ARMSTRONG
FENTON
ASSOCIATES

**PROJECT:** Strategic Housing Development

# Environmental Impact Assessment Report - Volume II

for proposed development at

Boherboy, Saggart, Co. Dublin.

**CLIENTS:** Durkan Estates Ireland Ltd and Kelland Homes Ltd

**DATE:** March 2022

Planning &
Development
Consultants

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# PART A - Introduction and Background

# 1.0. Introduction

## 1.1 Introduction

**1.1.1** This Environment Impact Assessment Report (hereafter EIAR) has been prepared by Armstrong Fenton Associates Planning Consultants on behalf of Durkan Estates Ireland Ltd and Kelland Homes Ltd. who intend to apply to An Bord Pleanála for a Strategic Housing Development (SHD) on lands at Boherboy, Saggart, County Dublin. The application is being made under the Planning and Development Act 2000, as it is amended by various pieces of legislation, including the Planning and Development (Housing) and Res Tenancies Act. This chapter of the EIAR was prepared by Tracy Armstrong MRUP MIPI MRTPI, of Armstrong Fenton Associates Planning Consultants. A full list of the competent experts who were involved in the preparation of this EIAR, along with their experience and qualifications, is included at 1.11.16 below

**1.1.2** The application site comprises c. 18.3 hectares located on lands that are north of the Boherboy Road, east of the Corbally and Verschoyle residential estate and south of the Carrigmore residential estate. To the west are agricultural lands and single dwellings.

**1.1.3** The project is located adjacent to the developing areas of Saggart, Citywest and Fortunestown in west County Dublin and is within the lands subject to the Fortunestown Local Area Plan 2012 (hereafter LAP). The background to the development is that a wide area of residential zoned lands across Fortunestown, Saggart, Citywest and Boherboy were identified for the preparation of an LAP by South Dublin County Council (hereafter SDCC) to guide the development of the area. The Fortunestown LAP 2012 was prepared in 2012 for c. 144 hectares of land. The LAP was accompanied by an Environmental Report, a Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) Screening Report. The LAP was adopted by the Elected Members of SDCC in May 2012 and has been extended until May 2022.

**1.1.4** In the above context, this EIAR is undertaken against a background of a significant amount of environmental information and assessment which informed the preparation of the LAP and its approval by SDCC.

**1.1.5** The EIA process, including the preparation of this EIAR and the examination of the information presented by SDCC, will inform the decision-making process. The purpose of this EIAR is to assist and inform An Bord Pleanála (hereafter ABP), as the competent authority, in undertaking an environmental assessment of this project.

Therefore, the objectives of this EIAR are summarised as follows:-

- To identify the significant environmental impacts of the proposed development during the construction and operational phases having regard to the characteristics of the receiving environment.

- To evaluate the magnitude and significance of these impacts and propose appropriate measures to mitigate potential adverse impacts.

- To identify, where appropriate, monitoring measures to be implemented during the construction and operational phases.

The nature and extent of the development being assessed is outlined in Chapter 3 of this EIAR and summarised in Section 1.2 over. This EIAR is prepared with reference to the plans and particulars submitted with the planning application.

## 1.2 Proposed Development

**1.2.1** Kelland Homes Ltd and Durkan Estates Ireland Ltd are applying to An Bord Pleanála for permission for a strategic housing development at a site at Boherboy, Saggart, County Dublin. To the immediate north of the site is the Carrigmore residential estate, to the west are agricultural lands and a single dwelling, to the east is the Corbally residential estate while to the south is the Boherboy Road. The proposed application represents the development of the entire Boherboy Neighbourhood as identified in the Fortunestown Local Area Plan (2012).

**1.2.2** The site is located approx. 2km south-west of Tallaght town centre, approx.1.3km east of Saggart, approx. 700m south-west of Citywest Shopping Centre and 1.6km south of the N7. The site is a greenfield, outer suburban site. To the immediate north of the site is the Carrigmore residential estate, to the west are agricultural lands and a single dwelling, to the east is the Corbally / Verschoyle residential estate while to the south is the Boherboy Road.

**1.2.3** The site is a greenfield site, having only ever been used for agricultural purposes. The site is steeply sloping, from south to north, with site levels ranging from 155mOD in the south-west corner to 117.5mOD in the north-west corner, which is a level difference of c. 37 metres across the entire site.

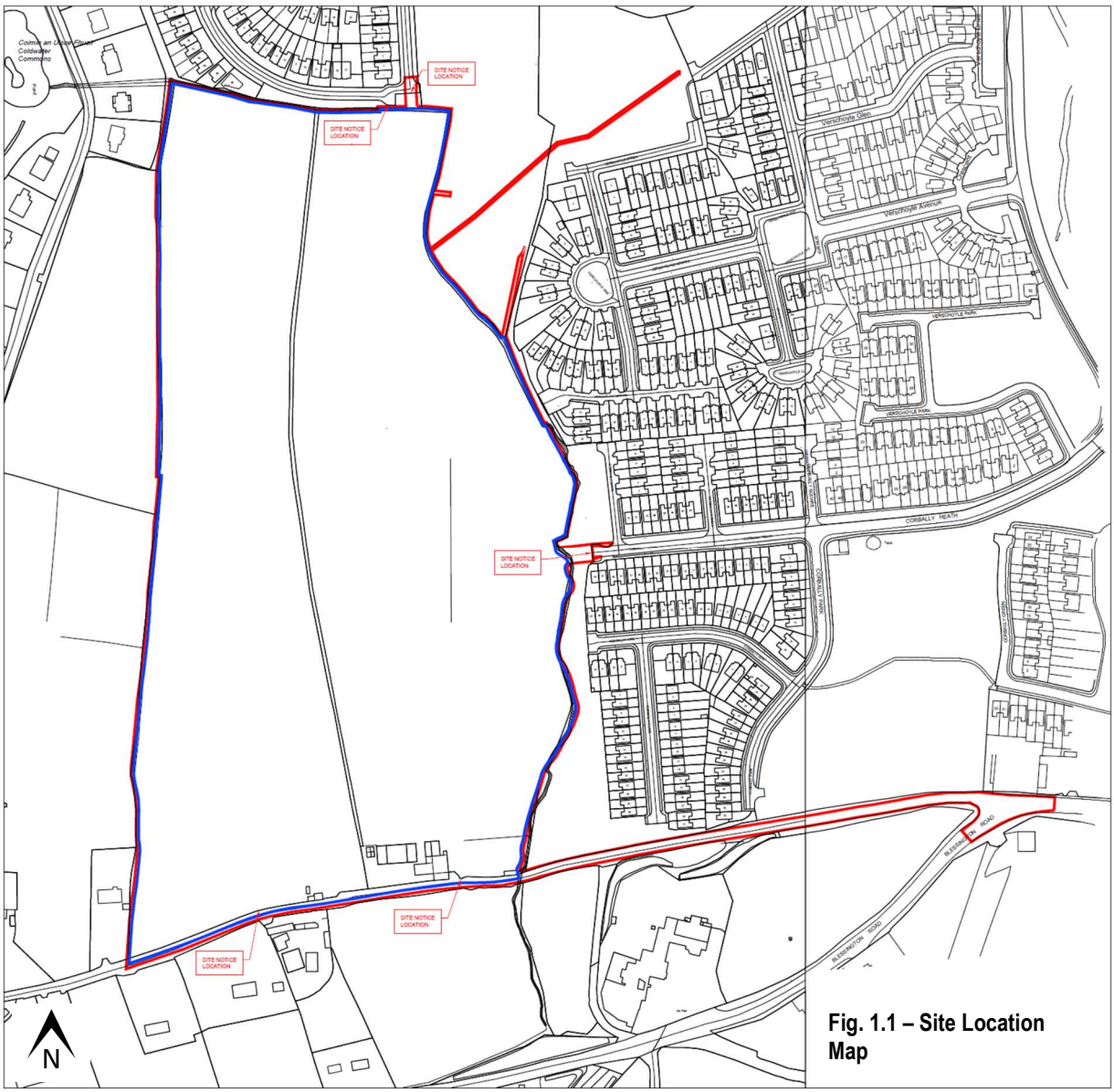



**Fig. 1.1 – Site Location Map**

**1.2.4** The development will consist of 655 no. dwellings, comprised of 257 no. 2, 3 & 4 bed, 2 & 3 storey detached, semi-detached & terraced houses, 152 no. 1, 2 & 3 bed duplex units in 17 no. 2-3, 3-4 & 4 storey blocks, and 246 no. 1, 2 & 3 bed apartments in 9 no. buildings ranging in height from 2, 2-5, 4-5 & 5 storeys, and a 2 storey crèche (693m²).

**1.2.5** Access to the development will by via one no. vehicular access point from the Boherboy Road, along with proposed upgrade works to Boherboy Road to include the provision of a roadside footpath along the front of the site at the Boherboy Road, continuing eastwards to the junction with the N81 Blessington Road (for an overall distance of c.370m). The proposed development also provides for pedestrian and cyclist connectivity to the adjoining Carrigmore Park to the north-east, and vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north.

**1.2.6** The proposed development provides for (i) all associated site development works above and below ground, including surface water attenuation & an underground foul sewerage pumping station at the northern end of the site, (ii) public open spaces (c. 3Ha), including alongside the Corbally Stream, which will accommodate the provision of pedestrian / cyclist links to Carrigmore Park to the north-east, (iii) communal open spaces (c. 6,392m²), (iv) hard and soft landscaping and boundary treatments, (v) undercroft, basement & surface car parking (914 no. car parking spaces, including EV parking), (vi) bicycle parking (797 no. bicycle parking spaces), (vii) bin & bicycle storage, (viii) public lighting, and (ix), plant

(M&E), utility services & 5 no. ESB sub-stations, all on an overall application site area of 18.3ha. In accordance with the Fortunestown Local Area Plan (2012) an area of approx. 1.42Ha within the site is reserved as a future school site.


**Fig. 1.2 – Proposed Site Layout Plan**

## 1.3 Definition of EIA and EIAR

**1.3.1** Directive 2011/92/EU of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU (hereafter the "EIA Directive") defines *'environmental impact assessment'* as a process which includes the responsibility of the developer to prepare an EIAR and the responsibility of the competent authority to provide reasoned conclusions following the examination of the EIAR and other relevant information.

**1.3.2** Article 1(2)(g) 4 of the EIA 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".*

The content of an EIAR is included in Article 5(1) and expanded upon in Annex IV (See Box 1.1):

*"Article 5*

*1. Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. 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."*

**BOX 1.1 ANNEX IV: DIRECTIVE 2011/92/EU AS AMENDED BY DIRECTIVE 2014/52/EU**

*INFORMATION REFERRED TO IN ARTICLE 5(1)*
*(INFORMATION FOR THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT)*

*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.*

**1.3.3** A definition of EIAR has not been included in the revised directive, however, the Draft EPA Guidelines (2017) provide the following definition:

*"A statement of the effects, if any, which proposed development, if carried out, would have on the environment.*

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

*The EIAR consists of a systematic analysis and assessment of the potential effects of a proposed project on the receiving environment. The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and these factors must be addressed in the EIAR.*

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

**1.3.4** In summary, EIA is a process for anticipating the effects on the environment caused by development. An EIAR is the document produced as a result of that process and provides information which the competent authority uses in deciding whether or not to grant consent. Where poential environmental effects are identified that are likely, significant and adverse; the EIA process aims to quantify and minimise the impact specified development projects have on the environment through appropriate mitigation measures. The preparation of an EIAR document 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.

## 1.4 EIA Legislation

**1.4.1** The EIA Directive is transposed into Irish law through a number of statutory instruments. Of these, the most relevant for this project are Part X of the Planning and Development Act 2000, as amended and the Planning and Development Regulations 2001, as amended.

**1.4.2** The following guidance has informed the preparation of this EIAR:

- the Draft EPA Guidelines, referenced above;
- the European Commission's Guidance on the preparation of the EIAR (2017); and
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment" (2018).

## 1.5. EIA Guidelines

**1.5.1.** 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 EIAs in the development sector. The relevant key EIA Guidance which has been consulted in the preparation of this EIAR document is detailed below. In addition, the individual chapters of this EIAR should be referred to for further information on the documents consulted by each individual consultant.

The following is a list of the EIA Guidelines consulted as part of the preparation of this EIAR:

**Irish Guidance**

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, August 2018.
- Draft Guidelines on the information to be contained in environmental impact assessment reports, EPA, August 2017.
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems.
- Key Issues Consultation Paper, Department of Environment, Community and Local Government, 2017.
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017).
- 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 / European Commission Guidance (in addition to Directives referenced above)**

- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (2017).
- Environmental Impact Assessment of Projects – Guidance on Screening (2017).
- Environmental Impact Assessment of Projects – Guidance on Scoping (2017).
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).
- EU Guidance on EIA Screening (DG Environment 2001).
- Guidance on EIA Scoping (DG Environment 2001).
- EIA Review Checklist (DG Environment 2001).

The most recent guidelines are the August 2018 EIA Guidelines for Planning Authorities and An Bord Pleanála, which replace previous Guidelines for Planning Authorities and An Bord Pleanála on carrying out environmental impact assessment published in March 2013.

**1.5.2.** The 2017 EPA draft guidelines were prepared to assist practitioners in interpreting the amended EIA Directive and in advance of new regulations transposing Directive 2014/52/EU becoming available. They provide practical guidance to planning authorities, An Bord Pleanála, and other relevant stakeholders, on procedural issues and the EIA process, and outline the key changes introduced by Directive 2014/52/EU. Updated guidelines from the EPA will now be published following the transposition of the 2014 Directive via the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018). This updated EPA guidance had not yet been published at time of writing.

### 1.6. The EIA Process

**1.6.1.** The main purpose of the EIA process is to identify the likely significant impacts on the human environment, the natural environment and on cultural heritage associated with the proposed development, and to determine how to eliminate or minimise these impacts. The EIAR summarises the environmental information collected during the impact assessment of the proposed development.

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 through consultation with statutory and non-statutory stakeholders.

**Assessing Alternatives:** This stage outlines the possible alternative approaches to the proposed development. Consideration of alternative sites and layouts within the final chosen site are set out in Chapter 3 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.

### 1.7. Screening

**1.7.1.** 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.

Annex I of the EIA Directive 85/337/EC requires as mandatory the preparation of an EIA for all development projects listed therein. Schedule 5 (Part 1) of the Planning & Development Regulations 2001 (as amended) transposes Annex 1 of the EIA Directive directly into Irish land use planning legislation. The Directive prescribes mandatory thresholds in respect to Annex 1 projects.

Annex II of the EIA Directive provides EU Member States discretion in determining the need for an EIA on a case-by-case basis for certain classes of project having regard to the overriding consideration that projects likely to have significant effects on the environment should be subject to EIA.

Schedule 5 (Part 2) of the Planning & Development Regulations 2001-2018 set mandatory thresholds for each project class. Sub-section 10(b) (iii) and (iv) addresses *'Infrastructure Projects'* and requires that the following class of project be subject to EIA:

(b) (i) Construction of more than 500 dwelling units.

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

This proposed Strategic Housing Development comprises of *inter alia* the provision of 655 no. residential units, creche, open space, and associated infrastructure on an overall site area of 18.3 hectares.

An EIA is therefore mandatory, as the proposed SHD development at Boherboy, Saggart, includes provision of 655 no. dwellings, exceeding the threshold of 500 dwelling units.

### 1.8. Scoping

**1.8.1.** The 2017 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 stated in the European Commission guidance[1] that: *'The Directive provides that Developers may request a Scoping Opinion from the Competent Authority which identifies the content and the extent of the assessment and specifies the information to be included in the EIA Report."*

[1] Guidance on EIA Scoping, EC, 2017

**1.8.2.** The applicant is committed to ensuring that all their development is conducted in a responsible and sustainable manner. An informal scoping process to identify the issues that are likely to be most important during the EIA process was carried out by the applicant, design team and EIAR consultants and informed the format of this EIAR.

## 1.9 Environmental Factors

**1.9.1** The EIAR prepared for the subject application has endeavoured to be as thorough as possible and therefore 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,
- Planning Context,
- Project Description and Alternatives Examined,
- Population and Human Health,
- Archaeology and Cultural Heritage,
- Biodiversity,
- Landscape and Visual Impact,
- Land and Soils,
- Water,
- Air Quality and Climate,
- Noise and Vibration,
- Material Assets,
- Interactions,
- Principle Mitigation and Monitoring Measures,
- Non-Technical Summary.

**1.9.2** In addition to the above, a series of standalone reports have been prepared to accompany the planning application, i.e., Pinnacle Consulting Engineers have prepared a Traffic and Transport Assessment Report, a Residential Travel Plan and a Construction Traffic Management Plan, and Roger Mullarkey Consulting Engineers has prepared an Engineering Services Report, Kilgallen & Partners Consulting Engineers have prepared a Site Specific Flood Risk Assessment. Scott Cawley has prepared an Appropriate Assessment (AA) Screening Report. John Purcell Archaeologist has prepared an Archaeological Assessment. Armstrong Fenton Associates have prepared *inter alia* a Planning Statement, a Building Life Cycle Report and a Social and Community Infrastructure Assessment, while the enclosed Construction and Demolition Waste Management Plan and Operational Waste Management Plan has been prepared by AWN Consulting Ltd. These reports have helped inform the chapters of the EIAR where relevant and are submitted as separate documents also.

**1.9.3** It is necessary to examine each section of this EIAR with respect to the impacts that the proposed development may have on the environment. The purpose of this scoping exercise is to shape and mould the EIAR so as not to dismiss any potential impacts that may in fact be significant, and to focus on issues which need to be resolved.

**1.9.4** The scope of this EIAR has, in particular, been informed by the following:

- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, August 2018.

- Draft Guidelines on the information to be contained in environmental impact assessment reports (EPA, 2017).
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (EC, 2017).
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems Key Issues Consultation Paper, Department of Environment, Community and Local Government, 2017.
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017).
- The requirements of Part X of the Planning and Development Act, 2000, as amended, and Part 10 of the Planning & Development Regulations, 2001-2018.
- The requirements of the South Dublin County Development Plan 2016-2022 and the Fortunestown Local Area Plan 2012.
- National and Regional Planning Policy Documents.
- The likely concerns of third parties.
- The nature, location and scale of the proposal.
- The existing environment together with any vulnerable or sensitive local features and current uses.
- The planning history and environmental assessments associated with the subject site and adjoining lands.
- The likely and significant impacts of the proposed development on the environment.
- Available methods of reducing or eliminating undesirable impacts.

**1.9.5** Prior to the submission of the SHD application to ABP, numerous meetings took place between the applicant and the technical staff of SDCC. One no. pre-application consultation also took place between the Applicant, the Planning Authority and ABP under the SHD process which assisted in the preparation of this EIAR and planning application.

**1.9.6** The content of this EIAR has been prepared in accordance with the provisions of Article 5(1) and the EIA 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."*

## 1.10 Purpose of the EIAR

**1.10.1.** The objective of the EIAR is to:

- identify and predict the likely environmental impacts of the proposed development;
- to 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.

As provided for in the Draft EPA 2017 guidelines, the EIAR focuses on:

- Impacts that are both likely and significant;
- Impact descriptions that are accurate and credible.

**1.10.2** The objective of the EIAR will also be to identify and predict the likely environmental impacts of the proposed development; to 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 definition of Environmental Impact Assessment is clarified within the 2014 EIA Directive and is as follows:

*"(g) '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".*

**1.10.3** Under Article 5(3) of the 2014 Directive, it is specifically required that the developer must ensure that the environmental impact assessment report is prepared by competent experts. Each chapter of this EIAR has been prepared by experts with the requisite qualifications and competences which are detailed in each relevant chapter.

