Influence and Potential Visual Receptors

Based on the assessment of the landscape characteristics, values and sensitivities, 19 representative viewpoints were selected to assess the visibility of the site, visual impact and effects.

The landscape architect's site survey and verified views were conducted in July 2022.

The 19 representative views are listed below in Table 9.8 with a rationale for the selection of the viewpoint and the distance from the proposed development site boundary to the viewpoint.

Table 9.8 – Schedule of Viewpoints and Representative Visual Receptors

VP	Receptor and Views	Rationale for Selection	Approx. Distance from Site Boundary
1	Ninth Lock Road / Thomas Omer Way junction looking south	Long distance views. Representing road and railway users	520m
2	Clondalkin Fonthill railway station looking south-west	Close proximity views. Representing road and railway users	60m
3	R113 between railway station and roundabout looking west	Close proximity views. Representing road users	60m
4	R113 roundabout / junction of proposed link street looking north-west	Close proximity views. Representing road and proposed site users	50m
5	R113 bridge over Grand Canal looking north-north-west	Elevated views. Representing road users and open space users	270m
6	Grand Canal Greenway at Fonthill Road R113 bridge looking north-north-west	Representing open space users	280m
7	Walking / Cycling ramp to Greenway looking north-north-west	Representing open space users	320m
8	Bawnogue Road residential estate looking north-north-east	Representing residential users and open space users	400m
9	Grand Canal Greenway at Omer Lock House looking north-east	Representing open space users	240m

VP	Receptor and Views	Rationale for Selection	Approx. Distance from Site Boundary
10	Grand Canal Greenway at resting place looking north-east	Representing open space users	290m
11	Melrose Road residential estate looking east-north-east	Representing residential users and open space users	680m
12	Grand Canal Greenway at resting place looking east-north-east	Representing open space users	900m
13	Grand Canal Greenway at Outer Ring Road R136 bridge looking east-north-east	Long distance views. Representing open space users	1450m
14	R136 bridge over Grand Canal looking east-north-east	Long distance elevated views. Representing road users	1450m
15	Kishoge railway station looking east	Long distance elevated views. Representing open space users	1400m
16	Kishoge and Griffeen Community College looking east-south-east	Long distance views. Representing road users and college users	1050m
17	Tor An Rí Lane residential estate looking south-east	Long distance views. Representing residential users	810m
18	Cappaghmore residential estate looking north-west	Long distance views. Representing residential users	230m
19	Ninth Lock Road looking west	Long distance views. Representing road users	480m

Figure 9.22 – Location of Representative Viewpoints (provided by photomontage consultant)



Visual effects are assessed initially in the Construction Phase and thereafter in the Operational Phase.

Photography and presentation of viewpoints

Each Viewpoint is illustrated by a photograph showing the existing view and a photomontage, or technical visualisation, showing the proposed development.

Photographs and photomontages have been produced by 3D Design Bureau and are presented in a separate booklet with a map of their locations. Verified photographs and photomontages have been taken with a wide angle focal length (FL) and prime lens to allow representation of the development within its context. In all visualisations, the extent of the 50mm FL view has been indicated for reference, which is broadly equivalent to the c.40 degree Horizontal Field of View (HFoV) and is representative of what the human eye perceives and reflects the requirements TGN 06/19 *Visual Representation of Development Proposals* by the UK Landscape Institute 2019.

Each viewpoint is described below in two parts, firstly its existing (baseline) condition, and secondly to describe the predicted effects or change brought about by the proposed development. The descriptions, including the change / effects, focus primarily on the extent of the 50mm view but refers also to the wider context provided by the visualisation, as appropriate, to inform analysis.

To correctly view the photomontage at the appropriate scale the extents of the 50mm FL lens or 40 degree HFoV should be extended to A3 in size and viewed at arm's length. This can be done by printing a hard copy or, more easily, digitally on screen, allowing reference back to the wider angle visualisation to help understand the context.

Effects at Construction stage are briefly described. Effects at Operational Stage will be described in more detail.

9.6.2 Construction Stage Impacts and Effects on Visual Receptors

The construction stage is expected to be phased over 36-48 months. To allow for flexibility in the delivery of units, it is noted that the permission sought is for up to 7 years.

There will be moderate negative impacts associated with the construction works over a phased basis for this development. This will be due to the substantial site clearance and building processes required to construct the proposed development. Effects on visual receptors are tabulated according to the representative viewpoints below, but by their nature are predominantly adverse in nature, varying in magnitude and significance. All effects on visual receptors resulting from the construction stage are expected to last under four years and are all therefore considered temporary effects.

9.6.3 Operational Stage Impacts and Effects on Visual Receptors

Viewpoint 1 – Ninth Lock Road / Thomas Omer Way junction looking south

Existing View

The existing view looks along the R113 in a south direction towards the Clondalkin Fonthill railway station and the site to the west of the R113. The viewpoint is approximately 520m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.) at this junction and the adjacent residential community of Ronanstown.

In the foreground and middle-ground, the viewer is looking at the large road junction / crossroads including extensive road surfacing, footpaths, cycle lanes, traffic light controlled pedestrian crossings and high public lighting masts. The middle ground view of the R113 continues into the background towards the Clondalkin Fonthill railway station. The view onto the SDZ lands west of the R113 are screened by a line of mature trees while the view to the SDZ lands east of the R113 opens to typical field/hedgerow patterns. The southern horizon is formed by the Dublin Mountains.

The viewpoint is located at the main Road junction in the neighbourhood of Ronanstown, a residential suburban area of Clondalkin. Whilst the foreground of the view is dominated by the road junction, the middle distance along the Fonthill Road, and further east towards the Dublin Mountains is an attractive evolving landscape composition. The viewpoint is representing road users passing through Ronanstown and local residents using the road, cycle lane or footpaths.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public*

transport, where they are partly but not entirely focused on the landscape. The visibility onto the SDZ lands changes throughout the year depending on seasonal vegetation status.

Visual Impacts and Effects

The top three floors of the proposed commercial building immediately south of the railway station are clearly visible against the horizon line of the Dublin Mountains while the other proposed building at lower height are mostly screened by existing vegetation. It is expected that growing vegetation will screen this visibility further over time. Otherwise the view would remain unchanged. The silhouette of the proposed development is complementing the backdrop of the Dublin Mountains. The overall compositional result to this view is the addition of an additional built element appearing small and partial in the background. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **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 essentially the character of the view or the visual amenity.*

The Significance of Visual Impact is assessed as **Moderate** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Beneficial** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility. The viewer sees buildings at the location where new development will add to placemaking with increased social, economic and transport activity.

Cumulative Impact

The various schemes of future development within the Clonburris SDZ lands, and on adjacent SDZ sites will change the character and setting of the existing view significantly and will alter this view and possibly partly screen the view of the future buildings on the T2 site. The majority of future developments of the Clonburris South-West Area will not be visible behind existing vegetation and fence structures in the middle ground. General maturing vegetation, particularly lining the Fonthill Road will reduce this effect further over time. Therefore, the cumulative impact will be of low significance and neutral.

Viewpoint 2 – Clondalkin Fonthill railway station / R113 looking south-west

Existing View

The existing view is taken from the eastern footpath of the R113 at the crossing with the Dublin-Cork railway line and the Clondalkin Fonthill railway station, looking in a south-west direction. The viewpoint is approximately 60m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.) and the adjacent residential communities passing or accessing the railway station.

In the foreground the viewer is looking at the road with western footpath bordered by a stone clad parapet wall to the railway. The future access gate to the railway station towards the south is fenced off. In the middle-ground the railway station structure frames the view to the north while dense tree and shrub vegetation frame the view to the south. The centre view opens up to trees on the Clonburris pasture lands and plant structures of the Grange Castle Business park behind vegetation on the horizon.

The viewpoint is located at a strategic transport node, between road and railway and dominated by railroad structures and associated infrastructure which break the vegetation screen along the R113. The viewpoint is representing road users passing this node and local residents using the road, cycle lane or footpaths to either pass or access the railway station. Particularly motorists using the Park & Ride car park to the immediate south-east of the railway station experience this view.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or are accessing public transport, where they are partly but not entirely focused on the landscape.* The visibility onto the SDZ lands changes throughout the year depending on seasonal vegetation status.

Visual Impacts and Effects

The northern section of the proposed development towards the Clondalkin Fonthill railway station is clearly visible. However, the existing wall that lines the western footpath screens the lower floors of the new structures in the middle ground. Existing vegetation frames the southern section of the proposed development. Maturing vegetation will

reduce the visibility of the new residential structures over time while the majority of the commercial building immediately south of the railway station will remain visible. This visibility appears suitable in the context and proximity of the proposed urban centre and transport node at this location. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as High - *Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features and introduces uncharacteristic elements to the suburban residential context, resulting in changes to the composition and overall character of the view and visual amenity.*

The Significance of Visual Impact is assessed as **Significant** with a clear visual and physical addition to the existing and changing suburban residential, commercial and transport environment while maturing vegetation will progress to screen visibility.

The Quality of Visual Impact is assessed as **Beneficial** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment, with a positive contribution to placemaking and creating an urban centre at this location and with an overall enhancing addition to the local character of a growing built environment and community.

Cumulative Impact

The various schemes of future development within the Clonburris SDZ lands will not change the character and setting of the existing view. Future development along the Fonthill Road R113 will not be visible behind the buildings of T2 and behind the screen of existing vegetation and future planting, with their potential to further mature and lessen any potential impact. It is concluded that a cumulative impact does not exist.

Viewpoint 3 – Fonthill Road R113 between railway station and roundabout looking west

Existing View

The existing view is taken from the eastern footpath of the R113 approximately halfway between the railway station and the future SDZ access point from the R113, looking in a west direction. The viewpoint is slightly elevated and approximately 60m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.) and the adjacent residential communities passing or approaching the railway station.

In the foreground the viewer is looking at the road with western footpath bordered by a metal fence. The middle-ground is formed by a screen of dense vegetation, consisting of trees and shrubs. A view of the background and horizon would be partially visible in the winter and partly spring and autumn when foliage is reduced.

The viewpoint is set at a geographic location of the R113 where an elevational eastern view of the proposed development behind the existing vegetation is theoretically possible for viewers passing. The viewpoint is representing road users on the R113 between Ronanstown and Clondalkin and local residents using the road, cycle lane or footpaths.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape. The visibility of the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The proposed development is in clear view in the middle ground and obstructs any background views of the SDZ lands. Existing trees and proposed tree planting on the falling terrain behind Fonthill Road frame this view partially, with denser screening to the south than towards the railway station to the north. Due to the raised viewpoint on the slightly elevated road only the upper floors of the proposed buildings are visible whereas the ground floor and surrounding landscaping is not discernible. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **High** - *Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features and introduces uncharacteristic elements to the context of former agrarian and now disused lands, resulting in changes to the composition and overall character of the view and visual amenity.*

The Significance of Visual Impact is assessed as **Significant** with a clear visual and physical addition to the existing and changing suburban residential, commercial and transport environment while maturing vegetation will progress to screen visibility over time.

The Quality of Visual Impact is assessed as **Neutral** - *Scheme complements the scale, landform and pattern of the landscape view and maintains landscape quality* - a positive contribution to placemaking and creating an urban centre at this location and with an overall enhancing addition to the local character of a growing built environment and area of South Dublin.

Cumulative Impact

The various schemes of future development envisaged within the Clonburris SDZ lands will not change the character and setting of the existing view. Future development along the Fonthill Road R113 will unlikely be visible behind the screen of existing vegetation and future planting, with the potential to further mature and lessen any potential impact. It is concluded that a cumulative impact does not exist.

Viewpoint 4 – Fonthill Road R113 junction with proposed link street looking north-west

Existing View

The existing view looks from the existing Fonthill Road R113 roundabout in a north-west direction. This location marks the future access point from the R113 into the Clonburris SDZ and the existing access to the Park & Ride car park east of the R113 behind this viewpoint. The viewpoint is approximately 50m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.) and future residents and visitors to the SDZ lands.

The foreground is characterised by the roundabout, its barriers and access gates with road blocks towards the future link road. In the middle-ground the viewer is looking at slightly undulating, disused pasture lands which are framed by views onto hedgerows and trees in the background. Parts of the not yet opened section of the Clondalkin Fonthill railway station building are visible in the east background. A line of high voltage power pylons is discernible on the horizon.

The viewpoint is located at a future strategic transport node where road users will experience views towards the proposed development in various directions, in particular when entering the Clonburris SDZ lands and when exiting the Park & Ride car park for Clondalkin Fonthill railway station on the opposite side of the road. The viewpoint is representing road users on the R113 between Ronanstown and Clondalkin and existing and future local residents using the road, cycle lane or footpaths.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers perceiving their surroundings from this viewpoint are primarily engaged in travelling and will be moving at slow to moderate speeds. They are partly but not entirely focused on the landscape.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The proposed development visually defines the foreground and the middle ground with residential buildings of five to seven floors. Designed soft and hard landscaping is visible, in the foreground and stretching to the background in a west and a north direction. None of the existing disused agrarian land is discernible in this view. The Clondalkin Fonthill railway station is screened by proposed trees and shrubs between the road and the new buildings. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **Very High** - *Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features and introduces uncharacteristic elements to the context of former agrarian and now disused lands, resulting in changes to the composition and overall character of the view and visual amenity.*

The Significance of Visual Impact is assessed as **Very Significant-Significant** with a very clear visual and physical modification to the existing and changing suburban residential, commercial and transport environment while maturing vegetation will progress to screen visibility.

The Quality of Visual Impact is assessed as **Beneficial** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment, with a positive contribution to placemaking and creating an urban centre at the central site entrance from the Fonthill Road and with an overall enhancing addition to the local character of a growing built environment and community.

Cumulative Impact

The various schemes of future development within the Clonburris SDZ lands will only change this view slightly. Future development on sites T3 (SDZ22A/0017), T4 and T5 will be discernible in the background. A generally maturing vegetation will change this view through additional screening. Therefore, the cumulative impact will be of slight significance and beneficial, contributing to the introduced setting of an urban neighbourhood.

Viewpoint 5 – Fonthill Road R113 bridge crossing Grand Canal looking north-north-west

Existing View

The existing view looks from the Fonthill Road R113 bridge crossing the Grand Canal at the 10th Lock in a north-north-west direction towards Balgaddy. The viewpoint is approximately 270m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.), recreational users entering the Grand Canal Greenway at this location and the residential communities between Ronanstown and Clondalkin.

The bridge parapet and the 10th Lock of the Grand Canal are the dominant features in the foreground, including a view of the northern towpath. In the middle-ground, the viewer is looking at thickets parallel to the canal and towpath, behind that hedgerows, trees and disused pasture lands. A line of telephone poles crosses the fields in the middle ground. The background is formed by a belt of vegetation, made of trees, bushes and hedgerows with structures of the Balgaddy residential estate being discernible on the horizon.

The viewpoint is located at the crossroads between the Fonthill Road R113 and the Grand Canal. Road users are experiencing long distance views of the linear features of the Grand Canal and of the Clonburris fields from here. Particularly for pedestrians and cyclists it is perceived of scenic value and a gate to the Greenway. The viewpoint is representing road users between Ronanstown and Clondalkin and local residents using the road, cycle lane or footpaths for commuting and recreational purposes. However, this view focusses on the disused fields and the length of Fonthill Road while the scenic values of the canal are not visible here.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers considered of high susceptibility, such as locations where viewers are travelling but dependent on mode and speed are experiencing a unique view of the landscape, with characteristic heritage features.*

Visual Impacts and Effects

The proposed development with residential buildings of 6-7 storeys is clearly discernible in the far middle ground screening any views of the railway and Balgaddy on the horizon. Existing fields with hedgerows retain the dominant features in the closer middle ground while existing vegetation along the banked Fonthill Road conceals views of the east section of the proposed development. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **High** - *Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features and introduces uncharacteristic elements to the context of former agrarian and now disused lands, resulting in changes to the composition and overall character of the view and visual amenity. The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).*

The Significance of Visual Impact is assessed as **Significant** with a clear visual and physical addition to the existing and changing suburban residential, commercial and transport environment while maturing vegetation will progress to screen visibility.

The Quality of Visual Impact is assessed as **Beneficial** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment, with a positive contribution to placemaking and creating an urban centre at this location and with an overall enhancing addition to the local character of a growing built environment and community.

Cumulative Impact

The various schemes of future development within the Clonburris SDZ lands, particularly the development of site T1 (SDZ21A/0022) will change this view considerably. Future development on adjacent SDZ sites might be partially discernible in the background while it is unlikely that any new structures on nearby sites outside the SDZ lands will be visible. Maturing existing vegetation immediately north of the canal and future planting will change this view through additional screening. Therefore, the cumulative impact will be of moderate significance and beneficial, adding a positive composition into an urban community with a presence towards the Fonthill road and an ecological corridor towards the Grand Canal.

Viewpoint 6 – Grand Canal Greenway at Fonthill Road R113 bridge looking north-north-west

Existing View

The existing view looks from the Grand Canal Greenway, which runs parallel along the south of the canal and is in a north-north-west direction. The viewpoint is approximately 280m from the site boundary and is representative of views experienced by recreational users of the Greenway, mostly pedestrians and cyclists moving west along the Grand Canal towards the Omer Lock House in the direction of Adamstown.

The 10th Lock of the Grand Canal is a protected structure and dominant feature in the foreground while the northern towpath is hardly discernible. In the middle-ground, the viewer is looking at thickets lining the northern towpath parallel to the canal. The line of trees and shrubs in the middle ground screens the view of the background and horizon from this location. A telephone line and posts are only barely discernible through the trees and scrubs in the middle ground. Partial visibility of the disused pasture fields behind the thickets is possible during autumn, winter, spring with reduced foliage.

The viewpoint is located at the bottom of the pedestrian/cycling access ramp leading down from the Fonthill Road R113 to the Grand Canal. The 10th Lock comes into view after passing the Greenway underpass under the R113 and is considered of scenic value of the Grand Canal heritage. The viewpoint is representing recreational users who use the Greenway for shorter and longer distances and local residents who are entering the Greenway at this access point from the R113 for various recreational purposes.

The Viewpoint Sensitivity is classified as **High** – *Viewers considered of high susceptibility, such as locations where viewers are travelling but are experiencing a unique view of the landscape, with characteristic heritage features.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The foreground view will not be changed by the proposed development. The upper levels and roof lines of proposed residential buildings will be partially visible in the middle ground behind the thick and maturing vegetation lining the canal towpath. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **Low** – *Minor intrusion of the development into the view, or introduction of elements that are characteristic in the suburban residential context, resulting in minor alteration to the composition and overall character of the view but no change to visual amenity.*

The Significance of Visual Impact is assessed as **Moderate-slight** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment, with a generally complementary effect on the existing landscape and visual quality for Greenway users passing this location.

Cumulative Impact

The various schemes of future development within the Clonburris SDZ lands, particularly the development of area T1 (SDZ21A/0022) will change this view with further residential buildings in the middle ground. Future development on adjacent SDZ sites might be partially discernible in the background. Maturing existing vegetation immediately north of the canal and future planting will change this view through additional screening. Therefore, the cumulative impact will be of moderate significance and beneficial, adding to the transformation into an urban community with a presence towards the Fonthill road with an ecological corridor towards the Grand Canal.

Viewpoint 7 – Walking / Cycling ramp to Greenway looking north-north-west

Existing View

The existing view is taken from approximately midpoint of the pedestrian/cycling access ramp between the Fonthill Road R113 and the Grand Canal Greenway looking in a north-north-west direction. The viewpoint is approximately 320m from the site boundary and is representative of views experienced by recreational users, mostly pedestrians and cyclists accessing the Greenway to move either east or west along the linear route parallel to the Grand Canal.

The view is of the tarmacked path and the dense vegetation of smaller trees and larger shrubs in the left and right foreground. The middle ground opens up at the bottom of the ramp towards the canal allowing a view onto the Clonburris fields and parts of the Clondalkin Fonthill railway station in the background. Visibility of the background behind the dense vegetation will change during autumn, winter, spring with reduced foliage.

The viewpoint enables channelled long distance views along the dropping ramp onto the SDZ lands in the direction of the proposed development. The framing effect of the vegetation enhances the expectation of a possibly scenic view opening up at the bottom of the ramp where it meets the linear open area of the Grand Canal Greenway. The viewpoint is representing recreational users who use the Greenway for shorter and longer distances and local residents who are entering the Greenway at this access point from the R113 for various recreational purposes.

The Viewpoint Sensitivity is classified as **High** – *Viewers considered of high susceptibility, such as locations where viewers are walking and cycling and are experiencing a unique view of the landscape, with characteristic heritage features.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The foreground view will not be changed by the proposed development. The southern front and the eastern edge of the proposed buildings will be partially visible between the vegetation lining the walking / cycle path in the foreground, and between the hedgerows and trees along the Grand Canal towpath in the middle ground. The existing view of the Clondalkin Fonthill railway station remains unaltered and might change with maturing existing and proposed vegetation. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **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 essentially the character of the view or the visual amenity.*

The Significance of Visual Impact is assessed as **Significant** with a clear visual and physical addition to the existing and changing suburban residential, commercial and transport environment while maturing vegetation will progress to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment, with a complementary effect on the existing landscape and visual quality for Greenway users passing this location. Beneficial as a positive contribution to placemaking and creating an urban centre at this location and with an overall enhancing addition to the local character of a growing built environment and area of South Dublin

Cumulative Impact

The various schemes of future development envisaged within the Clonburris SDZ lands will not change this view because it will be screened by buildings on site T2 or by existing dense vegetation immediately north of the canal and by proposed planting which will further mature. It is concluded that a cumulative impact does not exist.

Viewpoint 8 – Bawnogue Road residential estate looking north-north-east

Existing View

The existing view looks along Bawnogue Road in a north-north-east direction towards the road bend into Lindisfarne Park. The viewpoint is approximately 400m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, pedestrians etc.) of which a large proportion are from the local residential community of Bawnogue/Lindisfarne Park.

The foreground is structured by the single carriageway with tree lined verges and footpaths on either side. In the middle ground the viewer sees a residential garden wall to the west and high residential garden hedges to the east which frame the expanse of the streetscape. The background opens up to a view of the green open space north of Lindisfarne Road stretching towards the Grand Canal and Greenway, whose views are screened by a line of trees and shrubs that form the horizon line. The Clonburris SDZ lands are not visible from here and reduced foliage during autumn, winter, spring will only change the visibility slightly.

The viewpoint is on a neighbourhood link road of Bawnogue, a predominantly residential suburban area of South Dublin. Bawnogue Road is on a local bus route which makes this view more prominent for a larger user group. The viewpoint is representing road users passing through the neighbourhood of Bawnogue and local residents using the road, cycle lane or footpaths.

The Viewpoint Sensitivity is classified as **High** – *Residential receptors considered of high susceptibility, such as locations where viewers are travelling at low speed, walking and cycling and are experiencing a unique view of their local green open space, of good physical and visual quality.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The foreground and middle ground view will not be changed by the proposed development. The upper levels and roofline of the group of proposed buildings will be partially visible on the horizon behind the existing vegetation along the Grand Canal. The horizon line will be marginally altered in the location of the proposed development. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **Negligible** – *Very minor intrusion of the development into the view, or introduction of elements that are characteristic in the suburban residential context, resulting in minor alteration to the composition and overall character of the view but no change to visual amenity.*

The Significance of Visual Impact is assessed as **Slight-Not Significant** with visual and physical integration of the distant and partially discernible proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** without any perceptible change to the existing and changing suburban residential, environment and neighbouring communities, therefore not contributing to any changes to character or quality of the area experienced and viewed from this location.

Cumulative Impact

The various schemes of future development within the Clonburris SDZ lands will only change this view marginally with outlines of buildings vaguely discernible on the horizon. A generally maturing vegetation will reduce this view through additional screening. Therefore, the cumulative impact will not be significant and neutral.

Viewpoint 9 – Grand Canal Greenway at Omer Lock House looking north-east

Existing View

The existing view is taken from the Grand Canal Greenway looking at the derelict, overgrown and fenced in Omer Lock House, a protected structure, in a north-east direction. The viewpoint is approximately 240m from the site boundary and is representative of views experienced by recreational users, mostly pedestrians and cyclists using the Greenway and stopping for a look at the derelict and overgrown building while moving either east or west along the linear route of the Greenway, immediately south and parallel to the Grand Canal.

The view is of the tarmacked path and the vegetation forming the canal banks in the foreground. The middle ground shows the front elevation of the derelict Omer Lock House with dense vegetation of trees and shrubs to the east of the ruin, in the direction of the proposed development. Behind the building the Clonburris fields are partly visible in the background and the horizon. The view of the background will be clearer during autumn, winter, spring with reduced foliage.

The viewpoint is specifically focussed on the Omer Lock House in the middle ground, a feature that attracts views of Greenway users due to its uniqueness along this stretch of the Grand Canal. The viewpoint is representing recreational users who use the Greenway for shorter and longer distances and local residents who are stopping on the Greenway at this point for a view of the building.

The Viewpoint Sensitivity is classified as **High** – *Viewers considered of high susceptibility, such as locations where viewers are walking and cycling and are experiencing a unique view of characteristic heritage features, set in a visually pleasant landscape.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The foreground and middle ground view, including the view of the Omer Lock House, will not be changed by the proposed development. The upper levels and roofline of the western section of proposed buildings will be partially visible in the background behind the existing vegetation along the Grand Canal and in the pasture fields. The horizon line will be marginally altered in the location of the proposed development. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **Low** – *Minor intrusion of the development into the view, or introduction of elements that are characteristic in the suburban residential context, resulting in minor alteration to the composition and overall character of the view but no change to visual amenity.*

The Significance of Visual Impact is assessed as **Moderate-Slight** with visual and physical integration of the distant and partially discernible proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** with visual and physical integration of the proposed development into the existing and changing suburban residential, environment and neighbouring communities. The impact is assessed as complementary to placemaking. It contributes to creating a residential neighbourhood at this location and to contextualising the protected Omer Lock House while enhancing the local character of a growing built environment of this South Dublin area.

Cumulative Impact

The various schemes of future development envisaged within the Clonburris SDZ lands will change this view gradually and considerably. Future two-storey house with pitched roofs on site T1 (SDZ21A/0022) will be clearly visible in the middle ground and will add context to the ruin of the Omer Lock House whose views will be changed considerably during its future refurbishment. Therefore, the cumulative impact will be of moderate significance and beneficial, adding to the transformation and integration of a protected structure into a residential community with an ecological corridor towards the Grand Canal.

Viewpoint 10 – Grand Canal Greenway at resting place looking north-east

Existing View

The existing view is taken from a resting place with a bench along the Grand Canal Greenway looking across the canal in an east-north-east direction. The viewpoint is approximately 290m from the site boundary and is representative of views experienced by recreational users, mostly pedestrians and cyclists using the Greenway and stopping for a break while looking at the canal environs.

The view is of the Greenway verge, a timber boarded mooring place forming the south canal bank and the actual water body in the foreground. The middle ground, north of the canal consists of dense bank vegetation with a continuous line of trees and shrubs screening the view onto the background and horizon. The view of the background will be clearer during autumn, winter, spring with reduced foliage.

The viewpoint is typical for a visual experience along the Greenway in this area when looking across the Grand Canal towards the SDZ lands. The viewpoint is representing recreational users who use the Greenway for shorter and longer distances and local residents who are stopping on the Greenway at this point to sit down and rest.

The Viewpoint Sensitivity is classified as **High** – *Viewers considered of high susceptibility, such as locations where viewers are walking and cycling and are experiencing a unique view of characteristic heritage features, set in a visually pleasant landscape.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The existing view will not be changed by the proposed development. Any proposed structures / features will be screened by the existing vegetation lining the northern Grand Canal towpath. Visibility will not change during the construction phase and during the winter when vegetation foliage is reduced.

The proposed development would not be visible from this location.
There would be no impact or effect.

Cumulative Impact

It is assessed that the various schemes of future development within the Clonburris SDZ will not change this view. It is concluded that a cumulative impact does not exist.

Viewpoint 11 – Melrose Road residential estate looking east-north-east

Existing View

The existing view looks along Melrose Road in an east-north-east direction towards the round-about junction with Lindisfarne Park. The viewpoint is approximately 680m from the site boundary and is representative of views experienced by road users (motorists, cyclists, pedestrians etc.) of which a large proportion are from the local residential community of Deansrath/Lindisfarne Park.

The foreground is structured by the single carriageway with verges and footpaths on either side, including informal parking. In the middle ground the viewer sees partly greened residential front curtilages on the eastern road side, a single street tree and the centre of the round-about. The east middle ground is framed by the end of terraced two-storey houses. The background opens up to a view of the green open space north of Lindisfarne Park stretching towards the Grand Canal Greenway vegetation screen which forms the horizon line. The Clonburris SDZ lands are not visible from here and even reduced foliage during autumn, winter, spring will make its view barely discernible.

The viewpoint is on a neighbourhood local road of Deansrath, a predominantly residential suburban area of South Dublin. Melrose Road connects via a round-about to Lindisfarne Park, a neighbourhood perimeter road with an open visual setting towards the Grand Canal corridor. The viewpoint represents road users passing through the neighbourhood of Deansrath and local residents using the road, cycle lane or footpaths.

The Viewpoint Sensitivity is classified as **High** – *Residential receptors considered of high susceptibility, such as locations where viewers are travelling at low speed, walking and cycling and are experiencing a unique view of their local green open space, of good physical and visual quality.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The existing view will not be changed by the proposed development. Any proposed structures / features will be screened by the existing vegetation lining the northern Grand Canal towpath. Visibility will not change during the construction phase and during the winter when vegetation foliage is reduced.

The proposed development would not be visible from this location.
There would be no impact or effect.

Cumulative Impact

It is assessed that the various schemes of future development within the Clonburris SDZ will not change this view. It is concluded that a cumulative impact does not exist.

Viewpoint 12 – Grand Canal Greenway at resting place looking east-north-east

Existing View

The existing view is taken from a resting place with a bench along the Grand Canal Greenway looking across the canal in an east-north-east direction. The viewpoint is approximately 900m from the site boundary and is representative of views experienced by recreational users, mostly pedestrians and cyclists using the Greenway and stopping for a break while looking at the canal environs.

The view is of the tarmacked Greenway path and the green verge forming the south canal bank in the foreground. The middle ground, north of the canal consists of dense bank vegetation with a loose line of trees and shrubs. The background is screened by the canal bank vegetation. However, the background is possibly partly discernible during autumn / winter / spring with reduced foliage.

The viewpoint is typical for a visual experience along the Greenway in this area when looking across the canal towards the SDZ lands. The viewpoint is representing recreational users who use the Greenway for shorter and longer distances and local residents who are stopping on the Greenway at this point to sit down and rest.

The Viewpoint Sensitivity is classified as **High** – *Viewers considered of high susceptibility, such as locations where viewers are walking and cycling and are experiencing a unique view of characteristic heritage features, set in a visually pleasant landscape.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The existing view will not be changed by the proposed development. Any proposed structures / features will be screened by the existing vegetation lining the northern Grand Canal towpath. Visibility will not change during the construction phase and during the winter when vegetation foliage is reduced.

The proposed development would not be visible from this location.
There would be no impact or effect.

Cumulative Impact

It is assessed that the various schemes of future development within the Clonburris SDZ will not change this view. It is concluded that a cumulative impact does not exist.

Viewpoint 13 – Grand Canal Greenway at Outer Ring Road R136 bridge looking east-north-east

Existing View

The existing view looks from the Grand Canal Greenway, which runs parallel along the south of the canal and is in an east-north-east direction. The viewpoint is approximately 1450m from the site boundary and is representative of views experienced by recreational users of the Greenway, mostly pedestrians and cyclists moving east along the Grand Canal, from Adamstown towards Clondalkin.

The foreground view is of the junction of the tarmacked walking / cycling ramp coming from the Outer Ring Road R136 meeting the Greenway at this location. The Greenway with the canal verge and bank vegetation in the foreground continue through the middle ground into the background and horizon. On the north canal side a loose line of trees is visible, following the canal bank into the background and forming the horizon. The SDZ lands are not visible from here but partial visibility of the disused pasture fields behind the thickets is possible during autumn / winter / spring with reduced foliage.

The viewpoint is located at the bottom of the pedestrian/cycling access ramp leading down from the Outer Ring Road R136 to the Grand Canal. This view expresses the strong linear form of the Grand Canal corridor and parallel Greenway in an east-west direction. The viewpoint is representing recreational users who use the Greenway for shorter and longer distances and local residents who are entering the Greenway at this access point from the R136 for various recreational purposes.

The Viewpoint Sensitivity is classified as **High** – *Viewers considered of high susceptibility, such as locations where viewers are travelling but are experiencing a unique view of the landscape, with characteristic heritage features.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The existing view will not be changed by the proposed development. Any proposed structures / features will be screened by the existing vegetation lining the northern Grand Canal towpath. Visibility will not change during the construction phase and during the winter when vegetation foliage is reduced.

The proposed development would not be visible from this location.
There would be no impact or effect.

Cumulative Impact

It is assessed that the various schemes of future development within the Clonburris SDZ will not change this view. It is concluded that a cumulative impact does not exist.

Viewpoint 14 – Outer Ring Road R136 bridge crossing Grand Canal looking east-north-east

Existing View

The existing view looks from the Outer Ring Road R136 bridge crossing the Grand Canal east of the 12th Lock, in an east-north-east direction towards Ronanstown. The viewpoint is approximately 1450m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.), recreational users entering the Grand Canal Greenway at this location and viewers traversing between the residential communities of Adamstown, Griffeen, Finnstown and the Grange Castle Business Park.

The linear form of the Grand Canal is the dominant feature in the foreground, including a view of the towpaths either side. This view continues through the middle ground to end in a vanishing point at the horizon in the east. The view opens up to a dense arrangement of hedgerows and trees in the middle ground, a combination of the canal bank and field vegetation. Some field areas are visible in the background while lush lines of hedgerows dominate the background and the horizon. The extent of the SDZ lands is visible from here, with some structures in Ronanstown along the horizon.

The viewpoint is located at the crossroads between the Outer Ring Road R136 and the Grand Canal. Road users are experiencing long distance views of the linear features of the Grand Canal and of the Clonburris fields from here. Particularly for pedestrians and cyclists it is perceived of scenic value and as a gate to the Greenway. The viewpoint is representing road users using the Outer Ring Road and local residents driving, cycling or walking for commuting and recreational purposes.

The Viewpoint Sensitivity is classified as **High** – *Viewers considered of high susceptibility, such as locations where viewers are travelling but dependent on mode and speed are experiencing a unique view of the landscape, with characteristic heritage features.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The foreground and middle ground view will not be changed by the proposed development. The upper levels and roofline of the group of proposed buildings will be partially visible on the horizon behind the existing vegetation along the Grand Canal and on the pasture fields of the SDZ lands. The horizon line will be marginally altered in the location of the proposed development. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **Low** – Minor intrusion of the development into the view, or introduction of elements that are characteristic in the suburban residential context, resulting in minor alteration to the composition and overall character of the view but no change to visual amenity.

The Significance of Visual Impact is assessed as **Moderate-Slight** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** with visual and physical integration of the proposed development into the existing and changing suburban residential, environment and neighbouring communities, with a positive contribution to placemaking and creating an urban centre at this location and with an overall enhancing addition to the local character of a growing built environment and area of South Dublin.

Cumulative Impact

The various schemes of future development envisaged within the Clonburris SDZ lands will change this view considerably, particularly development phased later in the Kishoge Development Area of the lands. Future development on the sites T1 (SDZ21A/0022), T3 (SDZ22A/0017), T4 and T5 will change the horizon line of this view. A generally maturing vegetation will essentially reduce the cumulative impact through additional screening. Therefore, the cumulative impact will be of moderate significance and beneficial, with a gradual transformation of disused fields into a residential community with an ecological corridor towards the Grand Canal.

Viewpoint 15 – Kishoge railway station / R136 looking east

Existing View

The existing view is taken from the eastern footpath of the Outer Ring Road R136 at the crossing with the Dublin-Cork railway line and the Kishoge railway station, looking east. The viewpoint is approximately 1400m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.) and the adjacent residential communities passing or accessing the railway station.

In the foreground the viewer is looking at the Kishoge railway station car park which extends into the middle ground. The railway tracks are discernible along the north edge and are mostly covered by dense vegetation. Behind the car park the disused pasture lands of the SDZ are visible stretching into the background with lines of hedgerows and trees at the horizon.

The viewpoint is at a strategic transport node, between road and railway and is dominated by the tarmacked railway car park and a few railroad structures at this location along the Outer Ring Road R136. This viewpoint is representing road users passing this node and local residents using the road, cycle lane or footpaths to either pass or access the railway station. Particularly motorists using this Park & Ride car park experience this view.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or are accessing public transport, where they are partly but not entirely focused on the landscape.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The existing view will only be marginally altered by proposed development becoming discernible on the horizon, behind a line of vegetation. The existing hedgerows and trees on the SDZ land will screen a considerable part of the proposed development and only reveal the top levels and roofline of the new buildings. The proposed 9 storey commercial building adjacent to the Clondalkin Fonthill railway station will become a more prominent feature on the horizon. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **Low** – Minor intrusion of the development into the view, or introduction of elements that are characteristic in the suburban residential context, resulting in minor alteration to the composition and overall character of the view but no change to visual amenity.

The Significance of Visual Impact is assessed as **Slight** with visual and physical integration of the proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** with visual and physical integration of the proposed development into the existing and changing suburban residential, environment and neighbouring communities, complementary to placemaking and creating an urban centre at this location. It is assessed as an overall neutral addition to the local character of a growing built environment and area of South Dublin.

Cumulative Impact

The various schemes of future development within the Clonburris SDZ lands will change this view considerably, particularly development phased later in the Kishoge Development Area of the lands around the new railway station. Future buildings on SDZ sites T1 (SDZ21A/0022), T3 (SDZ22A/0017), T4 and T5 will be visible in the middle ground, the background and along the horizon. Maturing vegetation will further screen and reduce the cumulative impact of this view. Therefore, the cumulative impact will be of moderate significance and beneficial, with a gradual transformation of disused fields into a mixed-use zone with a transport hub around the existing Kishoge railway station and with an ecological corridor along the railway tracks.

Viewpoint 16 – Kishoge and Griffeen Community College looking east-south-east

Existing View

The existing view looks along the Thomas Omer Way in an east-south-east direction towards Clondalkin. The viewpoint is approximately 1050m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.) and particularly by viewers accessing the college or passing the Balgaddy community.

In the foreground and middle-ground, the viewer is looking at the dual carriageway including footpaths, cycle lanes, traffic light controlled pedestrian crossings and high public lighting masts. A fence and wall with access gate to the college is visible in the middle ground including a screen of trees in the east middle ground following the south edge of the road. A background and horizon line, and therefore of the SDZ lands is not visible from here due to the slightly elevated road and the college curtilage fence / wall screening the view.

The viewpoint is located along the Thomas Omer Way between the neighbourhoods of Griffeen and Balgaddy. The foreground of the view is dominated by the road and long distance views are blocked from this location. The viewpoint is representing road users passing through Balgaddy and local residents using the road, cycle lane or footpaths. Furthermore, this view is experienced by college students and staff.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The existing view will not be changed by the proposed development. Any proposed structures / features in the middle ground and background will be screened by the existing vegetation, fencing and walls along the southern edge of Thomas Omer Way. Visibility will not change during the construction phase and during the winter when vegetation foliage is reduced.

The proposed development would not be visible from this location. There would be no impact or effect.

Cumulative Impact

It is unlikely that the various schemes of future development on the sites T1 (SDZ21A/0022), T3 (SDZ22A/0017), T4 and T5 will change this view. Future development in the Kishoge Development Area might become partly visible behind the existing college wall and fence structures. Maturing vegetation will further screen and reduce the cumulative impact of this view. Therefore, the cumulative impact will be of slight significance and beneficial, with a gradual transformation of disused fields into a residential community.

Viewpoint 17 – Tor An Rí Lane residential estate looking south-east

Existing View

The existing view looks from the end of Tor An Rí Lane a residential local street in the Balgaddy neighbourhood in a south-east direction towards the SDZ lands. The viewpoint is approximately 810m from the site boundary and is representative of views experienced by local road users (motorists, cyclists, pedestrians etc.) of which a large proportion are from the residential community of Balgaddy.

The foreground is structured by hard landscaping of footpath and car parking areas, public lighting and a raised grass verge while the residential front curtilage arrangement of the viewpoint is not discernible from here. In the middle ground a green mound with shrubs is visible, partly screening the view onto a line of trees along the Thomas Omer Way in the background. Even during autumn, winter, spring with reduced foliage the SDZ lands are barely visible from this location due to the verge mound.

The viewpoint is in a predominantly residential suburban area of South Dublin. Tor An Rí is a typical local street in the Balgaddy neighbourhood which connects to Thomas Omer Way, a perimeter dual carriageway. The viewpoint is representing road users passing through the neighbourhood of Balgaddy and local residents using the road, cycle lane or footpaths.

The Viewpoint Sensitivity is classified as **High** – *Residential receptors considered of high susceptibility, such as locations where viewers are travelling at low speed, walking and cycling and are experiencing a unique view of their local green open space, of good physical and visual quality.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The existing view will not be changed by the proposed development. Any proposed structures / features in the middle ground and background will be screened by the existing vegetation and landscaped verge along Thomas Omer Way. Visibility will not change during the construction phase and during the winter when vegetation foliage is reduced.

The proposed development would not be visible from this location. There would be no impact or effect.

Cumulative Impact

It is assessed that the various schemes of future development within the Clonburris SDZ will not change this view. It is concluded that a cumulative impact does not exist.

Viewpoint 18 – Cappaghmore residential estate looking north-west

Existing View

The existing view looks from the Cappaghmore residential street in a north-west direction towards the Clondalkin Fonthill railway station. The viewpoint is approximately 230m from the site boundary and is representative of views experienced by road users (motorists, cyclists, pedestrians etc.) of which a large proportion are from the local residential community of the Cappaghmore residential estate.

The foreground is structured by the footpath and front curtilage of terraced two-storey houses at a bend in the road. A two-storey end of terrace house frames the east foreground. In the middle ground the viewer sees a second end of terrace of two-storey houses. The background opens up in a small section between the two terrace ends and reveals a view onto dense tree vegetation along the Fonthill Road R113 while structures of the Clondalkin Fonthill railway station are barely discernible between the dense vegetation. The Clonburris SDZ lands are not visible from here and reduced foliage during autumn, winter, spring will make its view barely discernible.

The viewpoint is on a neighbourhood local street of Cappaghmore, a predominantly residential suburban area of South Dublin immediately west of the Ninth Lock Road. The viewpoint is representing road users passing through the neighbourhood of Cappaghmore and local residents using the road or footpaths.

The Viewpoint Sensitivity is classified as **High** – *Residential receptors considered of high susceptibility, such as locations where viewers are travelling at low speed, walking and cycling and are experiencing a unique view of their local green open space, of good physical and visual quality.*

Visual Impacts and Effects

The foreground and middle ground view will not be changed by the proposed development. The roofline of two proposed buildings will be partially visible behind the existing vegetation in the middle ground. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **Low** - Minor intrusion of the development into the view, or introduction of elements that are characteristic in the suburban residential context, resulting in minor alteration to the composition and overall character of the view but no change to visual amenity.

The Significance of Visual Impact is assessed as **Moderate-slight** with visual and physical integration of the distant and partially discernible proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** with visual and physical integration of the proposed development into the existing and changing suburban residential, environment and neighbouring communities, complementary to placemaking and creating an urban centre at this location. It is assessed as an overall neutral addition to the local character of a growing built environment and area of South Dublin.

Cumulative Impact

It is unlikely that the various schemes of future development on the sites T1 (SDZ21A/0022), T3 (SDZ22A/0017), T4 and T5 will change this view. Future development in the Clonburris Development Area east of the Fonthill Road might become partly visible in the gap between the two houses. Maturing vegetation will further screen and reduce the cumulative impact of this view. Therefore, the cumulative impact will be of slight significance and beneficial, with a gradual transformation of disused fields into a transport hub with social and economic activity.

Viewpoint 19 – Ninth Lock Road looking west

Existing View

The existing view is taken from the western footpath of the Ninth Lock Road approximately halfway between the Cappaghmore residential estate and the railway line, looking west. The viewpoint is approximately 480m from the site boundary and is representative of views experienced by road users (motorists, public transport users, cyclists, etc.) and the adjacent residential communities between Clondalkin and Ronanstown.

In the foreground the viewer is looking at loose shrub vegetation along the side of the road which allows views of the SDZ lands in the middle ground. The background is formed of single trees and hedgerows. A dense line of trees along the Fonthill Road R113 closes the horizon.

The viewpoint is set at a location of the Ninth Lock Road where the road side opens up for partial views onto the SDZ lands. The viewpoint represents road users on the Ninth Road between Ronanstown and Clondalkin and local residents using the road, cycle lane or footpaths.

The Viewpoint Sensitivity is classified as **Medium** – *Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape.* The visibility onto the SDZ lands changes with the seasons depending on seasonal vegetation status (tree foliage etc.).

Visual Impacts and Effects

The fore, middle and background are not changed by the proposed development. However, the horizon line is largely changed by clearly visible upper levels and rooflines of proposed buildings behind the existing tree line along the Fonthill Road. The Magnitude of Change and resulting Significance of Visual Impact are larger during the construction phase and are therefore considered Temporary / Short-Term, in change, impact and effect.

The Magnitude of Change is classified as **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 essentially the character of the view or the visual amenity.