**1.10.4** The intention of this EIAR document is to provide transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes which led to the selection of the final project configuration. 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.

## 1.11 Objectives of this EIAR

**1.11.1** The EPA guidelines list the following fundamental principles to be followed when preparing an EIAR:

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

**1.11.2** This EIAR document describes the outcomes of the iterative EIA process which was progressed in parallel with the project design process. This forms the first part of the EIA process which will be completed by the competent authority, which in turn will be required to examine, analyse and evaluate the direct and indirect effects of the development on the various factors listed under Section 171A of the Planning and Development Act 2000, (as amended).

**1.11.3** 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 assessment process of the prescribed environmental factors in relation to the proposed SHD residential development on lands at Boherboy, Saggart, Co. Dublin.

**1.11.4** The EIA process was based on the following four key objectives:

i. Pursuing Preventative Action
ii. Maintaining Environmental Focus and Scope
iii. Informing the Decision
iv. Public & Stakeholder Participation

### i. <u>Pursuing Preventative Action</u>

Pursuing preventative action is the most effective means by which potential negative environmental impacts can be avoided. An assessment of anticipated likely and significant impacts was undertaken during the screening, informal scoping and the considerations of alternatives stages of the EIA process. This involved forming a preliminary opinion, in the absence of complete data, with respect to the approximate magnitude and character of the likely environmental impacts. This assessment was based on the knowledge, experience and expertise of the EIA and project design team with reference to the amended EIA Directive, EIA guidance material and local precedents.

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 3.

### ii. Maintain Environmental Scope and Focus

It is important that the EIAR document remains tightly focussed. This minimises expenses, delays and the potential for a confusing mass of data to obscure relevant facts. The EIA process has been project-managed and steered, so as to ensure that the EIAR documentation and analysis are confined to those topics and issues which are explicitly described in the legislation, and where environmental impacts may arise. Evaluation and analysis has been limited to topics where the indirect, secondary or cumulative impacts are either wholly or dominantly due to the project or development under consideration and remain focused on issues that:

- Are environmentally based
- Are likely to occur
- Have significant and adverse effects

### iii. Informing the Decision

The EIAR document enables the competent/consenting authorities 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.

### iv. Public & Stakeholder Participation

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.

Public participation and consultation is an integral part of the new Strategic Housing Development process as outlined in the Planning and Development Act (as amended), and the Planning and Development Regulations 2001 (as amended).

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 the likely environmental impacts of projects prior to the granting of consent.

Informal scoping of potential environmental impacts was undertaken with the Planning Authority through pre application meetings. Direct and formal public participation in the EIA process will be through the statutory planning application process under the new Strategic Housing Development procedures.

**1.11.5** To summarise, it is the intention of this EIAR document is to provide transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes which led to the selection of the final project configuration. 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 ABP, statutory consultees and the public in assessing all aspects of the proposed development.

## 1.12 Structure Methodology

### 1.12.1 Structure of the EIAR

The overall structure and scope of this EIAR has regard to the information required by the EU/EC Directives, Statutory Regulations and relevant environmental guidelines prepared by the Environmental Protection Agency (EPA). The EIAR has been written and illustrated with figures in a manner which, insofar as possible, is intended to be understandable to the public generally. A Non-technical Summary has been prepared in accordance with the statutory regulations and is submitted as a separate document to this EIAR, i.e. Volume I – Non-Technical Summary. The appendices to this EIAR contain background and technical details relating to the project and are referred to in the relevant Chapters, with all appendices incorporated into a separate document i.e. Volume III - EIAR Appendices.

The structure used in this EIAR is a Group Format structure. This structure examines each environmental topic in a separate section of the EIAR document. The Chapter Headings reflect the broadened scope of the environmental factors introduced by the 2014 Directive.

### 1.12.2 Contributors

This EIAR has been prepared on behalf of the developer by a design team of qualified experts, as required by Article 5(3) of Directive 2014/52/EU. The contributors involved in the preparation of this EIAR are identified at the beginning of each Chapter and in Table 1.2 of Section 1.11 of this EIAR and their qualifications and competence is described.

### 1.12.3 Methodology

A systematic approach is employed using standard descriptive methods, replicable prediction techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration. An outline of the methodology used to ensure consistency in each chapter of this EIAR and to examine each environmental topic is detailed in Table 1.1:

| Section | Description |
|---|---|
| Introduction | Provides an overview of the specialist area and specifies the specialist who prepared the assessment. |
| Study Methodology | Outlines the method by which the relevant assessment of the development impacts has been conducted within that chapter. |
| Baseline Situation | Describes and assesses the receiving environment, the context, character, significance and sensitivity of the baseline receiving environment into which the proposed development will fit. |
| Construction Impacts and Mitigation | Describes the specific, direct and indirect impacts that may arise during the construction phases of the development. A description of the appropriate |

| | |
|---|---|
| | mitigation measures either practicable or reasonable is also provided in this section |
| Operational Impacts and Mitigation | Focuses on the operational phase of the proposed development and describes the specific, direct and indirect impacts that may arise together with appropriate mitigation measures. |
| Do Nothing Impact | Describes a scenario in which the development does not proceed and the environment would not change as a result. |
| Monitoring | Describes the monitoring of the development in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring. The level of monitoring, along with the methods and the agencies that are responsible for such monitoring. The level of monitoring proposed is proportionate to the nature, location and size of the project and the significance of its effects. This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring. The level of monitoring, along with the methods and the agencies that are responsible for such monitoring. The level of monitoring proposed is proportionate to the nature, location and size of the project and the significance of its effects. |
| Reinstatement | While not applicable to every aspect of the environment considered within the EIAR, certain measures need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact on the environment. |
| Interactions | Where applicable, the assessment refers to impact interactions, including potential indirect, secondary and cumulative impacts. |
| Difficulties encountered | Where applicable, any difficulties encountered by the environmental specialist in compiling the required information are noted. |

**Table 1.1: EIAR Methodology Outline**

### 1.12.4 Forecasting Methods

The individual forecasting methods used to assess the various effects of the proposed development on the environment are outlined in the relevant chapters of this EIAR under the subheading *'Assessment Methodology'*.

### 1.12.5 Difficulties Encountered

Some details of the project and the construction methodology/programme are matters which may be subject to change depending on the contractor(s) appointed and other considerations which are not finalised at this stage, and which cannot be finalised until a grant of planning permission for the proposed development has been issued. However, these matters will not alter the nature or extent of the proposed development and the Contractor will be obliged to implement all mitigation measures proposed for the construction phase of the project.

No other significant difficulties were encountered in the preparation of the EIAR. Any limitations or technical difficulties associated with assessment of an environmental factor are detailed in the relevant chapter.

### 1.12.6 Terminology

In accordance with the EPA Guidelines on the Information to be contained in Environmental Impact Statements (2002) and Advice Notes on Current Practice in the preparation of Environmental Impact Statements (2003), the following definitions are used in this EIAR. These definitions take account of the 2017 Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Draft) and the 2015 Advice Notes for preparing Environmental Impact Statements (Draft), prepared by the EPA: The quality of the effects is defined as:

**Positive effects***:* A change which improves the quality of the environment (e.g. by increasing species diversity; or the improving reproductive capacity of an ecosystem, or removing nuisances or improving amenities).

**Negative effects***:* A change which reduces the quality of the environment (e.g. lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

**Neutral effects***:* A change which does not affect the quality of the environment.

The significance of the effects is described as:

**Imperceptible:** An effect capable of measurement but without noticeable consequences.

**Not significant***:* An effect which causes noticeable changes in the character of the environment but without noticeable 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 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 the majority of a sensitive aspect of the environment.

**Profound effects**: An effect which obliterates sensitive characteristics.

The magnitude of the effect is, where appropriate, indicated as:

**Extent:** Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.

**Duration:** Describe the period of time over which the effect will occur. (See further detail below)

**Frequency:** Describe how often the effect will occur. (Once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

**Context:** Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

The probability of the effect is, where appropriate, indicated as:

**Likely Effects:** The effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.

**Indeterminable Effects**: When the full consequences of a change in the environment cannot be described.

***'Worst case'* Effects:** The effects arising from a project in the case where mitigation measures substantially fail.

The duration of the effect is, where appropriate, indicated as:

**Momentary Effects**: Effects lasting from seconds to minutes

**Brief Effects**: Effects lasting less than a day

**Temporary Effects:** Effects lasting for one year or less.

**Short-term Effects:** Effects lasting one to seven years.

**Medium-term Effects**: Effects lasting seven to fifteen years.

**Long-term Effects:** Effects lasting fifteen to sixty years.

**Permanent Effects:** Effects lasting over sixty years.

The type of effect is described, where appropriate, as:

**Cumulative Effects:** The addition of many small effects to create one larger, more significant, impact.

**Do-nothing Effects:** The environment as it would be in the future should no development of any kind be carried out.

**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.

**Worst-case:** The impacts arising from a development in the case where mitigation measures substantially fail.

**Synergistic Effects:** Where the resultant effects is of greater significance than the sum of its constituents.

**Indirect Effects:** Effects that arise off-site or are caused by other parties that are not under the control of the developer (such as a quarry)

**Secondary Effects:** Effects that arise as a consequence of a project (a new waste water treatment plant will reduce the yield of mussels in a nearby estuary)

### 1.12.7 Non-Technical Summary

A Non-Technical Summary of the EIAR has also been prepared. The EIA Directive states that one of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions. The Draft EPA Guidelines note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by ABP. A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document.

### 1.12.8 Links between EIAR and Appropriate Assessment

A Screening Report for Appropriate Assessment (AA) was carried out for the proposed development to determine if there is a risk of effects to any Natura 2000 site and accompanies this EIAR as a separate document that is submitted as part of the planning application.

While AA is required by the proposer of any plan or project likely to have an adverse effect on a Natura 2000 site, EIA is required for projects listed in Annex I of the EIA Directive. The requirement for EIA relative to projects listed in Annex II of the EIA Directive is determined on a case by case. These two different types of assessment are independent and are required by separate legislation.

### 1.12.9 Availability of EIAR Documents.

A copy of this EIAR document and Non-Technical Summary is available for purchase at the offices of An Bord Pleanála and South Dublin County Council at a fee not exceeding the reasonable cost of reproducing the document. The application can also be viewed on the SHD website www.boherboy-shd.ie set up by the

applicants.

### 1.12.10 Impartiality

This EIAR 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 EIAR document produced is robust, impartial and objective.
It should be noted that, as highlighted above, an important part of the EIA process is preventative action which causes the project design team to devise measures to avoid, reduce or remedy significant adverse impacts in advance of applying for consent. As a result, where no likely significant impacts have been identified where they might reasonably be anticipated to occur, the design and layout of the proposed development has generally been amended to minimise the potential of any likely significant adverse impacts.

### 1.12.11 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 EIAR.

### 1.12.12 EIA Quality Control and Review

Armstrong Fenton Associates is committed to consistently monitoring the quality of EIAR 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 Report[2] and the Department of Housing, Planning, Community and Local Government have published a consultation paper[3], which have been consulted in the preparation of this EIAR. This document includes a detailed EIAR Review Checklist which has been used to undertake a review of this EIAR document.

### 1.12.13 Errors

While every effort has been made to ensure that the content of this EIAR 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 EIAR.

### 1.12.14 Reference List

At the end of each chapter in Part B, each contributor has included a reference list of sources relied on in that Chapter. Below is a detailed list of references which have generally informed the descriptions and assessments included in this EIAR.

**EU Directives / Legislation**

- The EU Directives on Environmental Impact Assessment (85/337/EEC as amended by 97/11/EC, 2003/35/EC, 2009/31/EC (codified in 2011/92/EU) and 2014/52/EU).
- The Planning and Development Act, 2000 (as amended).

[2] *Guidelines on the Information to be contained in an Environmental Impact Assessment Report, Environmental Protection Agency, 2017*

[3] *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.*

- The Planning and Development Regulations, 2001 (as amended).

**EIA and related Guidance**

- *Guidelines on the Information to be contained in Environmental Impact Statements*, EPA (2002)
- *Advice Notes on Current Practice in the preparation of Environmental Impact Statements*, EPA (2003)
- *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (Draft), EPA (2017)
- *Advice Notes for preparing Environmental Impact Statements* (Draft), EPA (2015)
- *Appropriate Assessment of Plans and Projects in Ireland, Guidelines for Planning Authorities* DEHLG (2009)
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*, DECLG (2013)
- Circular PL1/2017 – *Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive): Advice on Administrative Provisions in Advance of Transposition,* DHPCLG (2017)

**Planning Policy (National, Regional, Local)**

- The National Planning Framework (Project Ireland 2040)
- Eastern & Midland Regional Assembly Regional & Spatial Economic Strategy 2019-2031
- Smarter Travel – A Sustainable Transport Future 2009-2020
- Spatial Planning and National Roads, Guidelines for Planning Authorities 2012
- Sustainable Residential Development in Urban Areas, Guidelines for Planning Authorities 2009 and Urban Design Manual, A Best Practice Guide.
- Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities 2018 (as amended).
- Design Manual for Urban Roads and Streets, 2013
- The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009
- National Cycle Manual
- South Dublin County Development Plan 2016 – 2022
- Fortunestown Local Area Plan 2012

**1.12.15 List of Abbreviations**

The following is a non-exhaustive list of abbreviations used in this EIAR. Where an abbreviation is not listed below it is clarified in the relevant chapter of this EIAR.

**AA:** Appropriate Assessment
**AADT**: Annual Average Daily Traffic
**ACA:** Architectural Conservation Area
**ABP:** An Bord Pleanála
**BOD:** Biochemical Oxygen Demand
**CAP**: Climate Action Plan
**CDP:** City Development Plan
**CEMP:** Construction and Environment Management Plan
**CFRAMS:** Catchment Flood Risk Assessment and Management Study
**CMP:** Construction Management Plan
**CNT:** Construction Noise Threshold
**CoF**: Confirmation of Feasibility
**DoCHG:** Department of Culture, Heritage and the Gaeltacht
**DECLG:** Department of the Environment, Community and Local Government
**DED:** District Electoral Division
**DEFRA**: Department of Environment Food and Rural Affairs
**DEHLG:** Department of the Environment, Heritage and Local Government
**DELG:** Department of the Environment and Local Government
**DHPCLG:** Department of the Housing, Planning, Community and Local Government
**DMURS:** Design Manual for Urban Roads and Streets
**DoD:** Department of Defence
**EEC:** European Economic Community
**EIA:** Environmental Impact Assessment
**EIAR:** Environmental Impact Assessment Report
**EIS:** Environmental Impact Statement
**EPA:** Environmental Protection Agency
**ESB:** Electrical Supply Board
**EC:** European Commission
**EV:** Electric Vehicle
**EU:** European Union
**GDSDS:** Greater Dublin Strategic Drainage Strategy
**GSI:** Geological Survey of Ireland
**HDV**: Heavy Duty Vehicle
**INDC:** Intended Nationally Determined Contributions
**IOA:** Institute of Acoustics
**IW:** Irish Water
**LAP:** Local Area Plan
**KER:** Key Ecological Receptors
**NBDC:** Natural Biodiversity Data Centre
**NHA:** Natural Heritage Areas
**NPF:** National Planning Framework
**NPWS:** Natural Parks and Wildlife Service
**NRA:** National Roads Authority
**NTA:** National Transport Authority
**OPW:** Office of Public Works
**pNHA**: Proposed Natural Heritage Areas
**RMP:** Record of Monuments and Places
**RPS:** Record of Protected Structures
**RPGs:** Regional Planning Guidelines

**RSES:** Regional Spatial and Economic Strategy
**SAC:** Special Area of Conservation
**SCI:** Site of Community Importance
**SDCC**: South Dublin County Council
**SEA:** Strategic Environmental Assessment
**SEO:** Strategic Environmental Objective
**SI No:** Statutory Instrument Number
**SPA:** Special Protection Areas
**SSFRA:** Site Specific Flood Risk Assessment
**TII:** Transport Infrastructure Ireland
**TMP**: Traffic Management Plan
**UNFCCC:** United Nations Framework Convention on Climate Change
**WFD:** Water Framework Direction
**ZOI:** Zone of Influence

### 1.12.16 Project Team

This EIAR has been prepared on behalf of the developer by a team of qualified experts, as required by Article 5(3) of Directive 2014/52/EU. The contributors involved in the preparation of this EIAR are identified in Table 1.2, below, and at the beginning of their relevant Chapters in Part B.

| **Chapter** | **Author (s)** |
|---|---|
| Non – Technical Summary | Armstrong Fenton Associates, Planning Consultants: Tracy Armstrong BA, MRUP, MIPI, MRTPI |
| 1. Introduction | Armstrong Fenton Associates, Planning Consultants: Tracy Armstrong BA, MRUP, MIPI, MRTPI |
| 2. Planning Policy Context | Armstrong Fenton Associates, Planning Consultants: Tracy Armstrong BA, MRUP, MIPI, MRTPI |
| 3. Description of Project and Alternatives | Armstrong Fenton Associates, Planning Consultants: Tracy Armstrong BA, MRUP, MIPI, MRTPI |
| 4. Population and Human Health | Armstrong Fenton Associates, Planning Consultants: Tracy Armstrong BA, MRUP, MIPI, MRTPI |
| 5. Biodiversity / Species and Habitats | Scott Cawley: Síofra Quigley B.Sc. (Hons) M.Sc , |
| 6. Land and Soils | Roger Mullarkey & Associates: Roger Mullarkey BScEng, DipEng, CEng, EurIng, MIEI, FConsEI |
| 7. Water | Roger Mullarkey & Associates: Roger Mullarkey BScEng, DipEng, CEng, EurIng, MIEI, FConsEI |
| 8. Air and Climate | AWN Consulting Ltd.: Ciara Nolan MSc. Env Sci, BSc energy Systems Eng, MAMIAQM, MAMIEnvSc |
| 9. Noise and Vibration | AWN Consulting Ltd.: Chonaill Bradley, BSc in Environmental Science |

| | |
|---|---|
| 10. Material Assets: Built Services | Roger Mullarkey & Associates: Roger Mullarkey BScEng, DipEng, CEng, EurIng, MIEI, FConsEI |
| 11. Material Assets: Transportation | Pinnacle Engineering: Ronan Kearns, BA BAI MSc MBA CEng MIEI |
| 12. Material Assets: Resource and Water Management | AWN Consulting Ltd.: Chonaill Bradley, BSc in Environmental Science |
| 13. Cultural Heritage | John Purcell Archaeological Consultancy: John Purcell Archaeologist |
| 14. The Landscape | Ronan MacDiarmada & Associates: Ronan MacDiarmada B. Agr. Sc. (Land. Hort.) |
| 15. Identification of Significant Impacts / Interactions | Armstrong Fenton Associates, Planning Consultants: Tracy Armstrong BA, MRUP, MIPI, MRTPI |
| 16 Summary of EIA Mitigation & Monitoring Measures | Armstrong Fenton Associates, Planning Consultants: Tracy Armstrong BA, MRUP, MIPI, MRTPI |

**Table 1.2: EIAR Project Team**

# 2.0 Description of Project and Alternatives

## 2.1. Introduction

This chapter has been prepared by Armstrong Fenton Associates Planning Consultants (Tracy Armstrong MRUP MIPI MRTPI) and provides a description of the project site in the context of its receiving environment and a description of the project. As required by the EIA Directive and regulations thereunder, this chapter also outlines the Main Alternatives considered.