The Significance of Visual Impact is assessed as **Moderate** with considerable visual and physical change and resulting integration of the proposed development into the existing and changing suburban residential, commercial and transport environment and with maturing vegetation progressing to screen visibility.

The Quality of Visual Impact is assessed as **Neutral** with new elements that introduce a visual and physical change to the view, as a clear sign of development that adds to the changing suburban residential, commercial and transport environment. It is assessed as a generally neutral impact on the existing landscape and visual quality for road users as the identified user group passing this location.

Cumulative Impact

The various schemes of future development envisaged within the Clonburris SDZ lands. Future buildings on site T1 (SDZ21A/0022) will become visible in the left background while future buildings on the sites T3 (SDZ22A/0017), T4 and T5 will be covered by T2 development. A generally maturing vegetation will change this view through additional screening. Therefore, the cumulative impact will be of slight significance and beneficial with contributing to residential context, forming of a community and defining a location.

Table 9.9 – Summary of Impacts and Effects on the Landscape

VP	Receptor and Views	Viewpoint Sensitivity	Magnitude of Change	Significance / Term / Quality of Impact		
				Short	Medium	Long
1	Ninth Lock Road /Thomas Omer Way junction looking south	Medium	Medium – Considerable visibility in the background and minor alteration of visual amenity or overall character	Moderate	Moderate	Moderate
				Beneficial	Beneficial	Beneficial
2	Clondalkin Fonthill railway station / R113 looking south-west	Medium	High - Considerable visibility in the midground and alteration of visual amenity or overall character	Significant	Significant	Significant
				Beneficial	Beneficial	Beneficial
3	Fonthill Road R113 between railway station and roundabout looking west	Medium	High - Considerable visibility in the midground and alteration of visual amenity or overall character	Significant	Significant	Significant
				Neutral	Neutral	Neutral
4	Fonthill Road R113 junction with proposed link street looking north-west	Medium	Very High - Full visibility in the entire view and change of visual amenity or overall character	Very Significant-Significant	Very Significant-Significant	Very Significant-Significant
				Beneficial	Beneficial	Beneficial
5	Fonthill Road R113 bridge crossing Grand Canal looking north-north-west	Medium	High - Full visibility in the background and minor alteration of visual amenity or overall character	Significant	Significant	Significant
				Beneficial	Beneficial	Beneficial
6	Grand Canal Greenway at Fonthill Road R113 bridge looking north-north-west	High	Low - Partly visible intrusion of the background	Moderate-Slight	Moderate-Slight	Moderate-Slight
				Neutral	Neutral	Neutral
7	Walking / Cycling ramp to Greenway looking north-north-west	High	Medium - Considerable visibility in the background and minor alteration of visual amenity or overall character	Significant	Significant	Significant
				Neutral	Neutral	Neutral
8	Bawnogue Road residential estate looking north-north-east	High	Negligible - Barely visible intrusion of the background	Slight-Not Significant	Slight-Not Significant	Slight-Not Significant
				Neutral	Neutral	Neutral
9	Grand Canal Greenway at Omer Lock House looking north-east	High	Low - Partly visible intrusion of the background	Moderate-Slight	Moderate-Slight	Moderate-Slight
				Neutral	Neutral	Neutral
10	Grand Canal Greenway at resting place looking east-north-east	High	Not visible	No effects		
11	Melrose Road residential estate looking east-north-east	High	Not visible	No effects		

VP	Receptor and Views	Viewpoint Sensitivity	Magnitude of Change	Significance / Term / Quality of Impact		
				Short	Medium	Long
12	Grand Canal Greenway at resting place looking east-north-east	High	Not visible	No effects		
13	Grand Canal Greenway at Outer Ring Road R136 bridge looking east-north-east	High	Not visible	No effects		
14	Outer Ring Road R136 bridge crossing Grand Canal looking east-north-east	High	Low - Partly visible intrusion of the background	Moderate-Slight	Moderate-Slight	Moderate-Slight
				Neutral	Neutral	Neutral
15	Kishoge railway station / R136 looking east	Medium	Low - Partly visible intrusion of the background	Slight	Slight	Slight
				Neutral	Neutral	Neutral
16	Kishoge and Griffeen Community College looking east-south-east	Medium	Not visible	No effects		
17	Tor An Rí Lane residential estate looking south-east	High	Not visible	No effects		
18	Cappagh-more residential estate looking north-west	High	Low - Barely visible intrusion of the background	Moderate-Slight	Moderate-Slight	Moderate-Slight
				Neutral	Neutral	Neutral
19	Ninth Lock Road looking west	Medium	Medium - Considerable visibility in the background and minor alteration of visual amenity or overall character	Moderate	Moderate	Moderate
				Neutral	Neutral	Neutral

9.6.4 Do Nothing Scenario

The *Do-Nothing* impact refers to the scenario of not implementing the proposed development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant:

In the absence of this development the changes in the landscape and visual quality of the environs would be limited. The proposed development site would remain unused and remain as open pasture lands or decline / become increasingly overgrown while the objectives of the adopted South Dublin Development Plan and the Clonburris SDZ Planning Scheme 2019 for the identified Clonburris South West Area would not be realised.

9.7 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

The following recommendations are put forward to mitigate against the negative impacts mentioned above and to reinforce the positive impacts of the proposed development. Mitigation measures are proposed and considered only on the lands of the proposed development site.

9.7.1 Construction Stage

During construction there will be a change to the landscape and there will be adverse visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity.

The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures such as site hoarding and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

Existing trees adjacent to the site will be retained and protected in accordance with Arboriculture Recommendations. With regard to the protection of the retained trees on site during proposed construction works, reference should be made to BS5837: Trees in relation Design, Demolition and Construction – Recommendations (BSI, 2012).

9.7.2 Operational Stage

As described in Section 9.5 above, the scheme incorporates best practice design in urban and place-making composition in terms of architecture, layout, public realm, hard and soft landscape including extensive tree planting. This results in a scheme designed to integrate and contribute benignly, albeit prominently in places, to the changing landscape and visual amenity of the receiving environment.

Mitigation measures are therefore an integral part of the scheme quality and residential amenity and not an additional element to reduce or screen visibility and landscape change. Key measures include:

- Urban framework and scheme layout reflecting SDZ requirements
- Architectural and elevational treatments, materials and details contributing to place-making
- Street, public open space and associated tree planting in the public realm, softening, framing and integrating building into an evolving new urban landscape
- Other soft landscape plantings adding structure and biodiversity / greening to the scheme, incorporating a high degree of native species and habitat creation proposals

9.7.3 'Worst-case' Scenario

The 'worst-case' scenario would be if the proposed developments failed to safeguard any of the existing valued landscape features or was laid out in a way that failed to respond to surrounding landscape and townscape character, scale, sensitivities and views. Similarly, if the proposed developments are approved but failed to integrate proposed green infrastructure and if the positive attributes of the design and mitigation measures were not carried through in full or enforced by the Local Authority.

9.8 RESIDUAL IMPACTS

9.9 MONITORING

9.9.1 Construction Stage

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

9.9.2 Operational Stage

This will consist of weed control, replacement planting, pruning etc, in full adherence to the Biodiversity Management Plan, produced by Scott Cawley. All landscape works will be in an establishment phase for the initial three years from planting. The company responsible for site management of the scheme will be responsible for the ongoing maintenance of the site after this three-year period is complete.

9.9.3 Reinstatement

The proposed landscape development works in the form of tree and shrub planting will be used to re-instate the site, post-construction. These works will be carried out by an appointed landscape contractor and will be supervised by a suitably qualified landscape architect or manager.

9.10 INTERACTIONS ARISING

The pertinent environmental interactions for landscape and visual are with Human Beings, Biodiversity and Cultural Heritage. In this regard, landscape proposals for the scheme have been developed in consultation with the Project Ecologists and the Cultural Heritage Consultants. Given the existing nature of the site, i.e., having been cleared and excavated in the past there are no existing mature flora and fauna issues related to the site other than the existing ornamental trees, lawn grass and scrub area. The main cultural component on site is the protected monument which has been provided with an appropriate buffer and protection.

Adverse effects on Human Health / Human Beings have not been identified during the preparation of the landscape and visual impact assessment chapter. In general, the scheme is forming a new community as part of the Strategic Development Zoning and associated Planning Scheme objectives.

Adverse effects on protected Cultural Heritage have not been identified during the preparation of the landscape and visual impact assessment chapter.

Ecology and Biodiversity will illustrate a net gain through proposed planting and landscape, although this will take time to mature.

9.11 DIFFICULTIES ENCOUNTERED

Specific difficulties have not been encountered during the preparation of the landscape and visual impact assessment chapter.

10.0 TRAFFIC AND TRANSPORTATION

10.1 INTRODUCTION

This chapter of the EIA assesses the likely effects of the proposed development in terms of vehicular, pedestrian and cycle access during the construction and operational phases of the proposed development.

This Chapter of the EIA has been prepared by Daniel Garvey, Transportation Engineer, and reviewed by Danny Pio Murphy, Senior Transportation Engineer from DBFL Consulting Engineers. An overall commentary on the predicted changes in traffic, public transport, pedestrian, and cyclist environmental conditions are all discussed in this chapter and provide a setting for all the other assessments undertaken in this EIA.

10.2 BACKGROUND

10.2.1 Trip Generation

2018 historic traffic counts were obtained via the planning application for the Clonburris Southern Link Street; the historic baseline data was made available under National Transport Authority / South Dublin County Council's South West Dublin Local Area - Model Development Report. This report was analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.

A review of trip generation factors contained within the TRICS database was carried out. TRICS data is primarily UK based, although a number of Irish sites have recently been included and the number of Irish sites continues to expand. Nevertheless, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

Data supplied for inclusion in TRICS undergoes a procedure of validation testing, and there is no evidence from this procedure suggesting that data from Ireland bears any significant fundamental differences to that from the other countries included. Consequently, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

Table 10.1 below includes the predicted vehicle trip rates of the potential unrestrained traffic flows in and out of the proposed development during the morning and evening peak hour periods using data from TRICS. Trip generation will be discussed in more detail in Section 10.6.2.

Table 10.1 – Proposed Development Trip Rates (TRICS)

Land Use	AM Peak Hour			PM Peak Hour		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
Apartments	0.021	0.085	0.106	0.079	0.043	0.122
Creche	2.775	2.423	5.198	2.511	2.731	5.242
Offices	0.559	0.059	0.618	0.038	0.444	0.482

10.2.2 Impact on junctions

The Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments' states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the network's operational performance. These same thresholds are reproduced in the NRA/TII document entitled Traffic and Transport Assessment Guidelines (2014). A detailed analysis of the impact the development will have on the key local junctions is given in Section 10.6.2.

10.2.3 Car Parking

Reference has been made to the Transport Assessment & Transport Strategy section of the Clonburris Strategic Development Zone (SDZ) Planning Scheme, as published in 2019.

The subject development site is located within SDCC Zone 2 Parking and therefore the quantum of car parking provision should be minimised. The car parking standards as set out in the *South Dublin County Council Development Plan 2022 – 2028* are illustrated in **Table 10.2** below.

Table 10.2 – SDCC County Development Plan 2022 – 2028 Maximum Parking Rates

Land Use		Zone 2
Apartment / Duplex	1-Bed	0.75 / unit
	2-Bed	1 / unit
	3-Bed	1.25 / unit
Retail	Retail Convenience	1 / 25sqm
Enterprise and Employment	Offices Manufacturing	1 / 75sqm
Education	Creche	0.5/ classroom

In addition, as per the SDCC Parking Standards, 20% of the total car parking provision will be allocated as electric vehicle charging stations while the remainder of the parking spaces should be constructed to be capable of accommodating future charging points, as required. Car parking will be discussed in more detail in Section 10.5.

10.3 METHODOLOGY

The purpose of this assessment is to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of transport impact generated as a result of the proposed development. The scope of the assessment covers transport and sustainability issues including pedestrian, cyclist, and public transport connectivity. Recommendations contained within this chapter are based on existing and proposed road layout plans, site visits, traffic observations and historic junction vehicle turning count data. Our methodology incorporated a number of key inter-related stages, including;

- **Site Audit:** A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport. An inventory of the local road network was also developed during this stage of the assessment.
- **Traffic Counts:** Historic traffic counts were obtained via the planning application for the Clonburris Southern Link Street; the historic baseline data was made available under National Transport Authority / South Dublin County Council’s South West Dublin Local Area - Model Development Report. This report was analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.
- **Trip Generation:** A trip generation exercise has been carried out to establish the potential level of future vehicle trips using the proposed development.
- **Trip Distribution:** Based upon both the existing traffic characteristics and the network layout in addition to the spatial / land use configuration and density of the urban structure across the catchments area of the development, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.
- **Network Impact:** The specific level of influence generated by the proposed development upon the local road network was ascertained.
- **Network Analysis:** Detailed computer simulations were used to assess the operational performance of key junctions in the post development 2025, 2030 and 2040 development scenarios in accordance with the NRA/TII document ‘Traffic and Transport Assessment Guidelines’ (2014).

The assessment of effects of the proposed development on material assets are assessed in terms of quality (positive, neutral or negative effects), significance (imperceptible, not significant, slight, moderate, significant, very significant or profound effects), extent, context, probability (likely, unlikely effects) and duration (momentary, brief, temporary, short term, medium term, long term, permanent or reversable effects) in line with the criteria set out in **Table 3.4** ‘Description of Effects’ of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, May 2022).

10.4 RECEIVING ENVIRONMENT

10.4.1 Site location

The subject site is located within the Clonburris Strategic Development Zone lands. The subject site is bounded to the east by the R113 Fonthill Road North and to the north by the Kildare railway line. The site is bounded by the granted Phase 1A development (SDZ21/0021) to the west and south.

The SDZ is located to the west of Dublin City Centre and the M50. It is conveniently positioned between Lucan to the north-west, Clondalkin to the south-east and Liffey Valley to the north-east. The lands are intersected in an east-west orientation by the Kildare railway line and by the Grand Canal to the south. The general location of the subject scheme in relation to the surrounding region and road network is illustrated in **Figure 10.1**.

Figure 10.1 – Site Location (Source: ArcGIS Maps)



10.4.2 Land Use

The subject site is a greenfield site located within the Clonburris Strategic Development Zone lands. The Clonburris SDZ lands have an approximate land area of 280 hectares and is predominately agricultural in nature or greenfield sites. In recent years, Lucan East Educate Together National School and two secondary school; Griffeen Community College and Kishoge Community College, have been constructed on the lands. The lands also contain a number of private residences, together with traveller accommodation which has been provided by South Dublin County Council. There are two train stations constructed within the SDZ; the Clondalkin-Fonthill station which is currently operational whilst the Kishoge station is constructed but has not been operational to date.

Under the South Dublin County Development Plan 2022-2028, the subject site is zoned objective SDZ 'to provide for strategic development in accordance with approved planning schemes.' As part of the Clonburris SDZ planning scheme, the lands provide a mix of commercial and residential uses, as shown in **Figure 10.2**.

Figure 10.2 – Subject Site Current Zoning Objectives

(Source: Clonburris SDZ Planning Scheme, Land Use Area Map)

10.4.3 Existing road network

Clonburris is located c. 13 km to the west of Dublin City Centre and is well connected to the National Road Network, served by several key strategic routes. The Clonburris SDZ boundary is broadly bounded by the Arterial corridors of Adamstown Avenue and Thomas Omer Way to the north, Ninth Lock Road to the east, the Arterial corridor of Newcastle Road to the west, the Grand Canal to the south, as illustrated in **Figure 10.3**. The key north-south arterial corridors through Clonburris include:

- the R113 Fonthill Road North which crosses through the eastern portion of Clonburris;
- the R136 Grange Castle Road which crosses through the centre of the SDZ lands; and
- the R120 Newcastle Road which passes along the western boundary of the SDZ.

The R113, is located to the east of the subject site. This single carriageway road is subject to a speed limit of 60 km/h as it passes through the SDZ, with stretches of bus lane for southbound travel found along the western edge of the carriageway. Bus lanes for travel in both directions can be found north of the SDZ. The R113 connects to the N4 and Liffey Valley to the north and to Clondalkin and Tallaght to the south. The road also facilitates access to the Clondalkin Fonthill train station. The R113 provides vehicular, pedestrian and cycle access to the subject lands via the permitted Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) which is currently under construction.

The R136 (to the west of the subject lands) is situated centrally within the overall SDZ and runs through the middle of the SDZ, in a north-south direction. This road has two lanes of traffic travelling in each direction with bus lanes also found on both sides. A speed limit of 80km/h is in place along the section of the R136 that passes through the SDZ. Travelling north along the R136 leads to junction 3 of the N4. Travelling south along the R136 leads to junction 2 on the N7, Citywest and Tallaght. When completed, the permitted Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) will link the R113 to the R136.

The R120 can be found to the west of the SDZ, running in a north-south direction. The single carriageway road is subject to a speed limit of 60 km/h in the vicinity of the SDZ. Travelling north along the R120 provides a connection to Lucan Village and junction 4 on the N4. The N4 national road connects the M50 motorway to the M4 motorway. Travelling south along the R120 provides a connection to Newcastle, junction 4 on the N7 and Rathcoole. The N7 national road connects the M50 motorway to the M7 motorway.

The key east-west corridors through the area include Adamstown Avenue and Thomas Omer Way to the immediate north, where these roads provide a connection between Fonthill Road North and Grange Castle Road. Coldcut Road, also to the north of the site provides an east-west connection from Fonthill Road North to Palmerston and Ballyfermot.

Figure 10.3 – Existing Road Corridors in Clonburris SDZ lands (Source: Google Maps)



10.4.4 Existing Cycling Facilities

At present, the Clonburris SDZ lands are largely a greenfield site and as such there is limited cycle network within the lands. However, the Grand Canal Greenway, which links Adamstown to the City Centre, passes through the area along the Grand Canal as shown in **Figure 10.4**.

The SDZ lands are dissected by the Fonthill and Grange Castle Roads on a north south axis both of which include segregated cycle facilities offering links to Lucan Village, Liffey Valley and the N4, which also features segregated cycle facilities and a cycle link to the City Centre. To the South, there are cycle links to the Grange Castle Business Park and further south, Clondalkin Village and Tallaght.

Thomas Omer Way is orientated along the northern boundary of the Clonburris SDZ lands and has segregated cycle tracks on both sides of the road. The R120 Adamstown Road is orientated along the west of the Clonburris SDZ lands and features shared pedestrian and cyclist facilities on both sides.

Figure 10.4 – Existing Cycle Facilities South Dublin Active Travel (Source: SDCC Active Travel GIS Maps)



10.4.5 Existing Pedestrian Facilities

The Ninth Lock Road located along the eastern boundary and Thomas Omer Way on the northern boundary of the Clonburris SDZ lands includes footpaths on either side along most of its length. The paths surfaces are generally of a high-quality, whilst sections of the path are on Ninth Lock Rd narrow in places and the path is immediately adjacent the carriageway as shown in **Figure 10.5**.

Figure 10.5 – Fonthill Road (R113) Northbound



The Fonthill Road features footpaths on either side, segregated from the carriageway by way of a grass margin (**Figure 10.6**). The paths are generally in good condition and are of a consistent width throughout. Fonthill Road offers walking connections to the Fonthill Retail Park and Liffey Valley Shopping Centre to the north, and Clondalkin village and the Nangor Road to the south.

Figure 10.6 – Fonthill Road (R113) Northbound



The Grange Castle Road also features footpaths on either side segregated from the carriageway by way of a grass margin (**Figure 10.7**). The paths are generally in good condition and are of a consistent width throughout. The Grange Castle Road offers walking links to Lucan Village in the north, Adamstown to the west via its intersection with Adamstown Avenue, and to the south walking links to Grange Castle Business Park and Corkagh Park.

Figure 10.7 – Grange Castle Road Northbound (R136)

The Grand Canal Greenway, which follows an east west axis, offers a leisure walk links towards Dublin City Centre and Adamstown to the west. A new canal bridge has just been completed by SDCC. It features a shared space on the southern side and a pedestrian space on the southern side (**Figure 10.8**).

Figure 10.8 – Grand Canal Greenway from Fonthill Rd

10.4.6 Existing Bus Network

There are a number of roads in the immediate area that have bus priority in the form of Quality Bus Corridors (QBC's). These include the following and are shown in **Figure 10.9**:

- Grange Castle Road features QBC's in both directions (Bus no. 151),
- Lock View Road and Bawnogue Road (Bus no. 13 and 51d),
- Ninth Lock Road (Bus no. G2), and

- Fonthill Road features a southbound QBC (Bus no. 51d, G2 and L54).

Figure 10.9 – Existing Bus Route Network around the Subject Site



Table 10.3 below show the frequency of services for these bus routes.

Table 10.3 – Number of Daily Outbound Services from Clondalkin-Fonthill Station

Line	Direction	Mon-Fri	Sat	Sun
13	From Grange Castle to Harristown	87	68	63
	From Harristown to Grange Castle	85	68	59
G2	From Liffey Valley Shopping Centre to Spencer Dock	82	67	49
	From Spencer Dock to Liffey Valley Shopping Centre	81	67	49
51d	From Aston Quay / Waterloo Road To Clondalkin	1	-	-
	From Clondalkin to Aston Quay / Waterloo Road	1	-	-
L54	From River Forest to Red Cow Luas	35	32	29
	From Red Cow Luas to River Forest	36	32	39
151	From Foxborough (Balgaddy Rd.) to Docklands (East Rd.)	51	48	34
	From Docklands (East Rd.) to Foxborough (Balgaddy Rd.)	48	46	31

Figure 10.10 – Location of Local Bus Stops in Relation to the Subject Site.



10.4.7 Existing Rail Network

The proposed development is situated adjacent to the south of the Dublin to Kildare/Cork main railway line, which provides local commuter services. At the northeast boundary of the subject site lies the Clondalkin-Fonthill station (Figure 10.11). This station is served by commuter services to Heuston Station as well as Drumcondra, Dublin Connolly, Tara Street, Dublin Pearse and Grand Canal Dock, via the Phoenix Park Tunnel. Intercity trains do not serve this station.

Approximately 1,500m to the west lies Kishogue Railway Station, located on Grange Castle Road. Whilst the platform and station has been built, this station is not operational at present.

Figure 10.11 – Existing Rail Network around Clonburris SDZ



Eastbound services calling at Clondalkin-Fonthill offer good connections to Heuston station, which is the busiest station on the intercity train network offering strong connections to the regional cities and towns. **Table 10.4** below outlines the stations that are served by outbound trains from Clondalkin Fonthill station and the number of services these stations are served by outbound trains daily:

Table 10.4 – Number of Daily Outbound Services from Clondalkin-Fonthill Station

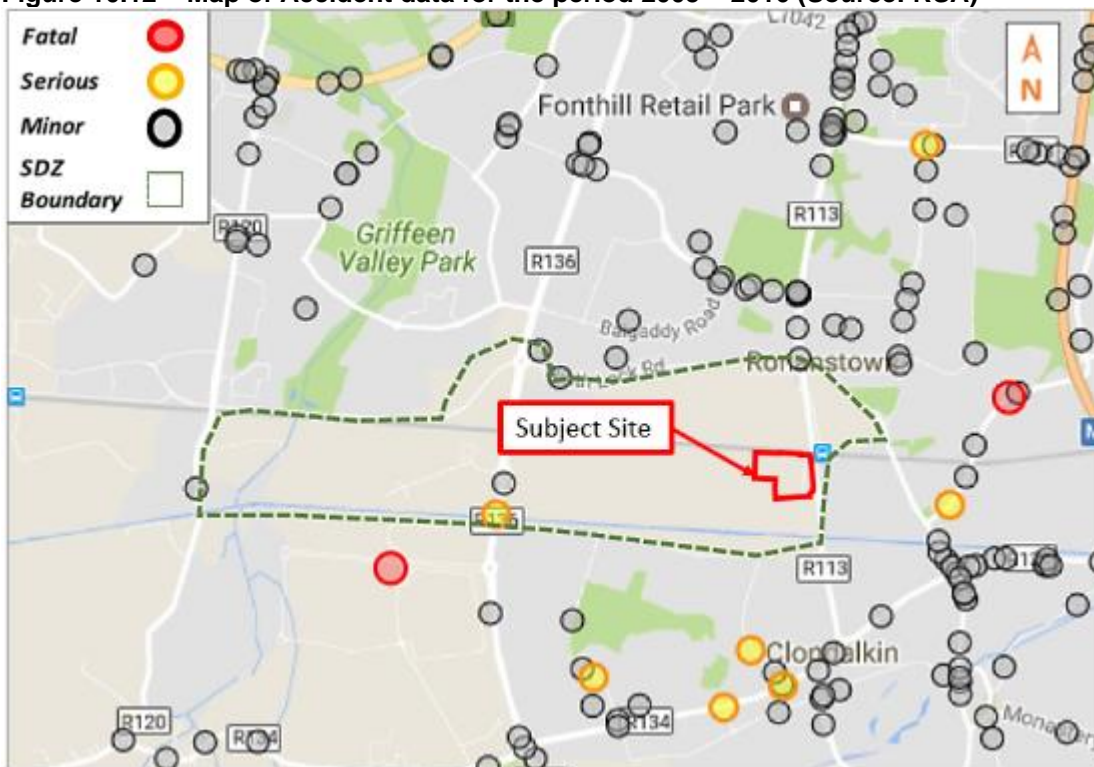
Station	No. of services from Clondalkin-Fonthill		
	Mon - Fri	Sat	Sun
Newbridge	5	-	1
Portlaoise	17	15	-
Hazelhatch & Celbridge	17	-	-
Carlow	1	-	-
Kildare	1	2	4
Grand Canal Dock	17	-	-
Dublin Heuston	22	18	5

10.4.8 Accident Data

Accident data was obtained for the area within and surrounding the Clonburris SDZ lands from the Road Safety Authorities Collision Statistics database. **Figure 10.12** below shows the location and severity of all road traffic accidents recorded in the Clonburris area in the period 2005 – 2016. As can be seen from the map, there was no collisions in the immediate vicinity of the subject site. In terms of the wider Clonburris SDZ Area, there was one fatal accident near Clonburris, which occurred in the Grange Castle Business Park.

A cluster of minor accidents was recorded to the south of the site on the New Nangor Road, Fonthill Road South and Lucan Newlands Road. Less dense clusters of minor accidents have also been recorded on the Balgaddy Road and Fonthill Road North.

Figure 10.12 – Map of Accident data for the period 2005 – 2016 (Source: RSA)



10.4.9 Proposed Road improvements

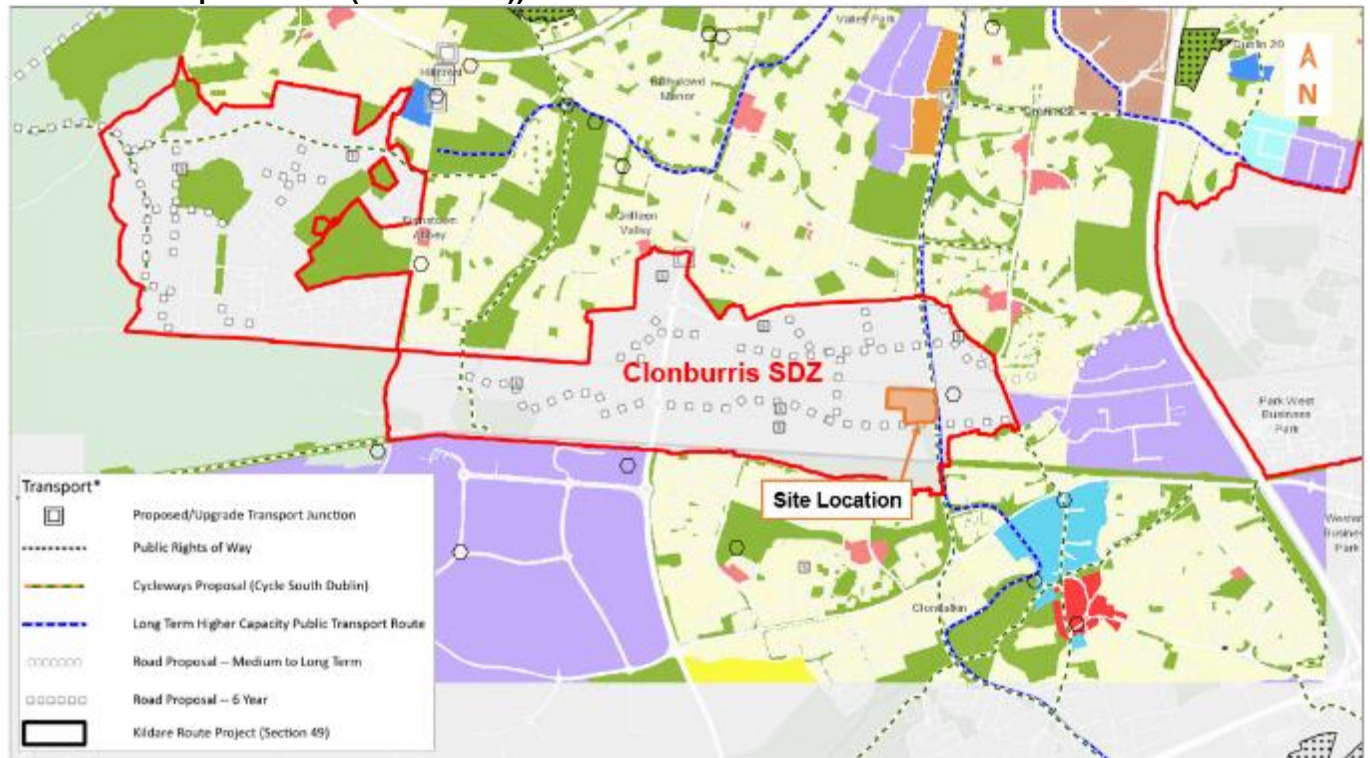
10.4.9.1 Overview

The following road infrastructure upgrades as outlined within the Clonburris SDZ Planning Scheme (May 2019) and the South Dublin County Council Development Plan (2022 – 2028) that are proposed within/close to the Clonburris SDZ scheme include the following and are shown in **Figure 10.13**:

- Clonburris/Kishogue Street Network: Various streets proposed within the Clonburris SDZ lands (which includes – the Clonburris ‘Southern Link’ Street; as well as the proposed ‘Northern Link’ Street),
- Celbridge Link Road: A new road between the Adamstown SDZ lands and Celbridge Road (R403),
- Newcastle Road (R120): Junction upgrades at SuperValu roundabout and Hillcrest Road,
- Griffeen Avenue: Improvements at junctions with Griffeen Road, Outer Ring Road and the link between them,
- New Nangor Road Extension: New road between R120 and Brownstown,
- Junction upgrade at Fonthill Road/N4,
- Cloverhill Road/Ninth Lock Road Upgrade and Link Road: Upgrade of Cloverhill Road from the M50 and upgrade of Ninth Lock Road from Fonthill Road to a new link road adjacent to the Dublin-Kildare railway Line,
- Western Dublin Orbital Route: New road from the N7 to the N4 Leixlip Interchange with an extension to the N81.

The aforementioned upgrades at Ninth Lock Road and Griffeen Avenue will be in line with the Clonburris SDZ Scheme. These existing roads will be designated as ‘Link Streets’ under this scheme and shall be upgraded as traffic calmed streets. The scheme also proposes a number of key junction improvements through and along the proposed ‘Arterial Streets’ within the subject lands to improve the connectivity. These improvements are proposed on Fonthill Road and Grange Castle Road. Furthermore, the proposed Western Dublin Orbital Route would provide additional connections towards Rathcoole, Saggart and Tallaght.

Figure 10.13 – Proposed Road Infrastructure around the Clonburris SDZ (Source: South Dublin County Council Development Plan (2022 – 2028))



10.4.9.2 Clonburris Southern Link Street

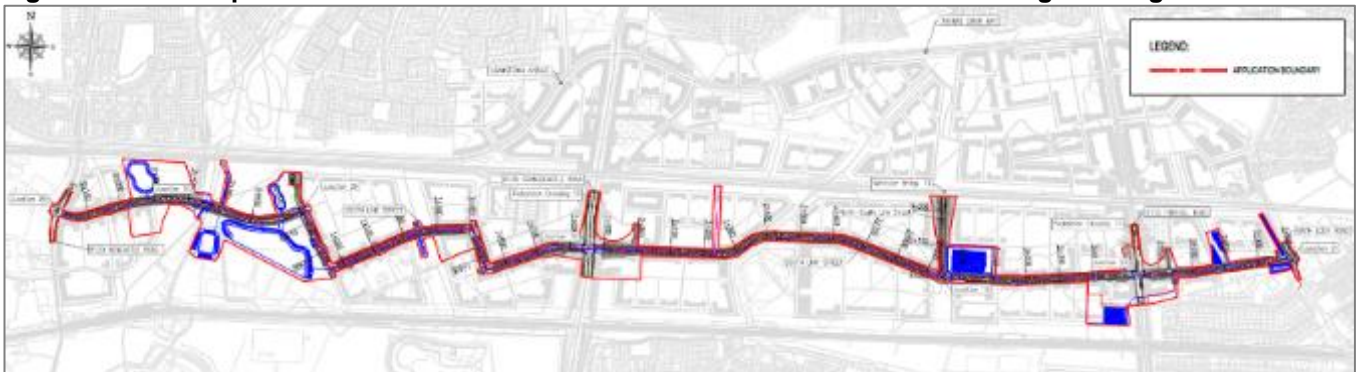
The Clonburris Southern Link Street Scheme was granted planning permission by South Dublin County Council in August 2021 (under SDZ20A/0021). The proposed scheme forms part of the Clonburris SDZ Planning Scheme (2019) as road infrastructure to support the development of SDZ lands in conjunction with the Clonburris Northern Link Street. The Clonburris Southern Link Street will allow the southern lands of the SDZ to be opened up for development and allowing access for the road network for future residents. The Link Street will form the southern boundary of the project site.

The Clonburris Infrastructure Development consists of the Clonburris Southern Link Street (CSLS) (**Figure 10.14**) and associated trunk infrastructure to serve the Clonburris Strategic Development Zone lands to the south of the Kildare/Cork Railway Line. The new CSLS will connect from the R120 Newcastle Road to the Ninth Lock Road with proposed intersections with the R136 Grange Castle Road and the R113 Font Hill Road. The proposed street will provide access for vehicular traffic, pedestrians, cyclists, and public transport to the Clonburris SDZ lands to the South of the Kildare/Cork Railway Line and provide linkages to the surrounding arterial road network.

The CSLS will consist of 4.0km of new road generally in the form of a 7m wide single carriageway with 1.75m wide off-road cycle tracks, 2m wide footpaths and public lighting. The CSLS includes the provision of 288 no. on-street car parking spaces (including 26 no. disabled parking spaces) as well as a number of pedestrian crossings and bus stop locations. It will include 8 no. new junctions and alterations to 4 no. existing junctions, in addition it will provide a number of vehicular access spurs to facilitate future development of adjoining lands.

As mentioned, the CSLS will run in an east-west direction through the subject site and provide the site with access to the surrounding road network in the form of the R113 Fonthill Road North and Ninth Lock Road to the east and the R136 Grange Castle Road and R120 Adamstown Road to the west. From the CSLS planning application, a construction period of 24 months is expected in the best-case scenario where no obstacles arise and funding is available for the entirety of the project, but it would be operational by the design year 2025.

Figure 10.14 – Proposed Clonburris Southern Link Street Scheme and Surrounding Existing Road Network

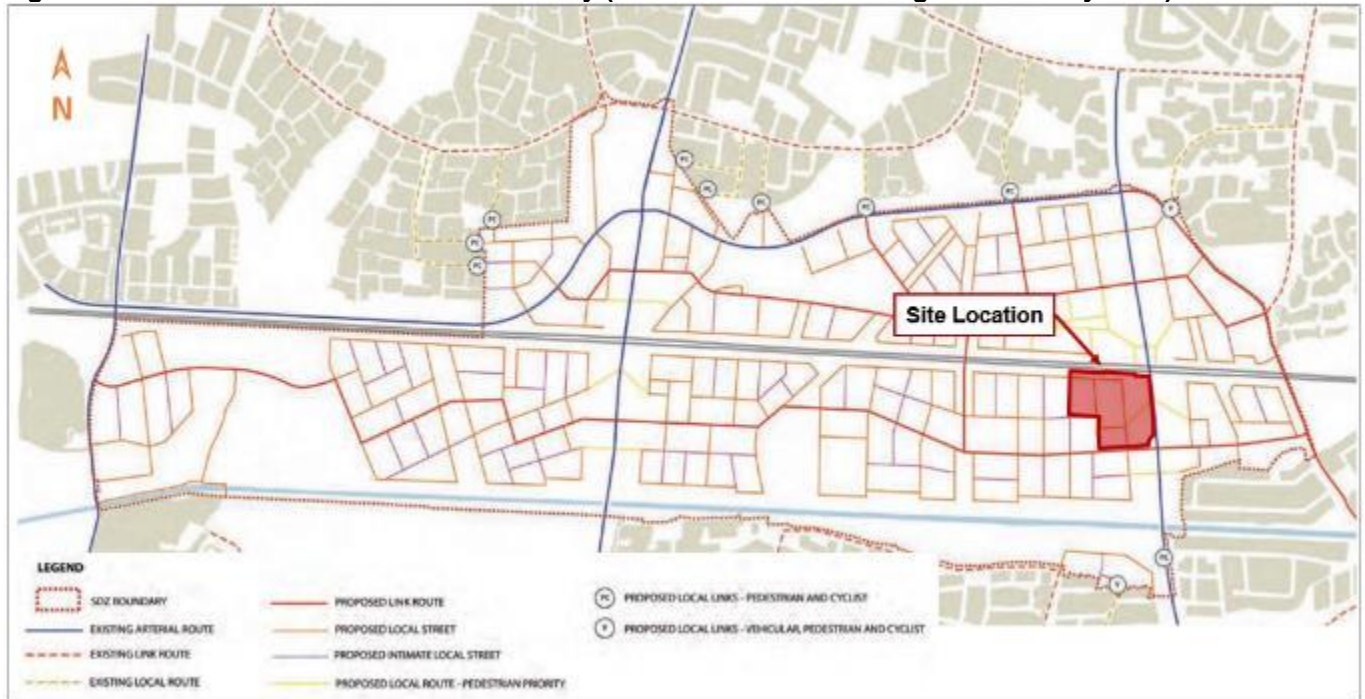


10.4.10 Proposed Pedestrian and Cycle Infrastructure

10.4.10.1 Clonburris SDZ Planning Scheme

The design approach for pedestrian and cyclist infrastructure will be to apply uniform design widths along the streets that are under consideration and will consider the existing greenway network and pedestrian priority routes to interact with the proposed 'Arterial' and 'Link' corridors under the Clonburris SDZ planning scheme.

Local pedestrian priority streets/routes shall also be provided in designated areas in and around the vicinity of the proposed Kishoge and Clonburris Urban Centres. These local routes within the SDZ lands will create an opportunity to link with the Grand Canal Green which runs through and along the entire southern boundary of the SDZ lands and links with Dublin City Centre in the form of a dedicated pedestrian and cycle route (**Figure 10.15**). Local Streets that provide through routes for strategic pedestrian and cycle routes should be filtered to prioritise pedestrian and cyclist through access where junctions intersect with the link or arterial streets only.

Figure 10.15 – Clonburris SDZ Street Hierarchy (Clonburris SDZ Planning Scheme May 2019)

Five dedicated pedestrian crossings on Arterial Streets have been incorporated in the designs of the road infrastructure proposals. These are located as follows:

- Three along the R136 Grange Castle Road:
- Two north and south of Kishoge train station where pedestrian priority route converges on either side of the arterial road corridor; and
- One on the bridge over the railway line, adjacent to the train station to cater for pedestrian desire crossing movements to/from either side of the road.
- Two along the R113 Fonthill Road North, north and south of Clondalkin and Fonthill train station where pedestrian priority route converges on either side of the arterial road corridor.

A number of bridges are required to enable north-south movement across the Grand Canal and Kildare Railway for different modes. A total of five new bridges are proposed in addition to the upgrade of an existing pedestrian and cycle bridge to a 'green bridge' at Hayden's Lane. Within the SDZ lands, the Railway Line splits the lands including Griffeen Valley Park and the lands to the south.

In order to mitigate the disintegration of the green infrastructure, in particular the Griffeen Valley Park and the Griffeen River, a green bridge shall be provided over the railway line. The Clonburris scheme aims to retrofit or replace the existing pedestrian bridge over the railway line to provide a green bridge connecting the Griffeen Valley Park and the proposed extension of the park to the south to enhance pedestrian and cyclist accessibility.

10.4.10.2 GDA Cycle Network Plan 2013

The subject road site is located within the "Dublin West Sector" as outlined within the Greater Dublin Area Cycle Network Plan (2013). The Sector "extends southward from the N4 and River Liffey, to a line south of the N7 and the Ballymount and Walkinstown areas."

In the vicinity of the subject residential development scheme, the Plan proposes the following route additions as indicated on **Figure 10.16** below:

- Route SO5/SO5a: "from Liffey Valley Shopping Centre southward Fonthill Road and Ninth Lock Road to Clondalkin Village and Tallaght (with a parallel variant SO5a along Neilstown Road and Fonthill Road west of Clondalkin Village). A northward link will extend across the River Liffey to Blanchardstown",
- Route SO6: "Lucan (Esker) - Grange Castle - Kingswood - Jobstown along the R136",

- Route SO7: “Lucan - Newcastle Road to Grange Castle and Nangor Road. (Continuation to Newcastle along rural route D6.)”,
- Route SO8: Proposed on Adamstown Avenue and Thomas Omer Way,
- Route 7B/N10 Grand Canal Greenway: “Pimlico to Rialto, Clondalkin, Adamstown via Grand Canal” and
- Western Canals Loop Link: “greenway route linking the Grand Canal at Adamstown to the Royal Canal at Leixlip via Griffeen Valley Park”.

Figure 10.16 – Proposed Cycle Routes (Extract: Sheet N5 GDA Cycle Network Plan 2013)



In November 2021, the NTA released an updated draft Greater Dublin Area Cycle Network Plan as part of the Draft Transport Strategy for the Greater Dublin Area 2022-2042. The majority of the proposed 2013 cycle network remains unchanged in the updated proposals. The primary changes to the network found in the updated plan is the provision of a number of greenway routes through the Clonburris SDZ lands as well as a change in hierarchy from secondary route to primary route for the facilities to be provided on the R136 Grange Castle Road, north of the roundabout junction with Thomas Omer Way. The proposed cycle facilities presented in the Draft Greater Dublin Area Cycle Network Plan 2021 are shown below in **Figure 10.17**.

Figure 10.17 – – Proposed Cycle Routes (Extract: Draft GDA Cycle Network Plan 2021)



10.4.10.3 Proposed Cycling Networks

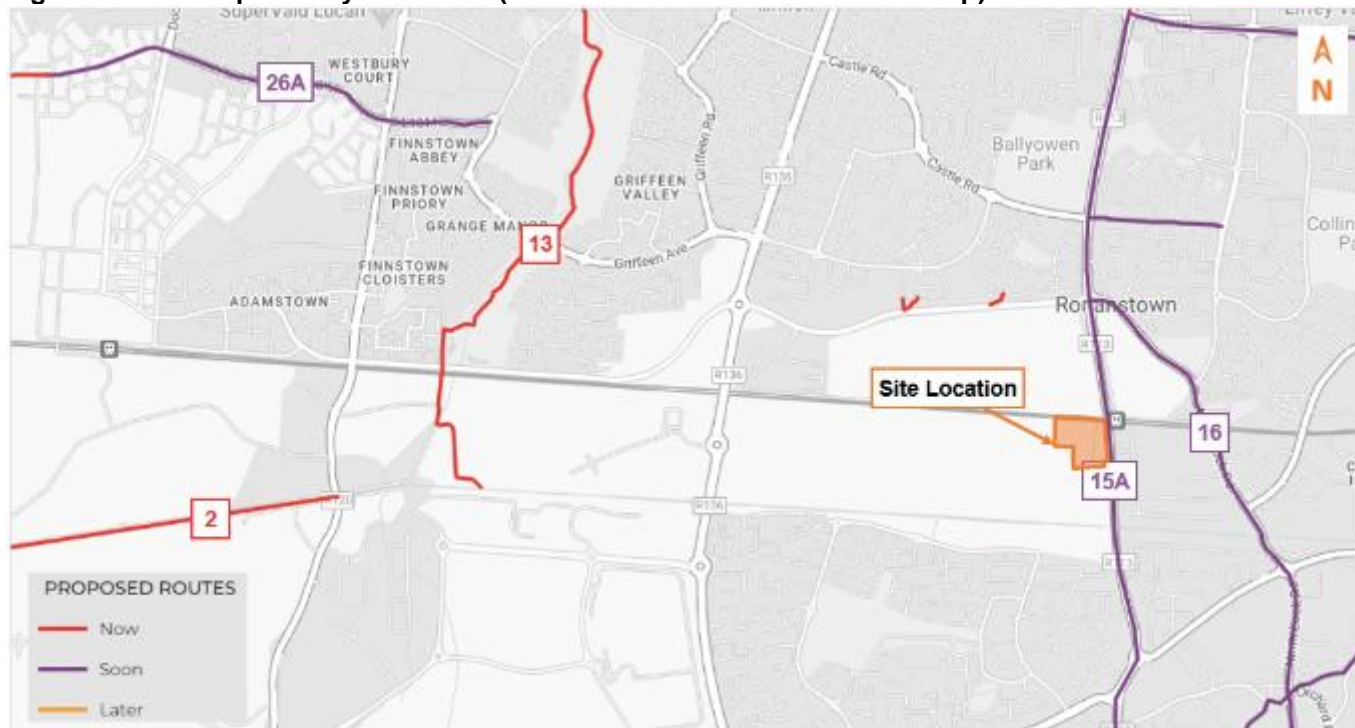
South Dublin County Council has prepared a Cycle Network Plan as part of the Cycle South Dublin Programme. Cycle routes detailed in the plan are at different stages of development, while some have been completed, other await construction or are at a design or consultation stage. A summary of the proposed routes in the vicinity of the Clonburris SDZ is presented in **Table 10.5** below.

Table 10-5 – Proposed Cycle Facilities in the Vicinity of the Clonburris SDZ (Source: SDCC Active Travel GIS Map)

Route No.	Description	Length (km)	Timeline	Current Status
13	Lucan Canal Loop	4.4 km	Now	Advanced Design Stage
2	Grand Canal Extension	5.4 km	Now	Final Design Stage
15(A)	Clondalkin Boot Road to Coldcut Road	2.6 km	Soon	Existing Cycle Lanes Reviewed
16	Ninth Lock Road	1.2 km	Soon	Preliminary Route Selection Stage
26(A)	Griffeen Valley Park to Celbridge Link Road	1.5 km	Soon	Under Construction

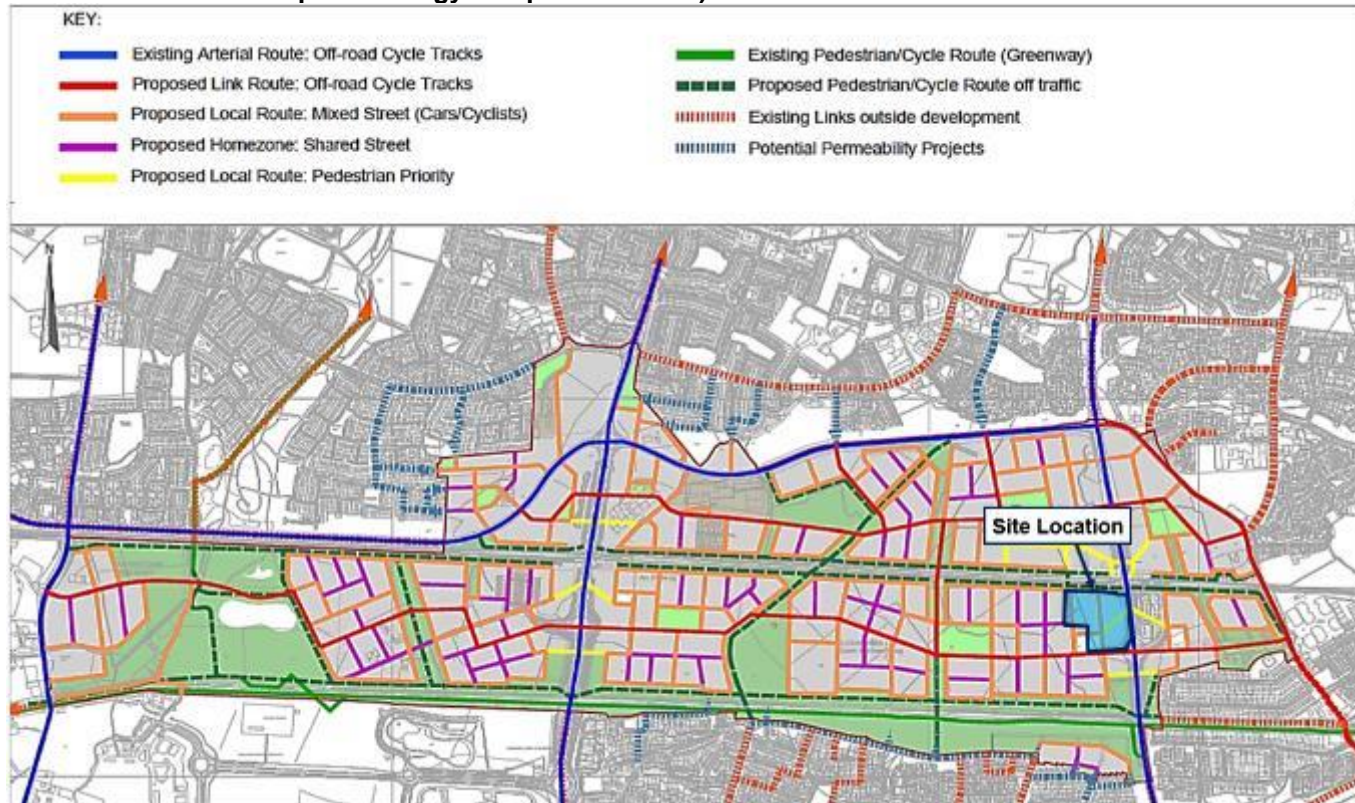
The location of these proposed cycle routes in the vicinity of the Clonburris SDZ are shown in **Figure 10.18** below.

Figure 10.18 – Proposed Cycle Routes (Extract: SDCC Active Travel GIS Map)



Likewise, the Clonburris SDZ Strategy also contains a comprehensive proposed walking and cycling network to be developed within the Clonburris SDZ Area as shown in **Figure 10.19** below:

Figure 10.19 – Proposed Walking and Cycling Network (Source: Source: Clonburris SDZ Transport Assessment and Transport Strategy – September 2017)



10.4.11 Proposed Public Transport Infrastructure

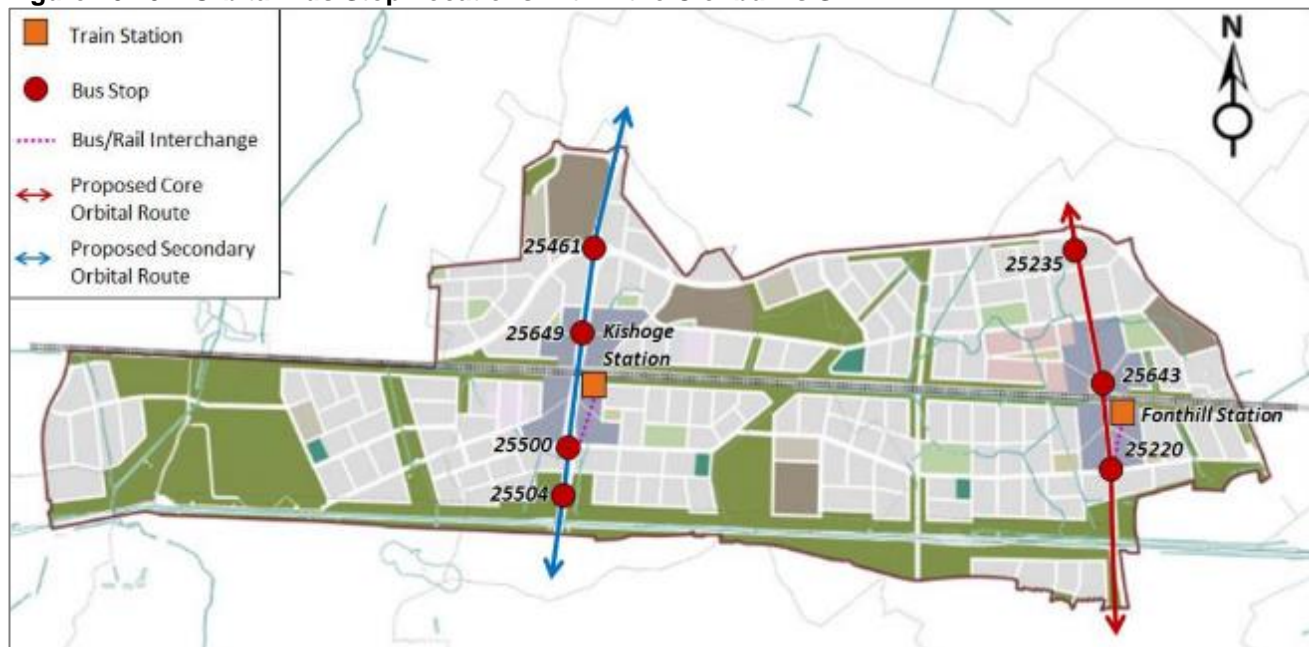
10.4.11.1 High Frequency Orbital Bus

The Clonburris SDZ Strategy outlines two orbital bus services operating from Tallaght to Blanchardstown, serving the Clonburris SDZ. These Orbital routes would tie into the BusConnects Plans and the GDA Greater Dublin Area Transport Strategy 2016-2035. It must be noted that these services have not been finalised and may be subject to change based on further design and planning undertaken by the NTA and SDCC. The two services include:

- Core Orbital Service operating North – South on the Fonthill Road North (R113) with an indicative headway of 5 minutes; and
- Secondary Orbital Service serving Liffey Valley to Tallaght via Lucan and Grange Castle Road (R136) with an indicative headway of 15 minutes.

As mentioned, these proposals are part of the 2035 GDA Strategy and it is envisaged that the provision of these high-quality orbital bus services would serve the demand by the residents and employees of Clonburris, provide an interchange with the rail stations at both Kishoge and Clondalkin-Fonthill and provide a high frequency service linking Clonburris to Tallaght, Blanchardstown, Liffey Valley and Fonthill Retail Park. **Figure 10.20** illustrates that the proposed orbital routing through the SDZ lands with indicative stopping and interchange locations highlighted.

Figure 10.20 – Orbital Bus Stop Locations within the Clonburris SDZ



(Source: Clonburris SDZ Transport Assessment and Transport Strategy – September 2017)

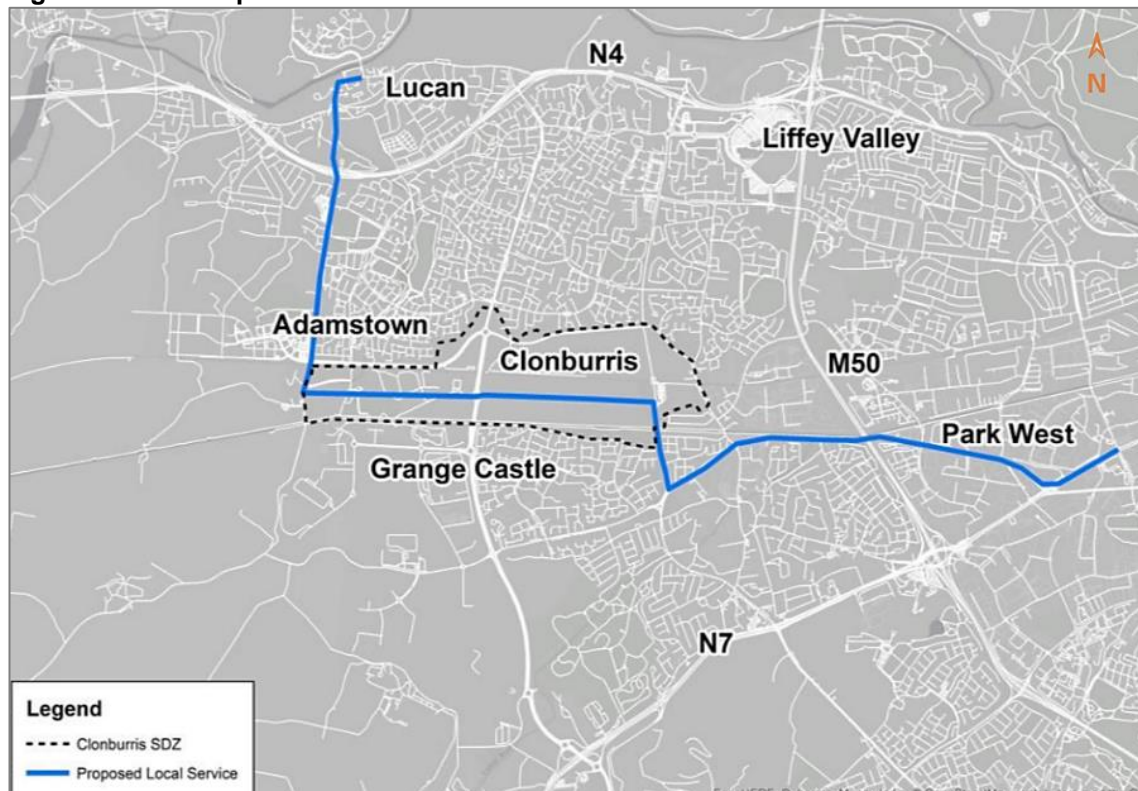
10.4.11.2 Local Bus

Local bus routes are planned to travel along the proposed Clonburris Southern Link Street in both directions. However, there would be an overall low to medium frequency. The Strategy also outlines local bus proposals that could support sustainable travel from Clonburris to key trip attractors with Lucan and Liffey Valley. These services include the following: -

- Local Bus 1: Lucan – Park West Service and
- Local Bus 2: Grange Castle to Liffey Valley Service via Clonburris.

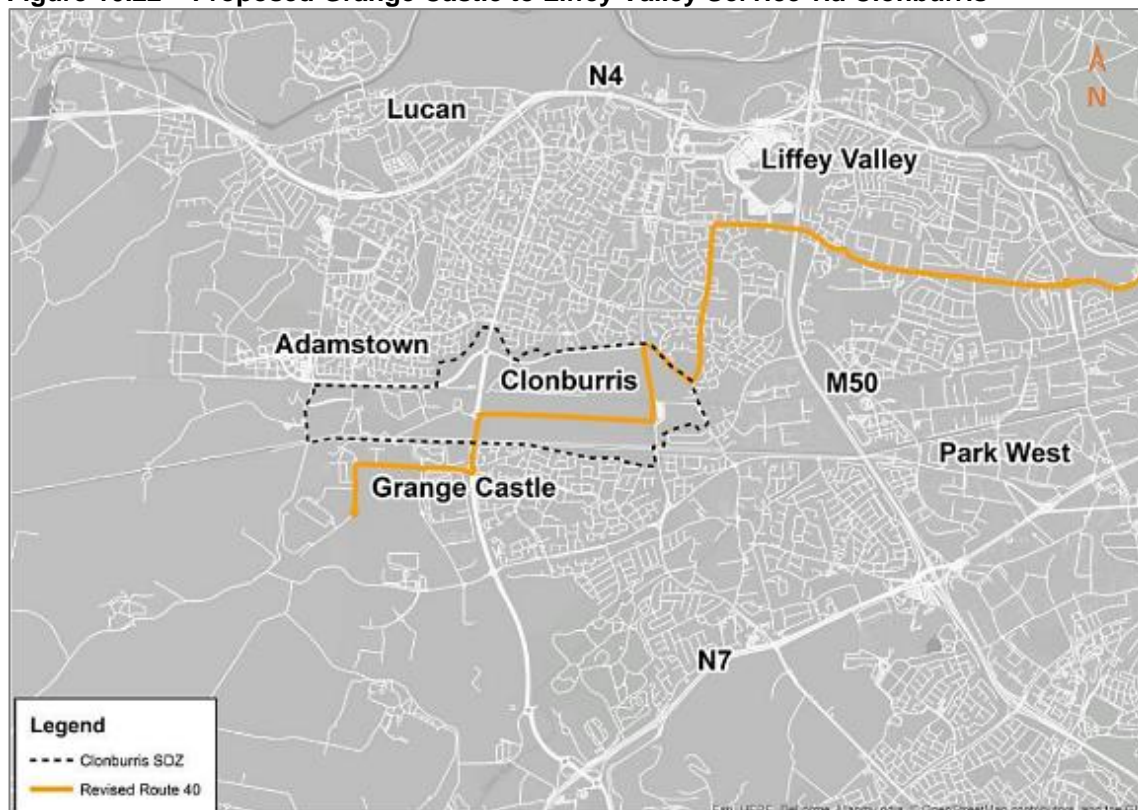
Local Bus 1 would link Lucan, Adamstown, Clonburris and Park West Business Park (Ref. **Figure 10.21**) whilst Local Bus 2 would provide a connection between Clonburris and the employment areas at Grange Castle Business Park and Liffey Valley (Ref. **Figure 10.22**). Both of these services will serve the aforementioned bus stops and these local services could potentially provide a sustainable alternative instead of car journeys within the local area. It would also provide interchange with core and orbital bus services and supports the Public Transport measure detailed in the 2025 GDA Strategy.

Figure 10.21 – Proposed Lucan – Park West Bus Route



(Source: Clonburris Transport Assessment and Strategy)

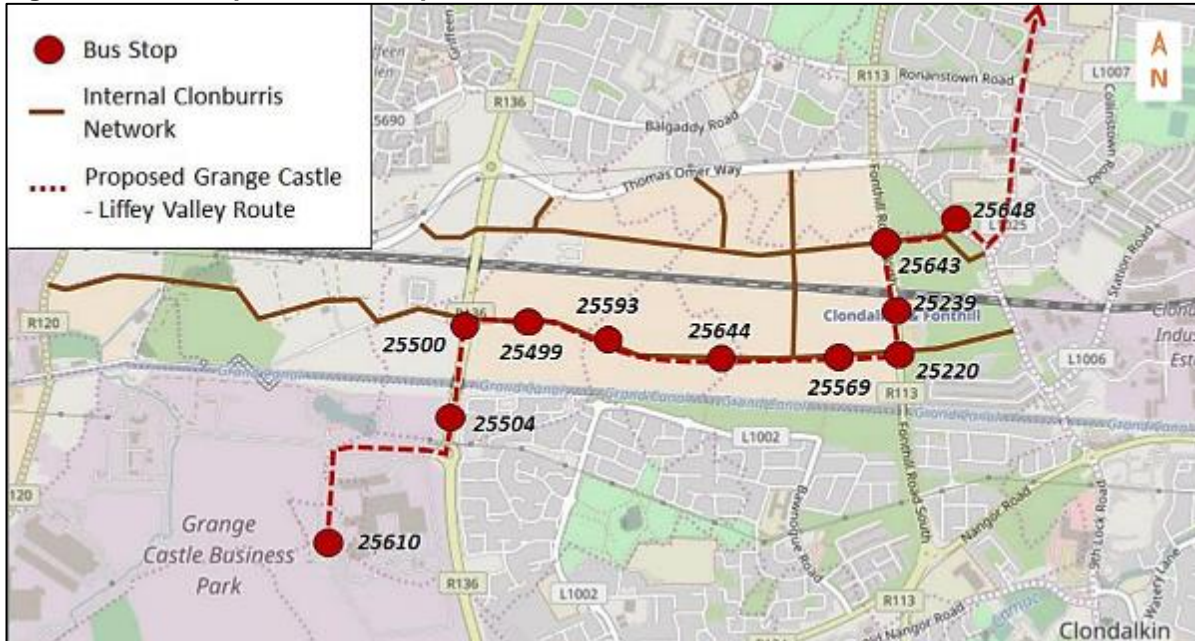
Figure 10.22 – Proposed Grange Castle to Liffey Valley Service via Clonburris



(Source: Clonburris Transport Assessment and Strategy)

Figure 10.23 illustrates the proposed routing of the new service through the Southern East-West Link Road within the Clonburris SDZ.

Figure 10.23 – Proposed Bus Stops on the Southern Link Street of Clonburris SDZ



(Source: Clonburris Transport Assessment and Strategy)

10.4.11.3 BusConnects

The latest BusConnects network redesign and core bus corridors have been considered as part of this brief. The current proposals effect the current existing road corridors in the Clonburris SDZ lands however, the BusConnects network is intended to evolve with the future road network in the Greater Dublin Area. As such future revisions of the BusConnects could include the proposed road infrastructure in the Clonburris SDZ lands.

As **Figure 10.24** shows, the Clonburris SDZ will benefit from the proposed orbital W4 which will travel through the Clonburris site on Grange Castle Rd. BusConnects aims to operate this route every 30 minutes on weekdays and weekends (every 15 minutes during peak hours on weekdays). An additional orbital route, the W2, will operate on Ninth Lock Rd at a frequency of every 15 minutes. These routes serve the following destinations: -

- Orbital Route W4: Blanchardstown Shopping Centre to Tallaght via Liffey Valley,
- Orbital Route W2: Liffey Valley to Tallaght via Clondalkin.

The development will benefit from convenient access to the C Spine which will operate north of the scheme on Griffeen Avenue. The C Spine that is located within the vicinity of the scheme will make up of two branches, namely the C1 and C2. Both of these routes will have a frequency of 8 to 15 minutes during peak hours on weekdays and 30 minutes at weekends and weekday off-peak hours once all of the infrastructural works associated with BusConnects are completed. Both routes will begin at Adamstown and terminate in Sandymount. Furthermore, branch D1 and G2 (both routes operate 15 minutes on weekdays/every 20 minutes on weekends) are proposed on Grange Castle Rd and Ninth Lock Road respectively while branch D3 will travel on St. Cuthbert’s Road. These routes will serve the following destinations:

- Branch Route C1 and C2: Adamstown to Sandymount via Dublin City Centre, Ballyowen and Griffeen Valley.
- Branch Route D1: Foxborough to City Centre via Grange Castle Business Park and the New Nangor Road.
- Branch Route G2: Liffey Valley Shopping Centre to Spencer Dock via Dublin City Centre.
- Branch Route D3: Clongriffin to Clondalkin via Bawnogue and Dublin City Centre.

Branch routes C1 and C2 were formally launched in November 2021 while branch G2 was launched in October 2022.

Table 10.6 summarises the future frequency at which all routes will operate.

Figure 10.24 – Proposed BusConnects Network



(Source: BusConnects)

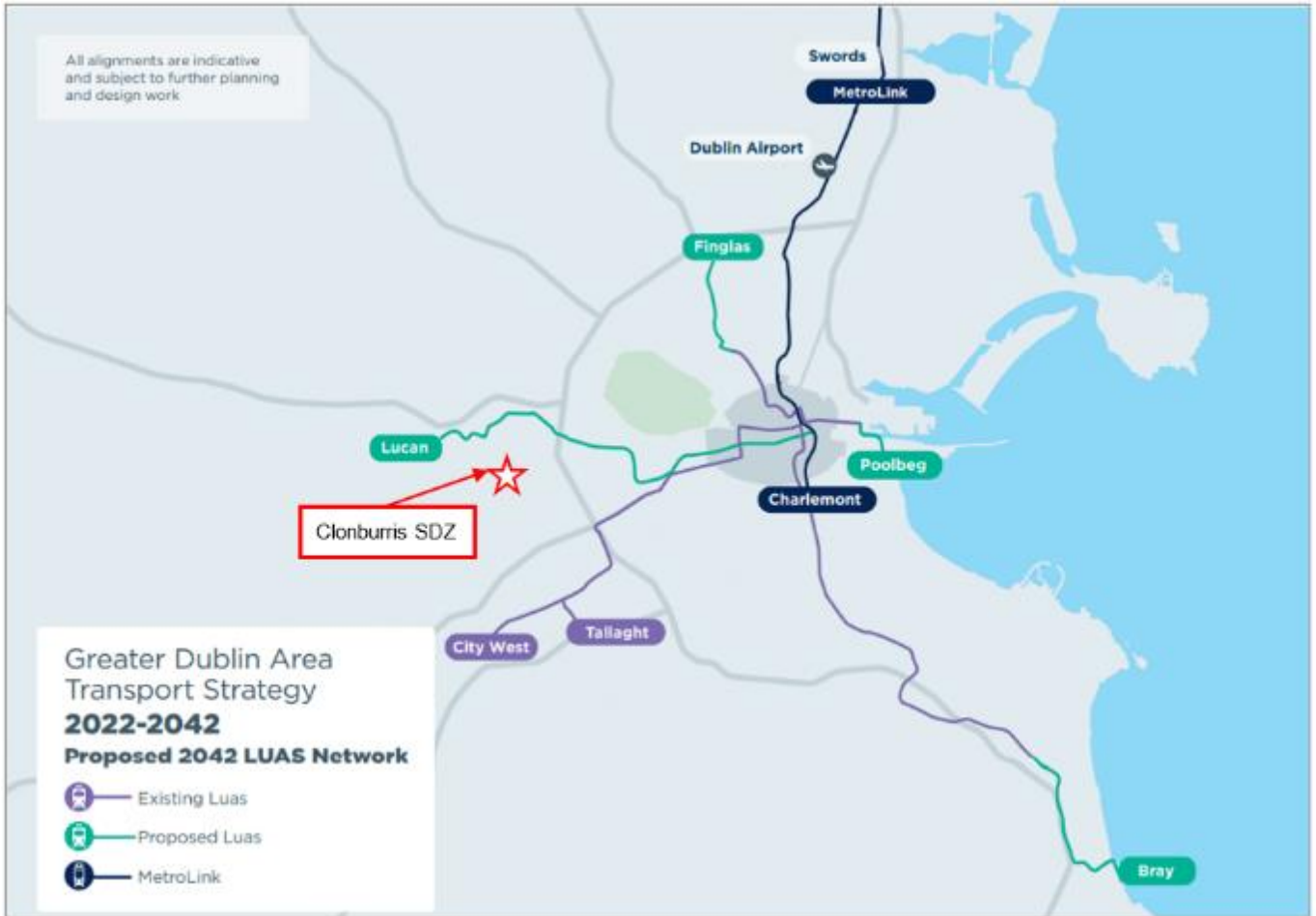
Table 10.6 – Future BusConnects Frequencies (minutes) by Route (Source: BusConnects)

Route No.	Description	Frequency (minutes)		
		Mon - Fri	Sat	Sun
D1	Clongriffin – City Centre – Grange Castle	15	15-20	20-30
D3	Clongriffin – City Centre – Clondalkin	15	15-20	20-30
G2	Liffey Valley SC – City Centre – Spencer Dock	12-15	15-20	20-30
W2	Liffey Valley – Clondalkin – Tallaght	15	15-20	20-30
W4	Blanch. SC – Liffey Valley – Grange Castle Rd - Tallaght	15	30-60	30-60
L54	River Forest – Lucan – Clondalkin – Red Cow	30	30-60	30-60
X55	Clondalkin – City Centre - Ringsend	5 services per day	-	-

10.4.12 Proposed Light Rail Infrastructure

The SDZ lands can be potentially served by the Lucan Luas that is currently planned under the NTA’s Transport Strategy for the Greater Dublin Area 2016 – 2035 and the Draft Transport Strategy for the Greater Dublin Area 2022-2042. Under both strategies, the future Lucan Line would serve Lucan, Liffey Valley and Ballyowen (Figure 10.25). Although the proposals are in its infancy stage, the Luas Line would finish in Lucan close to the Clonburris SDZ, but it is envisaged that there will be available interchange opportunities via BusConnects Routes or Active Travel mobility for the residents and employees in Clonburris.

Figure 10.25 – Schematic of Greater Dublin Area Proposed Luas Network



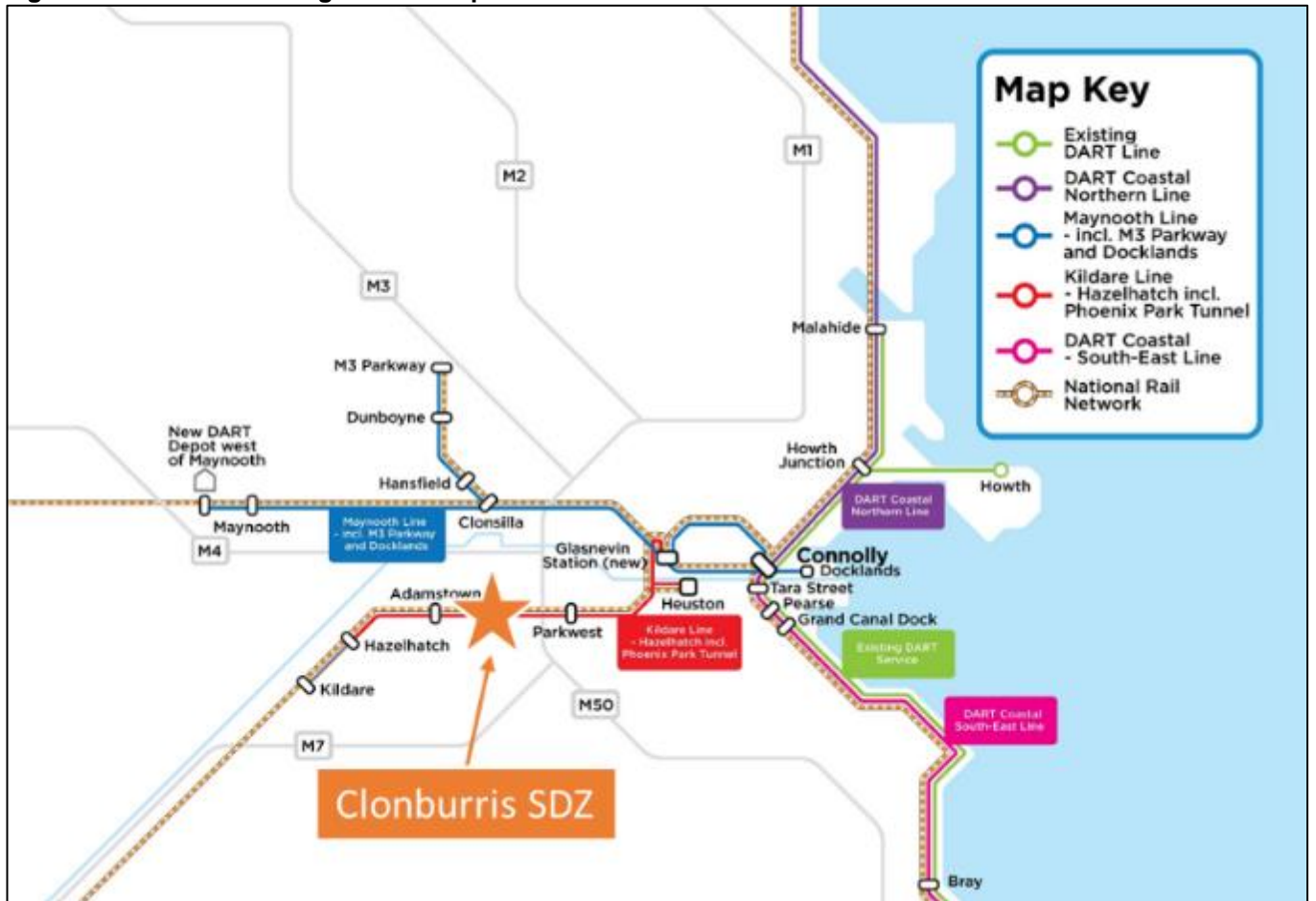
(Source: Draft GDA Transport Strategy 2022-2042)

10.4.13 Proposed Heavy Rail Infrastructure

The 2035 GDA Strategy outlines numerous public transport proposals to serve predicted growth in travel demand to 2035 and promote the use of sustainable modes of travel. In terms of heavy rail, the SDZ lands benefit from access to existing high-quality public transport services that operate along the Kildare/Cork Railway Line (**Figure 10.26**) which includes a four-track system between Park West and Hazelhatch railway stations. Specific heavy rail measures which are likely to impact on the Clonburris development include: -

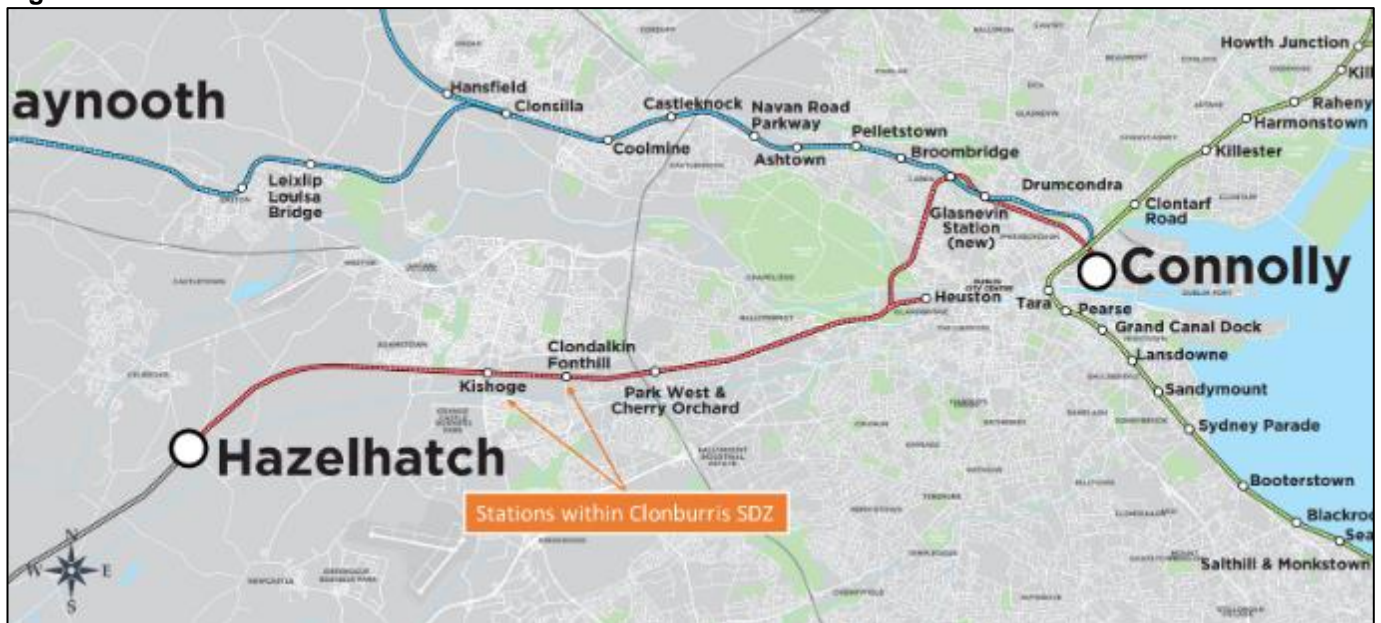
- **Kishoge Station:** The opening of the Kishoge Station within the proposed Clonburris SDZ will provide improved rail access for residents and staff employed at the subject site. The station building and platforms are already constructed in advance of the fully developed SDZ lands and the expected expansion of the DART network. While no additional works are proposed to the physical station, the upgrade works to bring Kishoge online (separate to Dart+ programme) are expected. Irish Rail intend have the station being operational within the next few years.
- **The DART+ Programme:** As shown in **Figure 10.26** below, this project will increase services between Dublin City Centre and Hazelhatch & Celbridge from 12 trains per direction per to 23 trains per direction per hour. It will also see an increase in capacity from 5,000 passengers per direction per hour to 20,000 passengers per direction per hour. New stations along the line will include Heuston West and Glasnevin. It is expected that the railway order for DART+ South West will be lodged before the end of 2022. The expansion incorporates both the Kishoge and Clondalkin-Fonthill Railway Stations (**Figure 10.27**).

Figure 10.26 – DART+ Programme Scope 2018 - 2027



(Source: Irish Rail)

Figure 10.27 – DART+ South West Line



(Source: Irish Rail)

10.4.14 Timescales of Proposed Infrastructure

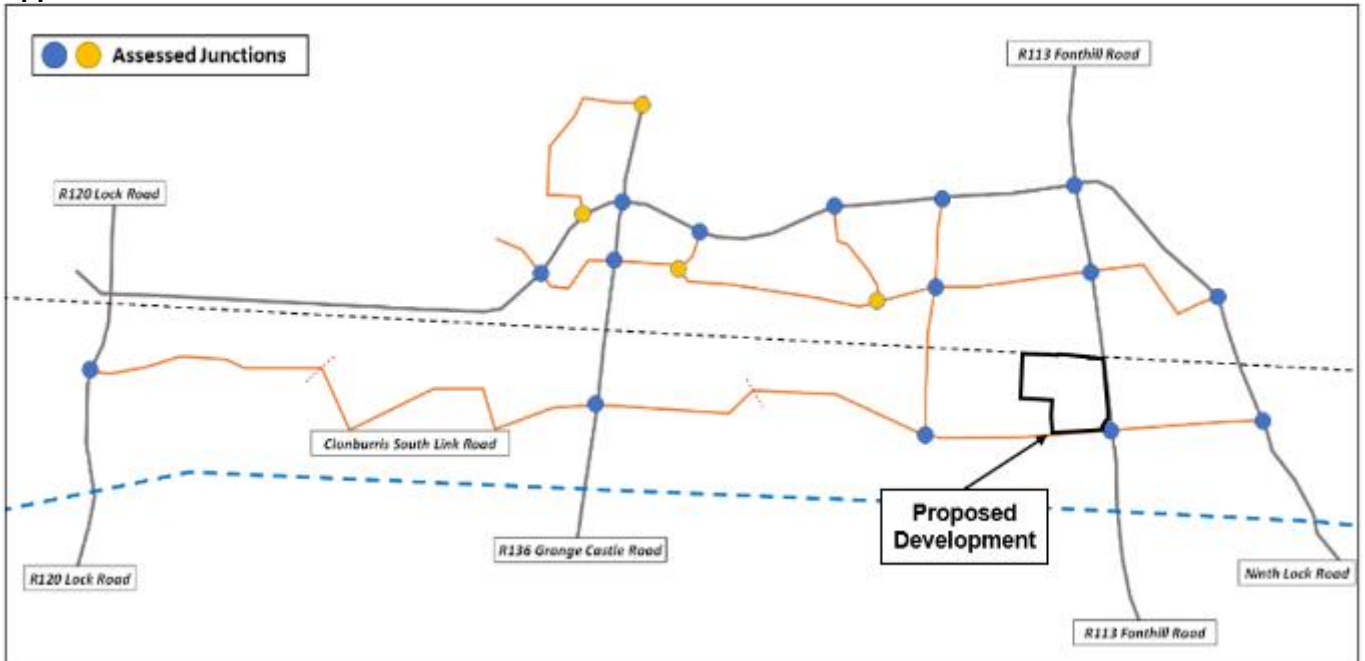
The implementation of the above transport infrastructure schemes by the local authority will be subject to the availability of funding. As no specific completion dates for any of these schemes have been published, for the purpose of this assessment we have assumed that none will be constructed by the subject residential development scheme’s adopted design years.

10.4.15 Baseline traffic data

With the objective of quantifying the existing baseline traffic movements travelling across the local road network historic traffic counts were obtained via the planning application for the Clonburris Southern Link Street; the historic baseline data was made available under National Transport Authority / South Dublin County Council’s South West Dublin Local Area - Model Development Report.

This report was analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development based on these historic figures.

Figure 10.28 – Junctions Included Within the Network Analysis for the Clonburris Southern Link Street Application



10.5 CHARACTERISTICS OF THE PROPOSAL

10.5.1 Development Schedule

The proposed development comprises a mixed-use development comprising of apartments, a commercial office development, retail units and a creche. Refer to Chapter 2 for a detailed project description. The proposed development can be summarised as per **Table 10.7**.

Table 10.7 – Development Schedule Summary

Unit Type	No. of Units	Total No. of Units
Apartment	1 Bed	255
	2 Bed	307
	3 Bed	32
		594

Unit Type	No. of Units	Gross Area (sqm)
Creche	1	609
Commercial office	1	4,516
Retail Units	4	887

10.5.2 Site Access Arrangements

10.5.2.1 Vehicle Access

The main vehicular accesses to/from the subject development will be provided via the Clonburris Southern Link Street, as shown in **Figure 10.27** below. In addition to this access there will be two vehicular access to proposed developments on the western border of the site. All of the vehicle accesses are in the form of priority junctions.

Figure 10.29 – Vehicle Access Locations



10.5.2.2 Pedestrian and Cyclist Access

The vehicular accesses will also be accessible to both pedestrian and cyclists. There are three additional pedestrian access points on the eastern boundary of the site as shown in **Figure 10.28**. These non-vehicular access points provide filtered permeability, ensuring shorter walking and cycling distances and increasing the attractiveness of these sustainable modes.

Figure 10.30 – Pedestrian and Cyclist Access Locations



10.5.3 Car Parking

Reference has been made to the Transport Assessment & Transport Strategy section of the *Clonburris Strategic Development Zone (SDZ) Draft Planning Scheme*, as published in September 2017.

The subject development site is located within SDCC Zone 2 Parking and therefore the quantum of car parking provision should be minimised. The car parking standards as set out in the South Dublin County Council Development Plan 2022 – 2028 are illustrated in **Table 10.8** below.

Table 10.8 – SDCC County Development Plan 2022 – 2028 Maximum Parking Rates

Land Use		Zone 2
Apartment / Duplex	1-Bed	0.75 Space
	2-Bed	1 Space
	3-Bed	1.25 Space
Retail	Retail Convenience	1 Space per 25sqm
Enterprise and Employment	Offices Manufacturing	1 Space per 75sqm GFA
Education	Creche	0.5 Space per Classroom

In addition, as per the SDCC Parking Standards, 20% of the apartment/duplex car parking provision will be allocated as electric vehicle charging stations while the remainder of the parking spaces should be constructed to be capable of accommodating future charging points, as required. Although Chapter 12 of the Development Plan does not explicitly raise the requirement for the provision of accessible car parking at private developments, it is suggested that in reference to national guidance, at least 5% of car parking spaces are designated for accessible parking.

Table 10.9 – SDCC County Development Plan 2022 – 2028 Maximum Parking Rates

Land Use		Zone 2
Apartment / Duplex	1-Bed	0.75 Space
	2-Bed	1 Space
	3-Bed	1.25 Space
Retail	Retail Convenience	1 Space per 25sqm
Enterprise and Employment	Offices Manufacturing	1 Space per 75sqm GFA
Education	Creche	0.5 Space per Classroom
Total Maximum Spaces		645

It is proposed that the 594 no. apartments will be provided with 330 no. car parking spaces, (0.56/ unit), 166 no. car parking spaces will be provided undercroft and 101 no. car parking spaces will be provided on the surface. Additionally, 20 no. mobility impaired car parking spaces, 39 no. electric vehicle car parking spaces and 4 no. car sharing car parking spaces will be provided undercroft for the apartments. Additionally, 44 no. car parking spaces are provided for the offices, (32 no. on the surface, 12 no. undercroft including 8 no. electric vehicle car parking spaces), 17 no. car parking spaces are provided for the retail units on the surface and 5 no. car parking spaces are provided for the creche, (2 no. on the surface and 3 no. undercroft). The proposed development will provide 396 no. car parking spaces in total.

The South Dublin County Council (SDCC) Development Plan 2022-2028 aims to take a “*balanced approach to the provision of car parking with the aim of using parking as a demand management measure to promote a transition towards more sustainable forms of transportation, while meeting the needs of businesses and communities*”. SDCC states that the number of spaces for a proposed site must not exceed the maximum provision. It also states that the “*maximum provision should not be viewed as a target and a lower rate of parking may be acceptable*”. This depends on the environment of the proposed site and its future residents.

It is an objective for this development to reduce the need for commuters to travel by car and instead to avail of more sustainable modes of travel in line with current and future travel requirements as set out in recent policy documents within Ireland. It is noted that the concept for car parking reduction in apartments is relatively new in Ireland and, therefore, proposals to implement a more sustainable approach for car parking may take time.

10.5.4 Cycle Parking

In order to determine the appropriate level of cycle parking provision for the proposed development, reference should be made to both (i) the South Dublin County Council (SDCC) requirements; and (ii) the Department of Housing and Planning and Local Government (DHPLG) Government ‘Sustainable Urban Housing: Design Standards for New Apartments’ (SUHDS guidance 2020).

The SDCC cycle parking standards state that for apartments, 1 no. long term cycle space is required per bedroom and 1 no. short term cycle space is required per 2 no. apartments. Therefore, according to the SDCC cycle parking standards the development is required to provide 965 long term cycle spaces for residents and 297 short term cycle spaces for visitors. This equates to a total cycle parking provision requirement of 1262 cycle parking spaces for the apartments. For the retail units, 1 no. long term cycle space is required per 5 no. staff and 1 no. short term cycle space is required per 50m². Therefore, according to the SDCC cycle parking standards the development is required to provide 6 long term cycle spaces for staff and 18 short term cycle spaces for visitors. For the offices, 1 no. long term cycle space is required per 200m² and 1 no. short term cycle space is required per 200m². Therefore, according to the SDCC cycle parking standards the development is required to provide 26 long term cycle spaces for staff and 26 short term cycle spaces for visitors. For the creche, 1 no. long term cycle space is required per 5 no. staff and 1 no. short term cycle space is required per 10 children. Therefore, according to the SDCC cycle parking standards the development is required to provide 1 long term cycle space for staff and 2 short term cycle spaces for visitors. For the whole development 1341 cycle spaces are required consisting of 998 long term cycle spaces and 343 short term spaces.

The Department of Housing, Planning and Local Government ‘Sustainable Urban Housing: Design Standards for New Apartments’ (SUHDS guidance 2020) states the following requirements for cycle parking:

- 1 cycle storage space per bedroom;
- 1 cycle storage space for studio units and
- 1 cycle space per two residential units for visitor parking.

In total, there are 594 no. apartment/ duplex units proposed. Of these, there is proposed to be 255 No. 1-bedroom apartments, 307 No. 2-bedroom apartments and 32 No. 3-bedroom apartments. Therefore, the development is required to provide a total of 1262 no. of cycle parking spaces based on the DHPLG guidelines. The SDCC cycle parking requirement for the development is the same as the DHPLG requirement.

Therefore, the development proposes to provide a total of 1232 cycle parking spaces with 1024 of these proposed as long term parking for the residents and an additional 208 proposed as short term stay. The level of cycle parking spaces is proposed to encourage positive modal shift towards a more sustainable mode of travel. Moreover, future residents of the subject site will also be able to benefit from pedestrian/cycle facilities along most of the roads to/from the proposed development.