In accordance with the EIAR preparation process, various mitigation measures are detailed in this report and can either be incorporated during the planning process or as conditions of a grant of planning permission.

The project description in Section 3.3. should be read in conjunction with the plans and particulars submitted with the planning application including the statutory planning notices and both the Planning Statement and Statement of Consistency submitted as part of the subject planning application.

## 2.2. Site Context

The lands are situated in the south west corner of the LAP plan area, with the application site area measuring approximately 18.3Ha. The lands are located south of the existing Carrigmore estate, west of the existing Corbally / Verschoyle estate and north of the Boherboy Road. To the west of the site lies greenfield land zoned *OS – To preserve and provide for open space and recreational amenities* in the SDDC Development Plan 2016 -2022.

The subject site slopes from a south to north and is currently undeveloped, greenfield land, being used for agriculture. The lands have a long planning history, with the eastern portion (i.e. Kelland Homes Ltd lands) having been zoned for residential land use since the adoption of the 1998 South Dublin County Development Plan and the adjoining portion to the west (i.e. Durkan New Estates Ireland Ltd land) being zoned for residential land use in the subsequent 2004 Development Plan. While the lands were zoned for residential development in 1998 and 2004 respectively, the aforementioned Development Plans required the preparation of a Local Area Plan, however, this did not occur until the adoption of the 2012 Fortunestown Local Area Plan, which remains the relevant LAP in place.

The subject site represents the development of the entire Boherboy Neighbourhood within the Fortunestown Local Area Plan (2012) and is divided by a ditch running from north to south. The lands are in dual ownership with the western portion of the lands are owned by Durkan Estates Ireland Ltd. representing c. 8Ha of the site while to the east Kelland Homes Ltd. owns 9.6Hha of land. It the applicants' intention to provide for a coordinated approach to the development of these lands, in line with proper planning principles, hence the joint application for permission.

The main access roads to the lands is from the N81 Tallaght by-pass and then the Boherboy Road to Saggart which runs along the southern boundary of the site and from which the proposed development will be directly accessed. The subject site is also located close to the Red Luas line with the Fortunestown Luas Stop located to the north-east of the site.

The surrounding area has experienced a rapid level of growth in the last 20 years with significant levels of both residential and commercial development, altering the environment from a rural to suburban setting.


**Fig. 2.1 – Site Location and Land Ownership**

## 2.3. Description of the Physical Characteristics of the Proposed Development

The project in question is a residential development consisting of 655 no. dwellings comprised of a mix of houses, duplex units and apartments, along with a crèche, and all associated site development and infrastructural works, open spaces, car parking, landscaping, etc.

The proposed development consists of two adjoining sites to be developed by (a) Kelland Homes Ltd. for 369 no. dwellings and a crèche on the eastern side, bounded by the Corbally Stream and (b) by Durkan Estates Ireland Ltd. for 286dwellings on the western side.

As per the public notices for the subject planning application, the proposed development can be described as follows:

**Kelland Homes Ltd and Durkan Estates Ireland Ltd are applying to An Bord Pleanála for permission for a strategic housing development at a site at Boherboy, Saggart, County Dublin. To the immediate north of the site is the Carrigmore residential estate, to the west are agricultural lands and a single dwelling, to the east is the Corbally residential estate while to the south is the Boherboy Road. The proposed application represents the development of the entire Boherboy Neighbourhood as identified in the Fortunestown Local Area Plan (2012).**

**The development will consist of 655 no. dwellings, comprised of 257 no. 2, 3 & 4 bed, 2 & 3 storey detached, semi-detached & terraced houses, 152 no. 1, 2 & 3 bed duplex units in 17 no. 2-3, 3-4 & 4 storey blocks, and 246 no. 1, 2 & 3 bed apartments in 9 no. buildings ranging in height from 2, 2-5, 4-5 & 5 storeys, and a 2 storey crèche (693m²).**

**Access to the development will by via one no. vehicular access point from the Boherboy Road, along with proposed upgrade works to Boherboy Road to include the provision of a roadside footpath along the front of the site at the Boherboy Road, continuing eastwards to the junction with the N81 Blessington Road (for an overall distance of c.370m). The proposed development also provides for pedestrian and cyclist connectivity to the adjoining Carrigmore Park to the north-east, and vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north.**

**The proposed development provides for (i) all associated site development works above and below ground, including surface water attenuation & an underground foul sewerage pumping station at the northern end of the site, (ii) public open spaces (c. 3Ha), including alongside the Corbally Stream, which will accommodate the provision of pedestrian / cyclist links to Carrigmore Park to the north-east, (iii) communal open spaces (c. 6,392m²), (iv) hard and soft landscaping and boundary treatments, (v) undercroft, basement & surface car parking (914 no. car parking spaces, including EV parking), (vi) bicycle parking (797 no. bicycle parking spaces), (vii) bin & bicycle storage, (viii) public lighting, and (ix), plant (M&E), utility services & 5 no. ESB sub-stations, all on an overall application site area of 18.3ha. In accordance with the Fortunestown Local Area Plan (2012) an area of approx. 1.42Ha within the site is reserved as a future school site.**

In accordance with the requirements for the Fortunestown LAP, a linear park (along with the eastern boundary of the site, abutting Corbally Stream) will be developed as part of the first phase of development in tandem with the permission. This linear park will accommodate pedestrian and cyclist access to the District Park to the north which connects to Fortunestown Centre, Citywest Shopping Centre and the Fortunestown Luas passenger stop. The site layout plan accommodates the central hedgerow, while open spaces are provided throughout, all of which contribute to the green infrastructure of the area. by being lined footpaths and cycle routes. A total of 31,076m² of public open space is provided for on site which equates to 17.5% of the subject site.

There are existing wayleaves traversing the site which will not be impacted upon by the proposed development. The Fortunestown LAP identifies a school site in the north-western part of the site. To this end, approx. 1.4ha of land is reserved for the provision of a school in the future, should the Department of Education and Skills require same.


**Fig. 2.2 – Proposed Site Layout Plan**

## 2.4 Access

The proposed development provides for the necessary upgrades to the Boherboy Road whereby the applicants propose to provide for a new public footpath (with associated site development works, public lighting etc.) along the northern side of the Boherboy Road, eastwards to the junction with the N81, from Chainage 750 to Chainage 1120, i.e. for a length of c.370m, while to the west of the subject site, proposed works to the Boherboy Road will consist of the provision of public lighting only. South Dublin County Council and Kerasoun Ltd, as the relevant stakeholders with regard to the proposed upgrade works to the Boherboy Road, have consented to the applicants to propose as part of this SHD planning application, the aforementioned upgrade works to Boherboy Road.

It is also proposed to connect the subject development into the adjoining residential development at Carrigmore to the north. Significant consultation has been undertaken with the Planning Authority with regard to the delivery of these connections. South Dublin County Council (SDCC) has completed the Taking-In-Charge (TIC) process of Carrigmore to the north and as such, it is proposed to provide vehicular, pedestrian and cyclist connections from the subject site into Carrigmore.

To the immediate east, the internal road network at Corbally is in the charge of SDCC, however, at the western end of Corbally Heath, there is a parcel of land in the ownership of a third party i.e. Kerasoun Ltd, and we enclose a letter of consent from them, consenting to the applicants proposing a vehicular connection from the subject site into Corbally Heath via their lands.

The proposed vehicular connections to Carrigmore and Corbally will provide for bridges over the Corbally Stream that runs in a north-south direction along the entire eastern boundary of the site and moves westwards along the northern boundary of the site. Detailed designs of the proposed connections including bridging details are submitted as part of the application and the impacts of same in terms of ecology/biodiversity are set out in Chapter 5 of this EIAR. In addition, section 3.6.2 of the submitted Traffic and Transport Assessment (TTA) sets out details of proposed stream crossings with respect to flooding.

The submitted Site Specific Flood Risk Assessment (hereafter SSFRA) and (section 5.5 of same) also assesses the impacts of flooding on the proposed stream crossings. The proposed development includes four stream crossings at the locations shown on Fig.5.7 of the SSFRA. A preliminary design for each structure has been carried out in accordance with OPW requirements. Soffit levels are at least 500mm above the 1% AEP level at all crossings and so comfortably exceed OPW requirements. Two of the crossings are vehicular and crossing levels are constrained by the requirement to tie-in to existing road levels. OPW Section 50 consent have been obtained for these crossings; a copy of the consents is included in Appendix E of the submitted SSFRA.

It should be noted that the proposed vehicular connections to Carrigmore and Corbally respectively are in accordance with roads objectives set out in both the Fortunestown LAP 2012 and the South Dublin County Development Plan 2016-2022, as illustrated in Fig. 3.2 over.

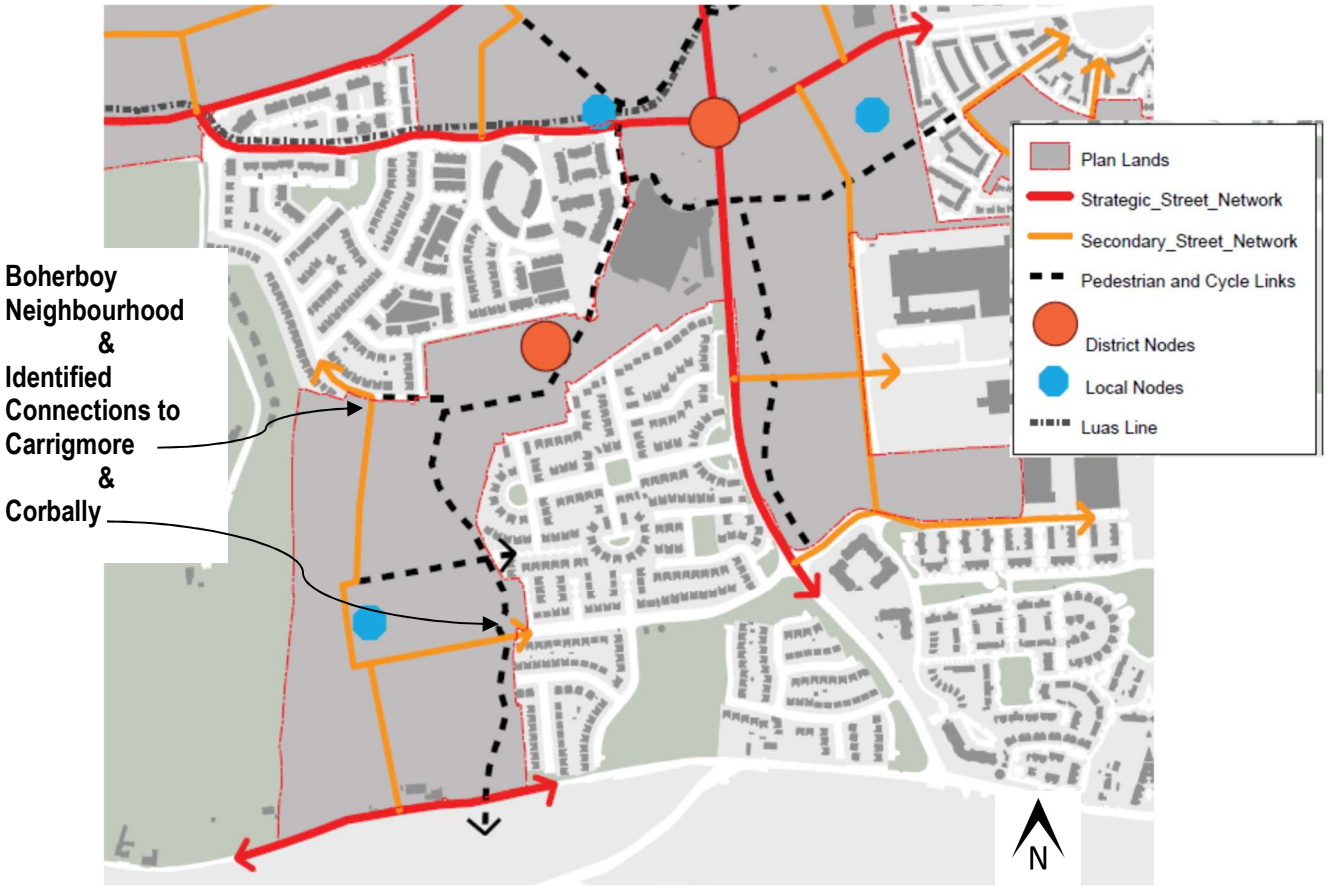



**Fig. 2.3 – Extract from Fig. 5.3 Accessibility & Movement Framework of the 2012 Fortunestown LAP**

## 2.5. Site and Development Works

The project includes the following works:

- Residential development (655 no. dwellings);
- Creche (693m²)
- Public and private open spaces;
- Landscaping;
- Services infrastructure, utilities and public lighting;
- Car parking and bin storage;
- ESB Substations;
- Building and directional signage and
- All associated site and development works.

Further details are provided in the plans and reports submitted with the planning application.

## 2.6. Project Life-Cycle

Beyond the construction and operational phases, there are no further phases of development envisaged for this project.

## 2.7. Demolition

Permission is sought for the demolition of the existing, vacant agricultural outbuildings on site (996m$^2$).

## 2.8 Residential Development

In summary, the proposed development comprises the construction of 655 no. dwellings comprised of 257 no. 2 & 3 storey houses, 152 no. 1, 2 & 3 bed duplex units in 17 no. 2-3, 3-4 & 4 storey blocks, and 246 no. 1, 2 & 3 bed apartments in 9 no. buildings ranging in height from 2, 2-5, 4-5 & 5 storeys.

| Dwelling Type | 1 bed | 2 bed | 3 bed | 4 bed | Total | Percentage % |
|---|---|---|---|---|---|---|
| **Houses** | 0 | 8 | 168 | 81 | 257 | 39% |
| **Apartments** | 62 | 177 | 7 | 0 | 246 | 38% |
| **Duplex** | 4 | 72 | 76 | 0 | 152 | 23% |
| **Total** | 66 | 257 | 251 | 81 | 655 | 100% |
| **Percentage %** | 10% | 39% | 39% | 12% | 100% | - |

**Table 2.1 – Overall Residential Development Mix**

A wide variety of dwelling typologies are included in the proposal all dispersed throughout the proposed development. Details of same are set out in section 5.7 of the submitted Planning Statement and on the submitted drawings no. PL06 "Site Layout Plan – Unit Mix – please refer to same.

There are nine character areas dispersed throughout the entire site, each with its own distinct design material palette. A variety of units types and building heights are also dispersed throughout the entire layout to create variety and distinctiveness throughout. This is illustrated in more detail in the submitted Architectural Design Rationale – please refer to same.

## 2.9 Non-Residential Development

The development proposal includes for a stand alone creche facility measuring c. 693m$^2$ located south of Street 07, north of Street 12, with associated external play area of 368m² and 16 no. dedicated car parking spaces.

## 2.10 Car Parking and Cycle Parking Provision

Car parking for the proposed development is provided for in the form of basement level, undercroft and surface level parking. In total, the proposed development caters for 914 no. car parking spaces.

For the houses, car parking will be provided in a mix of on-street and within the curtilage of each house. On street surface car parking will be provided for the apartments, duplexes, creches and visitor car parking spaces. Blocks A, B and C also have car parking in basement/undercroft arrangements.
Cycle parking for the proposed development is also provided in the form of basement level parking and surface level parking. In total, the proposed development caters for 797 no. bicycle parking spaces.

Please refer to the enclosed Traffic & Transport Assessment (TTA) carried out by Pinnacle Consulting Engineers for full details of parking in the proposed scheme.

## 2.11 Adjoining Development

This is a location in which residential use is a long established use, with further residential development having been permitted within the various neighbourhoods within the Fortunestown LAP area under numerous permissions, including *inter alia*, e.g. Citywest Village (Ref. SD15A/027), Cúil Dúin (Ref. SD14A/0121) and Edenbrook (Ref. ABP 302398-18). The adjoining land uses to the immediate north and east and long established residential estates i.e. Carrigmore to the north and Corbally / Verschoyle to the east of the development site. The development also adjoins the District Park, which is known as Carrigmore Park (to the north-east) which acts as the primary park for the LAP area and into which the current proposal will provide a number of pedestrian and cyclist connection points.

## 2.12 Construction

### 2.12.1. Construction Management

A Construction & Demolition Waste Management Plan (CDWMP) has been prepared for the proposed development and accompanies the planning application. The CDWMP incorporates all mitigation measures and construction methodologies outlined in this EIAR and is considered to provide the baseline requirements off which the contractor will work. It will remain a live document which will be updated by the contractor as construction progresses to take account of live requirements imposed by both the planning permission and the site conditions.

An Outline Construction Management Plan is submitted with the planning application, and on receipt of a grant of planning and prior to the commencement of works, a detailed final Construction Management Plan (CMP) will be prepared. The contractor will be required to comply with and implement the requirements and mitigation measures as set out in this EIAR and any conditions imposed as part of planning permission. In addition, a Residential Travel Plan (RTP) has also been prepared and is included as part of this application. It is likely that the applicants will set up a temporary site compound on the designated school site and upon completion of the proposed development, the site will be seeded and grassed until such time as the Department of Education and Skills confirms their position regarding the delivery of a school on the reserved site.

A Construction Traffic Management Plan has been prepared by Pinnacle Consulting Engineers which addresses traffic management, dust control, road cleaning, and staff parking associated with the construction works, and is submitted as part of this SHD planning application.

All of the aforementioned plans include further information on the construction programme and construction related activities. The plans also address issues relating to site access, compounds, site security, waste management contractors' responsibilities etc.

### 2.12.2. Construction Programme / Phasing

It is estimated that construction of the development will take approximately five years to complete. A phasing plan also accompanies the planning application – please refer to the submitted drawing PL07 "Site Layout Plan – Phasing" which illustrates the phasing of the overall development, and Fig. 2.3 over. The intended sequence of development may change post grant of planning permission as a detailed construction programme is dependent on contractor appointment, market and other considerations.

**Phase 1**: will commence at the southern end of the site delivering:

**(i)** the vehicular access from Boherboy Road & associated upgrade to Boherboy Road;
**(ii)** the central square of public open space;
**(iii)** pumping station and associated site development works, including north-south central avenue and associated flood relief works;
**(iv)** the "Riverside Park" including connections to Carrigmore Park to the northwest, all along the eastern boundary of the site;
**(v)** vehicular connection to Carrigmore to the north and
**(vi)** approximately 281 no. dwellings.

The proposed 281 no. dwellings to be delivered in Phase 1 are comprised of:

- 151 no. 2, 3 and 4 bed houses;
- 110 no. 1, 2 and 3 bed duplex units;
- 20 no. 1 and 2 bed apartments.

**Phase 2:** will consist of the completion of the proposed residential accommodation north of Streets 2 and 10, moving northwards to and including Streets 3 and 7. This will provide for:

**(i)** 173 no. dwellings,
**(ii)** associated open spaces;
**(iii)** vehicular connection to Corbally and
**(iv)** the crèche.

The proposed 173 no. dwellings to be delivered in Phase 2 are comprised of:

- 25 no. apartments in Blocks B & Y6;
- 42 no. 2 & 3 bed duplex units in Blocks D, E, J, K, K1 & L;
- 106 no. 3 & 4 bed houses.