10.6 POTENTIAL IMPACT (EFFECTS) OF THE PROPOSED DEVELOPMENT

10.6.1 Construction Phase

10.6.1.1 Management of Construction Activities

All construction activities on-site will be governed by a Construction Traffic Management Plan (CTMP), the details of which will be agreed in full with South Dublin County Council prior to the commencement of construction activities on site. Preliminary details of the CTMP are outlined within the Construction and Environmental Management Plan. The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders thereby ensuring that both the public's and construction workers safety is maintained at all times, disruptions minimised and undertaken within a controlled hazard free / minimised environment. The impact of the construction period will be temporary in nature. Both the CTMP and the CEMP will contain the mitigation measures included in this EIAR.

10.6.1.2 Construction Traffic

All construction activities on-site will be governed by a Construction Traffic Management Plan (CTMP), the details of which will be agreed in full with South Dublin County Council prior to the commencement of construction activities on site. Preliminary details of the CTMP are outlined within the Construction and Environmental Management Plan. Both the CTMP and the CEMP will contain the mitigation measures included in this EIAR.

In general, the impact of the construction period will be temporary in nature and less significant than the operational stage. During the construction of the proposed development, all excavated suitable material will be used for construction and fill activities where possible and appropriate. All unsuitable material will be disposed of at an approved tip, location to be agreed with the local authority.

In addition to the traffic generated by the disposal of surplus soil from the site, there will be traffic generated from deliveries of construction materials and equipment. It should be pointed out that construction traffic generated during the development works tends to be off-peak. Such trips would generally be spread out over the full working day and are unlikely to be higher than the peak hour predicted for the operational stage.

Haul routes have been designed considering all traffic during the Construction Stage. Construction traffic will only be generated on weekdays (07:00-19:00, subject to conditions of a planning permission) and will consist of the following two principal categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff.
- Excavation plant, dumper trucks and delivery vehicles involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready-mix concrete and mortar, concrete blocks, miscellaneous building materials, etc

On-site employees will generally arrive before 08:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 16:00. It should be noted that a large proportion of construction workers are anticipated to

arrive in shared transport subject to Covid-19 restrictions. Deliveries will be actively controlled and subsequently arrive at a dispersed rate during the course of the working day.

Based upon the experience of similar developments, a development of this type and scale would at a maximum necessitate approximately 40 staff on site at any one time, subsequently generating no more than 40 two-way vehicle trips over the day over the period of the construction works.

Based on a preliminary review of the existing survey data and proposed site levels we estimate that approximately 1,500m³ of material will require excavation.

An appropriate control and routing strategy for HGVs can also be implemented for the duration of site works as part of the CTMP. It is not proposed to utilise any roads with weight/height restrictions as part of the routing of HGVs during the construction phase.

A significant benefit of the subject development site’s characteristics is that all construction traffic vehicle parking demands can be accommodated on-site thereby minimising the impact upon the operational performance and safety levels of the adjacent public road network.

Considering the site’s proximity to the strategic road network and following the implementation of an appropriately detailed CTMP, it is concluded that construction traffic will not give rise to any significant traffic concerns or impede the operational performance of the local road network and its surrounding junctions. All construction traffic will access the site via Fonthill Road to the east of the site.

The scheme shall be constructed in a manner to minimise disruption to road users, local residents and businesses. All construction works are to be undertaken in a clearly delineated site area which will have specific entry and exit points for construction traffic.

The predicted construction HGV and staff vehicle generation levels as summarised above (including potential impact on the haul route) are lower than those predicted during the operational stage. The impact at construction is predicted to be imperceptible to not significant and therefore the lower vehicular traffic generated at construction stage is predicted to have a lesser impact compared to the operational stage. In addition, the peak construction stage traffic will occur before the local road networks AM peak hour and after the PM peak hour. Outside of peak network hour times, the local junctions and road links will have significantly more capacity compared to the peak hours and therefore are predicted to have more than enough capacity to accommodate the predicted construction vehicular traffic generation. The level of significance of the above findings are categorised in **Error! Reference source not found.**

Table 10.10 – Rating of Operational Phase Effects

Issues	Quality	Significance	Duration
HGV Traffic	Negative	Not Significant	Short-term
Dust generation	Negative	Not Significant	Short-term
Noise & Vibration	Negative	Not Significant	Short-term
Parking	Neutral	Imperceptible	Short-term

10.6.2 Operational Phase

10.6.2.1 Traffic Assessment

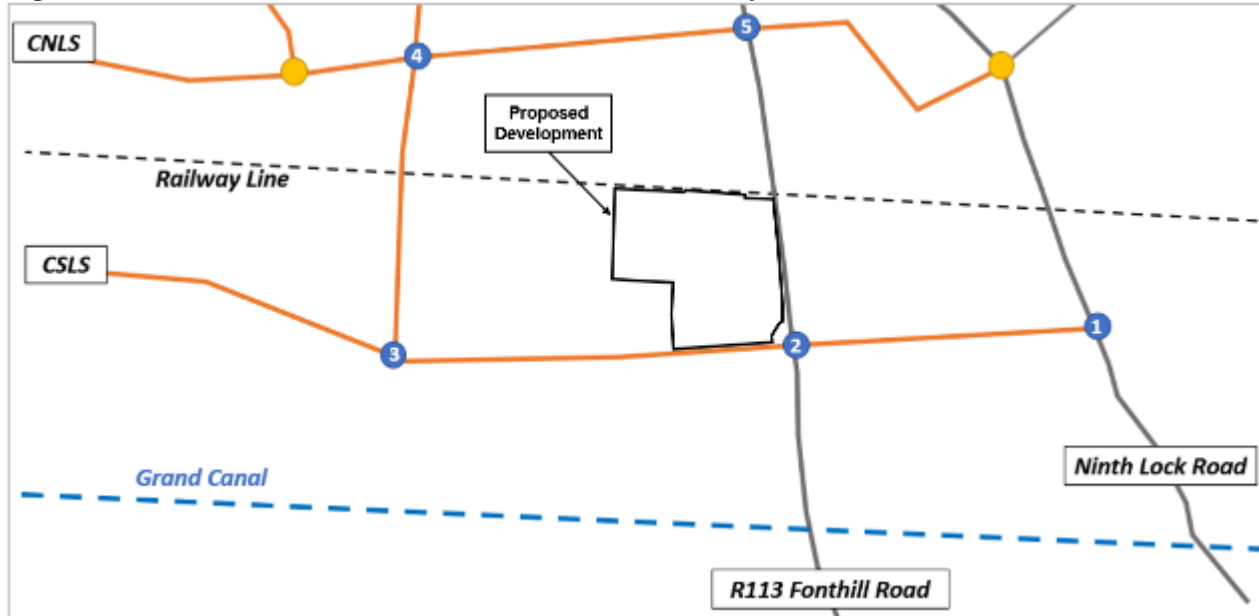
Historic traffic counts were obtained via the planning application for the Clonburris Southern Link Street; the historic baseline data was made available under National Transport Authority / South Dublin County Council’s South West Dublin Local Area - Model Development Report. This report was analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.

In order to analyse and assess the impact of the proposed link road scheme on the surrounding road network, a traffic generation and distribution model (excel based) of the following key junctions, as shown in **Figure 10.31**, was created:

- Junction 1 – Ninth Lock Road / CSLS;

- Junction 2 – R113 Fonthill Road / CSLS;
- Junction 3 – CSLS / New Link Road;
- Junction 4 – CNLS / New Link Road; and
- Junction 5 – R113 Fonthill Road / CNLS.

Figure 10.31 – Junctions Included Within the Network Analysis



10.6.2.2 Trip Generation

Historic traffic counts were obtained via the planning application, Planning Ref: SDZ20A/0021, for the Clonburris Southern Link Street; the historic baseline data was made available under National Transport Authority / South Dublin County Council’s South West Dublin Local Area - Model Development Report. This report was analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.

A review of trip generation factors contained within the TRICS database was carried out. TRICS data is primarily UK based, although a number of Irish sites have recently been included and the number of Irish sites continues to expand. Nevertheless, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

Data supplied for inclusion in TRICS undergoes a procedure of validation testing, and there is no evidence from this procedure suggesting that data from Ireland bears any significant fundamental differences to that from the other countries included. Consequently, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

Table 10.11 below includes the predicted vehicle trip rates of the potential unrestrained traffic flows in and out of the proposed development during the morning and evening peak hour periods using data from TRICS.

Table 10.11 – Proposed Development Trip Rates (TRICS)

Land Use	AM Peak Hour			PM Peak Hour		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
Apartments	0.021	0.085	0.106	0.079	0.043	0.122
Creche	2.775	2.423	5.198	2.511	2.731	5.242
Offices	0.559	0.059	0.618	0.038	0.444	0.482

Based on the above trip rates, potential peak hour traffic generation is calculated based on 594 no. apartment, a 609m² creche and a 4516m² office.

Table 10.12 summarises the revised predicted peak hour AM, and PM vehicle trips generated by the proposed development.

Table 10.12 – Proposed Development Trip Rates

Land Use	AM Peak Hour			PM Peak Hour		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
Apartments	12	50	63	47	26	72
Creche	17	15	31	15	16	31
Offices	29	3	32	2	23	25
Total	58	68	126	64	65	129

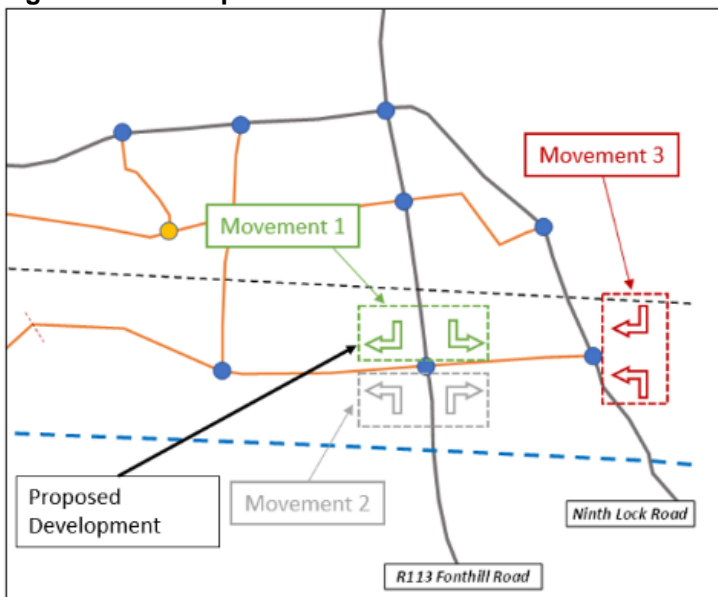
10.6.2.3 Trip Redistribution

A redistribution of traffic on the local network was carried out following the assumption that when the subject link road scheme is completed on the opening year of 2022 that this will have an impact on the surrounding road network as a new link is provided between the three regional routes, the R120 Lock Road, the R136 Grange Castle Road, and the R113 Fonthill Road. Hence providing an alternative route for a proportion of motorists and bypassing the R134 and Thomas Omer Way corridors.

The following assumptions (**Figure 10.32**) were made for the redistribution of the 2018 base year traffic to the surrounding network and the proposed CSLS:

- Movement 1 – Of the traffic travelling on the R113 Fonthill Road North 3% would turn right onto the CSLS West and 3% would turn left onto the CSLS East;
- Movement 2 – Of the traffic travelling on the R113 Fonthill Road South 10% would turn left onto the CSLS East and 40% would turn right onto the CSLS West;
- Movement 3 – 20% of traffic travelling along the Ninth Lock Road South would turn left onto the Clonburris Southern Link Street.

Figure 10.32 – Trip Redistribution



10.6.2.4 Traffic Growth

In response to the applicant's proposed construction schedule, this TTA adopts an Opening Design Year of 2025 and a long-term Future Design Year of 2040 (+15 years) as per TII guidelines. Although traffic growth may not increase at the rates once predicted, to ensure a robust analysis of the impact of traffic upon the local road network we have adopted growth rates using the Transport Infrastructure Ireland (TII) "Travel Demand Projections".

Applying the TII Zone growth factors (medium growth) for the adopted Opening Year of 2025 and Future Horizon Year of 2040 (+15 years), the following growth rates have been adopted to establish corresponding 2025 and 2040 baseline network flows: -

- 2018 to 2025 – 1.0950 (or 9.50%); and
- 2018 to 2040 – 1.1906 (or 19.06%).

10.6.2.5 Assessment Scenarios

Three different traffic scenarios have been assessed, namely (a) the 'Base' (Do-Nothing) traffic characteristics without the introduction of the CSLS and Full SDZ roads, (b) the 'Base' traffic characteristics with the introduction of the CSLS and Full SDZ roads (Do-Minimum) and (c) the 'Post Development' traffic flows with the introduction of the CSLS and Full SDZ roads (Do-Something).

The 'Base' traffic scenario considers the existing flows travelling across the network prior to the redistribution of the introduction of the subject link road scheme.

The proposed redistributed traffic accessing the CSLS and Full SDZ roads are then added to the network's 'Base' (Existing) traffic flows to establish the Do-Minimum Scenario. For the Do-Minimum scenarios in 2025 it is assumed that the CSLS is on service, and in 2040, the Full SDZ is developed. The proposed development traffic is then added to the network's 'Do-Minimum' (Base + Redistributed Traffic) traffic flows to establish the 'Post Development' traffic flows.

Do Nothing

- A1– 2018 Base Traffic Flows;
- A2– 2025 Base Traffic Flows (Growth from 2018); and
- A3– 2040 Base Traffic Flows (Growth from 2018).

Do Minimum

- B1– 2018 Base Traffic Flows (Redistributed);
- B2– 2025 Base Traffic Flows (Growth from 2018) (Redistributed) (CSLS fully developed)(Committed Development); and
- B3– 2040 Base Traffic Flows (Growth from 2018) (Redistributed) (SDZ lands fully developed)(Committed Development).

Do Something

- C1– 2025 Do Minimum + Proposed Development; and
- C2– 2040 Do Minimum + Proposed Development.

The network's AM and PM peak hour flows have been identified as occurring between 08:00 to 09:00 and 17:00 to 18:00 respectively.

The following figures (EIAR Appendix C Volume III of this EIAR) present the vehicle flows across the local road network for each of the adopted scenarios:

- **Figure 1** – 2018 Do Nothing (A1)
- **Figure 3** – 2025 Do Nothing (A2)
- **Figure 5** – 2040 Do Nothing (A3)
- **Figure 2** – 2018 Do Minimum (B1)
- **Figure 4** – 2025 Do Minimum (B2)

- **Figure 6** – 2040 Do Minimum (B3)
- **Figure 9** – 2025 Do Something (C1)
- **Figure 10** – 2040 Do Something (C2)

10.6.2.6 Network Impact

The Institution of Highways and Transportation document ‘*Guidelines for Traffic Impact Assessments*’ states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the network’s operational performance. These same thresholds are reproduced in the NRA/TII document entitled *Traffic and Transport Assessment Guidelines* (2014).

For the key local junctions, it can be seen in **Table 10.13**, that the proposed development upon full completion would have a material effect on the following two junctions in the adopted Do-Something scenario.

- Junction 2 – R113 Fonthill Road / CSLS Junction; and
- Junction 3 – CSLS / New Link Road Signalised Junction.

Table 10.13 – Increase in Vehicle Trips

Junction ID	Location	2025		2040	
		AM Peak	PM Peak	AM Peak	PM Peak
1	Ninth Lock Road / CSLS	2.88%	1.74%	1.67%	1.70%
2	R113 Fonthill Road / CSLS	4.68%	4.78%	2.90%	2.80%
3	CSLS / New Link Road	15.75%	16.65%	5.20%	5.65%
4	CNLS / New Link Road	N/A	N/A	1.37%	1.73%
5	R113 Fonthill Road / CNLS	2.42%	2.63%	1.22%	1.37%

For this proposed development’s analysis, Junction 2 and Junction 3 have been analysed. The impact on Junction 3 – CSLS / New Link Road Signalised Junction is particularly high as this junction is largely surrounded by greenfield lands and the Do Minimum scenarios only account for redistributed traffic and the granted Phase 1A development. When the entirety of these lands are developed upon the impact of the proposed development will be considerably reduced.

10.7 REMEDIAL OR REDUCTIVE MEASURES

10.7.1 Overview

A package of integrated mitigation measures has been identified to off-set the additional local demand that the proposed mixed-use development could potentially generate as a result of the forecast increase in vehicle movements by residents, commuters, and visitors of the development. The strategy includes specific measures for both the construction and operational stages of the proposed development.

10.7.2 Construction phase

The Preliminary Construction and Environmental Management Plan (which is a standalone report and included in the planning documentation) and the associated Construction Traffic Management Plan (CTMP) in addition to the application’s accompanying Construction and Waste Management Plan will incorporate a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed development’s on-site construction activities. Both the CTMP and the CEMP will contain the mitigation measures included in this EIAR.

The CTMP will be prepared prior to the commencement of construction work on site. This plan will be prepared in consultation with SDCC and submitted for approval in order to agree on traffic management and monitoring measures (in advance of works commencing) some of which are outlined below:

- All works on site will be undertaken during hours of the day in accordance with SDCC requirements.
- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths, and roads.
- The surrounding road network will be signed to define the access and egress routes for the development including dedicated 'haul' routes to/from the development site.
- The traffic generated by the construction phase of the development will be strictly controlled in order to minimise the impact of this traffic on the surrounding road network and local properties. All HGV trips could potentially be restricted from traveling to / from the development during the local road network's peak hours.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- All employees and visitors' vehicle parking demands will be accommodated by a permeable hardstand carparking area within the construction compound. The exact location of the construction compound is to be confirmed in advance of commencement of the works. On-street parking of construction vehicles and construction personnel vehicles will be discouraged.
- A programme of street cleaning across the local street and identified 'haul' routes' will be implemented.
- A construction Mobility Management Plan will be developed by the appointed contractor to encourage all construction personnel to utilise the vast range of sustainable travel options available when travelling to/from the subject proposed development site.

Construction of the proposed scheme will cause temporary short-term traffic impacts on the local road network. Enforcement of a Construction Management Plan will ensure that construction traffic impacts are minimized through the control of site access / egress routes and site access locations and any necessary temporary lane closure requirements.

10.7.3 Operational phase

A management regime will be implemented by the development's management company to control access to the on-site car parking spaces thereby actively managing the availability of on-site car parking for residents of the development.

Infrastructure measures identified to reduce reliance of private vehicles include the provision of ample secure cycle parking on site and ensuring a design which promotes permeability for pedestrians and cyclists to, through and from the development. The high level of high-frequency public transport facilities (Dublin Bus, Irish Rail) will also act as a powerful mobility management measure, as residents can rely on public transport over the private vehicle.

With the objective of mitigating the potential impact of the proposed development as predicted in section 10.6 above during its operational stage, and with the objective of promoting sustainable travel for all residents, workers, and visitors to the development; the following initiatives have been identified and subsequently form an integral part of the subject development proposals.

- Strategic Employment Centres – The location of the subject development adjoining the R113 Fonthill Road North corridor provides the unique ability for many of Dublin's strategic employment zones to achieve many of their sustainability obligations particularly in regard to staff accessibility, health, and sustainable modes of travel. Beyond the obvious ease of access to Dublin City Centre and Dublin Docklands provided by both LUAS and bus services, the proximity of the proposed development to a number of strategic employment areas has the potential to address existing staff access and recruitment issues at the following locations. Accordingly, a specific focus of the development's mobility strategy will be encouraging the uptake of sustainable travel options for the development's residents' 'commuter' trips to / from the local employment centres:
 - Clondalkin Industrial Estate / Fonthill Retail Park – both located within convenient walking and cycling distance of the subject site; and
 - Park West / Liffey Valley / Western Industrial Estate / JFK Industrial Estate / Cherry Orchard Industrial Estate / Grange Castle Business Park / Cookstown Industrial Estate / Tallaght / Ballymount Industrial Estate / Greenogue Business Park– All located within cycling distance and with direct public transport connections to / from the subject site.
- Management – A Mobility Management (MMP) will be rolled out with the aim of guiding the delivery and management of a range of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development site. It is proposed that two land use specific MMP's are developed under the framework of a 'parent' MMP for the entire

site. These two associated MMPs will be developed in partnership with SDCC to specifically consider the opportunities of shaping all journeys and promoting sustainable transport habits at both the proposed (i) residential units, and (ii) the office element of the proposed mixed-use scheme.

- Management – A Car Park Management Strategy. The availability of parking spaces is a key determinant of mode choice and car usage. With the objective of minimizing travel by car and encouraging the use of sustainable modes instead, it is proposed to limit the car parking provision and promote a ‘car lite’ scheme. This is considered an appropriate approach considering the site’s excellent accessibility characteristics (e.g., walking, cycling, bus, coach, LUAS and rail opportunities) to places of work, education and essential services. This ‘car lite’ approach will help to reduce car dependency in Dublin, reduce traffic congestion and pollution levels, improve the quality of the environment, and help tackle climate change in addition to encouraging sustainable travel.
- Facilities - In addition to facilitating and encouraging bicycle use, increasing the number of cycle parking provision on-site is considered best practice in situations such as when reducing car parking spaces. A total of 1232 no. cycle spaces are proposed within the development site as long term and short-term facilities.
- Infrastructure (by others) - Planning infrastructure investment that will further enhance the sites sustainable accessibility credentials include:
 - The latest BusConnects network redesign includes a number of routes that will benefit the subject site and provide access to locations including, Dublin City Centre, Clongriffin, Liffey Valley Shopping Centre, Clondalkin, Blanchardstown Shopping Centre and Tallaght. The routes in close proximity to the subject site include orbital routes W2 and W4 as well as branch routes C1, D1, D3 and G2.
 - The Clonburris SDZ Transport Assessment and Transport Strategy – September 2017 proposes a number of bus services that will serve the Clonburris SDZ including, two orbital bus services operating from Tallaght to Blanchardstown and two local bus routes, Lucan – Park West and Grange Castle – Liffey Valley.
 - The Clonburris SDZ Transport Assessment and Transport Strategy – September 2017 proposes the existing Grand Canal and Griffeen Valley Greenways will be complemented by a series of interconnecting and dedicated cycle routes linking the residential areas to key attractions, both internal and external to Clonburris.
 - The proposed GDA cycling network plan will also encourage a greater uptake in walking and cycling amongst residents, staff, and visitors.
 - The DART Expansion Programme will see the DART system expanded, providing fast, high-frequency electrified services to Drogheda on the Northern Line, Hazelhatch on the Kildare Line, Maynooth and M3 Parkway on the Maynooth Line and to Greystones on the South-Eastern Line. The subject site is ideally located to access these DART services via the existing Clondalkin-Fonthill Station and the new Kishoge Station.
 - The SDZ lands can be potentially served by the Lucan Luas that is currently planned under the NTA’s Transport Strategy for the Greater Dublin Area 2016 – 2035. Under this strategy, the future Lucan Line would serve Lucan, Liffey Valley and Ballyowen, however, the Luas Line could extend towards the Clonburris SDZ lands and would in turn expand the Luas transport users including the residents and employees in Clonburris.
- Car Sharing – Car sharing is also known as lift-sharing, car-pooling, or ridesharing. Car sharing offers people a cost effective and a more sustainable way of travelling by car when other forms of transport are not viable. Car sharing schemes encourage individuals to share private vehicles for particular journeys. Car sharing can be both formal and informal. Informal car sharing operates between individuals and neighbours and formal car sharing is defined by a more elaborate approach to trip matching, often focussed on the commuting journey. Car sharing has the aim of reducing the number of car trips made and participants have the opportunity to meet other members in the community. A National Car Sharing database is now available at www.carsharing.ie. It is an all-island service for the public and is free of charge to use. Car sharing has a number of benefits including reduces transport costs, reduces the number of cars on the road which results in less pollution, less congestion and fewer parking issues and reduces the need for a private car. The proposed development website would have a section dedicated to the car share scheme and residents would have an option to register. To encourage take up of the car sharing, the MMP Coordinator would host events to introduce prospective car sharers to each other and would help ‘break the ice’ as it is always more likely that people will share, particularly for the journey ‘home’, with somebody that they have met rather than a complete stranger.
- Car Clubs – Car Clubs are membership-based schemes providing shared cars for hire. A Car Club can play an important role in reducing costs, congestion, and environmental impact. Members have flexible access to the hire of a vehicle. Vehicles are parked in reserved parking spaces close to homes, town centres or workplaces and can be used and paid for on an hourly rate, daily or weekly basis. Individuals can join a car club;

alternatively, an organisation may have a corporate package with one of the car club providers. Car sharing clubs in Dublin have experienced significant growth in recent years. The facility allows members' access to a shared car in the local area for an hourly fee. This facility could be an attractive option for those who choose to start walking or cycling to work but may require access to a car at short notice. Residents can obtain further information at www.gocar.ie and also www.yuko.ie.

- Walking – The development has been designed to ensure that there are a number of access points / gateways to facilitate permeable walking through the site. The feasibility of measures that promote walking will be influenced by factors such as the safety and ease of walking to and from the site and the age profile of commuters. Generally speaking, a distance of up to 3km is considered reasonable for walking. This distance is only indicative but can help to define target groups. The health benefits of walking are a key element in promoting Mobility Management Plans. Walking improves cardiovascular fitness and burns calories. Walking will also increase your muscle tone, boost metabolism, ease stress, raise energy levels and improve sleep, which combined can also help with weight loss. Regular walking can also reduce the risk of coronary heart disease, diabetes, strokes, high blood pressure, cancer, osteoporosis, and arthritis. Walking will mainly be self-promoting, and initiatives should focus on making people aware of the routes available to them. A map showing the walking routes should be prepared and placed at key locations within the development. These could be stand-alone signs or maps on notice boards. This information would also be available on the community website. It is important to ensure that pedestrians are safe and are satisfied with the facilities available and their maintenance. It should be noted that: -
 - Walking is truly the most-sustainable form of transportation.
 - All trips, regardless of mode, both begin and end on foot.
 - Walking needs to have a greater level of priority in most cities, like walk-signal times, safer well-lit / marked crosswalks, and pedestrian zones.
 - Walking is an easy mode of travel for distances under 2km. Most people are prepared to walk between 800m to 1km to a train station or bus stop.
- Cycling – The proposed development is well located for cycling journeys and this mode of travel should be encouraged with the provision of a wide range of routes within the development and new links to existing and future major routes in the local area. A distance of up to 10km is considered reasonable for cycling. This distance is only indicative but can help to define target groups. A total of 1232 cycle spaces are proposed within the development to accommodate residents and visitors to the site. The on-site cycle facilities will be linked to the existing off-site cycle routes. Also, improved cycle infrastructure is proposed under the Greater Dublin Area Cycle Network Plan routes which runs in close proximity to this site. As with many measures relating to cycling, the aim is a mixture of support, through incentives and facilities, and encouragement, through information and marketing.
- Public Transport (Bus) – The proposed development will be well served by Dublin Bus services, with bus routes available along New Nangor Road, Grange Castle Road, Adamstown Avenue, Ninth Lock Road and Fonthill Road as well as BusConnects proposals for new routes which are proposed to pass close to the subject site along Grange Castle Road, Ninth Lock Road, St. Cuthbert's Road and New Nangor Road. At Present, the bus stops are located in close proximity with the closest bus stops are located along New Nangor Road, Grange Castle Road, Adamstown Avenue, Ninth Lock Road and Fonthill Road which offers the subject site a variety of frequent services operating daily. The subject site is located close to the proposed Bus Connects C1, D1, D3, G2, W2 and W4 routes which will provide enhanced levels of accessibility and mobility.
- Public Transport (Rail) – The proposed development is situated on the Kildare railway line and has two railway stations in close proximity, the Clondalkin-Fonthill Station and the completed but not yet operational Kishoge Railway Station. Clondalkin-Fonthill Station is served by commuter services to Heuston Station and following the recent upgrading of the Phoenix Park Tunnel, services calling at Clondalkin-Fonthill Station now offer connections to Drumcondra, Connolly, Tara Street, Pearse and Grand Canal Dock. The DART Expansion Programme will see the DART system expanded, providing electrified services to locations such as Drogheda, Hazelhatch, Maynooth and Greystones. The proposed development can be potentially served by the Lucan Luas, which could extend towards the Clonburris SDZ lands and would in turn expand the Luas transport users including the residents and employees in Clonburris.

10.8 PREDICTED (RESIDUAL) IMPACT OF THE PROPOSAL

10.8.1 Construction phase

Provided the above remedial or reductive measures and management procedures are incorporated during the construction phase, the residual impact on the local receiving environment will be temporary in nature and neutral in terms of quality and effect.

The significance of each of the projected impacts during construction phase are detailed in **Table 10.14** for the following key junctions:

- Junction 1 – Ninth Lock Road / CSLS;
- Junction 2 – R113 Fonthill Road / CSLS;
- Junction 3 – CSLS / New Link Road;
- Junction 4 – CNLS / New Link Road; and
- Junction 5 – R113 Fonthill Road / CNLS.

The significance of the impacts has been determined in accordance with the classifications stipulated within the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, May 2022).

Table 10.14 – Impact Assessment – Construction Phase

Junction ID	Location	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	Ninth Lock Road / CSLS	Low Sensitivity	Negative - Low	Not Significant	Temporary
2	R113 Fonthill Road / CSLS	Low Sensitivity	Negative - Medium	Not Significant	Temporary
3	CSLS / New Link Road	Low Sensitivity	Negative - Low	Not Significant	Temporary
4	CNLS / New Link Road	Low Sensitivity	Negative - Low	Not Significant	Temporary
5	R113 Fonthill Road / CNLS	Low Sensitivity	Negative - Low	Not Significant	Temporary

10.8.2 Operational phase

The significance of each of the projected impacts during operational phase are detailed in **Table 10.15** for the following key junctions:

- Junction 1 – Ninth Lock Road / CSLS;
- Junction 2 – R113 Fonthill Road / CSLS;
- Junction 3 – CSLS / New Link Road;
- Junction 4 – CNLS / New Link Road; and
- Junction 5 – R113 Fonthill Road / CNLS.

The significance of the impacts has been determined in accordance with the classifications stipulated within the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, May 2022).

Table 10.15 – Impact Assessment – Operational Phase

Junction ID	Location	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	Ninth Lock Road / CSLS	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term
2	R113 Fonthill Road / CSLS	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term
3	CSLS / New Link Road	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term
4	CNLS / New Link Road	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term
5	R113 Fonthill Road / CNLS	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term

The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package TRANSYT for two signal-controlled junctions.

When considering signalised junctions, a Degree of Saturation (DoS) of greater than 90% (0.90) would indicate a junction to be approaching capacity, as operation above this DoS value is poor and deteriorates quickly.

For the TRANSYT analysis a one-hour AM, and PM period has been simulated, from 08:00 to 09:00 and 17:00 to 18:00 respectively. For the TRANSYT analyses traffic flows were entered using an Origin-Destination table for the peak hours.

In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic model of the junctions was analysed for the schemes following opening and design years:

- 2025 – Opening Year;
- 2040 – Future Design Year (Opening Year + 15 years)

The following key junctions have been analysed:

- Junction 2 – Signalised Junction – R113 Fonthill Road / CSLS; and
- Junction 3 – Signalised Junction – CSLS / New Link Road.

The evaluation of the operational performance of the key off site junctions following the implementation of the proposed mixed-use scheme is summarised below for the Do Nothing (DN) and two Do Something (DS) scenarios.

The revised network analysis of Junctions 2 & 3 has been updated to investigate the following three scenarios thereby enabling a comparison and evaluation of the results for all scenarios:

- Do Minimum (DM). This scenario considers a network with the Clonburris South Link Street in 2025, and the full Strategic Development Zone in 2040, but without the Proposed Development.
- Do Something (DS). This scenario considers a network with the Proposed Development and the Clonburris South Link Street in 2025, and the full Strategic Development Zone in 2040.

In addition, **Table 10.16** provides a summary of the operational performance of Junctions 2 & 3 based upon the findings of the TRANSYT-based junction assessments.

Table 10.16 – Impact Significance – Operational Phase

Year	Scenario		Junction 2	Junction 3
			R113 Fonthill Road / CSLS	CSLS / New Link Road
2025	DM	AM	107%	33%
		PM	68%	26%
	DS	AM	107%	39%
		PM	70%	34%
	DN v. DS	AM	+0%	+0%
		PM	+2%	+3%
2040	DM	AM	135%	76%
		PM	149%	58%
	DS	AM	135%	82%
		PM	154%	61%
	DN v. DS	AM	+0%	+6%
		PM	+5%	+3%

TRANSYT assessment for Junction 2 shows an oversaturated performance during the morning peak hour in the DN and DS scenarios, and within capacity in the evening peak time. However, the impact of the development is an increase of 5% in capacity in the evening, and no increase in the morning. This means that the network is over capacity regardless of the Proposed Development. This result is expected and consistent with the Traffic & Transport Assessment of the Southern Link Street – Clonburris SDZ, prepared by DBFL Consulting Engineers. This document showed an oversaturated network for Opening Year and Future Horizon Year, similar to results obtained above. It is important to note that the analysis has assumed the pedestrian stage will be called during every cycle. As such the TRANSYT analysis represents a worst-case scenario, with the junctions performing better than the TRANSYT results indicate. Additionally, the area will be served with high frequency bus & rail services, high quality cycle infrastructure and new road developments.

For Junction 3, the analysis shows a network performance within capacity during all scenarios. The impact of the Proposed Development is again minimal, with an increase of capacity of 3% in the evening peak hour in 2040, and 6% in the morning peak hour in 2040.

Therefore, the impact of the development in Junctions 2 & 3 is an increase of 0% to 6% of the junction capacity, so it is not severe.

10.9 MONITORING

10.9.1 Construction phase

During the construction stage, the following monitoring exercises are proposed:

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and external road conditions; and
- Timing of construction activities.

10.10 REINSTATEMENT

10.10.1 Construction phase

The construction work areas will be reinstated following completion of development with landscaped areas provided where proposed. The works will be restricted to the footprint of the site for the proposed scheme. Excavated topsoil and subsoil will be reused in reinstatement and landscaping where appropriate or dealt with in the appropriate manner i.e. sent for soil recovery as appropriate.

10.10.2 Operational phase

No reinstatement requirements have been identified in relation to the operational phase of the proposed scheme.

10.11 POTENTIAL CUMULATIVE IMPACTS

The EU Guidelines define cumulative effects/impacts as: “Impacts that result from incremental changes caused by other past, present, or reasonably foreseeable actions together with the project. For Example;

- Incremental noise from a number of separate developments;
- Combined effect of individual impacts, e.g., noise, dust and visual, from one development on a particular receptor; and
- Several developments with insignificant impacts individually but which together have a cumulative effect.”

The EPA draft guidelines on the information to be contained in EIAR’s mirrors this approach and defines cumulative impacts/effects as ‘The addition of any minor or significant effects, including effects of other projects, to create larger, more significant effects’.

Therefore, the assessment of cumulative impacts considers the total impact associated with the Proposed Project when combined with other past, present, and reasonably foreseeable future developments.

An examination of the potential for other projects to contribute cumulatively to the impacts from this Proposed Project was undertaken during the preparation of this EIAR. The traffic assessment in this chapter includes a comprehensive assessment of the development within the strategic road network for the area and includes the effect of the forecast schemes in the area. The development has an integrated relationship with land use under the Clonburris SDZ, in that it supports the sustainable development of the SDZ area. This cumulative assessment has considered cumulative impacts that are:

1. Likely;
2. Significant; and
3. Relating to an event which has either occurred or is reasonably foreseeable together with the impacts from this development.

A search in relation to plans and projects that may have the potential to result in cumulative impacts was carried out. Data sources included the following:

- South Dublin County Council (planning and roads section);
- An Bord Pleanála website;
- South Dublin County Development Plan 2022-2028;
- Clonburris Strategic Development Zone;
- EIAR Portal.

10.11.1 Strategic Transport developments in the Area

From the County Development Plan, the following relevant roads were identified as a six-year road development for the County;

- Adamstown Street Network
- Celbridge Link Road
- Clonburris/Kishogue Street Network
- Griffeen Avenue
- New Nangor Road/R134 Upgrade

- Newcastle Road (R120)
- Fonthill Road/N4
- Western Dublin Orbital Route

The development process on each road is at different stages. There are a number of Medium to Long term road developments which are referred to in **Table 7.5** of the Development Plan. The proposed development is not dependent on road schemes outside the SDZ area, and in turn does not restrict or limit other infrastructure investment outside the SDZ area as a result of its implementation or non-implementation.

Additionally, other transport developments have been identified affecting the area. The following plans are undergoing Planning/Design/Construction.

- Dublin BusConnects

The total estimated cost of this development is €2 billion euro with an estimated completion date of 2027. Dublin BusConnects will deliver a transformational redesign of the bus system in Dublin. It will comprise a network of 'next generation' bus corridors on the busiest routes with segregated cycling facilities, a complete redesign of the bus network, cashless and simpler fare structures, and state-of-the-art ticketing systems, account-based ticketing, new bus branding, integrating bus vehicles of different operators and types, new bus stops and shelters and use of low-emission vehicles. The development of this scheme will improve the overall Clonburris Development and vice versa.

- DART+

The DART+ Programme will revolutionise travel in the Greater Dublin Area. It will see the DART network grow from its current 50km in length to over 150km. Bringing DART travel with all its benefits to new and existing communities. It will promote multi modal transit, active transport, boost regional connectivity and make public transport the preferred option for more and more people. The DART+ Programme will deliver frequent, modern, electrified services within the Greater Dublin Area (GDA) and will improve connectivity to regional towns and cities. The DART+ includes DART+ South West, with the high-frequency connection of Hazelhatch and Celbridge to the City Centre, and it serves directly the Clonburris area.

10.11.2 Planning applications in the area

Other developments currently under construction and other potentially committed development in the vicinity of the site are likely to have similar impacts during the construction phase in relation to Traffic and Transportation. Any other future development in the vicinity of the site would have to similarly undergo Traffic and transport assessments to assess the potential cumulative impacts to the transport network. A desktop study was conducted of planning application in the vicinity of the subject development in South Dublin County Council planning database archive to assess any cumulative impacts from granted or committed applications to the subject scheme. Planning applications found that would have a cumulative impact to traffic or to the subject scheme were as follows:

- The road and drainage infrastructure works permission under the Clonburris Strategic Development Zone Planning Scheme (Application no. SDZ20A/0021).
- Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)
- Development of 569 no. dwelling, a creche, innovation hub and open space within the SDZ lands (Application no. SDZ21A/0022).
- SD228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
- SDZ22A/0010 – 294 dwellings, creche and retail unit by Kelland Homes
- SD228/0003 Part 8 Development 263 no. units within Kishogue South West
- SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements.
- SDZ21A/0006 - Wastewater pumping station
- SDZ22A/0017 Tile 3 - Planning application 157 no. units

10.12 INTERACTIONS

Please refer to Chapter 15 of this EIAR.

11.0 MATERIAL ASSETS – WASTE MANAGEMENT

11.1 INTRODUCTION

Byrne Environmental Consulting Ltd have assessed the potential waste impacts that the proposed Clonburris SDZ T2 development may have on the receiving environment during the construction and operational phases of the project. Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd and prepared all aspects of this EIAR chapter. Ian Byrne has over 25 years-experience in the preparation of EIAR chapters.

11.2 STUDY METHODOLOGY

The Construction Waste Management Impact Assessment has been prepared to demonstrate how the Construction Phase will comply with the following relevant legislation and relevant Best Practice Guidelines:

- *Waste Management Acts 1996-2011.*
- *Waste Management (Collection Permit) Amendment Regulations 2016 (SI No. 24 of 2016).*
- *EPA "Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations – Version 3 June 2019*
- *Directive 2014/52/EU*
 - *EPA Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021*

The Operational Waste Management Impact Assessment has been prepared to demonstrate how the Operational Phase will comply with the following relevant regulations and South Dublin County Council's design standards for waste management in residential developments.

- *Waste Management Acts 1996.*
- *Waste Management (Collection Permit) Amendment Regulations 2016 (SI No. 24 of 2016).*
- *Eastern-Midlands Region Waste Management Plan 2015-2021 (under review)*
- *Section's 4.8 and 4.9 Refuse Storage of The Department of Housing, Planning and Local Government – Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities. 2020..*
- *South Dublin County Council Development Plan 2022-2028*

11.2.1 Construction Waste Management

Section 12.11.4 (iv) of the SDCC Development Plan 2022-2028 includes the following requirements:

Construction and demolition waste management plans should be submitted as part of development proposals for projects in excess of any of the following thresholds:

- New residential development of 10 units or more;
- New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250 sq metres;
- Demolition / renovation / refurbishment projects generating in excess of 100 cubic metres in volume of C&D waste;
- Civil engineering projects generating in excess of 500 cubic metres of waste materials used for development works on the site.
- A Construction and Demolition Waste Management Plan, as a minimum, should include provision for the management of all construction and demolition waste arising on site, and make provision for the reuse of said material and / or the recovery or disposal of this waste to authorised facilities by authorised collectors. Where appropriate, excavated material from development sites should be reused on the subject site.

11.2.2 Operational Waste Management

The South Dublin County Council Development Plan 2022-2028 has a Waste Management Strategy, the purpose of which is to promote and facilitate best practice in prevention, re-use, recovery, recycling and disposal of all waste produced in the County.

Chapter 11 of the South Dublin County Development Plan 2022 - 2028 – includes the following Objectives relating to Domestic Waste Management.

IE7 Objective 2 To support the implementation of the Eastern Midlands Region Waste Management Plan or as amended by adhering to overarching performance targets, policies and policy actions.

IE7 Objective 7 To require the appropriate provision for the sustainable management of waste within all developments ensuring it is sustainably designed into the development including provision of facilities for the storage, separation and collection of such waste.

Chapter 12 Implementation and Monitoring Development Standards - 12.11.3 (ii) Waste Management – Design and Siting of Refuse Storage, Recycling and Bring Bank Facilities in Developments

The following criteria is considered in the assessment of the design and siting of waste facilities and bring facilities:

- The location and design of any refuse storage or recycling facility should ensure that it is easily accessible both for residents and / or the public and for bin collection, be insect and vermin proofed, will not present an odour problem, and will not significantly detract from the residential amenities of adjacent property or future occupants;
- Provision for the storage and collection of waste materials shall be in accordance with the guidelines for waste storage facilities in the relevant Regional Waste Management Plan and the design considerations contained in Section 4.8 and 4.9 of the guidelines Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, DHLGH (2020). Refuse storage for houses should be externally located, concealed / covered and adequate to cater for the size and number of bins normally allocated to a household. For terraced houses, the most appropriate area for bins to be stored is to the front of the house, which should be located in well-designed enclosures that do not detract from visual amenity;
- Access to private waste storage in residential schemes should be restricted to residents only.

11.2.3 The Waste Hierarchy

It is the Applicants policy to conform to the waste hierarchy (Figure 11.1), whereby waste prevention is the most preferred strategy. Where waste generation is unavoidable, re-use is the most preferred fate, followed by recycling and then energy recovery, with disposal (e.g., to landfill) being the least preferred fate.

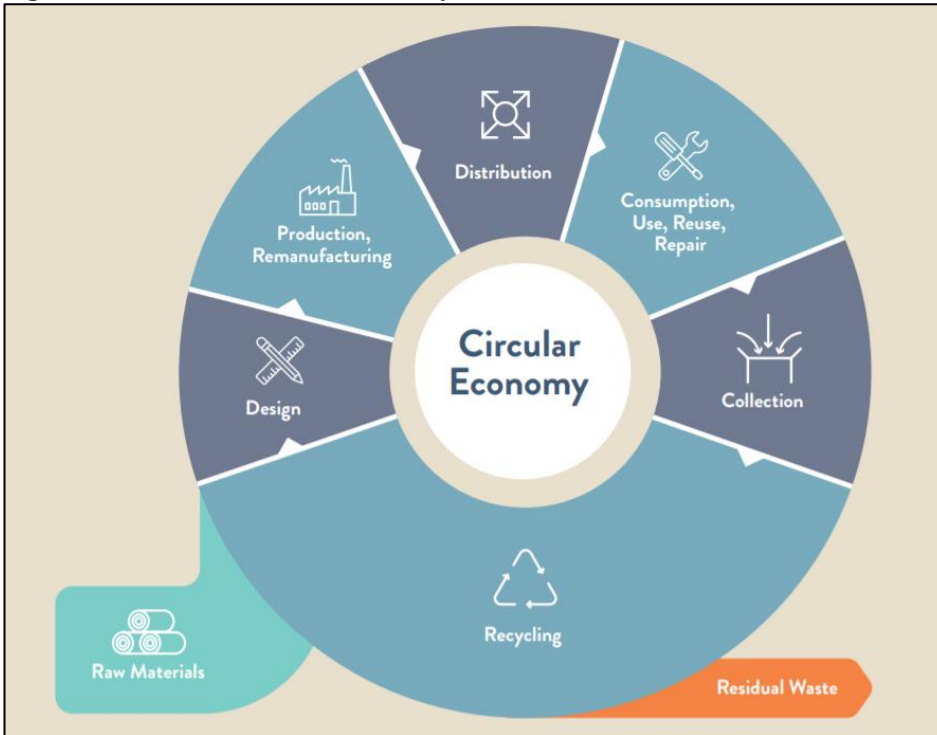
Figure 11.1 – The Waste Hierarchy (European Commission)



11.2.4 The Circular Economy

Ireland’s national waste policy is A Waste Action Plan for A Circular Economy – Ireland’s National Waste Policy 2020 – 2025. The policy, published in September 2020, is intended to move Ireland away from the traditional ‘cradle-to-grave’ model of resource use, towards a more ‘circular’ model, whereby “waste and resource use are minimised; the value of products and materials is maintained for as long as possible through good design, durability and repair; and when a product has reached the end of its life, its parts are used again and again to create further useful products” By extending the time resources are kept within the economy, environmental, social and economic benefits can be realised.