**Phase 3:** will be the final phase and will deliver:

**(i)** the 201 no. apartments in Blocks A and C;
**(ii)** adjoining open spaces.

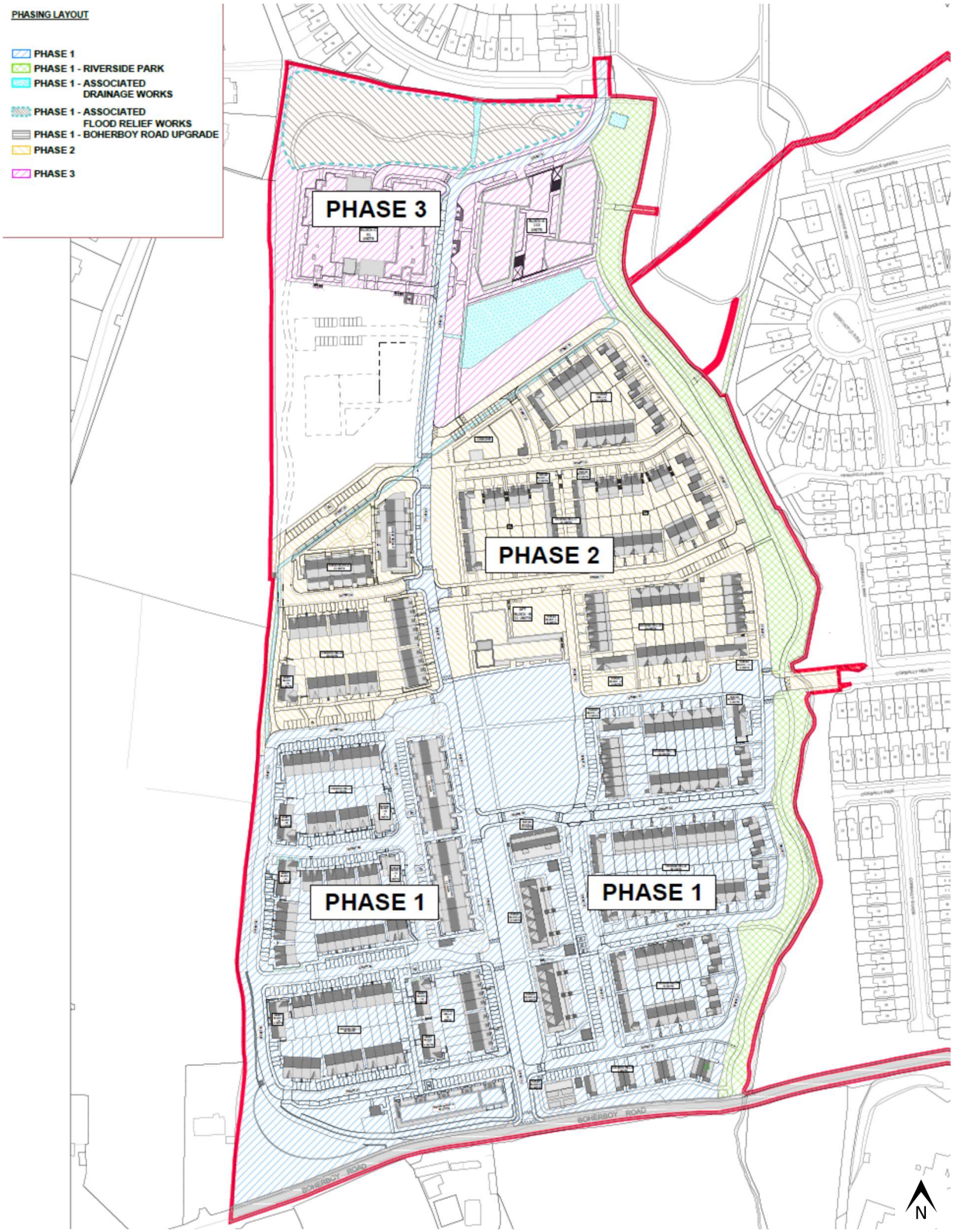



**Fig. 2.4 – Proposed Phasing**

### 2.12.3. Site Preparation

There is very little demolition proposed i.e. demolition of existing agricultural outbuilding at the southern end of the site.

Basement / undercroft car parking is proposed underneath Blocks A, B and C. **Note:** please refer to the submitted drawing no. 1324B/336 "Block B Foundation Layout" prepared by Roger Mullarkey & Associes Consulting Engineers for details of the foundations for Block B which has a basement car park.

Excavated material on site will predominantly be re-used on site / within the applicants' landholding.

The contractor(s) will require connections to the following services / utilities for the duration of the works:

- Water Supply;
- Foul Sewer;
- Surface Water Sewer;
- Electricity;
- Telecommunications.

Existing services / utilities within and adjoining the site will be protected during construction.

### 2.12.4. Construction Activities

The construction works associated with the project will be contained within the application site boundary. These works will include excavation, earthworks, etc.

Some construction activity may take place off-site within the control of the developer. These activities may include access and haul routes, site compound(s), storage of materials and soil/excavated material, screening and processing of existing materials for re-use within the development works, construction parking, staff welfare facilities etc. These areas will be identified in the detailed CMP.

Subject to the agreement of the Planning Authority, the following site operation hours are proposed:
- 07.00 to 19.00 – Monday to Friday;
- 08.00 to 13.00 on Saturdays;
- Works not permitted on Sundays and public holidays.

During the construction period, due to exceptional circumstances, construction work may be necessary outside these standard hours. If necessary, this will be agreed in advance with SDCC.

The contractor will be guided by the Construction & Demolition Waste Management Plan which accompanies the application with regard to re-use, recovery, recycle and disposal of waste produced during construction. Chapter 12 of this EIAR, Material Assets: Resource and Waste Management, also considered the re-use recovery, recycle and disposal of waste arising from the development.

### 2.12.5. Construction Material

The proposed development will have a requirement for imported materials, primarily concrete, steel, stone and asphalt. The estimated quantities for the overall development are provided in the C & D WMP. The majority of new materials brought to site will be used immediately. The remainder will be stored within the site boundary.

Material excavated on the site will be used in construction. The re-use of this material reduces the quantity of materials being imported to the site. Prior to use, this material will be subject to appropriate testing to ensure material is suitable for construction. Locations to stockpile this material will be identified by the contractor(s) in the CMP.

### 2.12.6. Construction Traffic

An Outline Construction Traffic Management Plan (CTMP) has been prepared with a final CTMP to be prepared by the appointed contractor prior to commencement of development which will outline proposals for construction deliveries and staff accessing the compounds and construction sites.

During all phases of construction access to all existing properties adjoining the development lands will be maintained. Local traffic management procedures will be put in place where required.

Site access / egress routes and construction traffic generation are discussed in Chapter 11 and reflected in the enclosed Outline CTMP.

## 2.13 Energy Statement

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.

Principle standards and references include:

- Building regulations Technical Guidance Document for Part L, Department of Environment, 2021 (TBG Part L);
- Building regulations Technical Guidance Document for Part F, Department of Environment, 2021 (TBG Part F);
- SEAI Building Energy Rating documentation and software (BER);
- S.I. No. 243/2012 - European Union (Energy Performance of Buildings) Regulations 2012.

Some of the proposed solutions to be employed are as follows, but not limited to:

1. Building Fabric, U-Values to meet Part L values as per table 1 of TBG Part L;
2. Air Permeability below 3m³/m²/hr (target is 2) as per TBG Part L;
3. Thermal Bridging below the Part L requirement of 0.11 as er TBG Part L (target is 0.08). 0.11 relates to 11% of total energy transfer. Using approved construction details and methods as published by the Department of the Environment;
4. Photovoltaic Panels to be mounted on roofs of all apartments, maisonettes, houses and other structures in accordance with NZEB requirements to meet the final BER requirements;
5. Space heating shall be by means of electrically operated heat pumps;
6. Domestic Water heating shall be by means of electrically operated heat pumps;
7. Waste Air shall have its energy recovered by means of a heat recovery ventilation unit, which shall employ this waste energy in heating the hot and space heating water to meet the requirements of TBG Part L and Part F;
8. LED lighting throughout the development;
9. All pumps to employ EC motors for lowest energy consumption in lifts, pumps etc.;
10. All pipes, ducts and vessels to be insulated as per TBG Part L;

11. Heating controls to be employed will include outdoor weather compensation, thermostatic radiator valves, zone control and other measures as set out in the building regulations Technical Guidance Document for TBG Part L;

The final combination of products, systems and other elements employed to meet Part L and Part F will be determined by means of a Building Energy Rating for each dwelling or unit.

### 2.13.1 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).

## 2.14 Emissions and Waste

### 2.14.1 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 remedial and reductive measures for surface water and foul drainage are recorded at Chapter 7 "Water" of this Environmental Impact Assessment Report.

### 2.14.2 Municipal Waste/Waste Management

A Waste Management Plan (WMP) will be prepared and shall be submitted to the Planning Authority for agreement prior to commencement of development on site. The WMP will demonstrate how the Construction Phase will comply with the following relevant legislation and relevant Best Practice Guidelines:

- *Waste Management Acts 1996;*
- *Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007);*
- *Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008);*
- *Department of the Environment, Heritage and Local Government – Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects – July 2006.*

The Waste Management Plan will present the potential environmental impacts, proposed monitoring methodologies, limit values where applicable, based on the concept of Best Practice and the proposed mitigation measures to be implemented at the development site. Reference to National and International Standards shall also be included where relevant.

Waste materials generated by construction activities will be managed according to the Department of the Environment, Heritage and Local Government's 2006 Publication - *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.*

Waste minimisation and prevention shall be the primary responsibilities of the Construction Project Manager who shall ensure the following:

**1)** Materials will be ordered on an *"as needed"* basis to prevent over supply
**2)** Materials shall be correctly stored and handled to minimise the generation of damaged materials
**3)** Materials shall be ordered in appropriate sequence to minimise materials stored on site
**4)** Sub-contractors will be responsible for similarly managing their wastes

**Construction Waste Disposal Management**

It is proposed that from the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

**Contaminated Soil**

In the unlikely event that contaminated soils are discovered, these areas of ground will be isolated, tested for contamination in accordance with *2002 Landfill Directive (2003/33/EC),* and pending the results of laboratory 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 / Licenced Waste Facility.

**Domestic Waste Management**

It shall be the responsibility of the Facilities Management Company to ensure that all domestic waste generated by apartment residents is managed to ensure correct storage prior to collection by an appropriately waste permitted waste collection company on a weekly basis.

Sufficient domestic waste storage areas shall be provided throughout the proposed residential development. It shall be the responsibility of the Facilities Management Company to ensure that appropriate signage is provided in each area notifying apartment residents of the importance to recycle domestic waste items in accordance with the requirements of the contracted Waste Collection contractor.

The proposed development shall be constructed and developed to minimise the generation of construction waste. During the construction phase, construction waste shall be stored and segregated in dedicated waste storage areas which shall optimise the potential for off-site reuse and recycling. All construction waste materials shall be exported off-site by an appropriately permitted waste contractor.

The development has been designed to provide adequate domestic waste storage areas for common residential areas (apartments) and individual houses. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the development. Waste bin storage areas shall be designed in a manner to ensure that appropriate signage for the correct waste disposal and recycling is available for residents.

The crèche shall have designated commercial waste bins for both general and recyclable waste which shall be stored within the boundaries of that building area. Waste shall be collected on a weekly basis by an appropriately permitted commercial waste contractor.

## 2.15 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 basement and surface levels. In general, it is noted that approximately 80% of all cars in Ireland run on unleaded fuel which can be expected to have a reductive effect on air emissions. As per the submitted plans for the apartments, 10% of the associated car parking spaces will have EV charging facilities. For the own door apartments, duplex units and houses that are afforded surface car parking, please refer to the submitted site layout plans which identify the proposed locations for EV parking (coloured blue). For private houses, future home owners will be offered the opportunity to install a charging facility within the curtilage of the property, however, the applicant's will provide the necessary piped services for same as part of the proposed site development works. It is expected therefore that the potential impact will be negligible.

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, e.g. 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.

## 2.16 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 4-14 which deal with *'Aspects of the Environment Considered'*. No significant adverse impact is predicted to arise from the use of natural resources.

## 2.17 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, where relevant, in the relevant in Chapters 3-13 which deal with '*Aspects of the Environment Considered'*. There will be no significant direct or indirect effects arising from these sources.

## 2.18 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 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 a number of the environmental assessments are outlined hereunder.

## 2.19 Transboundary Impacts

Large-scale transboundary projects[4] 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 townland of Boherboy to the east of Saggart, within the administrative area of South Dublin County, transboundary impacts on the environment are not considered relevant, in this regard.

## 2.20 Alternatives Examined

The consideration of Alternatives is an important part of the EIA process. By examining alternatives considered and indicating the main reasons for choosing the proposed development, it is possible to reduce or minimise environmental impacts and ensure that better solutions are not overlooked.

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) provides for, an outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking into account the effects on the environment, i.e.:

*"(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."*

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

- **i.** Alternative locations;
- **ii.** Alternative uses;
- **iii.** Alternative layouts;
- **iv.** Alternative processes.

[4] 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

Pursuant to Section 3.4.1 of the Draft Environmental Protection Agency (EPA) Guidelines on the *Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017), the consideration of alternatives also needs to be cognisant of the fact that "*in some instances some of the alternatives described below will not be applicable - e.g. there may be no relevant 'alternative location'…"*

In accordance with Draft EPA Guidelines (EPA, 2017), different types of alternatives may be considered at several key phases during the process. As environmental issues emerge during the preparation of the EIAR, alternative designs may need to be considered early on in the process or alternative mitigation options may need to be considered towards the end of the process.

The Draft 2017 Guidelines also state *"Analysis of high-level or sectoral strategic alternatives cannot reasonably 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'".*

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."*

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

The location and type of development proposed has been determined by the land use zoning objectives contained in the South Dublin CDP, and the Fortunestown LAP, both of which has been environmentally assessed, and statutorily adopted.

In the preparation of the CDP, SEA and AA were carried out. The SEA Report states that "the SEA process on the Development Plan has been positive. The early identification of the important environmental issues within the County, and refinement of those issues during the scoping process and production of the Environmental Report allowed for adoption of meaningful environmental protection policies into the Development Plan".

The AA screening of the CDP states that eight Natura 2000 sites were identified as being of relevance for the screening assessment by virtue of either being located within South Dublin County (Glenasmole Valley SAC, Wicklow Mountains SAC, and the Wicklow Mountains SPA), or having a hydrological/ecological pathway link to the Plan lands (Poulaphouca Reservoir SPA, North Dublin Bay SAC, South Dublin Bay SAC, South Dublin Bay and Tolka River Estuary SPA; and North Bull Island SPA). The AA Screening found that "that there are no likely significant direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on any Natura 2000 site and there was no requirement to proceed to a Stage 2 assessment – Natura Impact Statement (NIS).

The SEA Statement on the Fortunestown LAP states that "The early identification of the important environmental issues within the plan area, and refinement of those issues during the scoping process and production of the Environmental Report allowed for adoption of meaningful environmental protection policies into the LAP".

As the CDP and LAP, approved and adopted by SDCC, already provides a strategic framework indicating the manner in which the site may be developed, the range of alternatives was therefore lessened. The overall development for the site in this case should comprise of:

- Residential uses
- Educational uses
- Recreational & Open Space uses
- Development of pedestrian and cycle routes

The overall form and content of the any proposed development is fixed by the requirement of the LAP for the lands. In this regard, the consideration of alternatives during the design stage was confined to details such as:

- Residential layout and mix
- Residential density
- Design and layout of open space
- Form and layout of the vehicular access routes
- Form and layout of pedestrian and cycle routes

The development proposal in this case considered alternatives which are in keeping with the local, regional and national guidelines. In the first instance, the proposed development is considered relative to the *"do-nothing*", "*do-minimum*" and "*do-maximum"* scenarios.

### 2.20.1 Alternative Location, Size and Scale

The location and proposed housing mix has been determined by the land use zoning objectives contained in the SDCC Development Plan 2016-2022 and the Fortunestown LAP 2012. In addition, cognisance has been paid to An Bord Pleanála's Opinion (Pre-application Consultation Ref. 308352-20) in relation to density and housing mix. The proposed development has also had regard to the following Section 28 Ministerial Guidelines: (i) Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009) which refer to minimum net densities of 50 dwellings per ha along public transport corridors and encourage development at a sufficiently high density to provide for an efficiency in serviceable land usage and (ii) the Guidelines for Planning Authorities on Building Heights and Urban Development, 2018 and their SPPRs.

As noted above, the LAP was subjected to its own environmental assessment including consideration of alternative scenarios. Therefore, apart from localised interpretation of the LAP to suit conditions on the ground, no alternative sites were considered in this EIAR as the development of this site for the uses proposed has been identified as a strategic objective.

This is in line with EPA Guidelines (2002 and 2017 Draft Guidelines) which recognises that it is not realistic to consider alternative options for projects which have been previously determined by a higher plan.

*"Hierarchy*

*EIA is only concerned with projects. Many projects, especially in the area of public infrastructure, arise on account of plans, strategies and policies which have previously been decided upon. It is important to acknowledge that in some instances neither the applicant nor the competent authority can be realistically expected to examine options which have already been previously determined by a higher authority (such as a national plan or regional programme for infrastructure or a spatial plan)."* (Source: EPA Guidelines on

the information to be contained in Environmental Impact Statements, Section 2.4.3. Alternatives, page 12).

It is noted that the suitability of the subject site for the nature of development proposed was considered as part of the SEA process undertaken by SDCC in the making of the LAP.

### 2.20.2. Alternative Uses

The subject lands are currently in greenfield, agricultural use and have no specific / relevant previous grant of permission for similar residential development attached to them.

The development proposal is located on lands zoned objective RES-N: *"To provide for new residential communities in accordance with approved area plans"*in the existing CDP, therefore; it is evident that the Local Authority supports the provision of residential development on the subject lands.

The Fortunestown LAP identifies a primary school site on the north-western part of the site, with the subject proposal catering for the reservation of a site to accommodate a future school should the Department of Education and Skills require same.

The design parameters for the development proposal are set down in the first instance in the CDP which has determined the land use objective for the site. The LAP sets out objectives in relation to density, building height / plot ratio and other physical characteristics. The development proposal is put forward having been guided by detailed discussions with the relevant SDCC departments, Planning, Roads & Traffic, Parks and Water and Drainage etc. prior to the proposed development being prepared. These detailed discussions highlighted the environmental issues to be addressed, which informed the design process.

Alternative site layouts and siting progressed throughout the design process in order to minimise the impact on the receiving environment at the earliest opportunity. The initial stage involved a constraints analysis of the land within the proposed development site to identify all high-level constraints and aggregate them against the site to allow a suitable layout to be developed.

The main alternative use for the subject lands would be to maintain its current agricultural use. In any event, it is envisaged that in the long term, these lands will be developed for residential purposes to accommodate much needed new housing in Dublin.

As such it was not considered necessary to consider alternative uses for the proposed development. This approach is in line with EPA Guidelines (2002 and 2017 Draft Guidelines) which recognises that it is not realistic to consider alternative options for projects which have been previously determined by a higher plan as detailed below:

*"Hierarchy EIA is only concerned with projects. Many projects, especially in the area of public infrastructure, arise on account of plans, strategies and policies which have previously been decided upon. It is important to acknowledge that* ***in some instances neither the applicant nor the competent authority can be realistically expected to examine options which have already been previously determined by a higher authority*** *(such as a national plan or regional programme for infrastructure or a spatial plan)."* (Source: EPA Guidelines on the information to be contained in Environmental Impact Statements, Section 2.4.3 Alternatives, page 12).

### 2.20.3. Alternative Design & Layouts

The development proposal is put forward with the consent of the landowners (the Applicants) and as such, the development process has seen the applicants and the Local Authority work together to ensure that a number of design alternatives and layouts have been considered.