Figure 11.2 – The Circular Economy



11.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The existing site is currently an undeveloped greenfield area. The local South Dublin Area has various construction, commercial and domestic waste services providers who shall service the construction and operational phases of the development.

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

When considering a development of this nature, the potential impact on regional waste management infrastructure must be considered for each distinct stage. The Construction Phase will be of a Short Duration (1-7years). The overall construction phase will be undertaken over a c.2-3 year period. The Operational Phase will be Long-Term Duration (15-60 years).

The development will include the following:

Table 11.1 – Residential Units

Apartments	Creche	Retail Units	Office Unit
594	1	4	1

The Construction and Operational Waste Management Plans prepared as part of the application shall be implemented throughout the construction phase and operational stage of the development to ensure the following:

- That all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials.
- To ensure that all waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated Waste Management Regulations.
- The Operational Phase Waste Management Plan, a copy of which accompanies this application, for the development which will ensure that users of the development are provided with sufficient facilities to store, segregate and recycle waste.

11.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

11.5.1 Construction Phase

The development of the subject site will initially require the stripping of top and subsoils and the excavation of ground to foundation level. The range of works required for the Construction Phase are summarised in Table 11.2. The expected construction wastes that will be generated throughout the course of the development are described in Table 11.3. Construction wastes if not managed and segregated on-site will have the potential to be difficult to separate into different waste streams to allow for further processing, recovery, re-use or to be recycled.

Table 11.2 – Sequence of Construction Works

Activity Sequence	General Description
Identification of Existing Utility Services	Set up bunting, mark location of live services, including E.S.B., Gas etc.
Site Preparation	Removal of vegetation and excavation of soils
Site Compound	Installation of site offices, waste and materials compounds
Infrastructure	Installation of drainage, ducting, cabling
Substructure	Foundations/Basements
Superstructure	Frames and Roof
External Envelope	Place façade to superstructure
Internal Finishes	Mechanical & Electrical etc.
External Landscaping	Hard and soft landscaping

11.5.2 Description of construction waste arisings

Table 11.3 details the composition of construction waste that shall be generated based on EPA 2020 construction waste statistics.

The calculated construction waste tonnage with the exception of soils and stones has been derived from the Building Research Establishment Environmental Assessment Method (BREEAM) which specifies that 11.1 tonnes of construction waste is generated for every 100m² of development area. Based on the structures to be built with an area of c.72,211m², it has been calculated that c. 8,217 tonnes of construction waste shall be produced.

Table 11.3 details the estimated tonnage of each construction waste type that shall be generated.

Table 11.3 – Construction Waste Composition EPA 2020 Waste Statistics

Waste Type	%
Metal	15
Wood Plastic Glass	4
Bituminous Materials	10
Concrete Brick Gypsum	41
Mixed C&D	29

Table 11.4 – Predicted construction waste

LoW Code	Description	Volume Generated (tonnes)	Prevention (tonnes) Non Waste	Reused (tonnes) Non-Waste	Recycled (tonnes) Waste	Recovered (tonnes) Waste	Disposed (tonnes) Waste
17 01 01	Concrete	2876	0	1553	1179	0	144
17 01 02	Brick						
17 01 03	Tiles and Ceramics						
17 02 01	Wood	270	0	54	213	46	27
17 02 02	Glass						
17 02 03	Plastic						
17 03 02	Bituminous Material	719	0	309	410	0	0
17 04 07	Mixed Metals	1079	0	0	1015	0	0
17 05 04	Soil and Stone	98,266	0	61,744	0	0	33,522
17 09 04	Mixed C&D Waste	2067	0	641	765	372	291
20 01 08	Biodegradable Canteen Waste	10	0	0	0	0	10
20 03 01	Mixed Municipal Waste	10	0	0	0	0	10
20 01 01	Paper & Cardboard	1	0	0	1	0	0

11.5.3 Soil Excavation & Export

Tables 11.5 and 11.6 below present the estimated cut and fill soil volumes.

Table 11.5 – Topsoil volumes

Topsoil Volumes (approximate)	Volume (m ³)
Topsoil Strip (0.3m Thick Layer)	15,539
Topsoil reused on-site	14,762
Topsoil disposed off-site	777

Table 11.6 – Subsoil volumes

Subsoil Cut/Fill Volumes (approximate)	Volume (m ³)
Subsoil Excavation	45,880
Subsoil re-used on site as fill (Roads and buildings without basements)	23,412
Excess subsoil cut volume (Stockpiled for re-use on future development phase)	20,174

11.5.4 Operational Phase

11.5.5 Waste Types & Quantities Operational Phase

British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice states that 70 litres of waste are generated per bedroom per week.

As the subject apartment development includes 965 no bedrooms, the calculated waste generated per week will be 67,550 Litres or 67.55m³.

If waste infrastructure and appropriate waste management systems are not integrated into the design and the operation of the proposed development, domestic waste will not be segregated at source or appropriately managed on-site and the operation of the development will not function in accordance with the waste management policies of SDCC or comply with the waste reduction and recycling and re-use targets defined in the current *Eastern-Midlands Region Waste Management Plan (and subsequent revisions)*

11.5.6 Do Nothing' Scenario

Should the site not be developed for residential use it will continue not to have any impact or demand on local waste services or on the receiving environment. A vacant site may however be subject to unauthorised illegal dumping or fly-tipping.

11.6 MITIGATION MEASURES

The following measures will mitigate the impact of the construction and operational phases impact on regional waste management infrastructure.

11.6.1 Construction waste mitigation measures

The Resource and Waste Management Plan (RWMP) prepared by Byrne Environmental (included with the application) specifically addresses the following aspects:

Waste materials generated by construction activities will be managed according to the EPA's Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021

- Analysis of waste arisings / material surpluses;
- Specific Waste Management objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase;
- Methods proposed for Prevention, Reuse and Recycling;
- Waste Handling Procedures;
- Waste Storage Procedures;
- Waste Disposal Procedures;
- Record Keeping.

Waste minimisation and prevention shall be the primary responsibilities of the Resource and Construction Waste Manager (RCWM) who shall ensure the following:

- Implementing all aspects of the RWMP throughout the Construction Phase.
- Assisting the Project Manager on the implementing of the aspects of the Circular Economy.
- Ensuring that all resources are managed throughout the Construction Phase
- Recording the volumes and types of construction wastes generated.
- Communicating with the Local Authority on waste related matters and issuing of waste records.
- Management of the waste storage compound to ensure that all construction waste streams are stored separately and that cross-contamination does not occur.
- Maintaining a file of all Waste Collection Permits and Waste Facility Permits / Waste Licences that each waste load is exported to.
- Ensuring that all waste loads exiting the site are contained in a vehicle displaying an appropriate NWCPPO Permit number.
- Maintaining a receipt of each waste load delivered to authorised facilities.

- Identifying and reporting on damaged construction materials and identifying how damage to resources and materials shall be prevented.
- Preparation of monthly waste management report detailing waste volumes generated, re-use and recycling rates and details on damaged raw materials and how they can be returned for repair and future re-use.
- Conducting Resource and Waste Management Audits

Article 27 Declarations

Excavated soils may be declared during the construction phase as a by-product to the EPA in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA publication “Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations – Version 3 June 2019.

The notification of a potential by-product gives an opportunity to demonstrate, with an appropriate level of rigour, that:

- the material can have a further use and no longer be defined as waste;
- the material can be used as a ‘secondary’ resource in place of, and fulfilling the same role as a non-waste derived or virgin ‘primary’ resource; and
- the material can be used without causing overall adverse impacts to the environment or human health.

The by-product test is made up of four conditions, which represent the requirements of Article 27. All four of the following ‘conditions’ must be met for an economic operator to decide that a production residue is a by-product:

1. further use of the material is certain;
2. the material can be used directly without any further processing other than normal industrial practice;
3. the material is produced as an integral part of a production process; and
4. further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Regarding Condition 1, at this stage, it is too early to identify a specific site where the material would be used. This is because, it is necessary first to secure planning permission to have certainty regarding the availability of the by-product and only then can a further use be identified. However, having regard to the scale of development taking place in the Dublin region, it is reasonably expected that there will be projects seeking to avail of this by-product. The selected location will be identified in the notification to the EPA should it be required. This will be reviewed on an ongoing basis during the construction phase.

11.6.2 Operational waste mitigation measures

The Operational Waste Management Plan (OWMP) prepared by Byrne Environmental (included with the application) demonstrates how the required infrastructure will be incorporated into the design and operation of the development to ensure that domestic and commercial wastes will be managed to maximise the quantity of waste segregated at source and to reduce the generation of un-recyclable mixed waste streams.

Actions

The Operational Phase of the Waste Management Plan is defined by the following stages of waste management for both the residential and commercial aspects of the development:

- Stage 1 Occupier Source Segregation;
- Stage 2 Occupier Deposit and Storage;
- Stage 3 Bulk Storage and On-Site Management;

- Stage 4 On-site treatment and Off-Site Removal;
- Stage 5 End Destination of wastes.

All residential units will have a 3-bin system (non-recyclable, organic and recyclable) in each kitchen to encourage residents to segregate waste at source.

Apartment residents will be provided with waste recycling and waste disposal information by the development’s Facility Management Company who will be responsible for providing clean, safe and mobility impaired accessible communal waste storage areas for the apartment blocks.

The Facility Management Company shall maintain a register of all waste volumes and types collected from the development each year including a break-down of recyclable waste and where necessary, shall introduce initiatives to further encourage residents to maximise waste segregation at source and recycling. They shall also provide an annual bulky waste and WEEE and waste battery collection service for all residents.

The development shall be designed to provide adequate domestic waste storage areas for each apartment blocks. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the development. Communal waste bin storage areas shall be designed in a manner to ensure that appropriate signage for the correct disposal and recycling of waste is available for residents.

All commercial and retail waste shall be separately stored and managed by the operators of the units.

11.7 PREDICTED RESIDUAL IMPACTS

11.7.1 Construction Phase

Table 11.7 below summarises the identified likely significant effects of the proposed development during the construction phase post application of mitigation measures.

Table 11.7 – Summary of Construction Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Regional Construction Waste Infrastructure	Negative	Not Significant	Regional	Likely	Short-Term	Residual

11.7.2 Operational Phase

Table 11.8 below summarises the identified likely significant effects of the proposed development during the operational phase post application of mitigation measures.

Table 11.8 – Summary of Operational Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Regional Construction Waste Infrastructure	Negative	Not Significant	Regional	Likely	Long-Term	Residual

11.7.3 ‘Worst-case’ Impacts

There are no worst-case impacts associated with the proposed development as sufficient capacity, waste storage space will be provided for both the construction and operational phases.

11.8 CUMULATIVE IMPACTS

In accordance with the Planning and Development Regulations 2001 as amended, this section has considered the cumulative waste impact of the proposed development in conjunction with future and current development in the

vicinity of the subject site. This section relates to the cumulative impact on the subject site itself and on surrounding sites. A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently underway. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development.

Other projects in the wider Clonburris SDZ comprise:

SDZ21A/0022 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.
 SD228/0001 - Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
 SD228/0003 - Part 8 Development 263 no. units within Kishogue South West
 SDZ22A/0010 – 294 dwellings, creche and retail unit -Further Information lodged on the 28th of November 2022.
 SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements – granted 26th September 2022.
 SDZ21A/0006 - Wastewater pumping station granted permission 8th November 2022.
 Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)
 SDZ22A/0017 Tile 3 application 158 no. dwellings lodged 2nd December 2022.

The cumulative waste impact of the proposed residential development, and adjoining phases of development within the Clonburris SDZ when developed in the future will place a greater demand on local waste management services. However with regard to the requirements of all new developments to integrate waste segregation and recycling infrastructure into the design of residential units, the impact on regional waste management infrastructure will be minor.

Other new residential developments in the area will be similarly 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.

11.9 MONITORING

11.9.1 Construction Phase Waste Monitoring

The Construction Manager will maintain a written record of all quantities and types of construction wastes generated, reused / recycled and exported off-site during the construction phase.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description.
- Volume of waste collected.
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number.
- Destination of waste load including Waste Permit / Licence number of facility.
- Description of how waste at facility shall be treated i.e., disposal / recovery / export

Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis to determine compliance with the Construction Waste Management Plan.

11.9.2 Operational Phase Waste Monitoring

The Facility Management Company shall prepare an annual report for the Local Authority and residents of the development on the quantities of waste generated within the development to demonstrate how waste reduction and recycling targets are being achieved with regard to the targets defined in the current Eastern-Midlands Region Waste Management Plan 2015-2021 (under review) and future revisions.

11.10 SUMMARY OF MITIGATION & MONITORING

The Table below summarises the proposed construction phase mitigation and monitoring measures.

Table 11.9 – Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Additional construction Waste generation	Implementation of Site-Specific Resource & Waste Management Plan	Recording of all waste generated and exported off-site Waste auditing

The Table below summarises the proposed operational phase mitigation and monitoring measures.

Table 11.10 – Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Additional domestic waste generation	Implementation of Site-Specific Operational Waste Management Plan	Recording of all waste generated.

11.11 INTERACTIONS

The identified interactions between the management of waste arisings during both the construction and operational stages are as follows;

- Population & Human Health, management of waste in the construction and operational phase to mitigate nuisance.
- Land & Soils, excavation to facilitate the development.
- Traffic, specifically movement of waste associated with the construction stage.

11.12 REINSTATEMENT

No reinstatement is required.

11.13 REFERENCES AND SOURCES

Waste Management Act 1996-2011;
 Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007);
 Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008);
 Eastern-Midlands Region Waste Management Plan 2015-2021;
 European Communities (Waste Directive) Regulations 2011;
 South Dublin County Development Plan 2022-2028
 Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities(2018
 Department of Housing, Planning and Local Government, Section’s 4.8 and 4.9 Refuse Storage;
 British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice which provides guidance on methods of storage, collection, segregation for recycling and recovery for residential building.

12.0 MATERIAL ASSETS - UTILITIES

12.1 INTRODUCTION

This chapter was prepared by DBFL Consulting Engineers and assesses likely effects of the proposed development on existing surface water, water supply, foul drainage, and utility services in the vicinity of the site as well as identifying proposed mitigation measure to minimise any effects. The material assets considered in this chapter of the EIA include Surface Water Drainage, Foul Drainage, Water Supply, Power, Gas and Telecommunications.

This chapter was prepared by Dieter Bester, Chartered Civil Engineer [B.Eng CEng], DBFL Consulting Engineers. Utilities sections (ESB, Telecoms & Gas) was prepared by Kevin Farrell, Chartered Engineer with Waterman Moylan Consulting Engineers.

12.2 METHODOLOGY

12.2.1 Guidelines

Assessment of the likely effect of the proposed development on existing infrastructure, services and public utilities in the vicinity of the site included the following:

- Review of Irish Water wastewater (foul drainage) and watermain records
- Submission of a Pre-Connection Enquiry Application to Irish Water and consultation with Irish Water
- Review of South Dublin County Council surface water drainage records
- Consultation with South Dublin County Council.
- Review of ESB Networks service records and consultation with ESB Networks.
- Review of Gas Networks Ireland service records and consultation with Gas Networks Ireland.
- Review of Eircom E-Maps.
- Review of Virgin Media service records.
- Review of the Clonburris Strategic Development Zone (SDZ) Scheme and the corresponding strategy for infrastructure, services, and public utilities.

As part of assessing the likely effect of the proposed development, surface water runoff, future foul drainage discharge and future water usage calculations were carried out in accordance with the following guidelines:

- Greater Dublin Strategic Drainage Study (GSDS).
- Method outlined in Irish Water's Code of Practice for Wastewater Infrastructure.
- Method outlined in Irish Water's Code of Practice for Water Infrastructure.

12.2.2 Study Area

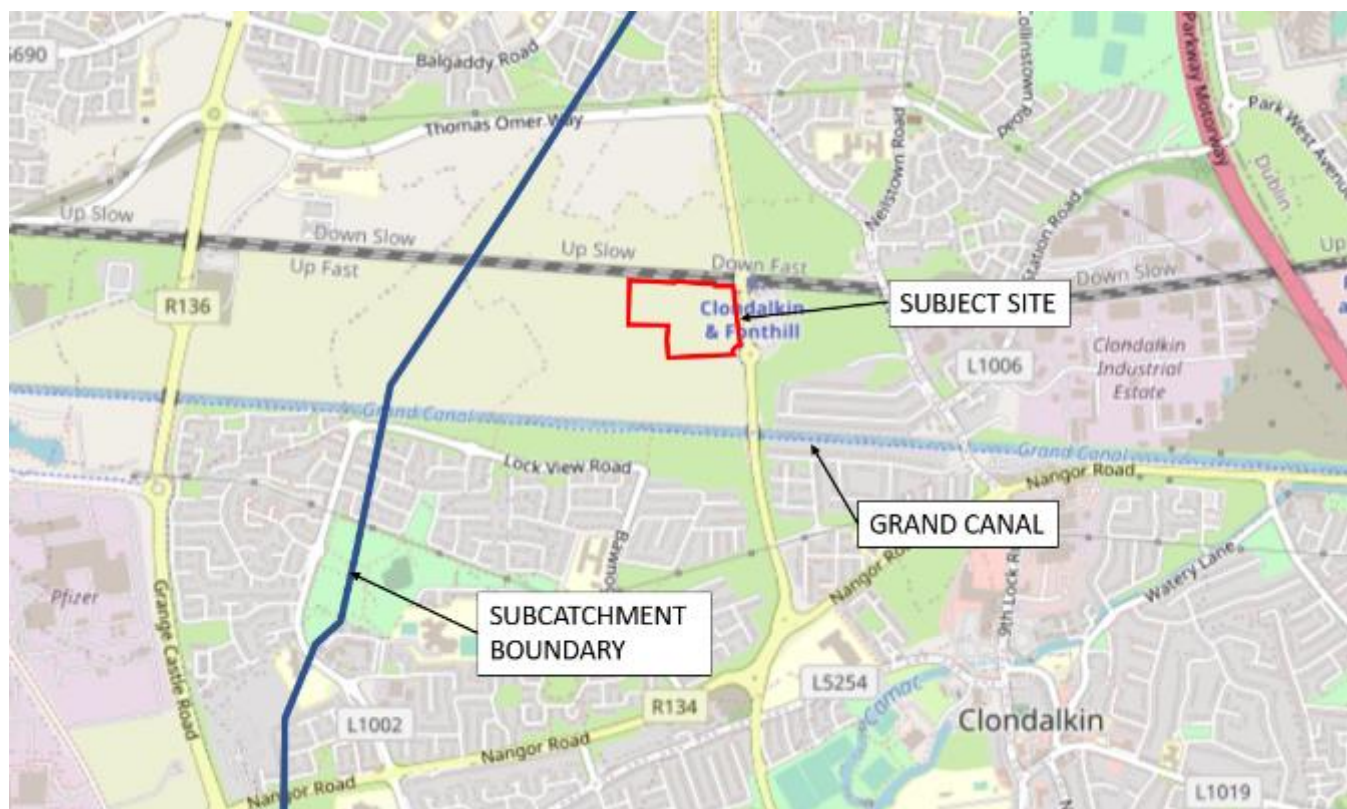
The proposed development site is located in the Local Authority area of South Dublin County Council (SDCC) and is part of the Clonburris Strategic Development Zone (SDZ). The subject site for this development is situated in the southern area of the Clonburris SDZ lands to the south of the Kildare/Cork railway adjacent to the R113 Fonthill Road. The proposed Southern Link Street will form the southern border of the site.

12.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

12.3.1 Existing Storm Water Infrastructure

The topography of the subject site is reasonably flat. Much of the primary road network bounding the site is situated at a significantly higher level. Site levels outside road embankments and watercourses generally range between 58m – 62m. There are a number of existing drainage ditches located throughout the subject site. These ditches are noted to generally have extremely flat or inconsistent gradients and are poorly maintained appearing to discharge beneath the R113 to the east.

Figure 12-1 – Existing Surface Water Drainage on Site



The lands east of the R113 and south of the railway, drain to the south-east to existing stormwater networks on Ninth Lock Road, as per **Figure 12-2** below. The drainage run continues south on Ninth Lock Road where it splits into parallel runs along Station Road which later merge and discharge to an open watercourse within the industrial estate and eventually discharge to the Camac River. A canal overflow channel runs alongside the canal towpath north of the canal before re-entering the canal downstream, it does not appear that local drainage connects to this overflow channel.

Figure 12-2 – Existing Surface Water Infrastructure



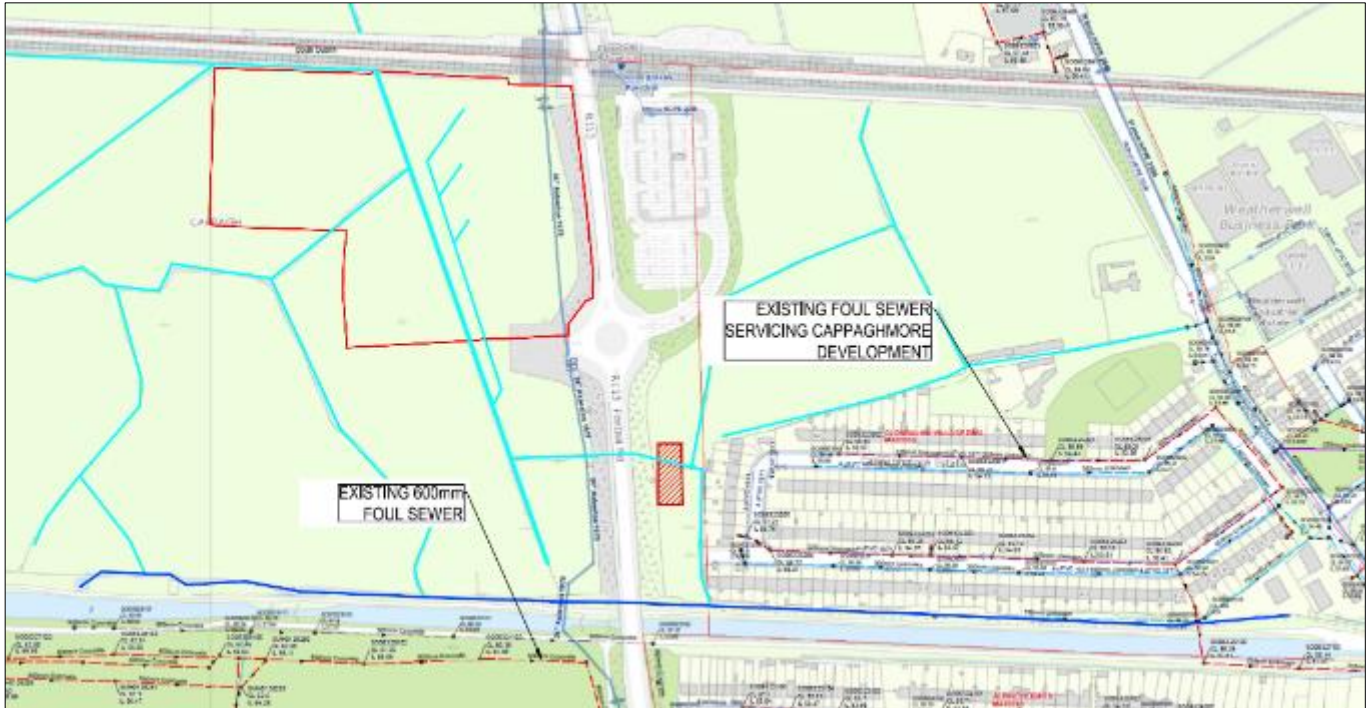
Refer to Chapter 6 Water and the Infrastructure Design report for additional details on existing drainage.

12.3.2 Existing Foul Water Infrastructure

According to wastewater drainage records from Irish Water, there is an existing network of three 600mm foul sewers located to the south of the Grand Canal, to the south of the subject site. There is a network of existing 225mm foul sewers to the south-east of the subject site within the Cappaghmore development which cross under the canal and discharge to a 900mm diameter sewer to the south.

To the north of the subject site, a foul sewer ranging from 750mm to 900mm runs in a west to east direction along the length of Thomas Omer Way to the Fonthill Road where it connects to the 1050mm diameter 9B sewer running southwards along the R113 Fonthill Road. The 9B sewer then turns east through the SDZ lands north of the railway line and outfalls to the east towards Ringsend Wastewater Treatment Plant. The existing 9B sewer has been identified as the main outfall for the overall future SDZ development.

Figure 12-3 – Existing Foul Infrastructure



12.3.3 Existing Potable Water Infrastructure

There is an existing 600mm watermain running adjacent to Fonthill Road at the bottom of the road embankment on the west side of the R113.

12.3.4 Existing ESB Infrastructure

ESB Networks have been contacted and an existing ESB network map for the area surrounding the proposed development has been obtained, refer to Appendix D Volume III of the EIAR. There are existing ESB Networks (ESBN) infrastructure within the site in the form of Medium Voltage overhead power lines which traverse south east corner of the site.

12.3.5 Existing Broadband Infrastructure

Eir and Virgin Media have been contacted and the existing network maps for the area surrounding the proposed development have been obtained, refer to Volume III of the EIAR.

12.3.6 Existing Gas Infrastructure

Gas Networks Ireland (GNI) have been contacted and an existing gas network map for the area surrounding the proposed development has been obtained, refer to Volume III of the EIAR. There are existing gas transmission line which runs parallel to R113 in the form of High Pressure (70bar) mains pipework.

12.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development comprises a mixed-use development comprising 594 no. apartments, retail and office space with associated infrastructure, including an urban square. Refer to Chapter 2 of this EIAR for detailed project description.

12.4.1 Surface Water Drainage

The Clonburris SDZ Planning Scheme included a pre-construction requirement to prepare a Surface Water Management Plan (SWMP) to implement the SDZ Surface Water Strategy for the overall SDZ lands. DBFL prepared this SWMP to provide robust, effective and economic measures for the management of surface water quality and quantity in the SDZ. This plan has been agreed with South Dublin County Council’s Drainage Department.

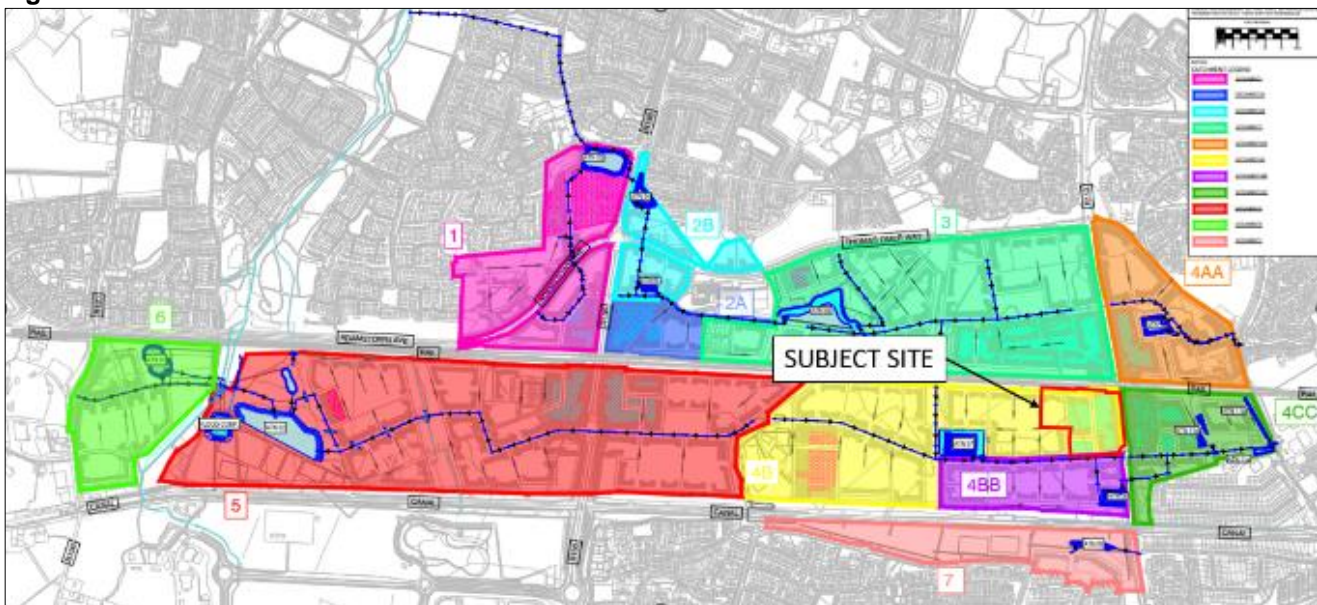
The proposed surface water drainage strategy for this planning application has been developed in accordance with the agreed measures in this SWMP.

The key objectives of the drainage strategy are as follows:

- Provide adequate infrastructure to discharge surface water generated on site to the trunk surface water sewer constructed as part of the greater SDZ.
- Minimise the risk of flooding of the development and avoid a flood risk increase upstream or downstream of the site.
- Provide an allowance for the effects of climate change.
- Implement a treatment train of Sustainable Drainage Systems (SuDS) measures within the drainage network to improve water quality prior to discharge to receiving watercourses.
- Establish the key infrastructural requirements required to implement the surface water management measures set out by the SWMP.

The Surface Water Management Plan intends for the proposed development to discharge east under the R113 via a new drainage network within a new gravity sewer to be constructed as part of the Clonburris Southern Link Street (CSLS), subject to a current planning application SDZ20A/0021. Trunk surface water sewers and regional attenuation are to be constructed as part of the CSLS to serve all lands in the southern portion of the SDZ including the proposed development.

Figure 12-4 SDZ SWMP Catchment Breakdown

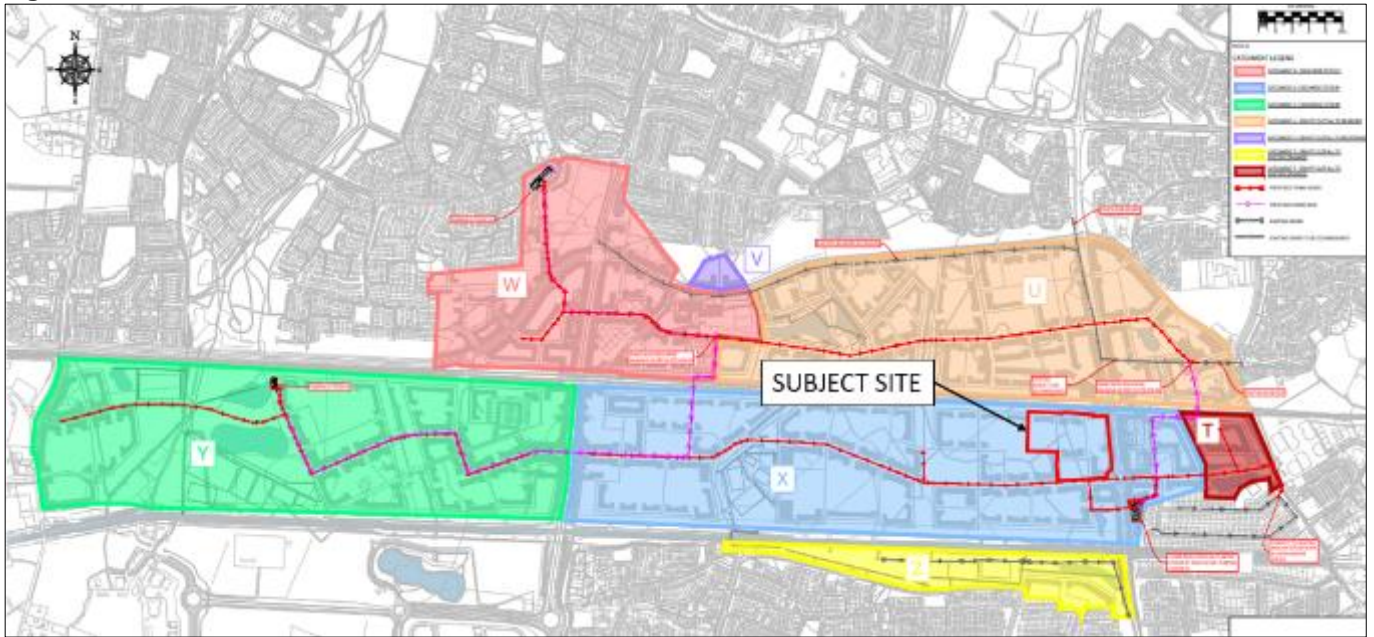


Refer to Chapter 6 Water and the Infrastructure Design report for additional details on proposed drainage.

12.4.2 Foul Drainage

A Water and Wastewater Design Report has been prepared by DBFL for the overall Clonburris SDZ. As part of the CSLS application, a trunk foul sewer is to be constructed within the CSLS. It is proposed that the wastewater generated from the new houses and apartments for this application will be collected by new gravity sewers that discharges to the trunk sewer within the new Link Road. Foul water from Blocks G and H will drain west through the Clonburris Phase T3 and then discharge into the CSLS trunk sewer. This in turn discharges to a future Irish Water pumping station adjacent to the R113 Fonthill Road. This future pumping station and its rising main connection to the existing 9B trunk sewer on Fonthill Road is being delivered by Irish Water as part of the Irish Water Clonburris Local Infrastructure Housing Activation Fund (LIHAF) Scheme. The pump station is currently at planning application stage with SDCC under planning reference SDZ21A/0006.

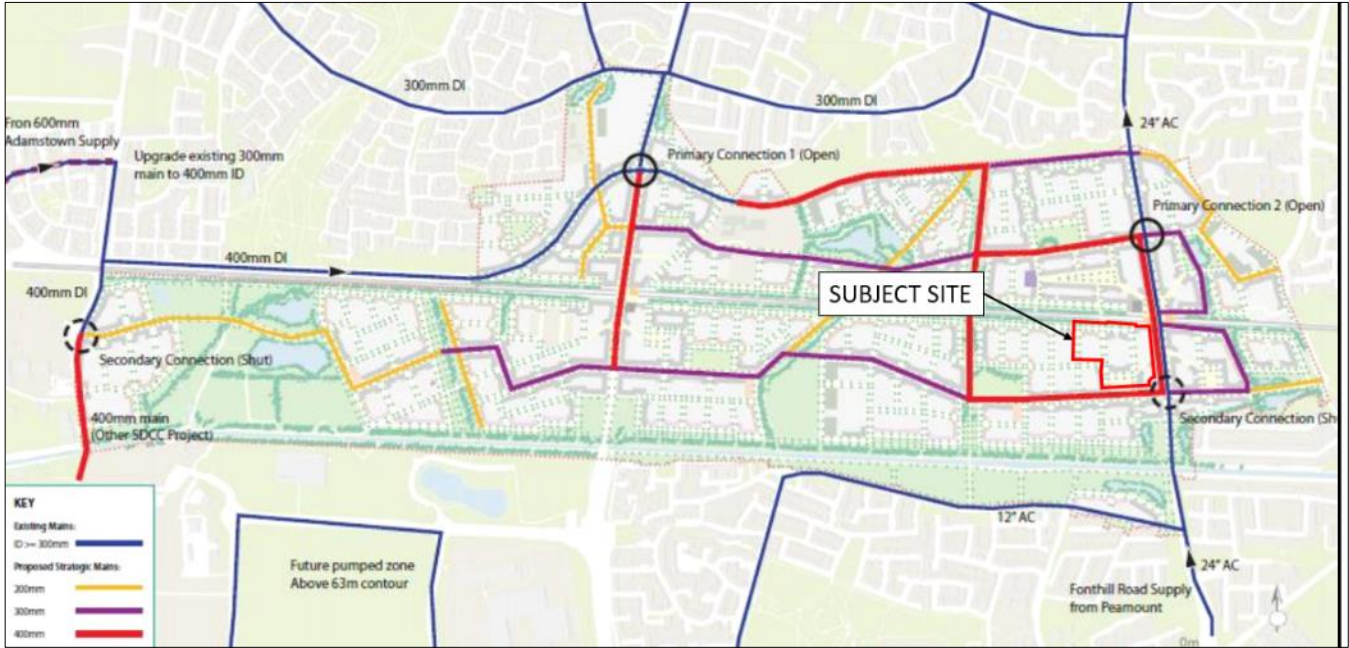
Figure 12-5 SDZ Foul Catchment Breakdown



12.4.3 Water Supply

The Water and Wastewater Design Report prepared by DBFL sets out a strategy for the water infrastructure to be constructed as part of the Joint Infrastructure Works (JIW) for the overall Clonburris SDZ. 200mm, 300mm and 400mm internal diameter trunk watermains are proposed to supply the site in order to satisfy the water requirement of the SDZ lands. DBFL have further developed the water supply strategy within the SDZ planning scheme through consultation with Irish Water and the preparation of preliminary watermain layouts. A number of trunk watermains are proposed along the main Arterial and Link Streets as shown in Figure 12.8. Water supply to the new houses and apartments in this application will be provided via new mains located with the footpaths of the proposed development which will feed from the new 400mm trunk main to be installed within the new Clonburris Southern Link Street to be constructed as part of the overall Clonburris SDZ.

Figure 12-6 SDZ Water Strategy Breakdown



12.4.4 ESB Power

The existing underground services on the site will be diverted as required. A new Medium Voltage below ground network will be provided in the proposed development which will connect to the existing ESB Networks infrastructure in the area. Up to 5 new sub-stations will be provided throughout the site to meet the electrical demands associated with the development.

The location of the incoming connections will be agreed with ESB Networks and ESB Network MV planners during the design stage of the project.

12.4.5 Gas

If gas is adopted as the fuel source of choice for the heating systems in the scheme, a new gas connection will be made to the existing network. The exact extent and location of these connections will be agreed with Gas Networks Ireland during the design stage of the project.

All works on the gas supply infrastructure will be carried out in accordance with Gas Networks Ireland relevant guidelines. All gas infrastructure will be below ground with the possible exception of a gas pressure reduction station if required by Gas Networks Ireland.

12.4.6 Telecommunications – Eir

There is an extensive Eir Network in the roads surrounding the site, the most significant of which is a ducted service with multiple access chambers running along both the northern and southern sides of R113.

New connections will be made to the existing Eir networks at the boundary of the site and services will be distributed throughout the site as required. The exact extent and location of these connections will be agreed with Eir during the design stage of the project.

12.4.7 Telecommunications – Virgin Media

There is an extensive Virgin Media Network in the roads surrounding the site, the most significant of which is a ducted service with multiple access chambers running along both the northern and southern sides of R113.

New connections will be made to the existing Virgin Media networks at the boundary of the site and services will be distributed throughout the site as required. The exact extent and location of these connections will be agreed with Virgin Media during the design stage of the project.

12.5 POTENTIAL IMPACT (EFFECTS) OF THE PROPOSED DEVELOPMENT

12.5.1 Construction Phase

This section identifies a list of possible significant effects to the infrastructure, services and public utilities within the subject site caused by the construction of the proposed development in the absence of mitigation measures.

Potential effects that may arise during the construction phase include:

- Contamination of surface water runoff due to construction activities.
- Improper discharge of foul drainage from contractor's compound.
- Cross contamination of potable water supply to construction compound and associated risk to human health.
- Damage to existing underground and over-ground infrastructure and possible contamination of the existing systems with construction related materials.

12.5.2 Operational Impacts

Potential operational phase effects on infrastructure, services and public utilities are listed below:

- Increased impermeable surface area may potentially increase surface water runoff (if not attenuated to greenfield runoff rate) – refer to Chapter 6 (Water).
- Accidental hydrocarbon leaks on the proposed road and subsequent discharge into piped surface water drainage network.
- Increased future discharge to foul drainage network when future development proceeds.
- Increased future watermain demand when future development proceeds.
- Contamination of surface water runoff from foul sewer leaks.

12.5.3 Power, Gas & Telecommunications

In relation to the high pressure gas network along the Fonthill Road, the potential exists for construction related activity to impact on the network.

12.5.4 'Do-nothing' scenario

There are no predicted effects to infrastructure, services and public utilities should the proposed development not proceed.

12.5.5 Worst Case Scenario

Contact between humans and machinery with above ground or below ground utilities is considered a 'worst case scenario' during the construction phase resulting in risk to health and safety and significant disruption to utility networks.

The majority of the mitigation measures outlined above are design solutions that will be managed through the design and construction process and enforced as part of the contract documentation.

12.6 MITIGATION MEASURES

12.6.1 Construction Mitigation

A Preliminary Construction Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A detailed Construction & Environmental Management Plan will be put in place by the Contractor to implement the mitigation measures from the EIAR. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction phase. The Construction & Environmental Management Plan includes a range of site-specific measures which will include the following mitigation measures in relation infrastructure, services and public utilities:

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.

- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tinkered off site to a licensed facility until a temporary connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.
- A competent contractor will be appointed to undertake the works and protect existing systems from damage during construction.

12.6.2 Operational Mitigation

The operational phase will employ the following mitigation measures in relation infrastructure, services and public utilities:

- Refer to Chapter 6 (Water) for mitigation measures associated with the surface water treatment and measures to reduce flood risk.
- All new foul drainage lines will be constructed in accordance with Irish Water Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.
- No specific mitigation measures are proposed in relation to water supply, however water conservation should be included in future developments
- An Emergency Response Plan prepared by the contractor will contain measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events. Spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.
- Special care should be taken when construction work is undertaken in the vicinity of the GNI wayleave along the eastern border of the site. No excavation should be undertaken within the wayleave area without contacting GNI beforehand. Refer to the PCEMP for further guidance on risk mitigation with regard to gas infrastructure in the vicinity of the proposed development.

12.7 CUMULATIVE IMPACTS

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented. A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently underway. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development. Should this scheme be granted it is anticipated that construction phase of the Link Street may overlap with construction of the proposed development. The CSLS application included an EIAR as part of its planning application and has identified similar mitigation measures therefore no significant potential cumulative impacts are not anticipated.

Other projects in the wider Clonburris SDZ comprise:

SDZ21A/0022 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.
 SDZ228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
 SDZ228/0003 Part 8 Development 263 no. units within Kishogue South West
 SDZ22A/0010 – 294 dwellings, creche and retail unit
 SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements.
 SDZ21A/0006 - Wastewater pumping station
 Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)
 SDZ22A/0017 - Tile 3 application of 157 no. dwellings (lodged December 2022)

12.7.1 Stormwater Infrastructure

The proposed surface water drainage infrastructure has been designed in accordance with the relevant guidelines. Any other developments currently under construction or other committed development in the vicinity of the site would have to be similarly designed in relation to permitted surface water discharge, surface water attenuation and SuDS.

All proposed developments in the area are to follow the Surface Water Management Plan for the Clonburris SDZ therefore no potential cumulative impacts are anticipated in relation to surface water drainage and flooding.

12.7.2 Foul Infrastructure

The proposed foul drainage infrastructure has been designed in accordance with the relevant guidelines. Wastewater generated on site is to discharge into the proposed trunk sewer being constructed as part of the Clonburris Southern Link Street, which has been designed to facilitate all wastewater generated within the potential developments of the Clonburris SDZ. Additional capacity within the foul network designed for the proposed development for this application has been allowed for to accommodate future developments to the north and west of the site. No potential cumulative impacts are anticipated in relation to foul drainage.

12.7.3 Potable Water Infrastructure

Water supply for the proposed development will be fed through the trunk watermain in the Clonburris Southern Link Road, designed to satisfy the water requirement of the entire SDZ lands. Therefore, no significant negative cumulative impacts are anticipated in relation to foul drainage.

12.7.4 Gas Infrastructure

The design of the footprint of the proposed development is sufficiently set back from the high-pressure gas network so that there is no impact. During the construction phase the contractor will liaise with Gas Networks Ireland in advance of the works.

12.7.5 ESB Infrastructure

The relocation or diversions of the existing overhead 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.

12.7.6 Broadband Infrastructure

There could be a potential loss of connection to the Telecommunications infrastructure while carrying out works to provide service connections. Any loss of supply will be managed by Eir / Virgin Media to minimise impact on neighbouring properties.

12.8 PREDICTED (RESIDUAL) IMPACTS

12.8.1 Construction Phase

Implementation of the measures outlined in Section 12.6 will ensure that the potential effects of the proposed development on infrastructure, services and public utilities do not occur during the construction phase and that any residual effects will be short term and not significant.

12.8.2 Operational Phase

As surface water drainage, foul water drainage, watermain and utilities design has been carried out in accordance with the relevant guidelines, there are no predicted significant negative residual effects on the drainage and water supply arising from the operational phase. All utilities ducting and diversions will be carried out as per the supplier instructions, therefore no predicted residual effects are expected from the operational phase.

12.9 MONITORING

12.9.1 Construction Phase

Proposed monitoring during the construction phase in relation to infrastructure, services and public utilities are as follows:

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of drainage, watermain and utility installation etc, inspections of works adjacent to existing infrastructure).
- Monitoring in relation to the surface water. Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content).

12.9.2 Operational Phase

Proposed monitoring during the operational phase in relation to the infrastructure, services and public utilities are as follows:

- Regular inspection and maintenance of the drainage system and oil interceptors.

12.10 INTERACTIONS

Please refer to Chapter 15.

12.11 REINSTATEMENT

Reinstatement of any excavations relating to the provision of surface and foul drainage, watermains, electrical, gas and telecommunications connections is to be carried out in accordance with the relevant asset provider's requirements and the requirements of South Dublin County Council.

12.12 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant difficulties were encountered during the assessment.

13.0 ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

13.1 INTRODUCTION

13.1.1 General

IAC Archaeology has prepared this chapter on behalf of Cairn Homes Properties Ltd to assess the impact, if any, on the archaeological, architectural, and cultural heritage resource of a proposed development at Clonburris T2, Cappagh, within the Clonburris SDZ, County Dublin (ITM 706034, 732534; Figure 13.1). The assessment was undertaken by Faith Bailey (MA, BA (Hons), MIAI, MCIfA) of IAC Archaeology and has been informed by a programme of geophysical survey (Dowling 2022, Licence 22R0200) and targeted archaeological testing (Licence Ref.: 22E0719), undertaken by Fergal Murtagh of IAC Archaeology.