The design parameters for the development proposal are set down in the first instance in the CDP and LAP which have determined the land use mix, the building height, density and other physical characteristics. The development proposal has been guided by detailed discussions with the relevant SDCC departments, Planning, Roads & Traffic, Parks & Water and Drainage etc. prior to the proposed development being prepared. These detailed discussions highlighted the issues to be addressed, which informed the design process.

Alternative site layouts and siting progressed throughout the design process in order to minimise the impact on the receiving environment at the earliest opportunity. The initial stage involved a constraints analysis of the land within the proposed development site to identify all high-level constraints and aggregate them against the site to allow a suitable layout to be developed.

The following analyses the alternative development options that were considered for the subject site, including previous development proposals, and then describing design options and changes which were incorporated into the scheme as the proposals progressed through the design process and pre-application discussions with the Planning Authority (S.247 pre-planning consultation) and with An Bord Pleanála (S. 5 Pre-application consultation).

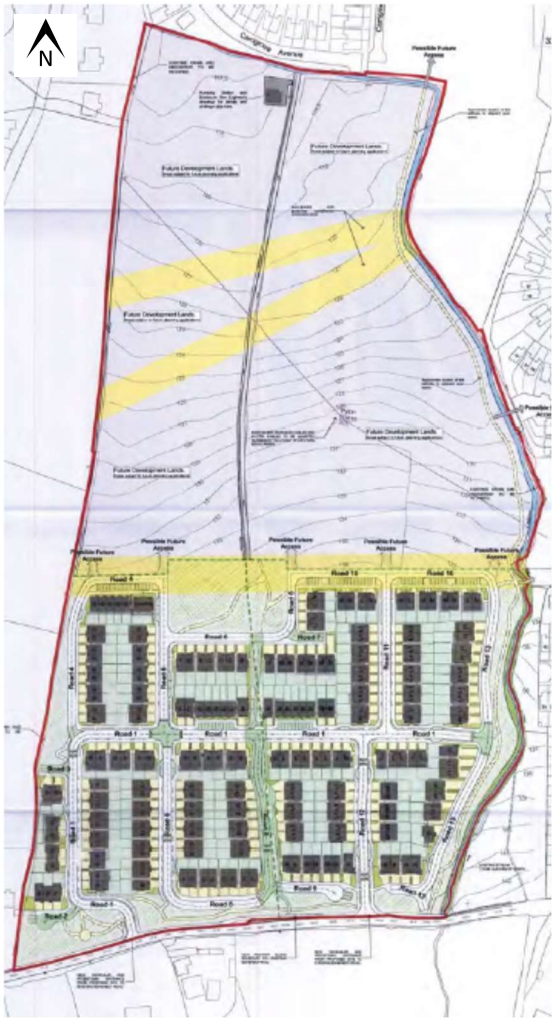



**Fig. 2.5 - Planning Application Ref.s SD15A/0388 & PL06S.247074 – refused on appeal by An Bord Pleanála 13.12.2016**


**Fig. 2.6 – Previous SHD Planning Application Ref. ABP-304828-198 - refused by An Bord Pleanála 30.09.2019**

The earliest proposal for the subject application and development of the site considered the layout and form of buildings, open spaces and road/street network for the subject site as shown in Figure 2.7:


**Fig. 2.7 - Earlier alterative design layout as discussed at S.247 pre-planning meeting with Planning Authority 27.07.2020**

The layout illustrated in Fig. 2.7 above was discussed with the Planning Authority at the S.247 pre-planning consultation stage in July 2020.

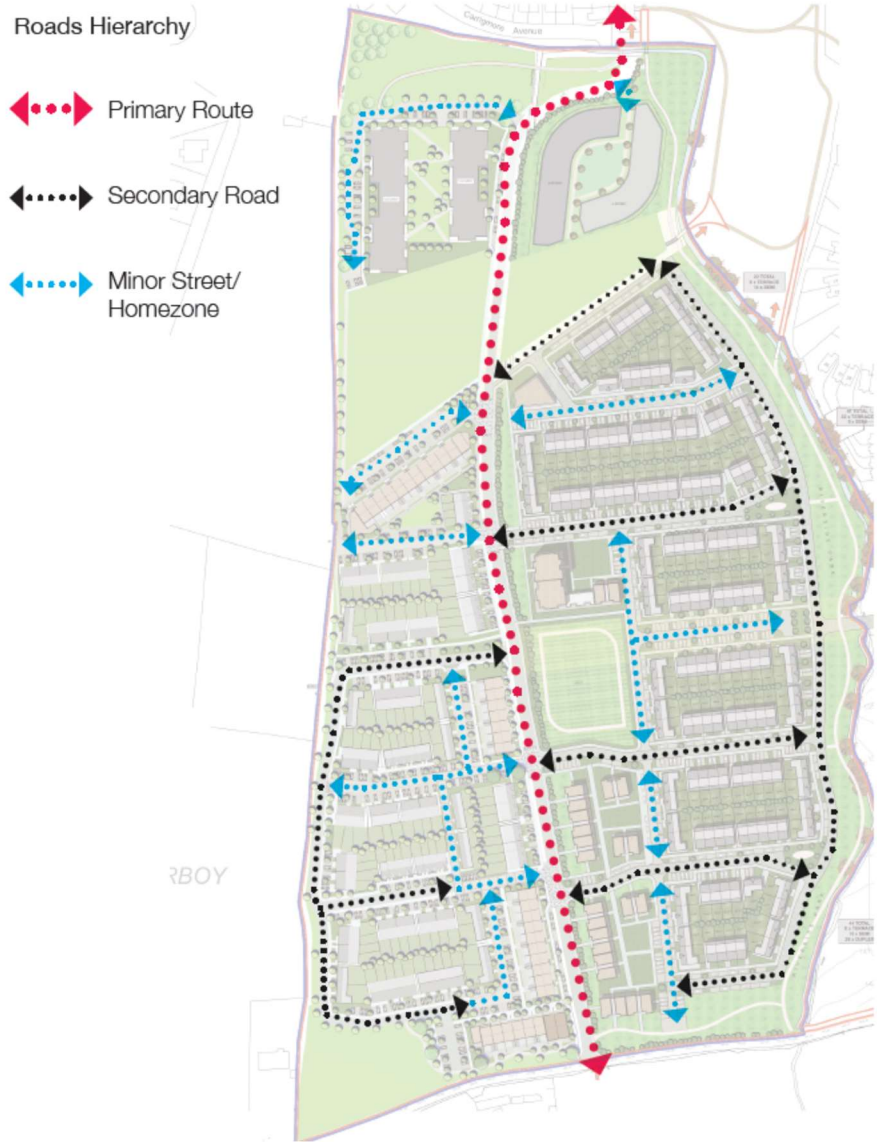



**Fig. 2.8 - Earlier Sketch Layout of the proposed roads hierarchy throughout the scheme**

These considerations have informed the consideration of alternative layouts, dwelling mix, density, designs, open space provision, the layout of the proposed roads/streets through the subject site and connections to adjoining lands, addressing the issues of population and human health, biodiversity, archaeology and traffic and access arrangements.

The layout now put forward for permission has also been informed by the feedback received via pre-planning consultation meetings held with the SDCC Planning Department under Section 247 of the Planning and Development Act, 2000 (as amended). A series of meetings have been held with the Council's Roads Department on the substance of the proposed development, particularly the proposed upgrades to the Boherboy Road and the proposed access connections to adjoining residential estates.

In addition, meetings and consultation took place with officials from the Roads & Traffic Section, Drainage, Parks and Housing Departments, between the applicant and various relevant members of the design team. The outcome of the various aforementioned meetings have been carefully considered, taken on board and incorporated into the development proposal that that subsequently submitted to An Bord Pleanála for pre-application consultation.

Figure 2.9 below details the layout submitted to An Bord Pleanála at pre-application consultation stage.


**Fig. 2.9 - Layout submitted to An Bord Pleanála for pre-application consultation**

The proposed design consideration for the subject lands were the subject of one no. formal pre-planning consultation meeting with SDCC as well as one formal pre-application consultation SHD meeting with An Bord Pleanála (which SDCC attended).

**An Bord Pleanála Opinion**

During the course of the pre-application tri-partite meeting with the Board, and within the Opinion of the Board, which was issued thereafter, details were set out regarding the specific information to be included as part of a SHD planning application, including details on density, a design report/rationale, details on the extent of works proposed to the Boherboy Road, cross sections, plans and details regarding connectivity and permeability within and through the site, details on the extent of cut and fill required to accommodate the proposed development, DMURS statement of compliance, housing quality assessment, building life cycle report, details on phasing, a draft Construction Management Plan, a draft Waste Management Plan and a Material Contravention Statement where necessary.

Following the receipt of detailed feedback from An Bord Pleanála during the course of the pre-application meeting, and receipt of the opinion of the Board, the applicants and design team undertook a number of revisions to the development proposal which is reflected within the final development proposal submitted for permission as part of a SHD planning application.

As noted within the development description sections of this chapter, the scheme now comprises a quantum of residential development consisting of 655 no. dwellings.

The key changes proposed related to:

- Increasing the density of residential development in the southern half of the site;
- Changes to the mix of dwelling types;
- Greater enclosure of streets through the location of buildings.

Responses to each of these items have been provided as part of the SHD planning application pack, and the scheme has been updated and improved where necessary as a result.

The overall development strategy is to divide the site up into a series of precincts determined by the natural topography and features of the site. Each precinct will have a distinctive character defined in some cases by the topography and open space network and in other cases by the density.

Based upon the feedback at pre-planning stages, as well as the planning history attached to the site, the layout now put forward for permission evolved from the earlier iterations and is based upon the need to achieve a net density of development that complied with the guidance set out in the 2009 Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas and to comply with the urban design guidance set out in its accompanying Urban Design Manual Best Practice. The need to provide connectivity to adjoining lands, provide variety in housing typology, create distinctives within the scheme, have regard to the topography of the site and create definition and a sense of enclosure around the central park

Thorough consideration was given to how the proposed layout integrates with the existing boundary conditions and neighbouring context in terms of height, density and connectivity. In terms of density, it was decided to locate the greatest density in closest proximity to public transport infrastructure and as such, the apartments proposed in this development are predominantly situated to the north of the site, 600m from the Fortunestown Luas stop.

Density on the site is also stratified from predominantly duplex and apartment style development along the central link street and down to lower density housing at the eastern and western edges. The duplex and apartment accommodation located along the central link street and central park have been designed as higher density 3 and 4 storey elements reflecting the status of the connecting nature of this primary north south boulevard. The eastern and western boundaries are characterised by a lower density comprising of mostly 2 and 3 storey semi-detached and terraced houses responding to the character of the existing developments that surrounds the site.

The greatest scale proposed is situated to the extreme north of the site. This is the lowest point of the site, some 25m lower than the Boherboy Road to the south. It is considered appropriate that the tallest buildings be located here to avoid obscuring views of the Dublin mountains to the south of the site, and also on account of proximity to public transport infrastructure.

The layout and orientation of the scheme has respected topography, aspect and views to ensure dwellings, their private gardens and areas of public open space achieve excellent sunlight penetration throughout the day. Generally most of the homes have been orientated north-south ensuring they enjoy east-west light throughout the day.

The proposal incorporates objectives from the Fortunestown LAP 2012 into the design proposal, including the provision of essential pedestrian, cycle and vehicular links connecting the Boherboy Road with the existing Carrigmore residential estate to the north and Carrigmore Park to the north-east, via the proposed central avenue through the scheme and the proposed "Riverside Park" along the eastern boundary of the site. The layout provides for a straight forward, easily accessible and easily navigable network of places.

The open spaces and street networks are overlooked by surrounding buildings maximising passive surveillance of the public realm. Blank gables and long runs of screen wall have been avoided and the use of dual frontage units with gable entry on corners reinforce the active street frontage strategy employed throughout.

Insofar as the EIA is concerned, a number of iterations of the site layout and alternative designs were prepared and considered for the project. This involved taking into account the various technical and environmental considerations which are addressed in the EIA and which informed the design of the proposed development.

The design process, having taken into consideration the discussions held with SDCC, individual consultants who inform the chapter of this EIAR, and the feedback received from An Bord Pleanála at the Pre-Application Consultations, has resulted in the layout now put forward for permission. It is considered that this layout represents the best utilization of these zoned lands, complies with the objectives for the lands contained in the CDP and LAP and mitigates against significant environmental impacts.

In summary, the development proposal will, *inter alia*:

- Comply with the land-use zoning designation for the subject site;
- Provide appropriate accommodation which can cater for different life stages by delivering a variety of 1, 2, 3 & 4 bedroom housing typologies;
- Provide an appropriate density of development;
- Comply with the Planning Authority's detailed quantitative standards for residential development as set out in the existing SDCC CDP and, where appropriate, Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2020);

- Provide a level of social and affordable housing (133 no. units) with equates to 20% of the overall quantum of proposed dwellings;
- Support sustainable transport modes via the creation of pedestrian and cycle connections;
- The proposed development also provides a creche (693m$^2$);
- Protect the existing residential amenity enjoyed by the residents of neighbouring developments;
- Preserve, where feasible, the natural amenity characteristics of the site, and provide for new features where necessary in order to ensure that the visual impact of the development is minimised. This has been achieved by allocating areas of open space for recreation, all of which will be developed in accordance with the overall Landscape Plan for this proposed development.


**Fig. 2.10 – Site Layout Plan being put forward for permission**

With regard to the layout put forward for permission, the iterative process included alternative site layouts that were considered with the objective of submitting an overall high-quality designed scheme which has undergone a robust consideration of relevant alternatives in reference to the comparison of environmental effects and meets the requirements of the EIA Directive, based on the multidisciplinary review across all environmental topics.

The final design now put forward for permission presents the most effective utilization of this site whilst also fulfilling the objectives of the Planning Authority and providing for long term, sustainable housing for which there is a considerable demand at present and providing for a use of material, architectural form and colour to create a high level of visual amenity.

The proposed development takes into account all effects raised with respect to the pre-application design submitted to An Bord Pleanála, and within the Board's Opinion, and provides for a sustainable development that has been optimised to emphasise positive environmental effects whilst reducing negative environmental impacts wherever possible.

The main consideration has been to achieve a design solution for the preferred layout which would enable all of the functional and operational requirements of the scheme to be met, whilst also ensuring the sensitive siting of new elements within the site. Having established the quantum, type and mix of residential units, a series of alternatives were considered by the design team. This process has enabled the final proposal to evolve. The need to provide for an appropriate level of enclosure of open spaces through the built form, in addition to landscaping, has driven the final layout form and design solution as proposed as part of the SHD planning application.

Alternative locations for the various built elements of the development were considered and examined at the design stage.

### 2.20.4. Alternative Processes

This is a residential / urban development and therefore there are no alternative processes to be considered.

## 2.21 The *"Do Nothing"* Scenario

The "*Do Nothing"* Scenario describes the impacts of the proposed development, if it were not carried out. The positive benefits to the national, regional and local community arising from the development of this site would not materialise in the *"Do Nothing"* scenario. In addition, the *"Do Nothing"* scenario would result in non-compliance with the NPF which contains the following relevant objectives:

- **National Policy Objective 3a** - Deliver at least 40% of all new homes nationally, within the built-up footprint of existing settlements;

- **National Policy Objective 32** - To target the delivery of 550,000 additional households to 2040.

This alternative is therefore not attractive with the site possibly remaining occupied by a tenant in the large industrial type building and associated yard on site.

## 2.22 The *"Do Minimum"* Scenario

The *"Do Minimum"* Scenario could involve the construction of the subject site at the minimum density prescribed in the LAP for this area, i.e. net residential density of c.30-40 units per hectare. As outlined in the Planning Report which accompanies the application the net developable area is c. 15.28 hectares which would result in a development of approximately 458 no. dwellings. However, the current proposal is supported by national and local planning policy to provide housing and intensify land use through increased densities. The CDP supports higher densities in appropriate areas in line with the standards set out in the CDP, which promotes higher residential densities at appropriate locations and to ensure that the density of new residential development is appropriate to its location and surrounding context. This approach is consistent with, and has been informed by, Guidelines for Planning Authorities on Sustainable Urban Development (Cities, Towns and Villages), (Department of Environment, Heritage and Local Government, 2009), and its companion document, Urban Design Manual: A Best Practice Guide.

Alternatively, the *"Do Minimum"* scenario could involve the construction of the application site via a number of individual planning applications. While this alternative may reduce the level of construction activity in the short term, it is considered that it would have the effect of spreading construction over a longer period of time and could result in incoherent development which will not deliver the objectives of the CDP. The *"Do-Minimum"* scenario would also result in reduced efficiencies in construction and delays.

## 2.23. The "*Do Maximum"* Scenario

The *"Do Maximum"* Scenario could involve the construction of the entire site in one phase of development i.e. circa 655 no. residential units. This would involve a greater degree of disruption to the receiving environment in the short term. This alternative was discounted on the basis of practical considerations relating to phasing of development, funding and feasibility.

## 2.24. Conclusion on Assessment of Alternatives

Based on the foregoing, it is considered that all reasonable alternatives to the proposed development were considered and no alternatives have been overlooked which would significantly reduce or further minimise environmental impacts.

## 2.25. The Existence 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 site development works, a creche, and areas of open space. 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 this 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.

### 2.25.1 Description of Changes to the Project

Draft Guidelines on the information to be contained in environmental impact assessment reports were published by the EPA in August 2017.

The draft guidelines 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 lifecycles 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 growth) does not imply permission for such growth, its identification and consideration can be an important factor in the determination of the application."*

- *Descriptions of changes may cover:*
- *Growth*
- *Decommissioning*
- *Other Changes."*

As per the draft 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, the limitations of physical boundaries and adjoining land uses, the potential for growth of the proposed development is considered limited and confined 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 CDP. The future (re)development of adjacent lands will be the subject of separate land use zoning and 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.

### 2.25.2 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.

### 2.25.3 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.

In accordance with Article 3(2) and Annex IV of the 2014 EIA Directive, the vulnerability of the project to risks of major accidents and/or disasters is considered, and the implications for likely significant effects on the environment if it did occur.

Article 3(2) of the 2014 EIA Directive states that an EIAR shall consider:

*'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'.*

An EIAR should also contain the following information prescribed in 5(d) of Annex IV of the 2014 EIA Directive:

> *5. "A description of the likely significant effects of the project on the environment resulting from, inter alia:*
> *....*
> *(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);"*

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

- *"The potential of the project to cause accidents and/or disasters, including implications for human health, cultural heritage, and the environment;*

- *The vulnerability of the project to potential disasters/accidents, including the risk to the project of both natural disasters (e.g. flooding) and man-made disasters (e.g. technological disasters)."*

*(Source: Page 31, Section 4.29)*

During the construction phase the risk of accidents and/ or disasters arise from the potential for construction accidents are addressed under Health and Safety Regulations and other codes. Insofar as they are relevant to the planning and EIA process, mitigation measures that will prevent and/ or mitigate the significant effects are identified.

During the operational phase the risk of fire related accidents is similarly addressed through the Building Regulations (Fire Safety) and is therefore addressed through primary mitigation in the design process. Residual risks of fire and road traffic accidents will be managed by emergency services as per their standard procedures.

The risk of flooding and vulnerability of the project is addressed in the Site Specific Flood Risk Assessment (SSFRA) submitted with the planning application documentation. Adherence to best practice and "proper planning and sustainable development" principles means these risks are reduced to an acceptable level, whereby the risk is unlikely and unexpected as a result, and further assessments within the EIA process are not necessary.

Otherwise, in terms of the project, no other major accidents or disasters are considered to give rise to effects that are 'likely' and 'significant'.

## 2.26. Construction Phase

The Construction Phase would be expected to commence in Q2 2022, and accordingly, the projected completion of the buildings by Q4 2026.

The Outline Construction Management Plan (CMP), the Outline Construction Traffic Management Plan and Construction & Demolition Waste Management Plan (CDWMP), which are included with this planning application, should be referred to for more detail on the Construction Phasing and Environmental Measures associated with same. The appointed Contractor will prepare a detailed final CMP, including detailed construction phasing and a Traffic Management Plan (TMP).

## 2.27. Description of the Operational Phase

The proposed development consists of 655 no. dwellings comprised of residential houses, apartments and duplex units ranging in height from 2 to 5 storeys. The proposed development also includes for a 2 storey crèche / childcare facility.

The primary direct significant environmental effects will arise during the Construction Phase. As a result, the Operational Phase of the 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 human beings, flora and fauna, soils, water, air and climate.

## 2.28. 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. However, all cumulative, secondary and indirect impacts are unlikely to be significant and, where appropriate, have been addressed in Chapter 15 (Interactions) and the cumulative impacts are fully addressed in the relevant specialist Chapters of this EIAR.

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other planned 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.

# Part B – Effects on the Environment

# 3.0. Population and Human Health

## 3.1. Introduction

This chapter of the EIAR provides an assessment of the potential impacts of the development proposal on human beings, population, and human health within the vicinity of the application site and an assessment of these issues.

Issues associated with population and human health are varied and cover a broad spectrum of topics associated with the existence, activities and wellbeing of people as groups. Whilst most developments will affect people in some form or way, this chapter of the EIAR focuses on those topics which are manifested in the environment, such as demographic change, impacts on community facilities, on the economy, and on indicators of human health. Actual and perceived impact of the proposed development on population and human health may also arise from a number of elements of the proposal. These impacts are dealt with throughout the EIAR, and in particular, the following chapters:

- Chp. 5: Land, Soil and Geology;
- Chp. 6: Water;
- Chp. 7: Air Quality and Climate;
- Chp. 8: Noise;
- Chp. 9: Material Assets: Built Services;
- Chp. 10: Material Assets: Traffic and Transport;
- Chp. 11: Material Assets: Resource & Waste Management;
- Chp. 13: The Landscape.

The EIA Directive updated the list of topics to be addressed in an EIAR and has replaced '*Human Beings*' with '*Population and Human Health*'. The term '*human health'* is not defined in the 2014 EIA Directive; however, the European Commission (EC) *Guidance on the Preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)* (2017) states that:

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

The EPA *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2017) state that:

*"In an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc."* (p. 29)

This Chapter also meets the requirement for assessment of '*Human Beings'* as per Schedule 6 of the Planning and Development Regulations, 2001 (as amended).

This Chapter has been prepared by Armstrong Fenton Associates Planning Consultants (Tracy Armstrong, BA, MRUP, MIPI, MRTPI).

### 3.2. Assessment Methodology

The assessment involved a desktop study of census information, divided into State, County, Town and District Electoral Division (DED) level where possible. While the primary focus of this EIAR is the lands located within the immediate vicinity the development proposal i.e. the Fortunestown LAP lands, Census statistics at a DED level have been used to assess the effects on the existing population as the DED level data generally provides the most accurate picture of existing population in the vicinity of a development. The proposed development lies within Saggart DED, as shown in Figure 3.2.

Based on this study, it was possible to consider the presence, importance and sensitivity of the population and the potential likely significant impacts on both the local and wider community. Based on these sources, the assessment involved a desk study of a range of planning and other sources. A profile of the residential communities adjacent to the proposed development is presented under the following headings:

- Land Use/ Settlement Patterns;
- Population Growth;
- Socio-economic Profile;
- Community Facilities;
- Movement and Transportation.
- Landscape and Visual
- Human Health

Chapter 1 of this EIAR noted the likely environmental effects which were assessed at a Strategic Level as part of the CDP and LAP. The public was consulted in the making of both the CDP and LAP, and their views taken into account by SDCC in finalising and adopting both the CDP and LAP.

This assessment has been carried out in accordance with the following guidance, and tailored accordingly based on professional judgement:

- EPA (2017). *Guidelines on the Information to be Contained in Environmental Impact Statements*;
- EPA (2015). *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*;
- IEMA (2017). *Health in Environmental Impact Assessment: A Primer for a Proportionate Approach*.

Perceptions of the proposed development are subjective, however, it is considered that the impacts presented are representative of the impacts on the majority of those residing/working within the study area.

#### 3.2.1. Significance of Impacts

In line with the EPA's "*Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports"* (EPA, 2017); seven generalised degrees of impact significance are used to describe impacts as detailed in Table 3.1 over:

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

**Table 3.1 Definition of Significance of Effects**

In addition, the following terms detailed in Tables 3.2 & 3.3 are defined when quantifying the quality of effects and the duration and frequency of effects.

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

**Table 3.2 Definition of Quality of Effects**

| Quality | Definition |
|---|---|
| Momentary Effects | Effects lasting from seconds to minutes |
| Brief Effects | Effects lasting less than a day |
| Temporary Effects | Effects lasting less than a year |

| | |
|---|---|
| Short-Term Effects | Effects lasting one to seven years |
| Medium-Term Effects | Effects lasting seven to fifteen years |
| Long-Term Effects | Effects lasting fifteen to sixty years |
| Permanent Effects | Effects lasting over sixty years |
| Reversible Effects | Effects that can be undone, for example through remediation or restoration |

**Table 3.3 Definition of Duration of Effects**

## 3.3. Characteristics of Proposed Development

The development proposal is described in detail in Section 1.2 of this EIAR. The development proposal comprises of, *inter alia*, 655 no. residential dwellings, a 2 storey creche (693m²).

The development will consist of 655 no. dwellings, comprised of 257 no. 2, 3 & 4 bed, 2 & 3 storey detached, semi-detached & terraced houses, 152 no. 1, 2 & 3 bed duplex units in 17 no. 2-3, 3-4 & 4 storey blocks, and 246 no. 1, 2 & 3 bed apartments in 9 no. buildings ranging in height from 2, 2-5, 4-5 & 5 storeys, and a 2 storey crèche (693m²).

Access to the development will by via one no. vehicular access point from the Boherboy Road, along with proposed upgrade works to Boherboy Road to include the provision of a roadside footpath along the front of the site at the Boherboy Road, continuing eastwards to the junction with the N81 Blessington Road (for an overall distance of c.370m). The proposed development also provides for pedestrian and cyclist connectivity to the adjoining Carrigmore Park to the north-east, and vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north.

The proposed development provides for (i) all associated site development works above and below ground, including surface water attenuation & an underground foul sewerage pumping station at the northern end of the site, (ii) public open spaces (c. 3Ha), including alongside the Corbally Stream, which will accommodate the provision of pedestrian / cyclist links to Carrigmore Park to the north-east, (iii) communal open spaces (c. 6,392m²), (iv) hard and soft landscaping and boundary treatments, (v) undercroft, basement & surface car parking (914 no. car parking spaces), (vi) bicycle parking (797 no. bicycle parking spaces), (vii) bin & bicycle storage, (viii) public lighting, and (ix), plant (M&E), utility services & 5 no. ESB sub-stations, all on an overall application site area of 18.3ha. In accordance with the Fortunestown Local Area Plan (2012) an area of approx. 1.42Ha within the site is reserved as a future school site.

## 3.4. The Existing Receiving Environment (Baseline Situation)

### 3.4.1. 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.

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

- Land-Use Planning / Settlement Patterns;
- Population Growth;
- Socioeconomic Profile;
- Community and Outdoor Facilities;
- Movement and Transport;
- Human Health.

### 3.4.2. Study Area

The existing site is greenfield that slopes from south to north with the Boherboy Road level being at c. 146m OD with a slope down to a contour of c. 119m OD at the northern boundary. The site has no inhabitants but is bounded by existing residential developments to the north (Carrigmore Estate) and east (Verchoyle Estate/ Corbally Estate). To the south, the site abuts the Boherboy Road while to the west of the site lays an individual dwelling, and greenfield lands, beyond which is Saggart village. The area of the application site is approximately 18.3Ha, slightly irregular in shape and has a dividing dry ditch running along a north-south axis acting as the boundary between the ownership of both applicants.

For the purposes of this assessment, a study area was identified and is broadly defined as the study area defined for the preparation of the Fortunestown LAP - see figure 3.1 over.

This study area includes 5 distinctly defined character areas:

- Business District;
- Established Residential District;
- New Residential District;
- Mixed District 1– Kingswood;
- Mixed District 2 – Saggart and Boherboy.

The area in relation to this proposed development is the Mixed District 2: Saggart & Boherboy. The Mixed District 2 comprises three distinct areas namely Citywest Hotel and Golf Complex; Saggart Village; and Boherboy.

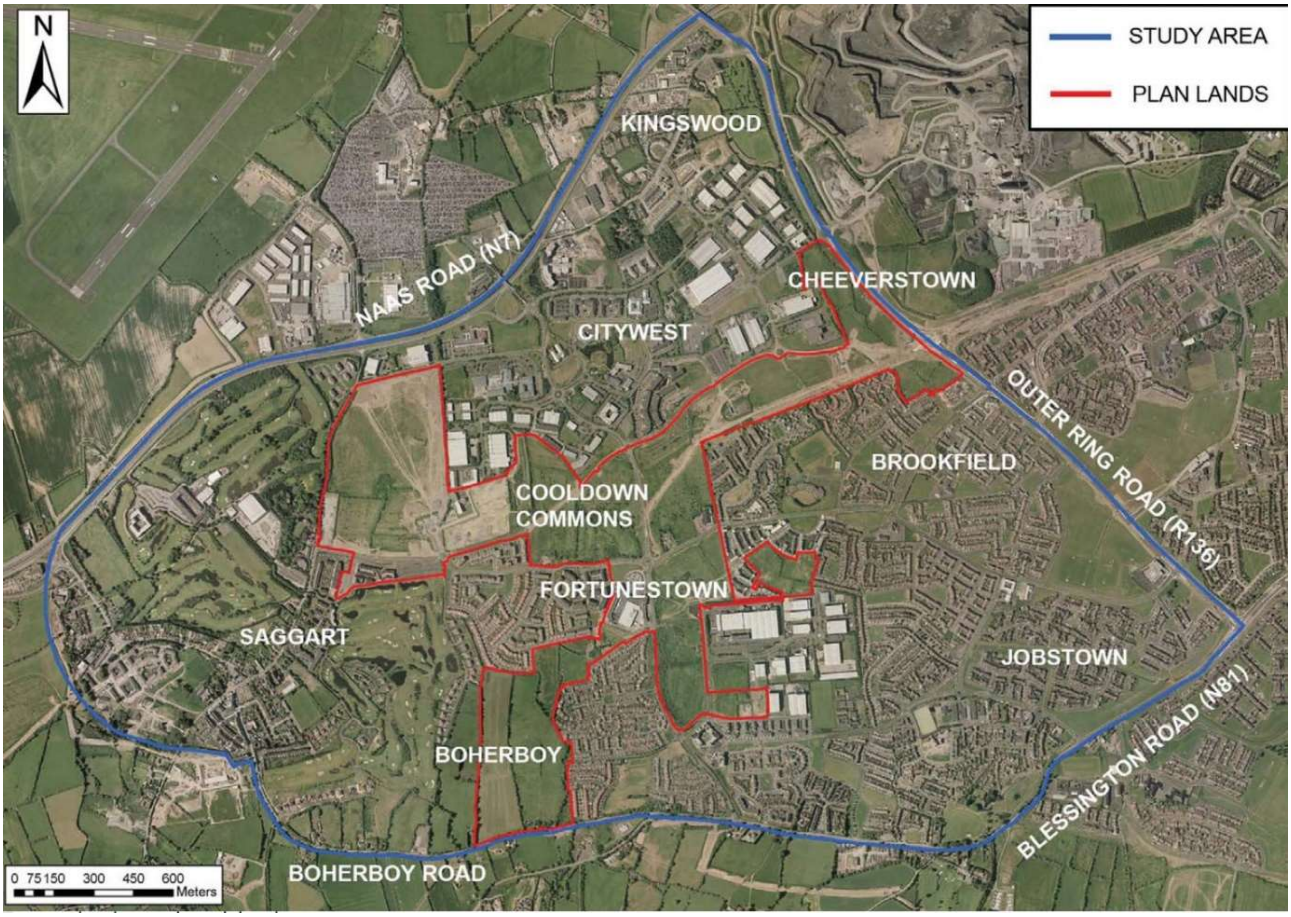



**Fig. 3.1 – Fortunestown LAP Plan Lands and Study Area** (Source: Figure 2.1 Fortunestown LAP 2012)

The primary focus of this EIAR are the lands in the immediate vicinity of the application site. The majority of the development site, is contained within the Saggart DED, with the eastern part of the site being within the Tallaght-Jobstown DED. A DED is the smallest area for which Census statistical data is published and therefore provides a detailed analysis of population fluctuations and demographic trends.

Sensitive receptors include neighbouring landowners, local communities and other parties which are likely to be directly affected by the project. In particular homes, hospitals, hotels, schools, community facilities and commercial premises are noted. Regard is also given to transient populations including drivers, tourists and walkers.

The sensitive receptors impacted upon by Air, Noise and Visual effects are identified in the relevant Chapters of this EIAR (Chapters 7, 8 and 13 respectively). The existing receptors specifically relevant to this Chapter include:

- The residents of Carrigmore, Corbally / Verschoyle and Saggart Lakes residential estates;
- The schools south of Fortunestown Lane;

Future receptors will be the residents of the proposed development and the schools proposed for development within the Boherboy Neighbourhood.

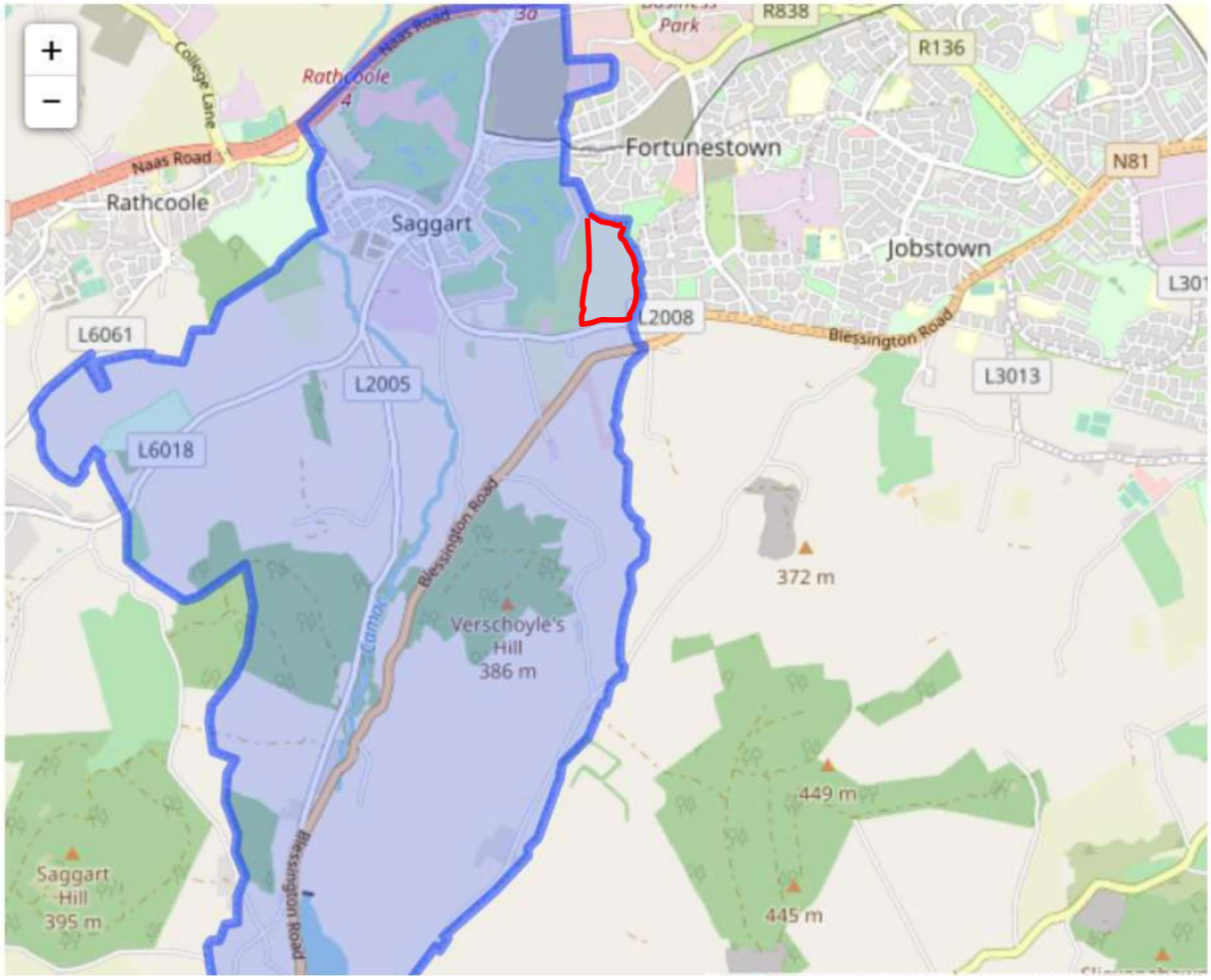



**Fig. 3.2 – Part of the Saggart DED area coloured blue, with subject site outlined in red**
**(Source: www.townlands.ie )**

### 3.4.3. Land Use Planning/Settlement Patterns

The project site is large, greenfield site zoned for residential use. Within the study area, the existing settlement pattern provides for a varied mix of uses including residential, light industrial, warehouse, office, recreational, retail and service uses.

Residential uses occupy the largest proportion of the Study Area, i.e. the Fortunestown LAP area. Recreational and tourism uses in the form of the Citywest Hotel, Golf Course and Convention Centre are concentrated in the western quadrant of the Study Area. Recreational lands and community facilities also permeate the eastern quadrant of the Study Area.

The main concentration of retail and service uses occurs close to the centre of the Study Area at the Citywest Shopping Centre.

Light industry, warehouse and office uses are primarily concentrated in the Citywest Business Park with a small cluster at Magna Business Park.

Within the study area, the existing settlement pattern provides for a varied mix of uses including residential, light industrial, recreational, retail and service uses. Residential and proposed residential uses occupy the largest proportion of the study area. Enterprise and employment uses are concentrated to the north and east of the study area. Education, community and institutional uses also permeate the study area.

### 3.4.4. Population Change

For the purposes of population evolution and growth forecasting, this EIAR has examined Census results from both the 2011 and 2016 Census in terms of the State, County and Local Level. The Study Area includes the following Electoral Division (ED's):

- Tallaght - Jobstown
- Tallaght - Fettercairn (the majority of this ED)
- Saggart (a significant amount of this ED)

A small area of the Rathcoole ED is located within the Study area. Due to the limited extent of this area, it has been excluded from the demographic analysis.

| | 2011 Population | 2016 Population | Actual Change | % Change |
|---|---|---|---|---|
| **State** | 4,588,252 | 4,761,865 | 173,613 | 4% |
| **South Dublin County** | 265,205 | 278,767 | 13,562 | 5% |
| **Saggart (ED ID 3027)** | 3,060 | 4,113 | 1,053 | 34% |
| **Tallaght – Jobstown (ED ID 3032)** | 16,630 | 17,788 | 1,158 | 7% |
| **Tallaght – Fettercairn (ED ID 3030)** | 7,607 | 8,318 | 711 | 9% |

**Table 3.4 - Population Change at State, County and Local Level 2011-2016**

The three EDs of Saggart, Tallaght-Fettercairn and Tallaght-Jobstown have grown to a population of 30,219 persons as per the published census data for 2016.