Figure 13.1 – Proposed development area showing surrounding recorded cultural heritage sites



This study determines, as far as reasonably possible from existing records, the nature of the archaeological, architectural and cultural heritage resource in and within the study area of the proposed development using appropriate methods of study. The study area is defined as an area measuring c. 250m from the proposed development area. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic, and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets.

This leads to the following:

- Determining the presence of known archaeological/architectural heritage assets that may be affected by the proposed development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- Determining the effect upon the setting of known cultural heritage sites in the surrounding area; and
- Suggested mitigation measures based upon the results of the above research.

13.1.2 Definitions

In order to assess, distil and present the findings of this study, the following definitions apply:

'*Cultural Heritage*' where used generically, is an over-arching term applied to describe any combination of archaeological, architectural, and cultural heritage features, where –

- the term '*archaeological heritage*' is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the Record of Monuments and Places)
- the term '*architectural heritage*' is applied to structures, buildings, their contents and settings of an (assumed) age typically younger than AD 1700
- the term '*cultural heritage*', where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations.

13.1.3 Significance of Effects

Imperceptible

An effect capable of measurement but without significant consequences.

Not Significant

An effect which causes noticeable changes in the character of the environment but without significant consequences.

Slight Effects

An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.

Moderate Effects

An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.

Significant Effects

An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.

Very Significant

An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.

Profound Effects

An effect which obliterates sensitive characteristics.

Significance of Effects as defined by the Environmental Protection Agency (2022) Guidelines (pg. 50).

13.1.4 Consultations

Following the initial research, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the background environment, receiving environment and study area, as follows:

- Department of Housing, Local Government and Heritage (DoHLGH) – the Heritage Service, National Monuments: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database and Preservation Orders;

- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland;
- South Dublin County Council: Planning Section;
- Trinity College Dublin, Map Library: Historical and Ordnance Survey Maps

13.1.5 Guidance and Legislation

The following legislation, standards and guidelines were consulted as part of the assessment.

- National Monuments Acts, 1930-2014;
- Planning and Development Act, 2000 (as amended);
- Heritage Act, 1995;
- Environmental Protection Agency (EPA) 2022 Advice Notes on Current Practice (in the preparation of Environmental Impact Statements). Dublin, Government Publications Office;
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR) (EPA 2022). Dublin: Government Publications Office;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act.
- Architectural Heritage Protection Guidelines for Planning Authorities (2011)

13.2 ASSESSMENT METHODOLOGY

Research has been undertaken in four phases. The first phase comprised a paper survey of all available archaeological, architectural, historical, and cartographic sources. The second phase involved a field inspection of the proposed development area. The third and fourth phases comprised a programme of geophysical survey and archaeological testing.

13.2.1 Paper Survey

The following sources were examined and a list of areas of archaeological, architectural and cultural heritage potential was compiled:

- Record of Monuments and Places for County Dublin;
- Sites and Monuments Record for County Dublin;
- National Monuments in State Care Database;
- Preservation Orders List;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- South Dublin County Development Plan 2022-2028;
- Aerial photographs;
- Place name analysis;
- Excavations Bulletin (1970–2022); and
- National Inventory of Architectural Heritage.

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. All recorded archaeological sites are also listed on a website maintained by the Department of Housing, Local Government, and Heritage (DoHLGH) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument.

The Minister for the DoH/LGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

Documentary sources were consulted to gain background information on the archaeological, architectural and cultural heritage landscape of the proposed development area.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey, Bing Maps, and Google Earth.

Place Names are an important part in understanding both the archaeology and history of an area. Place names can be used for generations and in some cases have been found to have their root deep in the historical past.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The South Dublin County Development Plan (2022–2028) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development area.

The National Inventory of Architectural Heritage (NIAH) is a government-based organisation tasked with making a nationwide record of locally, regionally, nationally and internationally significant structures, which in turn provides county councils with a guide as to what structures to list within the Record of Protected Structures. The NIAH have also carried out a nationwide desk-based survey of historic gardens, including demesnes that surround large houses.

Excavations Bulletin is a summary publication that has been produced every year since 1970. The hard copy publication summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. The information is also available online and includes years from 2011 to the present (www.excavations.ie).

13.2.2 Field Inspection

Field inspection is necessary to determine the extent and nature of archaeological, architectural, and historical remains and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The field inspection entailed:

- Inspecting the proposed development area and its immediate environs.
- Noting and recording the terrain type and land usage.
- Noting and recording the presence of features of archaeological, architectural, or cultural heritage significance.
- Verifying the extent and condition of any recorded sites.
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

13.2.3 Geophysical Survey

Geophysical survey is used to create ‘maps’ of subsurface archaeological features. Features are the non-portable part of the archaeological record, whether standing structures or traces of human activities left in the soil. Geophysical instruments can detect buried features when their electrical or magnetic properties contrast measurably with their surroundings. In some cases, individual artefacts, especially metal, may be detected as well. Readings, which are taken in a systematic pattern, become a dataset that can be rendered as image maps. Survey results can be used to guide excavation and to give archaeologists insight into the pattern of non-excavated parts of the site. Unlike other archaeological methods, the geophysical survey is not invasive or destructive.

A geophysical survey of the accessible portions of the proposed development area was carried out by Ger Dowling in June 2022, under licence 22R0200 and the results are summarised within this assessment.

13.2.4 Archaeological Testing

Archaeological testing is defined as ‘a limited programme... of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land or underwater. If such archaeological remains are present test trenching defines their character and extent and relative quality’ (CifA 2020a).

A programme of archaeological testing was carried out across Tiles 2 and 3 by Fergal Murtagh under licence 22E0719, as issued by the National Monuments Service of the DoH/LGH. The results of the assessment are given in this report.

13.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

13.3.1 Historical Background

The proposed development is located within the townland of Cappagh, Parish of Clondalkin, and Barony of Uppercross, County Dublin. The proposed development area comprises parts of three fields, north of the Grand Canal. There is one recorded monument partially located within the proposed development area. This consists of an enclosure (DU017-036), and the geophysical survey indicates potentially 75 percent of the feature is located within the development area (Figure 13.1). It should be noted that this site does not possess any upstanding remains and was identified as a site of potential from aerial photographs dating to 1971 (SMR file).

Prehistoric Period

Mesolithic Period (8000-4000 BC)

Although recent evidence suggests there may have been a human presence in the southwest of Ireland as early as the Upper Palaeolithic (Dowd and Carden 2016), the earliest evidence for widespread settlement in Ireland dates to the Mesolithic period. These communities subsisted on hunting, fishing and foraging with seasonal natural resources being of key importance. The most common evidence found to show the presence of Mesolithic communities at a site is scatters of worked flint, a by-product from the production of flint implements. The coastal areas of County Dublin have produced flint tools dating to the Mesolithic and seasonal habitation sites have been interpreted through the discovery of shell middens along this coastline. There is no evidence of Mesolithic activity in the vicinity of the proposed development area to date.

Neolithic Period (4000–2500 BC)

During the Neolithic period, communities became less mobile and their economy became based on agriculture. This transition was accompanied by major social change. Agriculture demanded an altering of the physical landscape, which meant forests were rapidly cleared and field boundaries constructed. There was a greater concern for territory,

which contributed to the construction of large communal ritual monuments called megalithic tombs, which are characteristic of the period. A Neolithic house was discovered in the townland of Kishoge, c. 1.2m west of the proposed development area (Licence 01E0061), indicating that the wider landscape was occupied during the Neolithic period.

Bronze Age (2500–800 BC)

The Bronze Age was marked by the widespread use and production of metal for the first time in Ireland. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. The megalithic tomb tradition declined and ended in favour of individual, subterranean cist or pit burials that occur either in isolation or in small cemeteries. These burials contained inhumed or cremated remains and were often accompanied by a pottery vessel. It is noted a bronze axe head (IA/163/1996) is recorded in the topographical files of the National Museum of Ireland as potentially originating from within the SDZ, although no detail as to the circumstances of the find is contained in the record.

Fulachtaí fia or burnt mound sites typically date to the Bronze Age and are amongst the most commonly found sites within the prehistoric landscape, with thousands recorded across the country. Such sites are often characterised by a horseshoe-shaped mound of heat-affected stone and charcoal, often associated with a trough and pits, and are located in close proximity to a water source or in areas where the water table is particularly high. They are often affected by agricultural activities such as ploughing and often survive only as irregular spreads of heat-affected stones and charcoal-rich material. *Fulachtaí fia* have traditionally been interpreted as cooking sites; however, alternative interpretations have been presented including brewing, tanning, dyeing and bathing. There are a number of *fulachtaí fia* recorded in the surrounding landscape. Enclosure DU017-035 is located c. 475m southwest of the proposed development area and is described in the SMR file as follows: 'An aerial photograph (FSI 1971/224-6) shows a horseshoe-shaped enclosure. Not visible at ground level.' The description suggests that this enclosure may in fact represent a *fulachtaí fia* or burnt mound, as a horseshoe plan is a common feature of the site type. Given that the site is located to the immediate north of the Grand Canal, it may also relate to the construction of that feature rather than being archaeological in nature.

Iron Age (800 BC–AD 500)

The Iron Age was traditionally seen as a period for which there was little evidence in comparison to the preceding Bronze Age and the succeeding early medieval period. However, development-led excavation in recent decades and projects such as the Late Iron Age and Roman Ireland Project has added significantly to our knowledge of the Irish Iron Age. In Europe, there are two stages to the Iron Age, the earlier Hallstatt and the later La Tène. While in Ireland, evidence of a Hallstatt phase is rare, and the La Tène phase is reflected strongly in the style of metalwork of this period. It is clear there was significant contact and interaction between Continental Europe, Britain and Ireland at this time. There are no recorded sites of Iron Age date in the vicinity of the proposed development area.

Early Medieval Period (AD 500–1100)

The early medieval period is portrayed in the surviving literary sources as entirely rural, characterised by the basic territorial unit known as a *túath*. Byrne estimates that there were likely to have been at least 150 kings in Ireland at any given time during this period, each ruling over his own *túath* (1973). It has been estimated that each *túath* comprised between 1,700 and 3,300 subjects, according to the most recent estimates placing the population of Ireland in the early medieval period between a quarter and a half a million people (Stout 2017). One of the most common indicators of settlement during this period is the ringfort. Ringforts were often constructed to protect rural farmsteads and are usually defined as a broadly circular enclosures. They are typically enclosed by an earthen bank and exterior ditch and range from 25m to 50m in diameter. Ringforts can be divided into three broad categories – univallate sites, with one bank or ditch; multivallate sites with as many as four levels of enclosing features and platforms or raised ringforts, where the interior of the ringfort has been built up. Multivallate ringforts are generally believed to reflect the higher status of the occupants (Edwards 1996). Many sites recorded as enclosures may represent ringforts or similar sites, though they may also date to the prehistoric period.

Enclosures (DU017-035 and DU017-036) may represent ringforts or similar sites, although as noted above it seems more probable that DU017-035 relates to Bronze Age activity. It is difficult to ascertain the date and function of 'enclosures' without archaeological investigation, particularly if no above ground trace remains.

Medieval Period (AD 1100–1600)

The beginning of the medieval period was characterised by political unrest that originated from the death of Brian Borumha in 1014. Diarmait MacMurchada, deposed King of Leinster, sought the support of mercenaries from England, Wales and Flanders to assist him in his challenge for kingship. Norman involvement in Ireland began in AD 1169 when Richard de Clare and his followers landed in Wexford to support MacMurchada. Two years later de Clare (Strongbow) inherited the Kingdom of Leinster and in AD 1171, Dublin was besieged and taken by Diarmait MacMurchada and his Leinster forces supported by a force of Anglo-Norman knights led by Strongbow (Richard Fitz-Gilbert de Clare) and Raymond le Gros. By the end of the 12th century the Normans had succeeded in conquering much of the country (Stout and Stout 1997). The initial stage of the invasion of the country was marked by the construction of motte and bailey castles, which were later replaced with stone castles.

A castle (DU017-032001) is recorded c. 498m to the northeast of the proposed development area in the townland of Neilstown. In the Down Survey of c. 1655, this site is referred to as 'old castle' suggesting it is of medieval date. A 16th/17th century house (DU017-032002) is recorded in association with the castle at Neilstown. These may relate to the 'three or four cabins' mentioned in the Civil Survey (1654-6). No upstanding remains are extant. A tower house (DU017-029) is recorded c. 3.1km west of the proposed development area, in the townland of Adamstown. While the three-storey tower house was demolished in the 1960s, it is likely that it dated to the later part of the medieval period.

Post-Medieval Period (AD 1600–1900)

During the 18th and 19th centuries, this landscape was typified by large manors with associated demesne landscapes and villages interspersed with medium-sized houses and farmsteads. The 18th century, a relatively peaceful period, saw the large-scale development of demesnes and country houses in Ireland. The large country house was often only a small part of the overall estate of a large landowner and provided a base to manage often large areas of land that could be located nationwide.

Lands associated with the large houses were generally turned over to formal gardens, which were much the style of continental Europe. Gradually this style of formal avenues and geometric garden designs was replaced during the mid-18th century by the adoption of parkland landscapes – to be able to view a large house within a natural setting. Considerable constructional effort went into their creation - the earth was moved, field boundaries disappeared, streams were diverted to form lakes and quite often roads were completely diverted to avoid travelling anywhere near the main house or across the estate. Several small demesnes are depicted on the first edition OS map of 1843 within the landscape surrounding the proposed development area, including Cappagh House, Rosebank, Clonburris Cottage and Moorfield.

The Grand Canal, located c. 210m south of the proposed development area, is c. 131km long and links Dublin City to the River Shannon. Work began on the canal in 1756 and it was officially opened to traffic in 1804. While the rise of the railway significantly reduced the popularity of the canal, it was not until 1960 that the last cargo was transported along the Grand Canal. A number of features of architectural significance are located within the vicinity of the proposed development, which forms part of the Grand Canal, including the 10th Lock (RPS 123, NIAH 11205013), the 11th Lock (RPS 128, NIAH 11205012) and Omer Lock House (RPS 122, NIAH 11205011). These structures are all listed within the NIAH survey and the RPS.

13.3.2 Summary of Previous Archaeological Fieldwork

A review of the Excavations Bulletin (1970–2022) has revealed that some recent archaeological excavations have taken place within the surrounding SDZ lands.

Archaeological testing was carried out to the immediate south of the proposed development area in September 2022, as part of a proposed residential development (Planning Ref.: SDZ21A/0022), (Licence Ref.: 22E0438). A number of small areas of archaeological potential were identified, including a number of charcoal production pits and three brick kilns or clamps. Scattered pits were also identified as well as the remains of a structure and track shown on the historic OS maps. None of these features expand into the proposed development area.

Archaeological testing and metal detection carried out in advance of the infrastructure development within the Clonburris SDZ under licences 20E0390 and 20R0168 and a number of the test trenches were excavated immediately adjacent to the proposed development area. Small archaeological areas were identified within the wider tested area. Of particular significance to the current application area are AA1 and AA2 (O' Neill 2020) located c. 50m to the southwest. AA1 comprises three pits, with evidence for burning and charcoal. No dating evidence was

recovered from these pits during testing. AA2 comprises a single large pit, capped in clay and containing charcoal. This may be the site of a charcoal production pit. No dating evidence was recovered during testing.

Post-medieval features were identified within the area of the haul route further to the west near Kishoge. These features were recorded as 'Kiln Area 3'. Previously unrecorded post-medieval brick manufacture was evident in the fields just to the east of the R136. An area of substantial brick debris and burning was identified that is potentially derived from a post-medieval brick manufacturing kiln. Two further brick kilns were identified during testing further to the west in the townland of Grange and AA3 was identified to the east in the townland of Cappagh and consisted of a possible charcoal production pit.

All features relating to the road infrastructure were subject to preservation by record during 2022 by ACSU, but no summary has been submitted to the Excavations Bulletin.

13.3.3 Cartographic Analysis

Down Survey Maps of the Barony of Newcastle, c. 1655

The Down Survey maps were created as a means to identify land ownership and while they are often scant in detail, major topographical features and occasionally notable man-made landmarks are depicted. The castle (DU017-032001) at Neilstown is shown and labelled as 'old castle', suggesting that the castle was already of substantial age by the time of this map. It is shown in association with a second smaller structure which may represent the 16th/17th century house (DU017-032002).

Rocque's An Actual Survey of County Dublin, 1760 (Figure 13.2)

Rocque's map of 1760 depicts a largely agricultural landscape with a dispersed settlement. The Grand Canal is visible as 'New Canal'. A small demesne is present to the east called 'Cappoh'. A group of structures is shown at the location of the castle at Neilstown but the castle is not annotated. To the west, 'Castle Adams' is depicted which may correlate to the tower house (DU017-029) in Adamstown.

John Taylor's Map of the County of Dublin, 1816

By the time of Taylor's map of 1816, the demesne at Cappagh and Moorfield is shown within a wooded landscape to the east of the development area, which remains within open land. A number of residences are also marked, including Springfield, immediately north of the Grand Canal, and Kishoge House. A number of locks are indicated along the Grand Canal to the south including the 9th-11th locks that possess several structures fronting the canal.

First edition Ordnance Survey Map, 1843, scale 1:10,560 (Figure 13.3)

The first edition OS map of 1843 is the first accurate depiction of the proposed development area. The development area is formed by parts of four undeveloped fields that are tree lined, within Cappagh townland. Several small demesnes are depicted in the local area including Cappagh House, Rosebank, Clonburris Cottage and Moorfield. There are a number of small structures immediately north of the Grand Canal, which are located to the south of the proposed development area. These are likely to represent vernacular houses, accessed from the canal path.

Second edition Ordnance Survey Map, 1871, scale 1:10,560

There are no major changes to note within the cartography of this map that relate to the proposed development area.

Ordnance Survey Map, 1906–9, scale 1:2,500

There are no significant changes to the proposed development area depicted within this map although it is now marked within three fields. The Great Southern and Western Railway line is now formed and is located along the north of the development area. Clondalkin Fonthill Station has not yet been built.

Third Edition Ordnance Survey Map, 1935, scale 1:10,560

There are no major changes to note within the cartography of this map that relate to the proposed development area.

Figure 13.2 – Extract from Rocque’s map of 1760, showing the approximate location of the proposed development area



Figure 13.3 – Extract from the first edition OS map of 1843, showing the proposed development area



13.3.4 County Development Plan

13.3.4.1 Archaeological Heritage

The South County Dublin Development Plan (2022-2028) recognises the statutory protection afforded to all RMP sites under the National Monuments Legislation (1930–2014). The development plans list a number of aims and objectives in relation to archaeological heritage (Appendix B 13.3 Volume III of the EIAR). It is a policy of the South County Dublin Development Plan (2022-2028) to promote the in-situ preservation of archaeology as the preferred option where development would have an impact on buried artefacts. Where preservation in situ is not feasible, sites of archaeological interest shall be subject to archaeological investigations and recording according to best practice, in advance of redevelopment.

One recorded monument is located partially within the proposed development area. This consists of an enclosure (DU017-036) (Figure 13.1; Appendix B 13.1 Volume III of the EIAR). The geophysical survey suggests approximately 75 percent of the site is located within the proposed development area, where as the remainder is located in Tile 3 lands to the immediate west.

13.3.4.2 Architectural Heritage

The South County Dublin Development Plan (2022-2028) recognises the statutory protection afforded to all protected structures under the Planning and Development Act. The plan also lists a number of aims and objectives in relation to architectural heritage (Appendix B 13.4 Volume III of the EIAR).

There are no protected structures within the proposed development footprint. Three protected structures are located within 250m of the site (Table 13.1, Figure 13.1). All three of these structures are also listed in the NIAH Building Survey. Details of the protected structures are given in Appendix B 13.2 Volume III of the EIAR.

Table 13.1 – Protected Structures in the vicinity of the proposed development area

RPS No. / NIAH Ref.	Structure Name	Location	Distance from Development
123/ 11205013	10th Lock	Cappagh, Clondalkin	c. 209m south
128/ 11205012	11th Lock	Cappagh, Clondalkin	c. 225m south
122/ 11205011	Omer Lock House, 11th Lock	Cappagh, Clondalkin	c. 237m south

There are no Architectural Conservation Areas (ACA) within the study area of the proposed development.

13.3.4.3 Clonburris Strategic Development Zone Planning Scheme 2019

Section 2.12.3 of the Clonburris Strategic Development Zone Planning Scheme 2019, states that, development should be designed and carried out in a manner that protects archaeological heritage and avoids adverse impacts on sites, objects or features of significant archaeological interest and that in accordance with the recommendations of the Framework and Principles for the Protection of Archaeological Heritage (1999), in-situ preservation of archaeological features is favoured.

Section 2.13.2 also states that development that has been pre-determined to have the potential to disturb archaeological sites, objects or features shall be supported by an Archaeological Impact Assessment and Mitigation Strategy particularly for development within the vicinity of known archaeological sites and previously unrecorded features identified through archaeological survey work. Where appropriate, the incorporation of any known or discovered archaeological sites or features should be detailed and described within design statements for all medium to large scale development proposals (see Section 2.8.2 – Design Criteria) on the SDZ lands.

13.3.5 Aerial Photographic Analysis

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995–2013), Google Earth (2008–2022), and Bing Maps revealed that the proposed development area has experienced a number of changes since 1995. As of 1995 the site is with three fields with the Fonthill Road having been constructed by 2000. The construction of the Clondalkin Fonthill Railway Station and the associated car park

is visible to the northeast and east in the aerial imagery of 2008 (Google Earth). A haul road and partial top soil stripping are also noted within the development area. No further changes are apparent from 2008 to the present day. No previously unrecorded sites or areas of archaeological potential were noted during the course of the inspection.

13.3.6 Topographical Files of the National Museum of Ireland

Information on artefact finds from the study area in County Dublin has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area. A bronze axehead (IA/163/1996) is recorded in the topographical files of the National Museum of Ireland as potentially originating from within the Clonburris SDZ, although no detail as to the circumstances of the find is contained in the record.

13.3.7 National Inventory of Architectural Heritage (NIAH)

13.3.7.1 Building Survey

There are three structures listed in the NIAH for the vicinity of the proposed development area. All three of these are also listed in the Record of Protected Structures (see Table 13.1, Figure 13.1).

13.3.7.2 Garden Survey

No demesne landscapes have been identified within the NIAH Garden Survey during the course of this assessment that relate to the proposed development area. The closest demesne was associated with Cappagh House, c. 230m to the east. Today no distinct designed remains survive of the landscape and the house itself is an overgrown ruin.

13.3.8 Cultural Heritage Sites

The term 'cultural heritage' can be used as an over-arching term that can be applied to both archaeology and architectural features. However, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. Settlements or industrial features such as mills, millraces, kilns and bridges which are visible on historic mapping but have disappeared from the modern landscape can also be considered as sites with cultural heritage value. No specific cultural heritage sites have been identified during the course of this assessment that relate to the proposed development area; however, the archaeological and architectural sites within the study area that are identified within this assessment can be considered as cultural heritage.

13.3.9 Placename Analysis

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830's and 1840's, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main references used for the place name analysis is Irish Local Names Explained by P.W Joyce (1870) and logainm.ie. A description and possible explanation of each townland name in the environs of the proposed development area are provided in the below table.

Table 13.2 – Placenames within the study area

Name	Derivation	Possible Meaning
Cappagh	<i>An Cheapach</i>	The tillage plot
Clonburris Little	<i>Cluain Buiríosa</i>	The pasture of the borough-town- likely divided into Little and Great at a later date.
Clonburris Great	<i>Cluain Buiríosa</i>	The pasture of the borough-town- likely divided into Little and Great at a later date.
Kishoge	<i>An Chiseog</i>	A wickerwork causeway
Grange	-	Grange - deriving from the English medieval name for a monastic farm
Kilmahuddrick	<i>Cill Mochuidbhricht</i>	Church of Mochuidbhricht (Cuthbert)

13.3.10 Townlands

The townland is an Irish land unit of considerable longevity as many of the units are likely to represent much earlier land divisions. However, the term townland was not used to denote a unit of land until the Civil Survey of 1654. It bears no relation to the modern word 'town' but like the Irish word *baile* refers to a place. It is possible that the word is derived from the Old English *tun land* and meant 'the land forming an estate or manor' (Culleton 1999, 174).

Gaelic land ownership required a clear definition of the territories held by each sept and a need for strong, permanent fences around their territories. It is possible that boundaries following ridge tops, streams or bog are more likely to be older in date than those composed of straight lines (*ibid.* 179).

The vast majority of townlands are referred to in the 17th century, when land documentation records begin. Many of the townlands are mapped within the Down Survey of the 1650s, so called as all measurements were carefully '*laid downe*' on paper at a scale of forty perches to one inch. Therefore, most are in the context of pre-17th century landscape organisation (McErlean 1983, 315).

In the 19th century, some demesnes, deer parks or large farms were given townland status during the Ordnance Survey and some imprecise townland boundaries in areas such as bogs or lakes, were given more precise definition (*ibid.*). Larger tracts of land were divided into a number of townlands, and named Upper, Middle or Lower, as well as Beg and More (small and large) and north, east, south and west (Culleton 1999, 179). By the time the first Ordnance Survey had been completed a total of 62,000 townlands were recorded in Ireland.

Although not usually recorded as archaeological monuments in their own right, townland boundaries are important as cultural heritage features as they have indicated the extents of the smallest land division unit in the country—the townland—which have been mapped since the 19th century. It remains unclear how old these land units actually are, though it has been convincingly argued that they date to at least the medieval period and may be significantly older than this (McErlean 1983; MacCotter 2008).

The proposed development area is located within the townland of Cappagh, Parish of Clondalkin, and Barony of Uppercross, County Dublin. The proposed development does not contain any townland boundaries

13.3.11 Field Inspection

The field inspection sought to assess the site, its previous and current land use, the topography and any additional information relevant to the report. During the course of the field investigation the proposed development site and its immediate surrounding environs were inspected.



Plate 13.1: Proposed development area, facing east

The proposed development area is characterised by three fields of rough pasture bordered to the north by the railway line and to the east by the R113. The eastern most field has been disturbed in the past and the ground here is rougher under foot. The fields are surrounded by mature hedgerows that are very overgrown, having not been subject to any maintenance in recent years (Plate 13.1). A very slight rise in the field containing recorded monument DU017-036 was noted, although it remains unclear as to whether this is archaeological or a natural undulation in the landscape (Plate 13.2).

No previously unrecorded features of archaeological potential were noted during the course of the inspection.



Plate 12.2: Slight rise in landscape at approximate location of DU017-036, facing southeast

13.3.12 Summary of Geophysical Survey

A geophysical survey was conducted within the accessible portions of the proposed development area in June 2022 (Dowling 2022, Licence 22R0200) as part of a preliminary archaeological investigation of the Cappagh area (Figure 13.4). The geophysical survey was focused on five separate fields and covered an area of approximately 8ha in total size. The investigation revealed several features of potential archaeological significance, including what may be the remains of a small, sub-circular enclosure, which may correspond to enclosure DU017-036. This feature appears to be bisected, east to west, by a possible ditch and is conceivably associated with several possible pits/spreads mapped in the surrounding area. Evidence for former agriculture was also detected.

13.3.13 Summary of Archaeological Testing

Archaeological testing of the geophysical anomalies was carried out by Fergal Murtagh of IAC Archaeology in the proposed development areas and the adjacent Tile 3, during November 2022. Test trenching was conducted under licence 22E0719, as issued by the DoHLGH. A total of six trenches were excavated in Tile 2, with an additional six trenches excavated in Tile 3 to the immediate west (Figure 13.4).

Trenches 7 and 8, located within Tile 2, targeted the more definitive geophysical anomalies that may relate to enclosure DU017-036. The anomalies comprise the remains of shallow ditches measuring between 1.52m and 2.05m wide and 0.4m to 0.48m deep (Plates 13.3 and 13.4). The ditches were filled by similar material in both trenches with the upper fill consisting of a compacted bright orange clay and the lower fill consisting of an orange clay with moderate amount of decayed stone present. No diagnostic material was recorded and if the ditches do relate to an enclosure, they appear to have been subject to a large amount of horizontal truncation due to the shallow depth.

No other features of archaeological potential were identified in the proposed development area.

Figure 13.4 – Proposed development area showing geophysical survey and position of test trenches



Plate 13.3: Remains of a ditch in Trench 7 that may relate to DU017-036, facing southeast



Plate 13.4: Remains of a ditch in Trench 8 that may relate to DU017-036, facing northeast

13.3.14 Conclusions

The proposed development area is located within the townland of Cappagh, Parish of Clondalkin, and Barony of Uppercross, County Dublin. A portion of one recorded monument is located within the proposed development area. This consists of an enclosure (DU017-036), which was identified from aerial photographs in the 1970s. The site does not possess upstanding remains. There are no protected structures located within the proposed development area, although three structures are located within c. 250m. All three of these features are also listed in the NIAH Survey and relate to the Grand Canal, located c. 205m south. There are no specific cultural heritage sites recorded within the proposed development area or surrounding study area.

A review of Excavations Bulletin (1970–2022) has revealed that archaeological testing has been carried out to the immediate south and west of the proposed development area as part of the SDZ road infrastructure requirements and as part of a permitted residential development. This work resulted in the identification of a number of areas post-medieval brick production, charcoal production sites and a number of scattered pits. Archaeological activity is scattered and relatively isolated and indicates probable small scale post medieval industrial activity.

A bronze axehead (IA/163/1996) is recorded in the topographical files of the National Museum of Ireland as potentially originating from within the Clonburris SDZ, although no detail as to the circumstances of the find is contained in the record.

Analysis of the available historic cartographic sources depicts the proposed development area as primarily agricultural greenfield throughout the post-medieval period. Several small demesnes are depicted in the local area including Cappagh House, Rosebank, Clonburris Cottage and Moorfield. These landscapes do not enter into the footprint of the development area.

Analysis of aerial photographic record available for the area failed to identify any previously unknown archaeological features. The construction of the Clondalkin Fonthill Railway Station and the associated car park is visible to the northeast and east in the aerial imagery of 2008 (Google Earth). A haul road and partial top soil stripping are also noted within the development area. No further changes are apparent from 2008 to the present day.

A geophysical survey was conducted within part of the proposed development area in June 2022. The investigation revealed several potential features of archaeological significance, including what may be the remains of a small, sub-circular enclosure at the approximate location of recorded enclosure DU017-036. This feature appears to be bisected, east to west, by a possible ditch and is conceivably associated with several possible pits/spreads mapped in the surrounding area. Evidence for former agriculture was also detected.

Archaeological testing was carried out within the proposed development area and within adjacent lands to the immediate west (Tile 3), during November 2022. The trenches targeted the geophysical anomalies. Six trenches

were excavated within the proposed development area two of the trenches targeted the more definitive geophysical anomalies potentially associated with enclosure DU017-036. A shallow ditch was revealed in each trench that may relate to the enclosure. The ditches were less than 0.5m in depth and as such, if these features relate to an enclosure, it is likely it has been subject to truncation.

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of a mixed-use development comprising 594 no. apartments, office floorspace, 4 no. retail units, a creche and urban square in the Clonburris Development Areas CUCS3 & CSW-S3 of the Clonburris SDZ Planning Scheme 2019 as follows:

A full description is provided in Chapter 2 of this EIAR.

13.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

13.5.1 Construction Phase

13.5.1.1 Archaeology

Ground disturbances associated with the construction of the proposed development have the potential to have a direct negative impact on the recorded enclosure site (DU017-036) and any archaeological features that may exist beneath the current ground level with no surface expression (and outside of the footprint of the excavated test trenches). Impacts, prior to the application of mitigation, have the potential to range from moderate to very significant negative, dependant on the nature, extent and significance of the remains that are encountered. It is noted that the potential remains of the enclosure identified during archaeological testing indicate that the site may have been subject to truncation in the past, based on the shallow depths encountered.

13.5.1.2 Architecture

No potential negative impacts upon the architectural heritage resource are predicted as a result of the construction of the proposed development.

13.5.1.3 Cultural Heritage

No potential negative impacts upon the cultural heritage resource are predicted as a result of the construction of the proposed development.

13.5.2 Operational Phase

13.5.2.1 Archaeology

No potential negative impacts upon the archaeological resource are predicted as a result of the operation of the proposed development, subject to the completion of mitigation measures detailed as part of the construction phase.

13.5.2.2 Architecture

No potential negative impacts upon the architectural heritage resource are predicted as a result of the operation of the proposed development.

13.5.2.3 Cultural Heritage

No potential negative impacts upon the cultural heritage resource are predicted as a result of the operation of the proposed development.

13.6 'DO-NOTHING' IMPACT

If the proposed development were not to proceed there would be no negative impacts on the archaeological, architectural or cultural heritage resource of the subject lands.

13.7 AVOIDANCE, REMEDIAL, AND MITIGATION MEASURES

13.7.1 Construction Phase

13.7.1.1 Archaeology

Whilst it is acknowledged that preservation in-situ is the best manner in which to conserve the archaeological resource, the preservation in situ of enclosure DU017-036, within the urban core of Clonburris would lead to an unsustainable form of development located adjacent to the Fonthill Train Station. This would be contrary to the key structuring principles of the Planning Scheme in terms of layout/design objectives, which the applicant is required to adhere to. The preservation of the remains in situ would lead to a substandard and suboptimal form of development in the SDZ area.

As such enclosure DU017-036 will be preserved by record (archaeological excavation), prior to the commencement of construction. This work will be carried out under licence from the DoHLGH and full provision for the excavation of the site will be made available by the applicant – both during the course of fieldwork and during the post excavation process.

In addition, all topsoil stripping associated with the proposed development will be subject to archaeological monitoring. This work will be carried out by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.

13.7.1.2 Architectural

As there are no predicted impacts on the architectural resource, no mitigation is deemed necessary.

13.7.1.3 Cultural Heritage

As there are no predicted impacts on the cultural heritage resource, no mitigation is deemed necessary.

13.7.2 Operational Phase

13.7.2.1 Archaeology

As there are no predicted impacts on the archaeological resource, no mitigation is deemed necessary.

13.7.2.2 Architectural

As there are no predicted negative impacts on the architectural resource, no mitigation is deemed necessary.

13.7.2.3 Cultural Heritage

As there are no predicted impacts on the cultural heritage resource, no mitigation is deemed necessary.

13.7.3 'Worst-Case' Scenario

Under a worst-case scenario, the proposed development would disturb previously unrecorded and unidentified archaeological deposits and artefacts without proper excavation and recording being undertaken.

13.8 PREDICTED IMPACT OF THE PROPOSAL

13.8.1.1 Archaeology

Following implementation of mitigation measures, no impacts are predicted upon the archaeological resource.

13.8.1.2 Architecture

There are no impacts predicted upon the architectural heritage resource.

13.8.1.3 Cultural Heritage

There are no impacts predicted upon the cultural heritage resource.

13.9 MONITORING

The mitigation measures recommended above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

13.10 REINSTATEMENT

Reinstatement is not applicable to this assessment.

13.11 POTENTIAL CUMULATIVE IMPACTS

No cumulative impacts are predicted upon the archaeological, architectural, or cultural heritage resource as all archaeological remains will be preserved by record.

13.12 INTERACTIONS

No interactions with other disciplines have been identified during the compilation of this assessment.

13.13 DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION

No difficulties were encountered during the compilation of this chapter.

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14.0 RISK MANAGEMENT

14.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has included 'Risk Management' as a new chapter to be addressed. Article 3 of the new EIA Directive requires that the EIA shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage, and landscape deriving from (amongst other things) the *“vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”*

This chapter identifies and assesses the likelihood and potential significant adverse impacts on the environment arising from the vulnerability of the proposed development to risks of major accidents and / or natural disasters. It considers whether the proposed development is likely to cause accidents and / or disasters and its vulnerability to them. This chapter was prepared by Dieter Bester, Chartered Civil Engineer [B.Eng CEng], DBFL Consulting Engineers.

The purpose of the chapter is to ensure that the safety and precautionary measures necessary to protect the proposed development in the event of a major accident and / or natural disaster are identified and that appropriate mitigation measures are provided that would protect the environment in the event of such occurrences.

This chapter will identify the types of major accidents / natural disasters that the project is vulnerable to; whether major accidents or natural disasters and the responses to these give rise to significant adverse environmental impacts; the nature of these impacts and the measures needed to prevent or mitigate the likely adverse impact of such events on the environment.

14.2 STUDY METHODOLOGY

The starting point for the scope and methodology of this assessment is that the proposed residential development has been designed and will be constructed in line with best practice (standard construction methods) and, as such, major accidents and / or natural disasters will be very unlikely. The identification, control, and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. For example, a Specific Site Flood Risk Assessment was carried out. Measures to control risks associated with Construction Phase activities are incorporated into the Preliminary Construction Management Plan.

The following sections set out the requirements as stated in the EIA Directive and in the EPA Guidelines on the information to be contained in an Environmental Impact Assessment Report (EIAR). The scope and methodology presented is based on the new EIA Directive, the draft EPA guidelines, and on professional judgement of the consultants with this responsibility in the construction and operation of the proposed development. Regard to the DHPLG's 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' (August 2018), has also been given in the preparation of this chapter. A risk analysis-based approach methodology which covers the identification, likelihood and consequence of major accidents and / or natural disasters has been used for the assessment. This type of risk assessment approach is an accepted methodology.

Recital 15 of the EIA Directive states that:

“In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU.”

The intent of the Directive 2009/71/Euratom directive is that a major accident and/or natural disaster assessment should be mainly applied to COMAH (Control of Major Accident Hazards involving Dangerous Substances) sites or nuclear installations. The proposed development in this instance is residential development on a greenfield site which when completed, will not give rise to ongoing significant risks in its operating environment.

The EPA Guidelines on the information to be contained in an EIAR refer to major accidents and/or disasters in a number of sections:

Characteristics of the Project – the EPA guidelines state that the project characteristics should include “a description of the Risk of Accidents – having regard to substances or technologies used.”

Impact assessment - the EPA guidelines state that the impact assessment should include “the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)”.

Likelihood of Impacts - the EPA guidelines state the following:

“To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH assessment.”

There are also a number of mechanisms which currently manage accidents outside of the EIA process. These would include the Preliminary Construction Management Plan, which would deal with pollution risks during construction (See Chapters 5 Land & Soils, Chapter 6 Water and Chapter 7 Air Quality and Climate) and risk of accidents during construction, including traffic accidents. The risk of flooding is dealt with in Chapter 6; Water. The site is in Flood Zone C which is low risk and is appropriate for residential development. Separately, the risk of fire is managed through the Fire Safety Certification process, which is an integral part of the design of the proposed development.

14.2.1 Site Specific Risk Assessment Methodology

This section identifies the potential of unplanned but potential events that could occur during construction and operation of the proposed development.

Risks are set out according to the classification of risk, taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010), as follows:

Table 14.1 – Risk Classification

Ranking	Classification	Likelihood
1	Extremely Unlikely	May occur only in exceptional circumstances; Once every 500 or more years
2	Very Unlikely	Is not expected to occur; and / or no recorded incidents or anecdotal evidence; and / or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; May occur once every 100-500 years.
3	Unlikely	May occur at some time; and / or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and / or strong anecdotal evidence. Will probably occur more than once a year.

14.2.2 Hazard identification

The site is not in an area prone to natural disasters. Risks were reviewed through the identification of plausible risks in consultation with relevant specialists. Therefore, the risks set out below are considered the most relevant potential risks.

Table 14.2 – Risk Likelihood

Category	Risk Factor Type	Likelihood
Weather	Storms, snow	3
Hydrological	Risk from flooding	1
Excavation work	Collapse	3
Road	Traffic accident	4

Category	Risk Factor Type	Likelihood
Industrial accident	General housebuilding construction	1
Explosion	Works in the vicinity of the Gas Transmission main running parallel to the R113	3
Fire	Hot works close to timber frame structures.	3
Building Collapse	Structural failure during construction. There are no existing buildings and no demolition works.	1
Hazardous substance escape	General housebuilding construction products.	2
Pollution	Construction	3

The risks are then tested in terms of consequences. It should be noted that when categorising the Consequence Rating, the rating assigned assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. In addition, South Dublin City County Council have in place a ‘Major Emergency Plan’ which, if implemented as intended, will work to reduce the effect of any major accident or disaster.

The impact ratings are taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

A risk matrix can be prepared against which the proposed development can be tested.

Table 14.3 – Risk Matrix

Likelihood Rating	Very likely	5					
	Likely	4					
	Unlikely	3					
	Very unlikely	2					
	Extremely Unlikely	1					
				Minor	Limited	Serious	Very Serious
			1	2	3	4	5
Consequence Rating							

14.3 RECEIVING ENVIRONMENT

The existing site and surrounding lands are predominately greenfield and agricultural lands. The R113 borders the proposed development to the east and the Kildare/Cork Railway is located north of the site. These do not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which would be likely to result in a risk to human health and safety or the proposed development. The receiving environment affected by the different aspects of this development are dealt with separately in the individual chapters of this report.

Article 3 of the Environmental Impact Assessment (EIA) Directive 2014/52/EU requires the assessment of expected effects of major accidents and/or disasters within an EIA. Article 3(2) of the Directive states that “*The effects referred to in paragraph 1 on the factors set out there in 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*”.

14.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development comprises the construction of a mixed-use residential development consisting of 594 no. apartments, a creche, retail and commercial (office) floorspace along with the provision of an urban park and ancillary development.

14.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

14.5.1 Health & Safety/ Risks of Major Accidents and/or Disasters in General

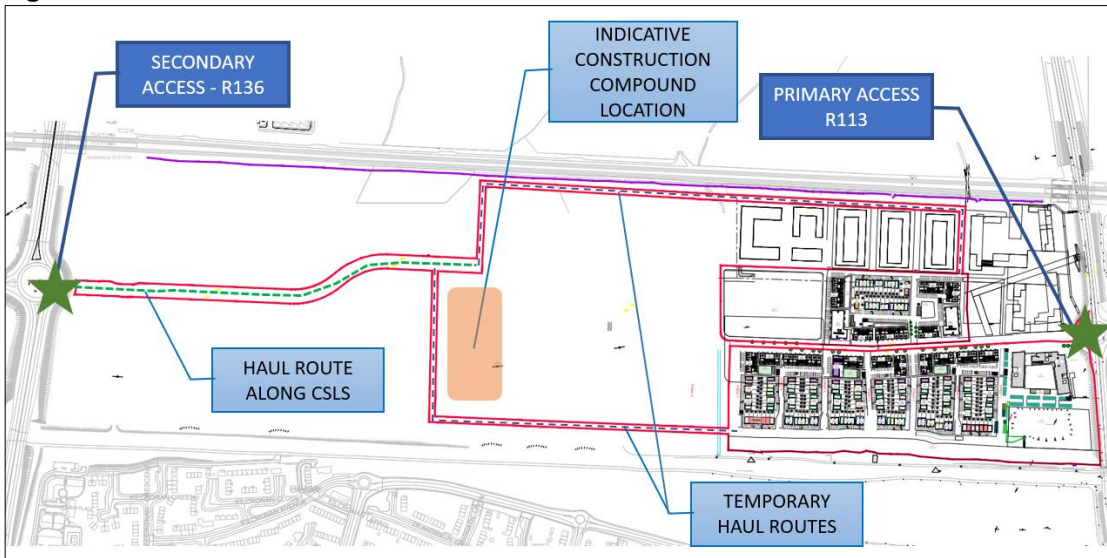
14.5.1.1 Construction Phase

It is considered that the main risks associated with the proposed development will arise during the construction phase.

The construction phase of the proposed development may give rise to short-term impacts associated with construction traffic, migration of surface contaminants, dust, noise and littering. Secondary impacts may include resulting increased traffic arising from hauling building materials to and from the proposed development site which are likely to affect population and human health distant from the proposed development site, including adjacent to aggregate sources and landfill sites.

There may be certain times when access from this location is constrained due to works as part of the CSLS, for example during works to modify the existing roundabout to a signalised junction. Therefore alternative routes to access the site are provided via haul routes from the west. The haul routes initially follow the route of the permitted CSLS from the R136 before diverging to provide a route to both the northern and southern development parcels. This results in potential risk of collision between vehicles involved in the two developments. The routes are generally designed to follow the future road network identified in the SDZ to minimise environmental impacts.

Figure 14.4 – Site Access



Construction impacts are likely to be short term and are dealt with separately in the relevant chapters of this EIAR document and will be subject to control through a Preliminary Construction Management Plan. The construction methods employed, and the hours of construction proposed will be designed to minimise potential impacts. The development will comply with all relevant Health & Safety Regulations during the construction of the project.

14.5.2 Operational Phase

The proposed development comprises of 594no. apartments with all associated infrastructure, including surface car parking, landscaping and open space as well as a crèche with a community/civic space above.

The main risk identified during operation is the potential leak or explosion while works are carried out in the vicinity of the gas transmission main running north/south parallel to the R113 along the eastern border of the site. In order to mitigate this risk a 14.0m wayleave around the transmission main in which no excavation works are to take place has been agreed with Gas Networks Ireland. Where infrastructure works (roads, footpaths, utilities etc..) are required to cross this gas main, a detailed design in compliance with GNI code of practice will be submitted for approval and all works will be carried out with supervision from the relevant authorities.

Another major risk identified during the operational phase is the potential for fire. It should be noted that the proposed uses are considered normal hazard fire risks as would be encountered in most residential developments and do not include any hazards which would be regarded as presenting an exceptional environmental fire hazard.