This is a growth of 11% (2,922) overall for the 3 ED's in the study area for the five year period since the 2011 census. Prior to this, the population had grown at a rate of 24% between 2006 and 2001. Please refer to Table 3.4 "Population change for EDs in the Study Area":

| Electoral Division | 2006 | 2011 | 2016 | % Change 2011 -2016 |
|---|---|---|---|---|
| **Saggart (ED ID 3027)** | 1,857 | 3,060 | 4,113 | 34.4% |
| **Tallaght-Fettercairn (ED ID 3030)** | 6,633 | 7,607 | 8,318 | 9.3% |
| **Tallaght-Jobstown (ED ID 3032)** | 13,483 | 16,630 | 17,788 | 7% |
| | | | | |
| **Total** | **21,973** | **27,297** | **30,219** | **11%** |

**Table 3.5 – Population Change for ED's in the Study Area (2011 – 2016)**

In addition to the resident population, there is also a significant working population within the study area.

### 3.4.5. Socioeconomic Profile

The socio economic profile of the study area is presented using 2016 Census data under the headings of household formation, age profile, dependant age cohorts (0-14 and 65+ years), the working age group (15-64 years) and the 25-44 age cohort.

#### 3.4.5.1. Household Formation

The total number of households in the study area was 9,339 according to the 2016 Census data. The total number of households in the Tallaght-Jobstown Area was 5,528 in 2016, 2,368 in Tallaght-Fettercairn and 1,443 in Saggart.

The average household size for the State as a whole was 2.75 persons in 2016 with South Dublin County having average household size of 2.99. Based on the above, the study area has an average household size of 3.2 persons which is higher when compared with both the State as a whole and county Dublin.

The average household size has increased from each of the ED's within the Study Area, with an average of 3.2 persons per household in 2016. This is compared to 3 persons per household in 2011.

#### 3.4.5.2. Age Profile

This section provides a comparative demographic breakdown of the study area (i.e. the three ED's of Tallaght-Jobstown, Tallaght-Fettercairn and Saggart), County Dublin and the State. For the purposes of analysing the receiving environment, three factors will be examined:

- **(i)** the dependant population (i.e. those persons within the 0-14 and 65+ age cohorts)
- **(ii)** the working/independent population (i.e. those persons residing in the 15-64 year age cohorts) and
- **(iii)** those persons within the family formation age cohorts, aged 25-44

Figure 3.3 over provides a comparison of the population's cohorts in the study area with South Dublin County and the State as a whole. The number of persons under 44 in the study area was 84% in contrast

to 67% in South Dublin County Council and 63% in the State. This demonstrates that the study area has a young population when compared to the population of the State and South Dublin County.

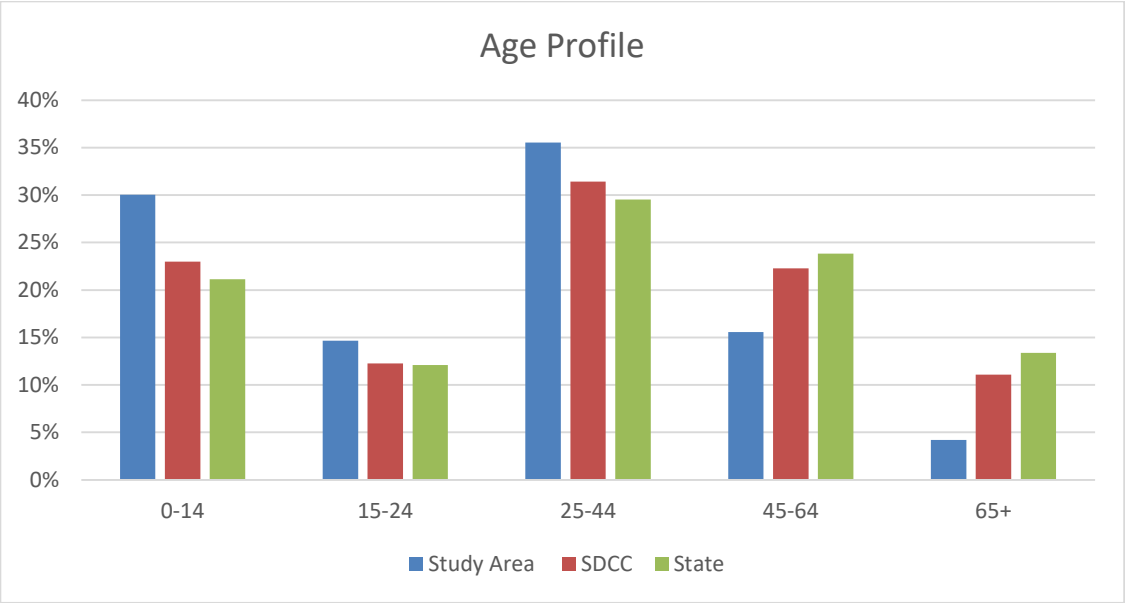



**Fig. 3.3:Age Profile of Study Comparison with Study Area SDCC and State**

The following tables, 3.6 & 3.7 detail the demographic breakdown of the study area (i.e. the three ED's of Tallaght-Jobstown, Tallaght-Fettercairn and Saggart), South County Dublin and the State from both the 2011 and 2016 Census.

| Area | 0-14 years | 15-24 years | 25-44 years | 45-64 years | 65+ years | Total Population |
|---|---|---|---|---|---|---|
| **State** | 979,590 | 580,250 | 1,450,140 | 1,101,380 | 535,393 | 4,646,753 |
| **South Dublin County** | 61,281 | 34,779 | 87,591 | 58,501 | 23,053 | 265,205 |
| **Saggart ED** | 666 | 307 | 1,391 | 430 | 266 | 3,060 |
| **Tallaght-Fettercairn ED** | 2,401 | 1,146 | 2,549 | 1,238 | 273 | 7,607 |
| **Tallaght-Jobstown ED** | 5,538 | 2,052 | 6,775 | 1,982 | 286 | 16,633 |

**Table 3.6 - Age Profile at State, County and Local Level 2011**

| Area | 0-14 years | 15-24 years | 25-44 years | 45-64 years | 65+ years | Total Population |
|---|---|---|---|---|---|---|
| **State** | 1,006,552 | 576,452 | 1,406,291 | 1,135,003 | 637,567 | 4,761,865 |
| **South Dublin County** | 64,088 | 34,147 | 87,539 | 62,068 | 30,925 | 278,767 |
| **Saggart ED** | 1,148 | 358 | 1,893 | 825 | 416 | 4,640 |
| **Tallaght-Fettercairn ED** | 2,485 | 1,320 | 2,697 | 1,430 | 448 | 8,380 |
| **Tallaght-Jobstown ED** | 5,847 | 2,237 | 6,619 | 2,656 | 465 | 17,824 |

**Table 3.7 - Age Profile at State, County and Local Level 2016**

The following tables 3.8 & 3.9, below, detail the percentile of each age cohort in the study area (i.e. the three ED's of Tallaght-Jobstown, Tallaght-Fettercairn and Saggart), South County Dublin and the State from both the 2011 and 2016 Census.

| Area | 0-14 years | 15-24 years | 25-44 years | 45-64 years | 65+ years |
|---|---|---|---|---|---|
| **State** | 21.08% | 12.48% | 31.2% | 23.7% | 11.52% |
| **South Dublin County** | 23.1% | 13.1% | 33.02% | 22.05% | 8.69% |
| **Saggart ED** | 21.76% | 10% | 45.45% | 14.05% | 8.69% |
| **Tallaght-Fettercairn ED** | 31.5% | 15% | 33.5% | 16.27% | 3.58% |
| **Tallaght-Jobstown ED** | 33.3% | 12.33% | 40.73% | 11.91% | 1.72% |

**Table 3.8 - Age Profile as percentile at State, County and Local Level 2011**

| Area | 0-14 years | 15-24 years | 25-44 years | 45-64 years | 65+ years |
|---|---|---|---|---|---|
| **State** | 21.13% | 12.1% | 29.53% | 23.83% | 13.38% |
| **South Dublin County** | 22.98% | 12.25% | 31.4% | 22.26% | 11.1% |
| **Saggart ED** | 24.74% | 7.72% | 40.79% | 17.78% | 8.96% |
| **Tallaght-Fettercairn ED** | 29.65% | 15.75% | 32.18% | 17.06% | 5.35% |
| **Tallaght-Jobstown ED** | 32.95% | 12.55% | 37.13% | 14.9% | 2.6% |

**Table 3.9 - Age Profile as percentile at State, County and Local Level 2016**

### 3.4.5.3. Dependant Age Cohorts (0-14 and 65+ years)

The proportion of dependants (aged 0-14 and 65+ years) within the three EDs of study area was recorded at an average of 34.75% of the population in the 2016 Census. This is an increase from the 2011 Census results which recorded the age dependant cohort within the study area at an average of 33.5%.

The proportion of dependants (aged 0-14 and 65+ years) for the State as a whole was recorded at 34.5% of the population in the 2016 Census. This is an increase from the 2011 Census results which recorded the age dependant cohort for the State at 32.6%.

Based on the above, the study area can be seen to be following the national trend for an increase in the age dependant cohort. At the study level, the older age group (65+ years) represents the minority of the age dependant cohort, however, over the five year intercensal period there was an increase in the proportion of the 65+ age group in line with the national trend.

These figures indicate that the study area has a younger population likely made of up young families, while the 65+ age cohort may create a likely demand for retirement care facilities. However, it should be noted that the split of the dependant age cohorts is a 84/16 split in terms of the 0.14 and 65+ age groups respectively and as such over the next decade the younger proportion of this age cohort will move into the working age groups and will likely increase pressure on future housing demands.

### 3.4.5.4 The Working Age Group (15-64 years)

The Working Age Group is defined as those persons residing within the 15-64 year age cohort. The majority of the population, in all areas examined, resides within this age cohort, which again reflects the youthful population structure of the study area and the State as a whole.

The working age group demographic within the study area represented 65% of the population in the 2016. This remains relatively the same from the 2011 Census results which recorded the working age group demographic within the study area at 65.45%.

The working age group demographic for the State represented 65.47% of the population in the 2016. This is a slight decrease from the 2011 Census results which recorded the working age group demographic for the State at 67.4%.

Based on the above, the study area can be seen to be not following the national trend for an decrease in the working age cohort. Notwithstanding same, the high percentile of the working age group residing in the study area (65% of the population) has implications on demand for housing, services, etc. in order to service this population age, which the proposed development may contribute to satisfying this demand.

#### 3.4.5.5. The 25-44 Age Cohort

The 25-44 age cohort is most likely to look to purchase a home, start a family and settle into a long-term community. It is therefore important to analyse this age cohort in particular as they will have the greatest impact on the social and economic conditions for the short and medium term, with regard to housing, employment and childcare facilities.

The 25-44 age cohort within the study area represented 36.7% of the population in the 2016. This is a slight decrease from the 2011 Census results which recorded the 25-44 age cohort within the study area at 39.89%.

The 25-44 age cohort for the State as whole represented 29.53% of the population in the 2016. This is a slight decrease from the 2011 Census results which recorded the 25-44 age cohort for the State at 31.2%.

For both the study area and the State the 25-44 age cohort represents the largest age demographic of the population. It is considered that the current demand for housing reflects the large percentage of this age cohort in the existing population. It is largely this age cohort that begins to have families and set up independent households, all of which has medium and long term social and economic implications and impacts on the demand for housing. The provision of housing for these group will also have an impact on workforce retention and therefore future economic growth of the area.

### 3.4.6 Community and Outdoor Facilities

The area is well served with a range of community facilities including education, religious, childcare, medical, leisure and community facilities. Facilities within the study area include 9 no. primary schools, 11 no. health and wellbeing providers, Youth and Community Centre, Tallaght Leisure Centre, playground and jogging track within the adjoining Carrigmore Park to the north-east and a community room in the Citywest Shopping Centre.

The study area also includes a number employment centres, i.e. the Citywest Business Centre and Magna Park with a wide variety of business operating from there. Please refer to the Social & Community Infrastructure Assessment which accompanies the planning application for a complete list of said facilities and services.

### 3.4.7 Movement and Transport

#### 3.4.7.1. Road Network

The N81 Blessington Road is located to the south of the development site and connects into the N82 Citywest Road which is to the east of the subject site. The N7 runs to the north of the site. The application site is therefore well connected to the national road network. The proposed development also caters for proposed upgrades to the Boherboy Road up to its connection with the N81 to the east.

#### 3.4.7.2. Pedestrian & Cycle Network

The proposed development also provides for pedestrian and cyclist access from the subject site to adjoining lands to the east and north, including the District Park / Carrigmore Park to the north-east which provides access further onto the Citywest Shopping Centre and Luas. The proposed connections are made in compliance with Greater Dublin Area Cycle Network Plan, 2013 and the Transport Strategy for the Greater Dublin Area 2016-2035.

The site will be highly accessible to pedestrians with the opening up of the lands to the public realm, as opposed to the current gated, agricultural situation.

#### 3.4.7.3. Public Transport

The area is served by both Dublin Bus and Luas Red line service, with the Saggart and Fortunestown Luas stops located to the north-west and north-east of the application site. These are high frequency services connecting the study area to Tallaght Town Centre and Dublin City Centre. Park and ride facilities are also provided at the Citywest Campus Stop and at the Cheeverstown Stop.

The nearby Citywest Campus offers other connections on top of the Dublin Bus service through private bus operators including Martleys Coaches (which provides a scheduled service from Citywest to Ballsbridge with stops at Heuston Station, O'Connell Bridge and St. Stephens Green) and Dualway (which provides a scheduled service through Citywest Campus between the N7 and N81.

### 3.4.8. Human Health

Health, as defined by the World Health Organization (WHO), is "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*". The Healthy Ireland Framework 2013-2025 defines health as '*everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play*'. This Framework also states that health is much more than an absence of disease or disability, and that individual health, and the health of a country, affects the quality of everyone's living experience.

Department of Health's 2019 report, *Health in Ireland – Key Trends 2019*, provides summary statistics on health and health care in Ireland over the past ten years. The report highlights the following key trends:

- The numbers and proportion of the population in the older age groups continues to grow, with the number of people over the age of 65 continuing to increase by over 20,000 a year.
- Life expectancy continues to improve in Ireland, while the gap between the life expectancy of men and women also continues to narrow.

- Mortality rates have declined 10.5% since 2009. Age-standardised death rates for major causes of death such as cancers and circulatory system diseases have declined by 10% and 25%, respectively, over the past ten years.
- Lifestyle factors such as smoking, drinking, levels of physical activity and obesity continue to be issues which have the potential to jeopardise many of the health gains achieved in recent years.

At the national level, population health presents a picture of decreasing mortality rates and high self-perceived health over the past ten years. Ireland has the highest self-perceived health status in the EU, with 82.9% of people rating their health as either 'good' or 'very good'. The number of people reporting a chronic illness or health problem is also better than the EU average, at around 27.7% of the population. However, health status reflects income inequality, with fewer low income earners reporting good health both in Ireland and across the EU. Infant mortality, measured as deaths per 1,000 live births, has also decreased by 5.2% since 2009 and remains below the EU average.

Ireland is currently below the EU average for suicide rates for both men and women. After a rise in the male suicide rate from 2008 to 2012, the three-year moving average has decreased, and in 2015 the rate fell below the EU average for the first time since 2010. However, it should be noted that improvements in mortality rates and high levels of self-rated health can mask variations between regions, age groups and other population subgroups.

Rates of cigarette smoking have decreased since 2000, and alcohol consumption has also decreased over the same period, although not as dramatically.

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

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

| Health Status of Study Area<br>3 no. ED.s | Very Good | Good | Fair | Bad | Very Bad | Not Stated |
|---|---|---|---|---|---|---|
| **Total Number of People** | 18,165 | 8,214 | 2,272 | 396 | 85 | 1,712 |
| **Total Percentage of People** | 58.89% | 26.63% | 7.36% | 1.28% | 0.27% | 5.55% |

**Table 3.9 Health Status of Study Area i.e. 3 no. ED.s of Saggart, Tallaght-Fettercairn & Tallaght-Jobstown**

Table 3.9 above shows that most people (a combined 85.5%) in the Study Area have identified themselves as being in '*very good'* or *'good'* health.

The baseline environments in terms of air, surface water and groundwater / soil are detailed in Chapter 7 (Air Quality & Climate), Chapter 6 (Water) and Chapter 5 (Land, Soils & Geology), respectively.

The risks of accidents and disasters are addressed, where relevant, in the various specialist chapters herein. Flood risk, for instance, is addressed in Chapter 6 (Water); while geohazards are addressed in Chapter 5 (Land, Soils & Geology). As discussed in Chapter 2, 'Major Accidents & Disasters' has been scoped out of this EIAR. It should also be noted that the subject application is accompanied by separate stand alone assessments i.e. a Site Specific Flood Risk Assessment (SSFRA) prepared by Kilgallen & Partners Consulting Enigneers and a Hydrological & Hydrogeological Qualitative Risk Assessment prepared by AWN Consulting.

In relation to the potential human health risks associated with the proposed works, an Outline Construction Management Plan (OCMP) is submitted under separate cover as part of this application. It outlines how the proposed works will be delivered safely and in a manner which minimises risk to human health, including that of Site personnel.

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

The proposed project is located within the SDCC administrative area which has access to national public hospitals, private hospitals, high-tech hospitals, accident and emergency services, psychiatric hospitals, rehabilitation centres, orthopaedic hospital and hospices. The submitted Social and Community Infrastructure Assessment provides details of health care services in the subject area (section 7.1).

### 3.5. Construction Impacts, Mitigation and Monitoring Measures

The duration of the construction phase is anticipated to be somewhere in the region of 60 months (or five years). As such, associated impacts are expected to be short-term in duration. During this time, there will be no severance of land, loss of rights of way or amenities as a result of the proposed development.

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

- Nuisance due to dust generating activities;
- Nuisance and disturbance due to noisy activities and vibration;
- Negative impacts on journey characteristics, parking availability and noise due to construction traffic;
- Negative visual impacts due to presence of construction site;
- Positive direct and indirect economic impacts due to construction employment and increased demand for local businesses, suppliers and other supporting services; and
- Negative impacts on site personnel and local community due to improper construction site waste management.

Overall, subject to adherence to best practice and implementation of appropriate mitigation measures detailed below and elsewhere in this EIAR, the overall temporary impacts associated with the construction phase (excluding employment, which will be positive) are considered to be negative and slight/moderate.

The main areas of impact are as follows:

**Population and Demographic**

There will be no impact on the demographic profile during the Construction Phase.

**Residential Amenity**

Construction of the proposed development will last for approximately five years. During this time, the proposed development will cause a certain amount of loss of amenity, disruption and inconvenience to local residents, particularly the residents close to the boundaries of the site at Corbally and Carrigmore and users of Carrigmore Park to the north-east.