Further details on risks associated with the operational phase of this development are dealt with separately in the individual chapters of this report.

14.5.3 'Do Nothing' Scenario

In the do-nothing scenario, the potential risk of the proposed development causing, or being affected by a disaster and / or accident would be low, given that the site is currently an undeveloped greenfield site.

14.6 MITIGATION MEASURES

The Construction Environmental Management Plan and associated Health and Safety Plan, as well as good housekeeping practices will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations.

The proposed development will involve ground works to facilitate the proposed development. Site investigations have been carried out and have not identified any hazardous material. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licensed facility. The following mitigation measures are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.
- In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short term disruption to local residents, and reduce the potential for accidents.
- There is a risk of accidents associated with CSLS road to be constructed in conjunction with the proposed development as stated above. In order to manage interactions between the two sites a Project Liaison Group will be established. This group will have regular meetings to ensure a co-ordinated approach to design interfaces, works programmes and environmental management activities for both sites
- Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.
- No Excavations are to be carried out within the 14.0m wayleave around the transmission gas main running north/west parallel to the R113. Where infrastructure works (roads, footpaths, utilities etc..) are required to cross this gas main, a detailed design in compliance with GNI code of practice will be submitted for approval and all works will be carried out with supervision from the relevant authorities.
- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.
- Safety on site will be of paramount importance. Only contractors with the highest safety standards (Health and Welfare at Work (Construction) Regulations 2013) and training will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.

- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

Table 14.5 – Strategy for tackling potential risks – Clonburris Phase T2

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE MITIGATION/INFORMATION
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique identifier for risk	A risk event statement states (i) what might happen in the future and (ii) its possible impact on the project.	Name or title of team member responsible for risk	Enter H (High); M (Medium); or L (Low) according to impact definitions	Enter H (High), M (Medium) or L (Low) according to probability definitions	List, by date, all actions taken to respond to the risk. This does not include assessing the risk
C01	Traffic Accidents	Project Supervisor Construction Stage (PSCS)	M	M	PSCS to develop Traffic Management Plan (implemented from mitigation as set out in PCEMP and Traffic Chapter). All material is within the site boundary. All parking is within the site boundary to limit any interaction with local areas or estates. This will avoid back up of traffic on approach, consideration of allocation of holding area. The road access to the site is mainly off secondary roads and as such a booking system should be considered whereby contractor deliveries and collections can be managed to avoid traffic delays. The PSCS to provide an internal traffic management plan. The plan to include segregation of vehicles from staff and visitors that will be present on the site. PSCS to liaise with Construction Project Manager involved with the CSLS works to manage interaction between the two projects.
C02	Scaffolding/risk of injury	PSCS	H	M	Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. In order to fully Co-Ordinate any temporary works submission the Project Supervisor for the

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE MITIGATION/INFORMATION
					Design Process must receive the following items before reviewing any submission; A full design submission, Calculations for the design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.
C03	Fire Risks	PSCS/ PSDP / Fire SC.	H	M	Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed. A fire marshal will be required - full co-operation from site supervisors and contractors will be required.
C04	Crane Lifting Operations	PSCS / PSDP	H	M	Lifting operations using cranes will be a requirement during the project. The PSDP must identify this as a risk factor ensuring the ground conditions are tested and appropriate to point loading from mobile cranes. The PSCS must ensure there is a fully risk assessed lift plan to manage all lifting operations on site.
C05	ESB Utilities disruption	PSCS /PSDP	H	M	The PSDP must highlight the existence of live overhead ESB cables on site. The sequence of work to be planned to avoid working in close proximity to the lines. The PSCS to arrange for the relocation of the lines prior to working around them. The PSCS must follow the ESB code of practice and provide a risk assessed RAMS document to manage this hazard.
C06	Gas Transmission Main disruption	PSCS / PSDP	H	M	The PSDP must highlight the existence and location of the transmission gas main on site, particularly the high pressure GNI gas line located along the eastern side of the proposed development.

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE MITIGATION/INFORMATION
					The sequence of work to be planned to avoid working within the wayleave around this main agreed with GNI. A detailed design for any works required within this wayleave to be submitted to GNI for approval prior to commencement of works. The PSCS must follow the GNI code of practice.

14.6.1 Operational Phase

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Building Regulations. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2018 from South Dublin County Council.

The measures will include inter alia:

- Provision of fire-rated materials in accordance with relevant building regulations.
Provision of early warning fire detection systems where required under building regulations;
- Use of materials which do not support fire spread with particular reference, inter alia, to internal wall and ceiling linings and external wall cladding.
Facilities to assist the fire service including fire tender access proximate to all units, dry rising mains, and external fire hydrants
- A bespoke Fire Emergency Evacuation Plan [FEPP] will be prepared by a fire consultant at detailed design stage.

14.7 PREDICTED IMPACTS - RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

A Risk Register has been developed which contains the main risks identified with the construction and operation of the Proposed Project. These have been identified as follows:

Table 14.6 – Risk Register

Risk No.	Risk Event	Possible Cause
1	Accidents during construction	Traffic accident Interaction with moving plant. Gas leak/explosion from interaction with gas transmission main Working at height /scaffolding Risk of fire Groundwater pollution Noise Dust
2	Fire during Construction	Work with timber frame construction. Hot works requirements for gas installation, balconies and roof work.
3	Lifting Operations	High winds Poor ground conditions Untrained personnel. Failures in lifting gear.
4	Fire following occupation	Inappropriate use of electrical devices / cooking etc.
5	Falls	Falling from communal gardens Window cleaning Falls on water feature during cold weather events

14.7.1 Risk Analysis

Following identification of risks, the next stage is to analyse how likely this is to occur and the consequences, should the risk arise. This will provide a risk score, i.e. the consequences versus the likelihood of the event taking place.

Table 14.7 – Risk Analysis

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score
1a	Accidents during construction	Movement of vehicles	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1b		Manual handling	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1c		Slips or falls	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1d		Ground water pollution	Impact on aquatic life, illness	3	Lack of direct pathways, controls of run-off during construction	3	Could result in environmental pollution	9
2a	Fire during Construction	Hot Works	Loss of life	1	Type of construction	4	Fire could result in loss of life	4
3a	Lifting Operations	Poor planning	Loss of life	3	Construction Statistics.	3	Poor planning could result in failure of lifting gear or cranes	9
4a	Fire following occupation	Electrical equipment / cooking	Injury or loss of life	1	Causes of fire statistics	4	Could result in loss of life	4
4b	Falls	Loss of balance	Injury or loss of life	1	CSO statistics	4	Could result in loss of life	4
5a	Explosion	Transmission Gas Main	Injury or loss of life	1	GNI Statistics	5	Interactions with the gas main could cause an explosion resulting in loss of life to those within the vicinity	5

14.7.2 Risk Evaluation

Taking the above table, and applying it below, the red zone represents 'high risk scenarios', the amber zone represents 'medium risk scenarios' and the green zone represents 'low risk scenarios.'

Table 14.8 – Risk Evaluation

Likelihood	Very Likely	5					
	Likely	4					

	Unlikely	3			1a – 9, 1b – 9 1c – 9, 1d – 9, 3a - 9		
	Very Unlikely	2				2b - 3	
	Extremely Unlikely	1				2a – 4, 4a - 4, 4b - 4,	5a - 5
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
Consequence Rating							

14.7.3 Main risks

The main risks arise during the construction period. Consequences may be limited but severe for the individuals concerned but considered unlikely. Geographical widespread environmental consequences are not anticipated. Further details on risks associated with the proposed development are dealt with separately in the individual chapters of this report.

14.8 INTERACTIONS

Please refer to Chapter 15.

14.9 RESIDUAL IMPACTS

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that would likely lead to significant residual impacts or environmental effects. No residual impacts arise from the construction phase.

14.10 CUMULATIVE IMPACTS

The proposed development represents, Phase T2 of the Cairn Homes lands within the Clonburris Urban Centre (CUC-S3). This is the second phase to be carried out within the CSW.

A planning application for Clonburris Southern Link Street [CSLS] (ref SDZ20A/0021) is currently underway. The proposed development is adjacent to the CSLS and Phase 1A (Tile 1) and is intended to connect to roads and services provided as part of the CSLS development. Should this scheme be granted it is anticipated that construction phase of the Link Street may overlap with construction of the proposed development.

Other projects in the wider Clonburris SDZ comprise:

SDZ21A/0022 Phase 1A (Tile 1) – 569 No. Units, Creche, Innovation Hub Open Space.
SDZ228/0001 Part 8 Development (Canal Extension Area) 118 no. units (to the south of Grand Canal)
SDZ228/0003 Part 8 Development 263 no. units within Kishogue South West
SDZ22A/0010 – 294 dwellings, creche and retail unit
SDZ22A/0011 Primary School, 16 no. classrooms, general purpose hall and ancillary elements.
SDZ21A/0006 - Wastewater pumping station
Green Pedestrian and Cycle Route along Grand Canal from 12th Lock to Inchicore (Application no. SDZ078/0012)
SDZ22A/0017 - Tile 3 application of 157 no. dwellings (lodged December 2022)

No cumulative impact or consequences are anticipated between the proposed development and future phases.

Subject to implementation of mitigation measures, good working practices and codes, the interactions between Risk Management and Traffic and Transport, and surface water, have been sufficiently considered in relation to risk management.

15.0 INTERACTIONS OF THE FORGOING

15.1 INTRODUCTION

The purpose of this chapter is to highlight the significant interaction between environmental factors, and the cumulative impact this interaction and the proposed development has on the receiving environment. In preparing the EIAR each of the specialist consultants have and will continue to liaise with each other and will consider the likely interactions between effects predicted as a result of the proposed development during the preparation of the proposals for the subject site and this ensures that mitigation measures are incorporated into the design process.

This approach is considered to meet with the requirements of Part X of the Planning and Development Act 2000 and Part 10, and schedules 6 and 7 of the Planning and Development Regulations 2001 as amended.

Article 3(1) of the EIA Directive (2014/52/EU) states that:

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).

As this EIAR document has been prepared by a number of specialist consultants an important aspect of the EIA process is to ensure that interactions between the various disciplines have been taken into consideration.

This chapter was prepared by Rory Kunz who has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has 19 years of experience of Environmental Impact Assessment and urban development. Inputs were also provided by the relevant authors of the individual chapters.

Having regard to the approach taken, the aspects of the environment likely to be significantly affected by the proposed development, during both the construction and operational phases, have been considered in detail in the relevant Chapters of this EIAR document.

The relevant consultants liaised with each other and the project architects, engineers and landscape architects where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. As demonstrated throughout this EIAR, most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the design, construction or operation of the proposed development.

15.2 INTERACTIONS

Section 3.7.2 of the EPA Guidelines 2022 states that the interactions between effects on different environmental factors should be addressed as relevant throughout the EIAR. The EPA Guidelines further note that:

“It is general practice to include a matrix to show where interactions between effects on different factors have been addressed. This is usually done using the actual headings used in the EIAR (which may differ from the factors contained in the Directive (ref section 3.3.6). This is typically accompanied by text describing the interactions.”

The relevant consultants liaised with each other and the project architects, engineers and landscape architects where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. As demonstrated throughout this EIAR, most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the design, construction or operation of the proposed development.

Table 15.1 – Matrix of summary of interactions between the environmental factors

Interaction	Population & Human Health	Biodiversity	Land and Soils	Water	Air Quality/Climate	Noise/Vibration	Landscape and Visual	MA-Traffic	MA-Waste/Utilities	Cultural Heritage	Risk Mgmt
Population & Human Health		x	x	x	✓	✓	✓	x	✓	x	x
Biodiversity	x		✓	✓	x	x	x	x	✓	x	x
Land and Soils	x	✓		✓	✓	x	x	x	x	✓	x
Water	x	x	✓		x	x	x	x	✓	x	x
Air Quality/Climate	✓	✓	x	✓		x	x	✓	x	x	x
Noise/Vibration	✓	✓	x	x	x		x	x	x	x	x
Landscape and Visual	✓	✓	x	x	x	✓		x	x	x	x
MA-Traffic	✓	✓	✓	✓	✓	✓	x		✓	x	x
MA-Waste/Utilities	✓	✓	✓	✓	✓	✓	x	✓		x	x
Cultural Heritage	x	x	x	x	x	x	x	x	x		x
Risk Mgmt	✓	x	✓	✓	✓	✓	x	✓	x	x	

✓ = Interaction envisaged; x = no interaction envisaged

15.3 INTERACTIONS

The following provides the interactions anticipated from the proposed development:

15.3.1 Population and Human Health

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

15.3.1.1 Population and Human Health - Air Quality/Climate

The completed development will generate additional emissions to the atmosphere due to associated with the development, and due to plant equipment within the development. However, air quality in the region of the site is expected to be within the limits set by the air quality standard.

During construction there may be potential for slight dust nuisance in the immediate vicinity of the site. However, dust control measures, as set out in the *Dust Control Management Programme* which include a range of measures such as wheel washes and covering of fine materials will minimise the impact on air quality.

The effect of construction on air quality will not be significant following the implementation of the proposed mitigation measures. It is proposed to adhere to good working practices and dust mitigation measures to ensure that the levels of dust generated will be minimal and are unlikely to cause an environmental nuisance. There will be no significant impact from dust once the development is completed. Overall, it is envisaged that the proposed development will not have a significant impact on air quality. This is dealt with in Chapter 7.

15.3.1.2 Population and Human Health - Noise/Vibration

The greatest potential for noise and vibration impact arising from the proposed development will be in the construction phase. However, following the implementation of the proposed mitigation measures in relation to noise, the impact associated with the construction phase of the proposed development is predicted to be moderate, transient and temporary. No significant impacts on the local noise and vibration climate are predicted during the operational phase of the proposed development. This is dealt with in Chapter 8.

15.3.1.3 Population and Human Health - Landscape and visual

The proposal has the potential to impact on the landscape and visual environment perceived by Human Beings. The high-quality landscape proposals will mitigate the perceived impacts. This is dealt with in Chapter 9.

15.3.1.4 Population and Human Health - Material Assets – Utilities

The operational stage increased population will create greater demand on built services, placing greater demand on water requirements and the public sewer. Irish Water have confirmed capacity. This is dealt with in Chapter 12.

15.3.2 Biodiversity

The potential significant impacts on biodiversity arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation, there are expected to be no residual negative effects to biodiversity which can be considered to be significant.

15.3.2.1 Biodiversity – Land and Soils

Excavation and soil works (site clearance and re-profiling) during the construction phase has the potential to cause impacts on the biodiversity of the site. Mitigation has been incorporated to reduce impacts. This is dealt with in Chapter 4.

15.3.2.2 Biodiversity – Water & Hydrology

Any negative impact on water quality arising from accidental spillages etc. may impact biodiversity. Mitigation has been incorporated to reduce impacts. This is dealt with in Chapter 4. No residual, negative effects are predicted during the operational phase.

15.3.3 Land and Soils

15.3.3.1 Land and Soils – Biodiversity

Excavation and soil works (i.e. through site clearance, re-profiling etc.) during the demolition and construction stage have the potential to cause impact on the biodiversity of the site, for example through disturbance of the available habitats, dust and noise. Mitigation has been incorporated to reduce impacts. This is dealt with in Chapter 5.

15.3.3.2 Land and Soils – Water

There are interactions between land and soils and water, with changes in depth and type of overburden impacting the protection provided to aquifers. The likely impact will be neutral, permanent and slight. This is dealt with in chapters 5 and 6.

There are interactions between land and soils and water, with some surface water conveyed and stored in SuDS features replicating the existing greenfield site drainage as closely as possible. The likely impact will be permanent, slight and neutral.

The potential significant impacts on land and soils arising from these interactions in the construction and operational phases 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.

15.3.3.3 Land and Soils – Air Quality

Excavation works and exposure of soil during the construction phase can influence the microclimate in an area. The construction phase may result in the spread of dust onto surrounding land uses and public roads. The air quality assessment indicates that there is no significant impact associated with these matters. The implementation of the 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. This is dealt with in Chapter 7.

The potential significant impacts on land and soils 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.

15.3.3.4 Land and Soils – Material Assets

There are interactions between lands and soils and material assets, with the construction of drainage and utilities impacting the soil and subsoil as these materials will be removed to facilitate construction. The likely impact will be permanent slight, permanent and negative.

There are interactions between lands and soils and material assets, with the delivery of stone fill under buildings and roads and footpaths resulting in additional construction vehicles on roads adjacent to the site. The likely impact will be negative, temporary and slight.

15.3.4 Water, Surface Water / Groundwater

15.3.4.1 Water, Surface Water / Groundwater - Material Assets/Waste Management

There is an interaction between the water environment and waste management as there may be the requirement for removal of contaminated soil off site to a suitable licensed facility to prevent contamination of water. This is dealt with in Chapter 11 Waste Management.

15.3.4.2 Water, Surface Water / Groundwater - Soils/geology/Waste Management

Impacts on the geological environment will also affect the agricultural environment. The removal of soils during the proposed construction project is inevitable.

Waste Management and dust management is also considered in interactions as soil removal will be required for this development. Interactions between soils/geology will be mainly limited to the construction phase due to material excavation. This is dealt with in Chapter 6.

There are interactions between water and land and soils, with changes in depth and type of overburden impacting the protection provided to aquifers. The likely impact will be neutral, permanent and slight.

There are interactions between water and land and soils, with some surface water conveyed and stored in SuDS features such as soakaway's and discharging to the ground where possible, replicating the existing greenfield site drainage as closely as possible. The likely impact will be permanent, slight and neutral.

The potential significant impacts on water and hydrology 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.

15.3.5 Air Quality & Climate

15.3.5.1 Air Quality & Climate - Population and Human Health

An adverse impact on air quality has the potential to impact upon human health, cause dust nuisance and cause disturbance to fauna. However, the risk to air quality as a result of the proposed development would not be considered significant, both at the local community level and on a broader national / global scale.

The interactions between Air & Climate impacts and Population and Human Health have been addressed in Chapter 7. Section 7.6 describes in detail the mitigation measures that shall be implemented to ensure that human health, residential amenity and livestock welfare are not adversely impacted by any aspect of the construction or operational phases of the development. Residual impacts are considered in Section 7.7.

During the construction phase the potential impact of dust would be temporary, given the transient nature of construction works. Dust control will be an integral part of construction management, with mitigation measures implemented where required, including sweeping of roads and hardstand areas, appropriate storage and transport of material and dust suppression measures where required. This is dealt with in Chapter 7.

15.3.5.2 Air Quality & Climate - Traffic

The interactions between Traffic and Air & Climate have been considered in chapter 7 and the traffic data used was obtained from the traffic and transport consultant, for the proposed development which is set out in Chapter 12 of this EIAR.

15.3.5.3 Air Quality & Climate - Biodiversity

There is also the potential for interactions with Biodiversity in terms of flora and fauna. Similarly, the mitigation measures have also been designed to minimise the potential impact that the construction and operational phases of the development may have on the receiving environment which includes flora and fauna.

During construction there are potential issues for biodiversity if the trees were to be covered in dust during construction. However, this will be mitigated by the implementation of a proposed dust minimisation plan and then there should be no significant impacts on nearby trees is anticipated.

The concept of control and attenuation at source of potential emission sources that may impact the receiving environment is the principle that has been adapted in the design, construction and operational phases of the development. The potential significant impacts on air quality and climate arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts will occur.

However, given the transient nature of construction works, and given that standard dust control measures will be implemented, no significant impact is anticipated. This is dealt within Chapter 7.

15.3.5.4 Air Quality & Climate - Surface Water / Groundwater

The interactions between Air & Climate and surface water and groundwater will be mainly limited to the construction phase and are mitigated by the drainage design and proposed mitigation measures. This is dealt with in chapter 7.

15.3.6 Noise/Vibration

15.3.6.1 Noise/Vibration - Population and Human Health/Biodiversity

The principal interactions between Noise & Vibration impacts and Human Beings have been addressed in this chapter. The mitigation measures described shall be implemented to ensure that human health and residential amenity are not adversely impacted by any aspect of the construction or operational phases of the development.

Increased noise levels during the construction phase will be temporary only and are not expected to have a long-term significant adverse effect upon Population and Human Health in the general area. Furthermore, the application of binding noise limits and hours of operation, along with the implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum. There will be no significant increase in ambient noise levels arising during the operational phase of the proposed development.

Noise generated during the construction and operational phases of the proposed development has the potential to impact upon Population and Human Health and fauna within the vicinity of the site.

During the construction phase, noise may be generated due to increased vehicle movements and the operation of construction plant. It is anticipated that there would be a moderate impact, for limited periods of time, on the nearest local residences and fauna within the vicinity of the development. Control and mitigation measures detailed in Chapter 8 will be implemented to reduce noise and vibration, including measures relating to equipment operation and timing of activities. Given the transient nature of construction works, and provided mitigation measures are implemented, noise from construction would not be considered to pose a significant impact upon human beings or Biodiversity. During the operational phase the noise impact generated by additional traffic movements associated with the development is predicted to be of a long-term not-significant to slight impact on existing ambient noise levels at receptors along the local road network.

The potential significant impacts on noise and vibration arising from these interactions have been considered within Chapter 8 and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts will occur.

15.3.7 Landscape and Visual

The potential significant impacts on landscape and visual 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.

The effects described are typically interactive and arise from the combined action of several environmental factors. There are a number of topic areas where interaction can occur with the Landscape and Visual Effects. These are as follows:

15.3.7.1 Landscape and Visual - Population and Human Health

Changes to the landscape character of the site itself will include the development of new buildings and associated landscape works. The landscape and visual impact associated with Population and Human Health focuses on the effects to dwellings. The proposed development generates visual effects, and the effects and associated amelioration of these effects are discussed in chapter 9.

15.3.8 Material Assets – Traffic and Transportation

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 residual negative impacts will occur.

15.3.8.1 Interaction of Traffic and Transportation & Population and Human Health

Construction and operational stage traffic and traffic management measures have the potential to affect journey amenity or economic activity as a result of increased congestion or access restrictions. The upgraded infrastructure provided as part of the scheme can facilitate growth in population and increased infrastructure for sustainable travel modes can contribute towards modal shift in travel patterns and increased physical activity. The scheme provides increased access to local attractions by virtue of reduced congestion. Additionally, employment and economic activity

will be generated during the construction stage of the project. Chapter 3 further describes the effect of the proposed scheme on Population and Human Health.

15.3.8.2 Interaction of Traffic and Transportation & Biodiversity

The presence of the proposed development and new traffic flows can have impacts on biodiversity including physical land take of habitat, severance of commuting or feeding routes and direct mortality. Chapter 4 Biodiversity sets out a range of mitigation measures to reduce the impact.

15.3.8.3 Interaction of Traffic and Transportation & Land & Soils

The volumes of surplus soils generated by the scheme and the earthworks import requirement will affect construction stage traffic generation. Remedial measures are proposed for Construction and Operational phases in section 10.7 of this chapter. During Construction, The Construction Management Plan will ensure that construction traffic impacts are minimised through the control of site access / egress routes and site locations and any temporary lane closure requirements. During Operation, a low level of car parking provision will be reflected in less use of land.

Measures to optimise design and minimise material generation are detailed in Chapter 2, Chapter 5 & Chapter 11. Further measures to mitigate against construction stage traffic impacts are detailed in Chapter 2 and section 10.7 of this EIA.

15.3.8.4 Interaction of Traffic and Transportation & Water and Hydrology

Construction and operational stage traffic have the potential to impact on water quality via hydrocarbon spills and leaks and via increased sediment/particle loading on trafficked surfaces. Measures to mitigate against impacts are detailed in Chapter 5 and Chapter 14.

15.3.8.5 Interaction of Traffic and Transportation & Air and Climate

The interaction between air quality and traffic is considered important. The proposed development will result in a change in traffic levels causing a change in ambient air pollution levels in certain areas along the scheme. However, ambient pollutant concentrations will increase in areas that did not experience high volumes of traffic prior to the scheme resulting in a negative impact. Overall, the impact of the interaction between air quality and traffic is considered temporary, low and not significant. Refer to the Chapter 7 for additional information.

15.3.8.6 Interaction of Traffic and Transportation & Noise and Vibration

The noise emission sources from the proposed development during the construction and operational stages is assessed in Chapter 8. The noise impact assessment has been prepared in consultation with the design team and traffic engineers. Noise emissions have the potential to negatively impact on human beings, population, and human health. The mitigation measures required to reduce traffic noise levels are specified in Chapter 8.

15.3.8.7 Interaction of Traffic and Transportation & Waste Management

Construction and operational stage traffic have the potential to be impacted by waste generation and resource management on site. Measures to mitigate against impacts are detailed in Chapter 2, Chapter 6 and Chapter 11.

Refer to the relevant chapters for additional information.

15.3.9 Material Assets – Waste Management

The potential significant impacts on Material Assets – Waste Management arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts will occur.

15.3.9.1 Material Assets – Waste Management/Traffic and Transportation/Soils and Geology

Waste management interacts with traffic and transportation, soils and geology. The direct and indirect effects of waste-related transport are considered in Chapter 10, Traffic and Transportation and the geotechnical characterisation of the scheme is considered in Chapter 5, Soils and Geology. Traffic, specifically movement of waste associated with the construction stage.

15.3.9.2 Material Assets – Waste Management & Water

Should waste be incorrectly handled or stored at the development site during construction works, it has the potential to cause an adverse impact upon water quality in the area through leaching of materials to groundwater or surface water. However, as mentioned above, waste will be segregated and stored in suitably contained waste receptacles at the site compound, considerably reducing the potential risk of pollution to water. It is not considered that there would be any significant risk to water quality as a result of waste management during the operational phase, given that waste will be collected by private, licensed waste contractors and recovered, recycled or disposed of at appropriately licensed waste facilities, which would have environmental controls in place as standard. This is dealt with in Chapter 11.

15.3.9.3 Material Assets – Waste Management & Biodiversity/Land and Soils/Water

Waste has the potential to impact upon biodiversity during the construction phase, by causing pollution to soils and water and by potentially attracting pests / vermin to the site. However wastes will be stored in suitably contained waste receptacles at the site compound, reducing the potential of pollution to soils and water. Furthermore, the majority of wastes generated during the construction phase would be inert materials, which would reduce the potential for issues regarding pests / vermin. It is not considered that there would be any significant impact upon biodiversity due to waste management during the operational phase, given that waste will be collected by licensed waste contractors and recovered, recycled or disposed of at appropriately licensed waste facilities, which would have environmental controls in place as standard. This is dealt with in Chapter 11.

15.3.9.4 Material Assets – Waste Management & Population and Human Health

Should waste be incorrectly handled or stored at the development site, it has the potential to cause an adverse impact upon human beings through nuisance, including visual, odour and pests, and pollution to soils and water. It should also be noted that given the inert nature of the majority of C&D waste types, it is unlikely that issues regarding odour or pests would arise. During the operational phase, suitably contained wheelie bins / waste receptacles will be provided to the residential area and childcare facility by private waste contractors, thus there would be no significant risk of pollution to soils. Waste will be collected on a regular basis, typically on a two-weekly basis alternating between recyclables and municipal waste. Therefore, waste would not be envisaged to accumulate to high enough volumes to cause nuisance. This is dealt with in Chapter 11. Population & Human Health, management of waste in the construction and operational phase to mitigate nuisance.

15.3.9.5 Material Assets – Waste Management & Landscape and Visual

Waste and litter have the potential to adversely affect the appearance of the landscape. However, as waste management measures will be implemented as part of the proposed development, it is considered that there would be no significant adverse impact upon the landscape. This is dealt with in Chapter 11.

15.3.10 Material Assets – Utilities

The potential significant impacts on Material Assets – Utilities arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts will occur.

15.3.10.1 Material Assets – Utilities & Land and Soils

There are interactions between utilities and lands and soils, with the construction of drainage and utilities impacting the quantity of soil and subsoil as these materials will be removed to facilitate construction. The likely impact will be permanent slight, permanent and adverse.

15.3.11 Risk Management

There are interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport. However, subject to implementation of mitigation

measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

The potential significant impacts on risk management 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.

15.3.12 Interactions & Cumulative Impacts

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other relevant existing and/or approved projects in the area.

The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the EIAR chapters has regard to these in the assessment and mitigation measures proposed.

The potential cumulative significant effects through interactions have been considered and there are no significant potential for cumulative significant effects to arise from multiple non-significant effects. In respect of the project.

16.0 SUMMARY OF EIA MITIGATION AND MONITORING MEASURES

16.1 INTRODUCTION

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by John Spain Associates and sets out a summary of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed. This chapter of the EIAR was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

EIA related conditions are normally imposed by the competent/consent authority as part of conditions of planning consent and form a key part of the Impact Anticipation and Avoidance strategy. Conditions are principally used to ensure that undertakings to mitigate are secured by explicitly stating the location, quality, character, duration and timing of the measures to be implemented. A secondary role of EIA related conditions is to ensure that resources e.g. bonds / insurances will be available and properly directed for mitigation, monitoring or remedial action, in the event that the impacts exceed the predicted levels.

Monitoring of the effectiveness of mitigation measures put forward in the EIAR document, both by the competent authorities and the developer, is also an integral part of the process. Monitoring of environmental media and indicators arise either from undertakings or from conditions.

In the case of mitigation and monitoring measures it is important for all parties to be aware of the administrative, technical, legal and financial burdens that can accompany the measures proposed. It is also important to ensure that, where monitoring is provided for, it is clearly related to thresholds, which if exceeded cause a clearly defined set of actions to be implemented.

16.2 MITIGATION STRATEGIES

16.2.1 Introduction

There are three established strategies for impact mitigation - avoidance, reduction and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e., impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

16.2.2 Mitigation by Avoidance

Avoidance is generally the fastest, cheapest and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes. The consideration of alternatives with respect to the development of the subject lands has been described in Chapter 2.

16.2.3 Mitigation by Reduction

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "end of pipe" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

16.2.4 Reducing the Effect

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

16.2.5 Reducing Exposure to the Impact

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is effected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

16.2.6 Mitigation by Remedy

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

Mitigation and Monitoring Measures

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

16.3 PROJECT DESCRIPTION & ALTERNATIVES EXAMINED

16.3.1 Construction Management Strategy

It is envisaged that the development of the lands subject of the proposed development will occur over a 3-5 year period. Given the nature of the project and the need for flexibility to respond to market demand, the development phases are indicative. A PCEMP has been prepared which, has been reviewed by the relevant EIAR consultants and is included in the application. The mitigation contained in this EIAR will be included in the contractor CEMP.

16.4 POPULATION AND HUMAN HEALTH

Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts.

16.4.1 Construction Phase

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. These remedial and mitigation measures are likely to result in any significant and likely adverse environmental impacts on population and human health during the construction phases being avoided. Readers are directed to Chapter 15 of this EIAR document which summarises all of the remedial and mitigation measures proposed as a result of this EIA.

POP & HH CONST 1:

In order to protect the amenities enjoyed by nearby residents, premises and employees a full Construction Management Plan (including traffic management) will be prepared by the contractor and implemented during the construction phase. The CMP will implement the mitigation measures contained in the EIAR.

With reference to the construction phase of the proposed development, the objective of the Construction Waste Management Plan prepared by Byrne Environmental Consulting Ltd is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 (as amended) are complied with.

During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short term disruption to local residents, and reduce the potential for accidents.

Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.

With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site Specific Flood Risk Assessment, prepared by MPA Consulting Engineers. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding.

A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.

Safety on site will be of paramount importance. Only contractors with the highest safety standards will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.

Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.

Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.

All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.

Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

16.4.2 Operational Phase

The operation phase is considered to have likely significant positive impacts on human beings in relation to the provision of additional residential units, open space, childcare provision, to cater for the demands of a growing population in accordance with the residential zoning objectives pertaining to the site.

During the operational phase of the development the design of the scheme has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars.

In accordance with Article 27 of the Waste Directive Regulations 2011, and the recent EPA Consultation regarding the Article, soil and stone may be suitable for use if the soil meets generally accepted standards for the management of soil contamination such as the LQM/CIEH Generic Assessment Criteria (2nd Edition) and the EPA's Management of Contaminated Land & Groundwater at EPA Licenced Sites. The Article 27 application can be supported where necessary by a site-specific use risk assessment that will assess the risk of the proposed soils re-use at the proposed end point.

The risk assessment process allows mitigating factors concerning the re-use of the material to be highlighted or addressed prior to the movement and placement of the soils at the end user site. The Article 27 Risk Assessment would be site specific to the receptor site.

16.5 BIODIVERSITY

16.5.1 Construction Phase

16.5.1.1 Loss of Hedgerow

As compensation for the loss of hedgerow associated with the proposed development, the following is proposed within the landscape plan to offset the loss:

- Additional native hedgerow planting along the existing fence and hedgerow at the northern boundary of the T2 site to strengthen and enhance this feature

- Approximately 1256m² of new native shrub planting to include the following indicative species: *Viburnum opulus**, *Euonymus europaeus**, *Cornus sanguinea**, *Lonicera periclymenum**, *Hedera helix**, *Crataegus monogyna**, *Prunus spinosa**
- Approximately 460m² structural shrub and hedge planting (to include the following species planted at approx. 4no. per sq.m: *Sarcococca humilis*, *Hypericum 'Hidcote'*, *Mahonia aquifolium*, *Rosmarinus officinalis*, *Viburnum davidii*, *Viburnum opulus*, *Salix aurita*, *Salix caprea*, *Rosa canina*, *Rosa pimpinellifolia*, *Euonymus europaeus*. To include species and varieties within the All-Ireland Pollinator Plan);
- Approximately 74m² Native woodland planting (to include the following species: *Alnus glutinosa*, *Betula pendula*, *Betula pubescens*, *Crataegus monogyna*, *Malus sylvestris*, *Quercus robur*, *Prunus avium*, *Acer campestre*, *Prunus spinosa*, *Salix spp.*, *Prunus padus*, *Corylus avellana*, *Pinus sylvestris*);
- Approximately 500 linear metres of native privet (*Ligustrum vulgare*) residential hedge.

See the Landscape Masterplan (Murray & Associates Drawing 1868_PL_P_01, included as Appendix C 5 Volume III of this EIAR) for further details of the proposed landscaping for T2.

The proposed tree, shrub and hedge planting will provide compensation for loss of tree and shrubs within the T2 site, and retention and strengthening of the northern boundary hedgerow will serve to maintain connectivity around the site for wildlife.

In addition, the landscaping plan specifies the planting of tree lined avenues throughout the site which will result in a significant increase in overall tree cover within the site. In addition to the tree lined avenue bisecting the proposed scheme, extensive additional tree planting will take place within green space areas and throughout the scheme. These amenity tree areas will be a mixture of semi-mature native trees and adopted species.

All tree and shrub cover at the northern and eastern site boundaries will be retained. The northern Retained trees along the site boundary of the site will be protected during construction in full accordance with BS:5837 (Trees in Relation to Construction) and the Arboricultural Method Statement and Tree Protection Plan, as provided in Appendix 1 of the Arboricultural Report, prepared by The Tree File, included with the application.

*Note: Species native to Ireland

16.5.1.2 Impacts on Water Quality and Associated Aquatic Fauna

The following best practice mitigation and environmental control measures will be adhered to throughout the construction phase to ensure the avoidance of impacts on water quality:

Site Set-up

- 2.4m high hoarding will be erected around the boundaries of the development site. All works will be located within the confines of this fencing
- A site compound will be established within the site boundary. The exact location of the site compound will be established by the contractor.
- Access routes will be clearly marked / identified. Access during construction to any working areas will be restricted to land within the outlined works area.

Pollution Prevention

- Any requirement for temporary fills or stockpiles will be sown with grass or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall.
- Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered;
- In the event of encountering groundwaters during excavation, the excavation will be de-watered using a pump equipped with a silt bag on the outlet if necessary, to capture any silty material prior to subsequent natural percolation to ground. Alternatively, this water will be tankered off site if required.
- As construction advances there may be a small requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into silt bags prior to overland discharge allowing water to percolate naturally to ground.
- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing.
- The design, construction and maintenance of an on-site drainage system can prevent sediment related pollution of nearby surface waters. Ground disturbance should be kept to a minimum, water from excavations should be

filtered, other sediment trapping technologies such as silt fences or “wheel wash” tanks can prevent sediment leaving the site. Exposed surfaces should be re-vegetated as soon as possible following construction.

- The minimum amount of soil/subsoils and bedrock material should be removed from site. Soil may be reused for landscaping elsewhere on the site.

Refuelling, Fuel and Hazardous Materials Storage

- Storage/refueling in a designated area of the construction site, located a suitable distance from excavation works. This area should be underlain by concrete hard standing and tanks should be inspected for leaks regularly. Spill kits should be supplied at these stations and staff should be trained in their use and in spill control. Drainage from these areas shall be diverted for collection and not discharged into waterbodies without treatment and other best management practices.
- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station;
- On-site refuelling will take place by direct refuelling from the delivery truck or using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site as required. The fuel bowser will be parked on a level area in the construction compound when not in use. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations.
- Vehicles will never be left unattended during refuelling. Only dedicated trained and competent personnel will carry out refuelling operations and plant refuelling procedures shall be detailed in the contractor's method statements.
- All fuels, lubricants and hydraulic fluids will be stored at the site compound. The storage area will contain a small bund lined with an impermeable membrane in order to prevent any contamination of the surrounding soils and vegetation.
- Fuels volumes stored on site will be minimised. Any fuel storage areas will be bunded appropriately for the volume of fuel stored for the time period of the construction. The bunded area will be roofed to prevent the ingress of rainwater.
- Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment.
- All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. All major repair and maintenance operations will take place off site.
- Potential impacts caused by spillages etc. during the construction phase will be reduced by keeping spill kits and other appropriate equipment on-site.
- Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner. Where on site fuelling facilities are used, there shall be a bunded filling area using a double bunded steel tank at a minimum.

Measures to avoid the release of cement-based material during construction

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and pre-cast elements for culverts and concrete works will be used.
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
- Use weather forecasting to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

Measures to avoid effects associated with the disposal of wastewater

- A self-contained port-a-loo with an integrated waste holding tank will be used at the site compounds, maintained by the providing contractor, and removed from site on completion of the construction works;
- No wastewater will be discharged on-site during either the construction or operational phase.

Waste Management

- All waste will be collected in skips and the site will be kept tidy and free of debris at all times.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.
- All construction waste materials will be stored within the confines of the site, prior to removal from the site to a licenced waste facility.

Environmental Monitoring

The contractor will assign a member of the site staff as the environmental officer with the responsibility for ensuring the environmental measures prescribed in this document are adhered to. Any environmental incidents or non-compliance issues will immediately be reported to the project team.

Vegetation Clearance

Any scrub clearance will be undertaken in line with the Wildlife Act 1976-2019.

The following additional measures are as set out in the DBFL Construction Environmental Management Plan (CEMP) that accompanies this application:

Erosion and Sediment Control

- Measures shall be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around specific exclusion zones and earth bunding adjacent to open drainage ditches) prior to discharge of surface water at a controlled rate.
- Groundwater pumped from excavations shall be directed to on-site settlement ponds.
- Discharge from any vehicle wheel wash areas shall be directed to on-site settlement ponds.
- On-site settlement ponds shall include geotextile liners and ripped inlets and outlets to prevent scour and erosion.
- Weather conditions and seasonal weather variations shall be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- The duration that bedrock layers are exposed to the effects of weather shall be minimized by back filling excavations as soon as practicable after construction of the drainage and pumping station.

Accidental Spills and Leaks

- In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery shall take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- An Emergency Response Plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.
- Pouring of concrete including wash down and washout of concrete from delivery vehicles shall be controlled in an appropriate facility to prevent contamination.
- Regular samples shall be taken from soils affected by earthworks which shall be analysed for contamination

Concrete

- Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site
- Pumped concrete will be monitored to ensure there is no accidental discharge
- Mixer washings are not to be discharged into surface water drains

Wheel Wash Areas

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

16.5.1.3 Potential Impacts on Bats

Habitat Loss/Fragmentation

The proposed retention and enhancement of the northern hedgerow and scrub associated with the northern site boundary will retain existing connectivity along Site boundaries for commuting and foraging bats. The northern site boundary hedgerow/scrub will be enhanced with supplementary planting as shown in the landscaping plan and will develop over the lifetime/operational phase of the development, and retention of tree cover where possible along the eastern boundary and planting of compensatory tree here will maintain connectivity to the south along this eastern boundary for bats.

Retention of tree cover along the southern boundary of the wider Clonburris SDZ site, and enhancement of the Grand Canal Park, extensive planting of native tree and shrub species throughout the scheme and provision of new treelines and hedgerow in carefully considered locations in order to ensure that habitat connectivity is maintained across the wider Clonburris scheme from the northern boundary (and the proposed new park to the north of the railway line) to the Grand Canal to the south.

The lighting associated with the proposed development will be designed to avoid light disturbance to nocturnal wildlife, and will not be focussed onto areas of ecological sensitivity such as boundary hedgerows of development tiles or tree planting areas. The “Dark Sky” principle should be followed – i.e. no upward lighting to reduce light

pollution. Lighting should also be designed in accordance with the BCT/ ILP guidance document: Bats and artificial Lighting in the UK²². Recommendations to accord with this guidance is prescribed as follows:

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible. Ballard lighting should be considered for pedestrian and greenway areas, if deemed necessary.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers. The intensity of external lighting should be limited to ensure that skyglow does not occur in order to reduce light pollution.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

As part of the proposed project, it is recommended that a bat box scheme should be erected within the landscaping plan for the proposed development (see Section 5.6.3 of the Bat Assessment Report). This will be in the form of three rocket bat boxes to be erected within the boundary habitats and parks.

Precise locations for bat boxes should be specified by a bat specialist. The rocket bat boxes are to be erected on a 5m pole fixed in 1m³ of 40 newton strength concrete (Please see appendices of the Bat Assessment Report for details) and these should be located in parks proposed along the Grand Canal and linear park.

Monitoring mitigation measures for bats is proposed to ensure that they are implemented successfully; this will comprise inspection of bat boxes within one year of erection and for a minimum of 2 years. All other mitigation will be checked following implementation by a suitably experienced ecologist and a full summer bat survey carried out post-construction to ascertain bat activity levels within the Clonburris scheme (see Section 5.6.4 of the Bat Assessment Report).

Disturbance/ Displacement

No disturbance of bats will occur; therefore, no specific mitigation is proposed in relation to direct disturbance of bats. Potential displacement as a result of an increase in artificial lighting will be mitigated through the measures relating to artificial lighting as described above.

16.5.1.4 Potential Impacts on Birds

Habitat Loss

The design of the proposed development includes measures for compensatory hedgerow and tree planting which will provide compensation for loss of nesting habitat. In addition, it is proposed to incorporate 5 bird boxes throughout the T2 site (integrated within buildings or on suitable retained trees) to provide additional nesting features for local bird species.

Disturbance

Site clearance will be undertaken under the provisions of the Wildlife Act and outside of the nesting bird season (1st March – 31st August). If vegetation clearance is required during the nesting bird season, this will be preceded by a nesting bird survey and all clearance works supervised by an appropriately qualified ecologist.

An ecologist will be on site during site clearance to minimise impact on foraging/roosting bird species. The ecologist will have the ability to cease works on site that could cause disturbance, in the event of significant disturbance impacts being possible.

²² Bat Conservation Trust / Institute of Lighting Professionals

16.5.1.5 Potential Impacts on Badgers

Habitat Loss/Fragmentation

No specific mitigation is required.

Disturbance/Displacement

In order to fully assess the potential for disturbance related effects on badgers during construction, given the time that can elapse between the original surveys and any future planning consent and construction, a pre-construction badger survey will be carried out in order to identify any sett entrances that may have been excavated in the intervening period. Any requirement for additional mitigation will be assessed following the pre-construction survey. All badger survey work will be undertaken in line with current best practice guidance²³.

Should any setts within 50m of the proposed works be found to be in active use by badgers during the pre-construction badger monitoring, it would be necessary to ensure that the risk of disturbance to badgers is mitigated appropriately. Any badger mitigation required would be undertaken following published best practice guidelines for the treatment of badgers (NRW, 2006) and in consultation with NPWS.

16.5.1.6 Potential Impacts of Frogs

The following measures will be implemented as mitigation for frogs within the wider SDZ site, as specified in the Non-avian Fauna Survey report:

1. The period of construction at or near affected breeding sites should exclude the breeding period wherever possible.
2. If this is not possible then a licence will be required to remove frogs, spawn and tadpoles from affected pools and ponds, and the frogs etc. translocated to other suitable habitat in the locality. Such translocations require licence from NPWS.
- 3) The proposed development(s) will lead to significant loss of frog foraging habitat and frog breeding sites in channels, drains and pools. These losses will be ameliorated by provision of artificial ponds or pools (or wet ditches) within the SDZ lands, and these should preferably be created at early stages of site development.
- 4) Bioretention areas within the streetscape and additional frog breeding pools are to be created as part of landscaping measures within the wider Clonburris SDZ. Frog breeding pools will be integrated into the ecological corridor along the railway.
- 5) The creation of breeding pools etc. within the SDZ lands should be conducted outside of the frog breeding season (to avoid mortality within existing pools and drains on site) and with due care to minimise impacts on both frog foraging habitats and frog breeding sites during their construction. Frog ponds should be created in advance of the frog translocation measures.

16.5.2 Operational Phase

The specific mitigation measures are set out in the relevant Tables 4.19 and Section 4.8.3.11 above, and within Chapter 16 of this EIAR for both the construction and operational phases.

16.5.2.1 Impacts on Habitats

There will be no loss or fragmentation of habitats during the operational phase of the proposed development. All habitat loss will occur during construction. As such, no negative effects on habitats are predicted during the operation of this proposed residential development. In addition, the habitat compensation measures incorporated into the construction phase of the proposed development, outlined in Section 4.8.3 of this report, will also establish on site to provide biodiversity benefits in terms of plant species variety and biodiversity generally. The landscaping plan includes for the creation of two main open green spaces within the T2 site; this includes the Local Park space (0.52ha) and a portion of the linear park (0.72ha), totalling 1.24ha. In addition, planting proposals are aimed at gaining the maximum possible benefit for biodiversity and pollinators in accordance with the All-Ireland Pollinator Plan, and the proposal includes for additional tree and shrub planting throughout the scheme and for biodiverse green roofs on buildings.

²³ National Roads Authority (2006) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.

16.5.2.2 Impacts on Water Quality

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapters 2, 6 and 12 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Section 2 and within the DBFL Consulting Engineers Infrastructure Design Report for T2. The measures ensure that the operation of the proposed development does not adversely affect the water quality of downstream watercourses.

As outlined in the DBFL Consulting Engineers (2022) in relation to foul water generation on site “*The proposed site will benefit from foul infrastructure proposed as part of the CSLs. Trunk Foul sewer network has been designed as part of the CSLs to serve the subject based on the average net density for catchment X, ranging from the “Low margin” to a “High Margin”*”

The overall SDZ lands are relatively flat therefore the pumping of wastewater is required. It is proposed that the wastewater generated from the new apartments for this application will be collected by new gravity sewers that discharges to the trunk sewer within the new Link Road via the adjacent Clonburris T1 development. This in turn discharges to a future Irish Water pumping station (Pumping Station #1 as shown in Figure 4.2) adjacent to the R113 Fonthill Road. This future pumping station and its rising main connection to the existing 9B trunk sewer on Fonthill Road is being delivered by Irish Water as part of the Irish Water Clonburris Local Infrastructure Housing Activation Fund (LIHAF) Scheme. The pump station is currently at planning application stage with SDCC under planning reference SDZ21A/0006.

Foul sewers have been designed in accordance with the Building Regulations and specifically in accordance with the principles and methods set out in the Irish Water Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2) and the recommendations of the ‘Greater Dublin Strategic Drainage Study’, (GSDSDS).

All foul sewers and manholes will be constructed in accordance with the Irish Water Standard Details and the Irish Water Code of Practice for Wastewater. The proposed foul sewer design and layout is in accordance with the Irish Water Code of Practice for Wastewater Infrastructure and The Irish Water Wastewater Infrastructure Standard Details. The proposed foul sewer design and layout complies with the Clonburris Water and Wastewater Report as agreed with SDCC and Irish Water.

In relation to the receiving surface water network (i.e. Clonburris T1 (Phase 1A SDZ21A/0022), “*certain portions of Stormwater infrastructure installed as part of the adjacent Clonburris T1 have been upsized so that they are suitable to receive surface water runoff from future development phases, including the subject development. The urban centre area will have its own local attenuation as per the SWMP and the restricted outflow has been allowed for*” - see Section 3.11 of the DBFL Infrastructure Design Report for T2).

These design measures will ensure that there is no potential for deterioration in water quality associated with the operational phase of the proposed development.

16.5.2.3 Impacts on Fauna

Bats

The proposed development will include implementation of artificial lighting with the potential to significantly affect bats (see Section 5.8 of the Bat Assessment report – Appendix C 1 Volume III of this EIAR). The lighting associated with the proposed development will therefore be designed to avoid light disturbance to nocturnal wildlife, and will not be focussed onto areas of ecological sensitivity such as boundary hedgerows the T3 development or tree planting areas. The “Dark Sky” principle should be followed – i.e. no upward lighting to reduce light pollution. Lighting should also be designed in accordance with the BCT/ ILP guidance document: Bats and artificial Lighting in the UK²⁴. Recommendations to accord with this guidance is prescribed as follows:

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.

²⁴ Bat Conservation Trust / Institute of Lighting Professionals

- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible. Ballard lighting should be considered for pedestrian and greenway areas, if deemed necessary.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers. The intensity of external lighting should be limited to ensure that skyglow does not occur in order to reduce light pollution.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Monitoring for bats has been specified during the operational phase of the works (see Section 5.8.4 of the Bat Assessment Report). This monitoring is to comprise the following aspects:

- Inspection of bat boxes within one year of erection of bat box scheme/rocket box and alternative roosts for Natterer's bat and brown long-eared bats. Register bat box scheme, rocket bat boxes and supplementary roosts with Bat Conservation Ireland. This should be undertaken for a minimum of 2 years in relation to bat boxes/rocket bat boxes.
- Monitoring of any bat mitigation measures. All mitigation measures should be checked to determine that they were successful. A full summer bat survey is recommended post-works.

Provided the above mitigation measures are successfully implemented, no significant negative effects on any faunal receptors are anticipated as a result of the development.

16.5.3 Monitoring

16.5.3.1 Construction Phase

Proposed monitoring during the construction phase in relation to the water environment are as follows (see also Section 6.9, Chapter 6 of this EIAR):

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of drainage installation etc, inspections of works adjacent to existing watercourses).
- Monitoring in relation to the surface water. Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content).

16.5.3.2 Operational Phase

Proposed monitoring during the operational phase in relation to aquatic receptors are as follows:

- Regular inspection and maintenance of the drainage and attenuation systems

16.6 LAND AND SOILS

16.6.1 Incorporated Design Mitigation

The site layout has been designed to minimise impact on the land and soil environment. The design has evolved to minimise environmental impact throughout the various design stages.

The vertical and horizontal alignment of the road and development levels have been optimized to minimize cut and fill requirements and seek to obtain a balance of cut and fill materials (within constraints of road design criteria and landscape considerations). However, the flat topography of the site forced the raising of site levels to allow for enough slope from north to south to drain the site.

Sufficient space has been provided within the works area for segregated spoil storage.

Preconstruction soils testing has been carried out to determine if any contamination exists.

16.6.2 Construction Phase Mitigation

A Preliminary Construction Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A Construction & Environmental Management Plan will be put in place by the Contractor to implement the mitigation measures from the EIAR. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction phase. The Preliminary Outline Construction Management Plan includes a range of site-specific measures which will include the following mitigation measures in relation to geology, soils, and land:

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stripping will not take place during inclement weather.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. Topsoil stockpiles will also be located so as not to necessitate double handling.
- The design of site levels have been carried out in such a way as to minimize the interaction with rock. Rock will likely be encountered during the installation of drainage due to topography of the subject site and levels of drainage outfalls.
- The duration that rock layers are exposed to the effects of weather will be minimized by back filling excavations as soon as practicable after construction.
- Stockpiles of excavated and crushed rock will be protected for the duration of the works.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to water bodies).
- Earthwork's plant and vehicles exporting soil and delivering construction materials to site will be confined to predetermined haul routes around the site.
- Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.
- In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- An Emergency Response Plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.
- Pouring of concrete including wash down and washout of concrete from delivery vehicles will be controlled in an appropriate facility to prevent contamination.
- Regular samples will be taken from soils affected by earthworks which shall be analysed for contamination
- All materials exported from site to be in accordance with the Waste Management Acts.
- Imported materials to be suitably separated to avoid contamination or mixing.
- For imported materials, the use of local quarries or locally available material should be prioritised.
- Any potential for use of surplus material within local sites shall be pursued at construction and detailed design stage (subject to compliance with Waste Management Acts). If any material is to be reused on another site as a by-product (and not as waste), this will be done in accordance with Article 27 of the Waste Directive Regulations.

16.6.3 Operational Phase

Once the development is completed, risks to the geology, soil and land will be from loss of soil value and pollution of soils/subsoils due to accidental spills. The following mitigation measures will be implemented:

- A detailed landscape plan will be prepared and constructed for the development to ensure all areas are planted and established.
- Earthworks will be designed and constructed in accordance with good practice and design standards to ensure slope stability.
- All new drainage on site will be pressure tested and have a CCTV survey carried out prior to being made operational to ensure it is adequately constructed.
- Oil interceptors will be installed on all surface water drainage networks.
- Vegetated Sustainable urban drainage systems will be installed to treat run-off.

16.6.4 Monitoring measures – construction

Proposed monitoring during the construction phase in relation to the geology, soil and land are as follows:

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)

16.7 WATER

16.7.1 Incorporated Design Mitigation

The project layout has evolved in order that the design avoids conflict with the water environment. Design evolution to minimise environmental impact has been prioritised throughout the various design stages to prevent significant adverse impacts on the local water environment/hydrology. These measures will seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

All new foul drainage lines will be constructed in accordance with Irish Water Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational. The design of proposed site levels (roads, buildings etc.) has been carried out in such a way as to replicate existing surface gradients where possible, therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as required for urban centres in the SDZ as outlined in the SWMP prepared for the overall Clonburris SDZ. Surface water discharge rates will be controlled by a Hydrobrake flow control device in conjunction with attenuation storage.

SuDS features such as swales, bioretention areas and green roofs to provide additional storage and promote infiltration of and treatment of surface water run-off have been provided in landscaped areas.

All new surface water drainage on site will be pressure tested and will have a CCTV survey carried out prior to being made operational. The site is attenuated to mimic the greenfield scenario as part of the overall Clonburris SDZ.

Due to the inter-relationship between surface water and soils, hydrogeology and ecology the mitigation measures discussed will also be considered applicable to these sections and this chapter should be read in conjunction with Chapter 4 Biodiversity and Chapter 5 Land and Soils.

16.7.2 Construction Phase Mitigation

The nature of the proposed development dictates that the greatest potential impact on surface waters associated with the development will be in the construction phase. In order to prevent / minimise potential impacts, it is necessary to devise mitigation measures to be adopted as part of the construction works on site.

A Preliminary Construction Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A Construction & Environmental Management Plan will be put in place by the Contractor to implement the mitigation measures from the EIAR. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction phase. The Preliminary Construction Management Plan includes a range of site-specific measures which will include the following mitigation measures:

16.7.2.1 Erosion and Sediment Control

The following measures are proposed for erosion and sediment control:

- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around specific exclusion zones and earth bunding adjacent to open drainage ditches) prior to discharge of surface water at a controlled rate.
- Groundwater pumped from excavations will be directed to on-site settlement ponds.
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds.
- On-site settlement ponds will include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.
- Surface water discharge points during the construction phase will be agreed with South Dublin County Council's Environment Section prior to commencing works on site
- Weather conditions and seasonal weather variations will be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.

16.7.2.2 Accidental Spills and Leaks

The following measures are proposed for accidental spills and leaks:

- In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- An Emergency Response Plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.
- Pouring of concrete including wash down and washout of concrete from delivery vehicles will be controlled in an appropriate facility to prevent contamination.
- Regular samples will be taken from soils affected by earthworks which shall be analysed for contamination.

16.7.2.3 Human Health

An Emergency Response Plan prepared by the contractor will contain measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events. Spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.

16.7.3 Operational Phase

The operational phase of this development is unlikely to have any significant adverse impacts on the local water environment/hydrology due to the environmental design considerations incorporated into the development. These measures will seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

16.7.4 Monitoring

16.7.4.1 Construction Phase

Proposed monitoring during the construction phase in relation to the water environment are as follows:

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of drainage installation etc, inspections of works adjacent to existing watercourses).
- Monitoring in relation to the surface water. Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content).

16.7.4.2 Operational Phase

Proposed monitoring during the operational phase in relation to the water environment are as follows:

- Regular inspection and maintenance of the drainage, attenuation systems and SuDS features.

16.8 AIR QUALITY AND CLIMATE

This section provides the measures that shall be implemented during the construction and operational phase and into the design of the development to minimise the impacts on the receiving environment, local population and human health, livestock and agricultural lands, local flora and fauna, local businesses and on climate.

16.8.1 Construction Phase

In order to ensure that adverse air quality impacts are minimised during the construction phase and that the potential for soiling of property and amenity and local public roads is minimised, the following mitigation measures shall be implemented during the course of all construction activities:

AQ CONST 1: Air Quality Mitigation Measures

- Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust.
- Use of rubble chutes and receptor skips during construction activities.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including top soils shall be managed locally.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used locally to prevent unnecessary dust emissions. . All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM₁₀ are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall be reviewed and altered as required. .
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.
- Site hoarding shall be installed along the north, south, east and western site boundaries to minimise fugitive windblown dust emissions falling on third party lands and existing residential areas.

16.8.2 Operational Phase

The Operational Phase of the Clonburris development site will not generate air emissions that would have an adverse impact on local ambient air quality or local human health and as such there are no mitigation measures specified for the Operational Phase.

The elements of the development designed to minimise the impact of the operational phase of the development on air quality and climate are as follows:

AQ OP1: Climate Impact Mitigation Measures

- Energy Efficiency - All proposals for development shall seek to meet the highest standards of sustainable design and construction with regard to the optimum use of sustainable building design criteria such as passive solar principles and also green building materials.
- All residential units shall be designed and constructed in accordance with The Irish Building Regulations *Technical Guidance Document L – Conservation of Fuel & Energy – Dwellings* amended in 2017 includes requirements for all residential dwellings to be “Nearly Zero Energy Buildings” (NZEB’s) by 31st December 2020. In order to reduce energy consumption, the following key design features have been considered in the design process and will be incorporated into the construction of the residential units:
 - Passive solar design including the orientation, location and sizing of windows
 - The use of green building materials: low embodied energy & recycled materials
 - Energy efficient window units and frames with certified thermal insulation properties
 - Building envelope air tightness
 - Thermal insulation of walls and roof voids of all units

AQ OP2: Air Quality Mitigation Measures

A range of heat sources and renewable energy options for the residential and non-residential buildings will be considered at the detailed design stage and will include Combined Heat and Power Units, Exhaust Air Heat Pumps, Solar Photovoltaics, Air Source Heat Pumps and Variable Refrigerant Flow Systems. The minimum renewable energy contributions as required by Part L 2019 of the Building Regulations is the Renewable Energy Ratio (RER) with a minimum of 20%

- Inclusion of electric car charging points to encourage electric vehicle ownership
- Proximity of Irish Rail, Bus Eireann and private bus operator’s commuter services
- Bicycle parking and cycle routes
- Provision of open landscaped areas, to encourage residents to avail of active lifestyle options

16.8.3 Construction Phase Monitoring

This section describes the dust monitoring methodologies that shall be implemented at the site during the construction phases to ensure that the principal pollutant, dust generated by site activities does not cause nuisance or cause adverse health effects to residential areas and other receptors located in the vicinity of the site boundaries.

7.12.2 Dust Deposition Monitoring Methodology

Dust deposition levels will be monitored at the construction site boundaries, (North and East) to assess the impact that site construction site activities may have on the local ambient air quality and to demonstrate that the environmental control measures in place at the site are effective in minimising the impact of construction site activities on the local receiving environment including the Fonthill Road and the Irish Rail lands bordering the site. The following procedure shall be implemented at the site on commencement of site activities:

The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 +/-2 days. Monitoring shall be conducted on a monthly basis during the construction phase.

The selection of sampling point locations will be completed after consideration of the requirements of *Method VDI 2119* with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert to ensure that the dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of the site boundaries and existing on-site buildings.

After each (30 +/-2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m²-day in accordance with the relevant standards.

Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager. Monitoring reports shall be made available to the Local Authority as requested.

A dust deposition limit value of 350 mg/m²-day (measured as per German Standard Method VDI 2119 – Measurement of Particulate Precipitations – Determination of Dust Precipitation with Collecting Pots Made of Glass (Bergerhoff Method) or Plastic) is commonly specified by Local Authorities and by the EPA to ensure that no nuisance effects will result from specified activities and it is to this Best Practice standard method that this programme of dust monitoring and control has been prepared.

The *German Federal Government Technical Instructions on Air Quality Control - TA Luft* specifies an emission value for the protection against significant nuisances or significant disadvantages due to dustfall. This limit value is 350 mg/m²-day and it is to this limit value that all measured dust deposition levels shall be assessed. This limit value is commonly specified by Local Authorities at construction sites.

16.9 NOISE AND VIBRATION

Construction Phase Noise & Vibration mitigation

The following noise management measures shall be implemented at the site from the outset of site activities to control and manage noise levels during the construction phase of the proposed development:

Noise complaints shall be investigated by site management.

N&V CONST 1 Construction Works Noise Control & Mitigation

Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include:

- no plant used on-site will be permitted to cause an ongoing public nuisance due to noise;
- the best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on-site operations;
- all vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- during construction, the appointed Contractor will manage the works to comply with noise limits outlined in *BS 5228-1:2009+A1 2014. Part 1 – Noise*;
- all items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures;
- monitoring noise and vibration levels at sensitive locations.
- selection of plant with low inherent potential for generation of noise and/or vibration;
- erection of good quality site hoarding to the site perimeters which will act as a noise barrier to general construction activity at ground level;

N&V CONST 2 Vibration Mitigation Measures

The following specific vibration mitigation and control measures shall be implemented during the construction phase:

- Choosing alternative, lower-impact equipment or methods wherever possible
- Sequencing operations so that vibration causing activities do not occur simultaneously
- Isolating the equipment causing the vibration on resilient mounts
- Keeping equipment well maintained.

16.9.1 Operational Phase Noise & Vibration Mitigation

The inward noise impact shall be mitigated by the following design measures.

N&V OPERA 1: Inward Noise Mitigation Measures

- Residential Units fronting onto the Northern (Dublin-Cork Rail Line) and Eastern (Fonhill Road) site boundaries will include acoustically rated glazing with to achieve the required BS8233 internal noise criteria.
- Ventilation installations are to be acoustically treated, in the form of suitably approved and tested acoustic attenuation systems if required to maintain the acoustic integrity of the façades.

16.9.2 Construction Phase Noise Monitoring

Quarterly noise monitoring surveys shall be conducted at NSR1 Cappaghmore estate c. 170m southeast of the site and NSR2 Lindsfarne estate c. 330m south of the site to assess the impact that site construction activities may have on ambient noise levels at these local noise sensitive receptors.

The environmental noise measurements will be completed in accordance with the requirements of *ISO 1996-1: 2017: Acoustics – Description, measurement and assessment of environmental noise and with regard to the EPA's 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*. The measurement parameters to be recorded include L_{Aeq} , L_{A90} , L_{A10} and L_{Amax} , 1/3 Octave Frequency analysis and tonal noise analysis.

16.9.3 Construction Phase Vibration Monitoring

In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, it is proposed that vibration monitoring shall be conducted during the course construction works in proximity to the Irish Rail line north of the site. It is proposed that vibration monitoring will be conducted using live data logging vibration monitors and geophones with live text and email alert functionality to ensure that if vibration levels approach or exceed the specified warning and limit values, nominated construction staff shall be instantly alerted to cease at the earliest instance and appropriate mitigation measures may then be implemented to minimise the ongoing impact on the monitored structures.

The table below summarises the proposed construction phase mitigation and monitoring measures.

Table 16.1 – Summary of Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Additional Noise in Local Area	Best Practice Noise Mitigation in accordance with BS5228 Part 1	Quarterly attended noise surveys at closest residential receptors during the construction phase
Vibrational impact on Irish Rail infrastructure	Best Practice Noise Mitigation in accordance with BS5228 Part 2	Continuous live vibration surveys for duration of construction phase

16.10 LANDSCAPE AND VISUAL

The following recommendations are put forward to mitigate against the negative impacts mentioned above and to reinforce the positive impacts of the proposed development. Mitigation measures are proposed and considered only on the lands of the proposed development site.

16.10.1 Construction Stage

During construction there will be a change to the landscape and there will be adverse visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity.

The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures such as site hoarding and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

Existing trees adjacent to the site will be retained and protected in accordance with Arboriculture Recommendations. With regard to the protection of the retained trees on site during proposed construction works, reference should be made to BS5837: Trees in relation Design, Demolition and Construction – Recommendations (BSI, 2012).

16.10.2 Operational Stage

As described in Section 9.5 above, the scheme incorporates best practice design in urban and place-making composition in terms of architecture, layout, public realm, hard and soft landscape including extensive tree planting. This results in a scheme designed to integrate and contribute benignly, albeit prominently in places, to the changing landscape and visual amenity of the receiving environment.

Mitigation measures are therefore an integral part of the scheme quality and residential amenity and not an additional element to reduce or screen visibility and landscape change. Key measures include:

- Urban framework and scheme layout reflecting SDZ requirements
- Architectural and elevational treatments, materials and details contributing to place-making
- Street, public open space and associated tree planting in the public realm, softening, framing and integrating building into an evolving new urban landscape
- Other soft landscape plantings adding structure and biodiversity / greening to the scheme, incorporating a high degree of native species and habitat creation proposals

16.10.3 Monitoring

16.10.3.1 Construction Stage

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

16.10.3.2 Operational Stage

This will consist of weed control, replacement planting, pruning etc, in full adherence to the Biodiversity Management Plan, produced by Scott Cawley. All landscape works will be in an establishment phase for the initial three years from planting. The company responsible for site management of the scheme will be responsible for the ongoing maintenance of the site after this three-year period is complete.

16.11 MATERIAL ASSETS – TRAFFIC

16.11.1 Overview

A package of integrated mitigation measures has been identified to off-set the additional local demand that the proposed mixed-use development could potentially generate as a result of the forecast increase in vehicle movements by residents, commuters, and visitors of the development. The strategy includes specific measures for both the construction and operational stages of the proposed development.

16.11.2 Construction phase

The Preliminary Construction and Environmental Management Plan (which is a standalone report and included in the planning documentation) and the associated Construction Traffic Management Plan (CTMP) in addition to the application's accompanying Construction and Waste Management Plan will incorporate a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed development's on-site construction activities. Both the CTMP and the CEMP will contain the mitigation measures included in this EIAR.

The CTMP will be prepared prior to the commencement of construction work on site. This plan will be prepared in consultation with SDCC and submitted for approval in order to agree on traffic management and monitoring measures (in advance of works commencing) some of which are outlined below:

- All works on site will be undertaken during hours of the day in accordance with SDCC requirements.
- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths, and roads.
- The surrounding road network will be signed to define the access and egress routes for the development including dedicated 'haul' routes to/from the development site.
- The traffic generated by the construction phase of the development will be strictly controlled in order to minimise the impact of this traffic on the surrounding road network and local properties. All HGV trips could potentially be restricted from traveling to / from the development during the local road network's peak hours.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- All employees and visitors' vehicle parking demands will be accommodated by a permeable hardstand carparking area within the construction compound. The exact location of the construction compound is to be confirmed in advance of commencement of the works. On-street parking of construction vehicles and construction personnel vehicles will be discouraged.
- A programme of street cleaning across the local street and identified 'haul' routes' will be implemented.
- A construction Mobility Management Plan will be developed by the appointed contractor to encourage all construction personnel to utilise the vast range of sustainable travel options available when travelling to/from the subject proposed development site.

Construction of the proposed scheme will cause temporary short-term traffic impacts on the local road network. Enforcement of a Construction Management Plan will ensure that construction traffic impacts are minimized through the control of site access / egress routes and site access locations and any necessary temporary lane closure requirements.

16.11.3 Operational phase

A management regime will be implemented by the development's management company to control access to the on-site car parking spaces thereby actively managing the availability of on-site car parking for residents of the development.

Infrastructure measures identified to reduce reliance of private vehicles include the provision of ample secure cycle parking on site and ensuring a design which promotes permeability for pedestrians and cyclists to, through and from the development. The high level of high-frequency public transport facilities (Dublin Bus, Irish Rail) will also act as a powerful mobility management measure, as residents can rely on public transport over the private vehicle.

With the objective of mitigating the potential impact of the proposed development as predicted in section 10.6 above during its operational stage, and with the objective of promoting sustainable travel for all residents, workers, and visitors to the development; the following initiatives have been identified and subsequently form an integral part of the subject development proposals.

- Strategic Employment Centres – The location of the subject development adjoining the R113 Fonthill Road North corridor provides the unique ability for many of Dublin's strategic employment zones to achieve many of their sustainability obligations particularly in regard to staff accessibility, health, and sustainable modes of travel. Beyond the obvious ease of access to Dublin City Centre and Dublin Docklands provided by both LUAS and bus services, the proximity of the proposed development to a number of strategic employment areas has the potential to address existing staff access and recruitment issues at the following locations. Accordingly, a specific focus of the development's mobility strategy will be encouraging the uptake of sustainable travel options for the development's residents' 'commuter' trips to / from the local employment centres:
 - Clondalkin Industrial Estate / Fonthill Retail Park – both located within convenient walking and cycling distance of the subject site; and
 - Park West / Liffey Valley / Western Industrial Estate / JFK Industrial Estate / Cherry Orchard Industrial Estate / Grange Castle Business Park / Cookstown Industrial Estate / Tallaght / Ballymount Industrial Estate / Greenogue Business Park– All located within cycling distance and with direct public transport connections to / from the subject site.

- Management – A Mobility Management (MMP) will be rolled out with the aim of guiding the delivery and management of a range of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development site. It is proposed that two land use specific MMP's are developed under the framework of a 'parent' MMP for the entire site. These two associated MMPs will be developed in partnership with SDCC to specifically consider the opportunities of shaping all journeys and promoting sustainable transport habits at both the proposed (i) residential units, and (ii) the office element of the proposed mixed-use scheme.
- Management – A Car Park Management Strategy. The availability of parking spaces is a key determinant of mode choice and car usage. With the objective of minimizing travel by car and encouraging the use of sustainable modes instead, it is proposed to limit the car parking provision and promote a 'car lite' scheme. This is considered an appropriate approach considering the site's excellent accessibility characteristics (e.g., walking, cycling, bus, coach, LUAS and rail opportunities) to places of work, education and essential services. This 'car lite' approach will help to reduce car dependency in Dublin, reduce traffic congestion and pollution levels, improve the quality of the environment, and help tackle climate change in addition to encouraging sustainable travel.
- Facilities - In addition to facilitating and encouraging bicycle use, increasing the number of cycle parking provision on-site is considered best practice in situations such as when reducing car parking spaces. A total of 1232 no. cycle spaces are proposed within the development site as long term and short-term facilities.
- Infrastructure (by others) - Planning infrastructure investment that will further enhance the sites sustainable accessibility credentials include:
 - The latest BusConnects network redesign includes a number of routes that will benefit the subject site and provide access to locations including, Dublin City Centre, Clongriffin, Liffey Valley Shopping Centre, Clondalkin, Blanchardstown Shopping Centre and Tallaght. The routes in close proximity to the subject site include orbital routes W2 and W4 as well as branch routes C1, D1, D3 and G2.
 - The Clonburris SDZ Transport Assessment and Transport Strategy – September 2017 proposes a number of bus services that will serve the Clonburris SDZ including, two orbital bus services operating from Tallaght to Blanchardstown and two local bus routes, Lucan – Park West and Grange Castle – Liffey Valley.
 - The Clonburris SDZ Transport Assessment and Transport Strategy – September 2017 proposes the existing Grand Canal and Griffeen Valley Greenways will be complemented by a series of interconnecting and dedicated cycle routes linking the residential areas to key attractions, both internal and external to Clonburris.
 - The proposed GDA cycling network plan will also encourage a greater uptake in walking and cycling amongst residents, staff, and visitors.
 - The DART Expansion Programme will see the DART system expanded, providing fast, high-frequency electrified services to Drogheda on the Northern Line, Hazelhatch on the Kildare Line, Maynooth and M3 Parkway on the Maynooth Line and to Greystones on the South-Eastern Line. The subject site is ideally located to access these DART services via the existing Clondalkin-Fonthill Station and the new Kishoge Station.
 - The SDZ lands can be potentially served by the Lucan Luas that is currently planned under the NTA's Transport Strategy for the Greater Dublin Area 2016 – 2035. Under this strategy, the future Lucan Line would serve Lucan, Liffey Valley and Ballyowen, however, the Luas Line could extend towards the Clonburris SDZ lands and would in turn expand the Luas transport users including the residents and employees in Clonburris.
- Car Sharing – Car sharing is also known as lift-sharing, car-pooling, or ridesharing. Car sharing offers people a cost effective and a more sustainable way of travelling by car when other forms of transport are not viable. Car sharing schemes encourage individuals to share private vehicles for particular journeys. Car sharing can be both formal and informal. Informal car sharing operates between individuals and neighbours and formal car sharing is defined by a more elaborate approach to trip matching, often focussed on the commuting journey. Car sharing has the aim of reducing the number of car trips made and participants have the opportunity to meet other members in the community. A National Car Sharing database is now available at www.carsharing.ie. It is an all-island service for the public and is free of charge to use. Car sharing has a number of benefits including reduces transport costs, reduces the number of cars on the road which results in less pollution, less congestion and fewer parking issues and reduces the need for a private car. The proposed development website would have a section dedicated to the car share scheme and residents would have an option to register. To encourage take up of the car sharing, the MMP Coordinator would host events to introduce prospective car sharers to each other and would help 'break the ice' as it is always more likely that people will share, particularly for the journey 'home', with somebody that they have met rather than a complete stranger.

- Car Clubs – Car Clubs are membership-based schemes providing shared cars for hire. A Car Club can play an important role in reducing costs, congestion, and environmental impact. Members have flexible access to the hire of a vehicle. Vehicles are parked in reserved parking spaces close to homes, town centres or workplaces and can be used and paid for on an hourly rate, daily or weekly basis. Individuals can join a car club; alternatively, an organisation may have a corporate package with one of the car club providers. Car sharing clubs in Dublin have experienced significant growth in recent years. The facility allows members' access to a shared car in the local area for an hourly fee. This facility could be an attractive option for those who choose to start walking or cycling to work but may require access to a car at short notice. Residents can obtain further information at www.gocar.ie and also www.yuko.ie.
- Walking – The development has been designed to ensure that there are a number of access points / gateways to facilitate permeable walking through the site. The feasibility of measures that promote walking will be influenced by factors such as the safety and ease of walking to and from the site and the age profile of commuters. Generally speaking, a distance of up to 3km is considered reasonable for walking. This distance is only indicative but can help to define target groups. The health benefits of walking are a key element in promoting Mobility Management Plans. Walking improves cardiovascular fitness and burns calories. Walking will also increase your muscle tone, boost metabolism, ease stress, raise energy levels and improve sleep, which combined can also help with weight loss. Regular walking can also reduce the risk of coronary heart disease, diabetes, strokes, high blood pressure, cancer, osteoporosis, and arthritis. Walking will mainly be self-promoting, and initiatives should focus on making people aware of the routes available to them. A map showing the walking routes should be prepared and placed at key locations within the development. These could be stand-alone signs or maps on notice boards. This information would also be available on the community website. It is important to ensure that pedestrians are safe and are satisfied with the facilities available and their maintenance. It should be noted that: -
 - Walking is truly the most-sustainable form of transportation.
 - All trips, regardless of mode, both begin and end on foot.
 - Walking needs to have a greater level of priority in most cities, like walk-signal times, safer well-lit / marked crosswalks, and pedestrian zones.
 - Walking is an easy mode of travel for distances under 2km. Most people are prepared to walk between 800m to 1km to a train station or bus stop.
- Cycling – The proposed development is well located for cycling journeys and this mode of travel should be encouraged with the provision of a wide range of routes within the development and new links to existing and future major routes in the local area. A distance of up to 10km is considered reasonable for cycling. This distance is only indicative but can help to define target groups. A total of 1232 cycle spaces are proposed within the development to accommodate residents and visitors to the site. The on-site cycle facilities will be linked to the existing off-site cycle routes. Also, improved cycle infrastructure is proposed under the Greater Dublin Area Cycle Network Plan routes which runs in close proximity to this site. As with many measures relating to cycling, the aim is a mixture of support, through incentives and facilities, and encouragement, through information and marketing.
- Public Transport (Bus) – The proposed development will be well served by Dublin Bus services, with bus routes available along New Nangor Road, Grange Castle Road, Adamstown Avenue, Ninth Lock Road and Fonthill Road as well as BusConnects proposals for new routes which are proposed to pass close to the subject site along Grange Castle Road, Ninth Lock Road, St. Cuthbert's Road and New Nangor Road. At Present, the bus stops are located in close proximity with the closest bus stops are located along New Nangor Road, Grange Castle Road, Adamstown Avenue, Ninth Lock Road and Fonthill Road which offers the subject site a variety of frequent services operating daily. The subject site is located close to the proposed Bus Connects C1, D1, D3, G2, W2 and W4 routes which will provide enhanced levels of accessibility and mobility.
- Public Transport (Rail) – The proposed development is situated on the Kildare railway line and has two railway stations in close proximity, the Clondalkin-Fonthill Station and the completed but not yet operational Kishoge Railway Station. Clondalkin-Fonthill Station is served by commuter services to Heuston Station and following the recent upgrading of the Phoenix Park Tunnel, services calling at Clondalkin-Fonthill Station now offer connections to Drumcondra, Connolly, Tara Street, Pearse and Grand Canal Dock. The DART Expansion Programme will see the DART system expanded, providing f electrified services to locations such as Drogheda, Hazelhatch, Maynooth and Greystones. The proposed development can be potentially served by the Luca Luas, which could extend towards the Clonburris SDZ lands and would in turn expand the Luas transport users including the residents and employees in Clonburris.

16.11.4 Monitoring

16.11.4.1 Construction phase

During the construction stage, the following monitoring exercises are proposed:

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and external road conditions; and
- Timing of construction activities.

16.12 MATERIAL ASSETS – WASTE MANAGEMENT

The following measures will mitigate the impact of the construction and operational phases impact on regional waste management infrastructure.

16.12.1 Construction waste mitigation measures

The Resource and Waste Management Plan (RWMP) prepared by Byrne Environmental (included with the application) specifically addresses the following aspects:

Waste materials generated by construction activities will be managed according to the EPA's Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021

- Analysis of waste arisings / material surpluses;
- Specific Waste Management objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase;
- Methods proposed for Prevention, Reuse and Recycling;
- Waste Handling Procedures;
- Waste Storage Procedures;
- Waste Disposal Procedures;
- Record Keeping.

Waste minimisation and prevention shall be the primary responsibilities of the Resource and Construction Waste Manager (RCWM) who shall ensure the following:

- Implementing all aspects of the RWMP throughout the Construction Phase.
- Assisting the Project Manager on the implementing of the aspects of the Circular Economy.
- Ensuring that all resources are managed throughout the Construction Phase
- Recording the volumes and types of construction wastes generated.
- Communicating with the Local Authority on waste related matters and issuing of waste records.
- Management of the waste storage compound to ensure that all construction waste streams are stored separately and that cross-contamination does not occur.
- Maintaining a file of all Waste Collection Permits and Waste Facility Permits / Waste Licences that each waste load is exported to.
- Ensuring that all waste loads exiting the site are contained in a vehicle displaying an appropriate NWCPD Permit number.
- Maintaining a receipt of each waste load delivered to authorised facilities.
- Identifying and reporting on damaged construction materials and identifying how damage to resources and materials shall be prevented.

- Preparation of monthly waste management report detailing waste volumes generated, re-use and recycling rates and details on damaged raw materials and how they can be returned for repair and future re-use.
- Conducting Resource and Waste Management Audits

Article 27 Declarations

Excavated soils may be declared during the construction phase as a by-product to the EPA in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA publication “Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations – Version 3 June 2019.

The notification of a potential by-product gives an opportunity to demonstrate, with an appropriate level of rigour, that:

- the material can have a further use and no longer be defined as waste;
- the material can be used as a ‘secondary’ resource in place of, and fulfilling the same role as a non-waste derived or virgin ‘primary’ resource; and
- the material can be used without causing overall adverse impacts to the environment or human health.

The by-product test is made up of four conditions, which represent the requirements of Article 27. All four of the following ‘conditions’ must be met for an economic operator to decide that a production residue is a by-product:

1. further use of the material is certain;
2. the material can be used directly without any further processing other than normal industrial practice;
3. the material is produced as an integral part of a production process; and
4. further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Regarding Condition 1, at this stage, it is too early to identify a specific site where the material would be used. This is because, it is necessary first to secure planning permission to have certainty regarding the availability of the by-product and only then can a further use be identified. However, having regard to the scale of development taking place in the Dublin region, it is reasonably expected that there will be projects seeking to avail of this by-product. The selected location will be identified in the notification to the EPA should it be required. This will be reviewed on an ongoing basis during the construction phase.

16.12.2 Operational waste mitigation measures

The Operational Waste Management Plan (OWMP) prepared by Byrne Environmental (included with the application) demonstrates how the required infrastructure will be incorporated into the design and operation of the development to ensure that domestic and commercial wastes will be managed to maximise the quantity of waste segregated at source and to reduce the generation of un-recyclable mixed waste streams.

Actions

The Operational Phase of the Waste Management Plan is defined by the following stages of waste management for both the residential and commercial aspects of the development:

- Stage 1 Occupier Source Segregation;
- Stage 2 Occupier Deposit and Storage;
- Stage 3 Bulk Storage and On-Site Management;
- Stage 4 On-site treatment and Off-Site Removal;
- Stage 5 End Destination of wastes.

All residential units will have a 3-bin system (non-recyclable, organic and recyclable) in each kitchen to encourage residents to segregate waste at source.

Apartment residents will be provided with waste recycling and waste disposal information by the development's Facility Management Company who will be responsible for providing clean, safe and mobility impaired accessible communal waste storage areas for the apartment blocks.

The Facility Management Company shall maintain a register of all waste volumes and types collected from the development each year including a break-down of recyclable waste and where necessary, shall introduce initiatives to further encourage residents to maximise waste segregation at source and recycling. They shall also provide an annual bulky waste and WEEE and waste battery collection service for all residents.

The development shall be designed to provide adequate domestic waste storage areas for each apartment blocks. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the development. Communal waste bin storage areas shall be designed in a manner to ensure that appropriate signage for the correct disposal and recycling of waste is available for residents.

All commercial and retail waste shall be separately stored and managed by the operators of the units.

16.12.3 Construction Phase Waste Monitoring

The Construction Manager will maintain a written record of all quantities and types of construction wastes generated, reused / recycled and exported off-site during the construction phase.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description.
- Volume of waste collected.
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number.
- Destination of waste load including Waste Permit / Licence number of facility.
- Description of how waste at facility shall be treated i.e., disposal / recovery / export

Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis to determine compliance with the Construction Waste Management Plan.

16.12.4 Operational Phase Waste Monitoring

The Facility Management Company shall prepare an annual report for the Local Authority and residents of the development on the quantities of waste generated within the development to demonstrate how waste reduction and recycling targets are being achieved with regard to the targets defined in the current Eastern-Midlands Region Waste Management Plan 2015-2021 (under review) and future revisions.

16.13 MATERIAL ASSETS – UTILITIES

16.13.1 Construction Mitigation

A Preliminary Construction Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A detailed Construction & Environmental Management Plan will be put in place by the Contractor to implement the mitigation measures from the EIAR. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction phase. The Construction & Environmental Management Plan includes a range of site-specific measures which will include the following mitigation measures in relation infrastructure, services and public utilities:

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tinkered off site to a licensed facility until a temporary connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.
- A competent contractor will be appointed to undertake the works and protect existing systems from damage during construction.

16.13.2 Operational Mitigation

The operational phase will employ the following mitigation measures in relation infrastructure, services and public utilities:

- Refer to Chapter 6 (Water) for mitigation measures associated with the surface water treatment and measures to reduce flood risk.
- All new foul drainage lines will be constructed in accordance with Irish Water Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.
- No specific mitigation measures are proposed in relation to water supply, however water conservation should be included in future developments
- An Emergency Response Plan prepared by the contractor will contain measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events. Spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.
- Special care should be taken when construction work is undertaken in the vicinity of the GNI wayleave along the eastern border of the site. No excavation should be undertaken within the wayleave area without contacting GNI beforehand. Refer to the PCEMP for further guidance on risk mitigation with regard to gas infrastructure in the vicinity of the proposed development.

16.13.3 Monitoring

16.13.3.1 Construction Phase

Proposed monitoring during the construction phase in relation to infrastructure, services and public utilities are as follows:

- Adherence to the Construction & Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of drainage, watermain and utility installation etc, inspections of works adjacent to existing infrastructure).
- Monitoring in relation to the surface water. Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content).

16.13.3.2 Operational Phase

Proposed monitoring during the operational phase in relation to the infrastructure, services and public utilities are as follows:

- Regular inspection and maintenance of the drainage system and oil interceptors.

16.14 ARCHAEOLOGY, ARCHITECTURE AND CULTURAL HERITAGE

16.14.1 Construction Phase

16.14.1.1 Archaeology

Whilst it is acknowledged that preservation in-situ is the best manner in which to conserve the archaeological resource, the preservation in situ of enclosure DU017-036, within the urban core of Clonburris would lead to an unsustainable form of development located adjacent to the Fonthill Train Station. This would be contrary to the key structuring principles of the Planning Scheme in terms of layout/design objectives, which the applicant is required to

adhere to. The preservation of the remains in situ would lead to a substandard and suboptimal form of development in the SDZ area.

As such enclosure DU017-036 will be preserved by record (archaeological excavation), prior to the commencement of construction. This work will be carried out under licence from the DoHLGH and full provision for the excavation of the site will be made available by the applicant – both during the course of fieldwork and during the post excavation process.

In addition, all topsoil stripping associated with the proposed development will be subject to archaeological monitoring. This work will be carried out by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.

16.14.2 Monitoring

The mitigation measures recommended above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

16.15 RISK MANAGEMENT

The Construction Environmental Management Plan and associated Health and Safety Plan, as well as good housekeeping practices will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations.

The proposed development will involve ground works to facilitate the proposed development. Site investigations have been carried out and have not identified any hazardous material. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licensed facility. The following mitigation measures are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.
- In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short term disruption to local residents, and reduce the potential for accidents.
- There is a risk of accidents associated with CSLS road to be constructed in conjunction with the proposed development as stated above. In order to manage interactions between the two sites a Project Liaison Group will be established. This group will have regular meetings to ensure a co-ordinated approach to design interfaces, works programmes and environmental management activities for both sites
- Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.
- No Excavations are to be carried out within the 14.0m wayleave around the transmission gas main running north/west parallel to the R113. Where infrastructure works (roads, footpaths, utilities etc..) are required to cross this gas main, a detailed design in compliance with GNI code of practice will be submitted for approval and all works will be carried out with supervision from the relevant authorities.
- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the

construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.

- Safety on site will be of paramount importance. Only contractors with the highest safety standards (Health and Welfare at Work (Construction) Regulations 2013) and training will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

Table 16.2 – Strategy for tackling potential risks – Clonburris Phase T2

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE MITIGATION/INFORMATION
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique identifier for risk	A risk event statement states (i) what might happen in the future and (ii) its possible impact on the project.	Name or title of team member responsible for risk	Enter H (High); M (Medium); or L (Low) according to impact definitions	Enter H (High), M (Medium) or L (Low) according to probability definitions	List, by date, all actions taken to respond to the risk. This does not include assessing the risk
C01	Traffic Accidents	Project Supervisor Construction Stage (PSCS)	M	M	PSCS to develop Traffic Management Plan (implemented from mitigation as set out in PCEMP and Traffic Chapter). All material is within the site boundary. All parking is within the site boundary to limit any interaction with local areas or estates. This will avoid back up of traffic on approach, consideration of allocation of holding area. The road access to the site is mainly off secondary roads and as such a booking system should be considered whereby contractor deliveries and collections can be managed to

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE MITIGATION/INFORMATION
					avoid traffic delays. The PSCS to provide an internal traffic management plan. The plan to include segregation of vehicles from staff and visitors that will be present on the site. PSCS to liaise with Construction Project Manager involved with the CSLS works to manage interaction between the two projects.
C02	Scaffolding/risk of injury	PSCS	H	M	Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. In order to fully Co-Ordinate any temporary works submission the Project Supervisor for the Design Process must receive the following items before reviewing any submission; A full design submission, Calculations for the design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.
C03	Fire Risks	PSCS/ PSDP / Fire SC.	H	M	Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed. A fire marshal will be required - full co-operation from site supervisors and contractors will be required.
CO4	Crane Lifting Operations	PSCS / PSDP	H	M	Lifting operations using cranes will be a requirement during the project. The PSDP must identify this as a risk factor ensuring the ground conditions are tested and appropriate to point loading from mobile cranes. The PSCS must ensure there is a fully risk assessed lift plan to

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE MITIGATION/INFORMATION
					manage all lifting operations on site.
C05	ESB Utilities disruption	PSCS /PSDP	H	M	The PSDP must highlight the existence of live overhead ESB cables on site. The sequence of work to be planned to avoid working in close proximity to the lines. The PSCS to arrange for the relocation of the lines prior to working around them. The PSCS must follow the ESB code of practice and provide a risk assessed RAMS document to manage this hazard.
C06	Gas Transmission Main disruption	PSCS / PSDP	H	M	The PSDP must highlight the existence and location of the transmission gas main on site, particularly the high pressure GNI gas line located along the eastern side of the proposed development. The sequence of work to be planned to avoid working within the wayleave around this main agreed with GNI. A detailed design for any works required within this wayleave to be submitted to GNI for approval prior to commencement of works. The PSCS must follow the GNI code of practice.

16.15.1 Operational Phase

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Building Regulations. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2018 from South Dublin County Council.

The measures will include inter alia:

- Provision of fire-rated materials in accordance with relevant building regulations.
Provision of early warning fire detection systems where required under building regulations;
- Use of materials which do not support fire spread with particular reference, inter alia, to internal wall and ceiling linings and external wall cladding.

Facilities to assist the fire service including fire tender access proximate to all units, dry rising mains, and external fire hydrants

- A bespoke Fire Emergency Evacuation Plan [FEEP] will be prepared by a fire consultant at detailed design stage.