These impacts will be related to construction traffic (particularly HGVs) and travel disruption and also to the generation of noise and dust which is generally associated with the construction of such infrastructural projects. These issues are considered elsewhere in this EIAR and mitigation measures identified. In particular, the access constraints arising in respect of receptors are considered in Chapter 11 - Materials Assets: Transportation and impacts arising from the generation of noise and dust are considered in Chapter 9 – Noise and Chapter 8 – Air and Climate respectively. The visual impacts of the development are considered in Chapter 14 – The Landscape.

The overall impacts associated with the construction phase are temporary/short term and moderate.

**Land Take, Use and Planning Policy**

The construction works associated with the proposed development will generally be contained within the application site boundary and the lands under the control of the applicants. The proposed development also includes the undertaking upgrading of the Boherboy Road, including provision of a footpath along the Boherboy Road eastwards to the junction with the N81, as identified within the red line boundary of the application and for which a letter of consent from the Planning Authority and relevant third party are included with this application for permission. The proposed development also proposes vehicular, pedestrian and cyclist connections from the subject site into adjoining areas to the north and east, i.e. Corbally, Carrigmore and Carrigmore Park, for which the relevant consents are also submitted.

The development proposal is for a residential development on lands zoned to accommodate / permit for such use.

**Employment**

During the Construction Phase, the proposed development will have a short-term positive effect in terms generating economic activity. It is anticipated that up to c.250 no. construction personnel will be employed either directly or indirectly during the Construction Phase which is anticipated to extend over a period of approximately 60 months. Apart from the direct employment associated with the project, additional employment will be generated through the multiplier effect. In this case, the multiplier effect refers to the indirect impact that new spending has when it is circulated through the local economy. In the context of the overall economy of the area, the impact of the project in terms of employment (direct and indirect) will be slight and positive.

**Travel and Commuting**

During the Construction Phase there will be some traffic impacts on the receiving environment by virtue of the works related traffic. Measures to address these impacts are detailed in the CDWMP and they will be slight and short-term.

## Health and Safety

The construction of any project of this nature has potential to give rise to an impact on health and safety of human beings if such activities are not managed properly. These concerns are addressed in the CDWMP and Outline CMP submitted as part of this planning application.

## Human Health

The proposed development is likely to give rise to a short-term direct negative impact on the surrounding settlements during the Construction Phase, in particular the existing Corbally and Carrigmore residential developments located to the east and north respectively. This will be a short-term significant effect on a localised scale and this is further discussed in Chapter 8 (Air Quality) Chapter 9 (Noise) and Chapter 14 (The Landscape) of this EIAR.

The Construction Phase will result in an element of noise, mobility of heavy vehicles, dust and the arrival and departure of construction workers into the area. This impact will be negative, short-term, significant and localised.

## Conclusion

In the absence of mitigation, predicted likely, significant, negative effects on population and human health as a result of the construction phase of the proposed development are as follows:

- A *negative, significant, short-term and reversible* impact within 50m of the site due to noise-generating activities, affecting residential receptors within 40m of the subject site. Note that predicted noise levels are typical of developments of this scale and will be limited to site working hours (i.e. the day-time). The impacts will be limited to nuisance, irritation, minor disturbance while working, etc., and are highly subjective – lasting health impacts (e.g. hearing damage) are not expected to occur as a result of the proposed works.
- A *negative, moderate to significant and short-term* visual impact due to the presence of a substantial construction site.
- A *negative, localised, significant, short-term impact* due to the potential improper management of waste generated on the construction site.

## Mitigation

Mitigation measures for the Construction Phase are outlined in each of the relevant chapters (No.s 4-14) and are also provided in Chapter 16 "*Summary of EIA Mitigation and Monitoring Measures*". During the Construction Phase a number of mitigating measures should be considered, including *inter alia:*

- Restrict working hours from 07.00 to 19.00 Mondays to Fridays inclusive, between 09.00 to 13.00 on Saturdays. No general works are envisaged to be carried out on Sundays. Should there be a need to work Sundays/Bank Holidays, a written request will be made to SDCC for permission to do so. Any conditions from SDCC relating to out of hours working will be followed including any required notifications to relevant parties;

- Maintain a Traffic Management Plan (TMP) in effect for duration of works;

- The CEMP will be agreed with the Planning Authority upon receipt of planning permission. The construction of the proposed development shall adhere to the relevant provisions of this Plan; and;

- As part of the CEMP, maintain a Dust and Noise abatement plan in operation.

**Monitoring**

Measures to monitor potential negative effects on people in respect of noise, air, traffic etc. are included in the following relevant Chapters of this EIAR.

In respect of the impacts assessed above, the contractor will monitor development during the construction phase to ensure compliance with the parameters of the Construction Management Plan. Remedial action will be taken, if required, to ensure construction activities conform to its requirements.

**Reinstatement**

It is not considered that reinstatement works are required during the Construction Phase.

### 3.6. Operational Impacts, Mitigation and Monitoring Measures

The duration of the operational phase of the proposed development is assumed to be long-term in duration, as per the definitions in the EPA 2017 draft EIAR guidelines.

The proposed development will comply with the statutory land use zoning policies and objectives of the South Dublin County Development Plan (2016 – 2022) and the Government's National Planning Framework (NPF). Development of the site will align with the NPF's high-level objective to achieve compact, sustainable growth and, in doing so, will realise the efficient use of currently agricultural lands with medium to high density housing.

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

- Nuisance and disturbance of residents due to noisy building services plant and vehicular deliveries / collections within the site;
- Negative impacts on journey characteristics due to additional operational phase traffic generated by the proposed development;
- Positive impacts on pedestrians and cyclists due to enhanced permeability and provision of public realm which prioritises these users;
- Nuisance and disturbance due to increased traffic volumes arising from operation of proposed development;
- Visual impacts due to completion of proposed development, establishing significant new residential development;
- Direct and indirect positive socioeconomic impacts due to employment opportunities and increased demand for goods and services from local businesses;
- Positive impacts on existing and new residents due to provision of new facilities i.e. creche as well as direct links to local services, facilities and amenities;
- Positive socioeconomic impacts due to provision of significant additional housing; and
- Negative impacts on residents and local community due to improper waste management.

## Population and Demographic

During the Operational Phase of the proposed development, the demographic profile will change with additional people moving into the locality. The changing demographic profile during the Operational Phase of the proposed development is likely to ensure a balanced age profile within the local area. Projected residential population from the proposed development will be approximately 2,096 persons. This is based on the average number of persons per household 3.2 persons, which is the average household size in the Study Area in 2016.

The impact on population is considered to be permanent but slight, and appropriate to the land-use zoning designation for the site, and the Core Strategy of the Development Plan.

## Residential Amenity

All of existing local amenities will remain in place during the Operational Phase of the proposed development. Furthermore, the potential viability of these amenities going forward will be strengthened from the increased population of the area. The population increase will result in a greater demand for community and outdoor facilities in the study area. The CDP's zoning of the subject site has made provision for the development of new community facilities and requires for a detailed land use and function strategy, which sees the Applicants providing for a purpose built childcare facility on the subject lands.

Therefore, the effects on community and amenities is deemed to be slightly positive or neutral in the long-term.

## Land Take, Use & Planning Policy

The existing CDP set out the overall land use patterns for the lands on which this residential project is proposed. The nature of the development is permanent and will in time change the character of the area from a greenfield site to residential use. The proposed land use (i.e. residential, open space, amenity and employment) and will not impact on human health. Overall, the impact on land use and settlement is considered to be moderate, permanent and positive.

## Employment

During the Operational Phase, the proposed development will have a slight, positive long-term impact. The proposed development will result in the creation of jobs associated with the proposed childcare facility, permanent apartment building management jobs. Other associated jobs such as gardening and window cleaning, with spin-off economic activity created for local retail and service providers.

## Travel and Commuting

During the Operational Phase of the proposed development, there are likely to be some impacts on the receiving environment in relation to travel and commuting. The proposed development will provide additional people to sustain the public transport network. The impact due to the increase in number of persons potentially travelling and commuting will be significant and permanent, with a neutral long-term effect. Detailed information on the traffic impacts of the proposed development are set out in Chapter 10 Material Assets: Transportation.

### Health and Safety

The operational phase of the development is unlikely to give rise to any additional risks of health and safety on human beings. Maintenance and building management plans will form part of the programme of development upon receipt of a grant of permission.

### Human Health

The changes in the area will have a positive impact in terms of changing the age profile and increasing the longevity of local schools and facilities. The proposed development will create a modern living environment adjacent to a wide range of amenities, within easy commuting distance of Dublin city centre, providing locally positive health benefits to its residents.

### Conclusion

Overall, the proposed development is expected to result in a net positive impact on population and human health once operational, principally in that it will deliver a high volume of high-quality housing in the context of an ongoing housing crisis, in a manner that is consistent with national and regional level policy. Notwithstanding the proposal's positive impacts, in the absence of mitigation, the following likely, significant, negative effects on population and human health have also been predicted to occur as a result of the operational phase of the proposed development:

- A *negative, localised, long-term and significant impact* on on-site residents due to potential improper storage, management and disposal of solid waste.

### Mitigation

Where relevant, mitigation measures to address the potential impacts of noise, air traffic etc. on people are included in the appropriate chapters of this EIAR. No likely significant impacts have been identified for population, or land use, accordingly no mitigation measures are required for the Operational Phase.

The proposed development has been designed to avoid significant impacts in relation to local amenities and recreational facilities by:

- Incorporating the provision of a new childcare facility within the design proposal;
- Reserving a site to accommodate a potential new primary school, dependent on confirmation from the Department of Education and Skills for the need for same;
- The provision of c.30,450 sq.m of public open space representing c. 17% of the site area;
- Providing new pedestrian and cyclist links to local amenities and facilities.

Accordingly, no further mitigation measures are required.

### Monitoring

No additional monitoring is proposed for the Operational Phase other than that proposed in other Chapters of this EIAR.

**Reinstatement**

It is not considered that reinstatement works are required during the Operational Phase.

## 3.7 Predicted Impacts

The predicted impacts on human health below are compiled from the relevant chapters of this EIAR.

### 3.7.1 Human Health - Land, Soil and Geology

It is stated in Chapter 5 'Land, Soils & Geology' of this EIAR, prepared by Roger Mullarkey & Associates Consulting Engineers, that predicted impacts on human health from soils and the geological environment can occur during construction, i.e. dust generation occurring during extended dry weather periods as a result of construction traffic. However, with the implementation of mitigation measures, the likelihood of such events occurring would be local and not significant.

#### 3.7.1.1 Construction Phase

This section found that there would be a loss of agricultural lands due to the proposed development. It is noted that this area is zoned for residential development and that there are other agricultural lands in the surrounding area. This assessment identified no likely significant impacts to human health during the construction phase in terms of land, soils and geology due to the mitigation measures proposed. As such the predicted impact is considered to be short-term, imperceptible with a neutral impact on quality.

#### 3.7.1.2 Operational Phase

This assessment concluded that there are no likely significant impacts to human health during the operational phase in terms of land, soils and geology. As such the impact is considered to be long term, imperceptible with a neutral impact on quality.

#### 3.7.1.3 Cumulative Impact

Section 5.6 of this EIAR assesses cumulative impacts in respect of Land, Soils and Geology. This assessment found that there will be no significant cumulative impacts to land, soil and geology resulting from this project, and other local existing/proposed developments such as the Fortunestown Centre, Cheeverstown, Saggart Cooldown Commons. All impacts on soils and geology relating to the proposed project will be localised and within the development footprint.

### 3.7.2 Human Health - Water

This section has been informed by Chapter 6 'Water' prepared by Roger Mullarkey & Associates Consulting Engineers.

#### 3.7.2.1 Construction Phase

Due to the mitigation measures proposed and the fact that the water in the surrounding area is not used as a potable water supply, the impacts to human health during the construction phase are not considered to be significant.

### 3.7.2.2 Operational Phase

During the operational phase, the potential for a release is low as there is no bulk fuel/chemical storage and no silt laden run-off. Stormwater will be collected by the SuDS intercepting systems which includes interception measures to capture initial run-off. Furthermore, there are petrol interceptors located upstream of all discharge locations to the Corbally Stream. The wastewater is to be discharged to the Irish Water infrastructure and ultimately treated downstream at the Ringsend Wastewater Treatment Plant (WWTP) prior to discharge to Dublin Bay. It is noted that an application for a new upgrade to this facility is currently in planning. The plant operates under an EPA licence (D0034-01) and is currently in the process of being upgraded to a PE of 2.4 million. These upgrade works have commenced and are expected to be fully complete by 2025. The upgrade works to Ringsend WWTP will result in a higher quality of effluent discharge to Dublin Bay and will comply with the Urban wastewater Treatment Directive towards the end of 2023. This chapter concludes that the proposed development will have no impact on the water quality discharge at the Ringsend WWTP. With the implementation of mitigation measures, it is considered that the impacts on human health will not be significant.

### 3.7.2.3 Cumulative Impact

Section 6.5.4 of this EIAR chapter contains the assessment of cumulative impacts in respect of water and refers to the submitted Hydrological & Hydrogeological Qualitative Assessment prepared by AWN Consulting, and states that *"based on the implementation of the suitable mitigation measures, such as using the appropriate SuDS designs and proper planning compliance, within the on this and other development sites (Fortunestown Centre, Cheeverstown, Saggart Cooldown Commons), it can be concluded that the in-combination effects of surface water arising from the proposed development taken together with that from other developments, will not be significant based on the low potential chemical and sediment loading".*

Once water quality is managed in accordance with legislative requirements it was found that cumulative impacts on water quality during the construction phase would not be significant. The residual cumulative impact on water and hydrology for the operational phases is anticipated to be not significant, once appropriate mitigation measures to manage water quality runoff in compliance with legislative requirement are put in place for each development. In this way, the impact on human health arising from cumulative impacts to hydrology and hydrogeology are not significant.

## 3.7.3 Human Health - Air Quality

This section has been informed by Chapter 7 'Air Quality and Climate" prepared by AWN Consulting.

### 3.7.3.1 Construction Phase

The assessment in Section 7.5.1.3 of this EIAR indicates that the greatest impacts on human health during the

construction phase arise from the release of $PM_{10}$ and $PM_{2.5}$ emissions. In the absence of mitigation there is the potential for slight, negative, short-term impacts to human health as a result of the proposed development.

### 3.7.3.2 Operational Phase

Section 7.5.2 assesses the potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development and states that the potential impact of

the proposed development on ambient air quality in the operational stage is considered long-term, localised, negative and imperceptible and therefore, no mitigation is required.

### 3.7.3.3 Cumulative Impact

The traffic data reviewed for the operational stage impacts to air quality and climate included the cumulative traffic associated with other existing and permitted developments in the local area. Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term, negative and imperceptible with regards to air quality and climate due to the low level changes in traffic on the surrounding road network and the low level changes in $NO_2$ and $CO_2$ emissions predicted.

### 3.7.4 Human Health - Noise and Vibration

This section has been informed by Chapter 8 'Noise' prepared by AWN Consulting

### 3.7.4.1 Construction Phase

The assessment undertaken by AWN found that potential impacts on human health may arise from noise and vibration nuisance. Human health impacts arising from outward noise from the proposed development will relate to traffic flows to and from the development site onto the public roads, mechanical and electrical services used to service the residential properties and the creche external play area. The implementation of mitigation measures, including the adherence to good practice noise reducing measures will ensure that the residual impact on human health is negative, moderate and short-term.

### 3.7.4.2 Operational Phase

Potential noise impacts during the operational phase include the following:

- Vehicular traffic accessing and moving around the site;
- Building and mechanical services plant; and
- Creche playground noise breakout.

The predicted increase in noise levels associated with vehicles at road junctions in the vicinity of the proposed development is of long-term not significant impact.

The predicted increase in noise levels associated with vehicles at the internal road junctions in the vicinity of the proposed development is of long-term, not significant impact.

The predicted increase in noise levels associated with building services plant in the vicinity of the proposed development is of long-term, not significant impact.

The predicted increase in noise levels associated with creche playground noise breakout in the vicinity of the proposed development is of long-term, not significant impact.

### 3.7.4.3 Cumulative Impact

The assessment undertaken by AWN states that there are a number of approved applications in the local area, and that depending on the proximity of the construction works to the nearest noise sensitive locations (NSLs), it is possible that cumulative impacts could occur at the nearest receptors to the proposed site should all sites progress construction simultaneously. In this scenario elevated construction noise emissions due to cumulative noise are potentially likely to occur at receptor locations as well as a potential increase in the length of time that the receptor will be exposed to construction noise. Hence, cumulative construction impacts will need to be considered and managed during the construction phase. It is

recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors. Cumulative construction noise impacts are expected to be negative, moderate and short-term.

### 3.7.5 Human Health - Material Assets: Traffic and Transport

This section is informed by Chapter 11 'Material Assets: Transportation' prepared by Pinnacle Consulting Engineering. This assessment found that potential risks to human health arise from increased traffic, changes to air quality, and risks form traffic accidents.

#### 3.7.5.1 Construction Phase

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. Measures will be put in place to reduce the risk of road traffic accidents during the construction phase. Furthermore, it 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 and no unusual substance or underground tunnelling works required or predicted.

A number of temporary risks to human health may occur during construction phase related to noise, dust, air quality and visual impacts which are addressed in other sections of this EIAR. Traffic impacts are considered to be negligible due to the implementation of mitigation measures identified.

#### 3.7.5.2 Operational Phase

There will be a slight increase in traffic on the local road network. In this way, no significant impacts on human health were identified.

#### 3.7.5.3 Cumulative Impact

It is considered that the cumulative impact on population and human health would be likely, positive and long term as a result of the improved infrastructure being provided. It is anticipated that the proposed development will encourage walking and cycling, will in turn promote increased accessibility to public transport options locally.

### 3.7.6 Human Health – Material Assets: Water Supply, Drainage and Utilities

This section is informed by Chapter 9 'Material Assets: Built Services' prepared by Roger Mullarkey & Associates Consulting Engineers.

#### 3.7.6.1 Construction Phase

During the construction phase, the implementation of potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term.

### 3.7.6.2 Operational Phase

During the operational phase, it was considered that in providing the proposed SuDS measures and interception of the "first flush" rainfall events, there will be a reduction in the S/W run-off in extreme events. This will therefore increase the capacity of the receiving waters, i.e., the Corbally Stream. The use of SuDS systems will remove polluting matter from the first flush of rainfall event, which will improve the overall storm water quality leaving the site.

In providing the flood compensatory area detailed in the Kilgallen & Partners Site Specific Flood Risk Assessment, there will be an increased storage area for the Q100 + 10% Climate Change storm event and therefore reduce the risk of overtopping in extreme events.

Subject to the local infrastructure upgrades requested by Irish Water, there is sufficient capacity in the foul drainage network as confirmed in the Irish Water issued Confirmation of Feasibility and subsequent Statement of Design Acceptance.

There is potential for adverse impact on human health of maintenance personnel arising from maintenance activities, from a possible reduction in utility service, and from pollution of ground and surface water. The implementation of standard health and safety measures and mitigation measures ensure that these potential impacts are not significant.

### 3.7.6.3 Cumulative Impact

The assessment states that there are no predicted cumulative impacts arising from the construction or operational phase.

## 3.8 Residual Impacts

### 3.8.1 Construction Phase

Assuming the proper and full implementation of the mitigation measures in this EIAR (summarised above in relation to population and human health), the following significant, negative, residual impacts on population and human health are predicted:

- The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures (as set out in Chapter 8), will ensure that noise and vibration impacts are minimised as far as practicable. However, given the nature of the proposed works and the proximity to residential receptors; the possibility remains for *short-term, negative, slight to significant noise impacts* to arise within a 40m radius of the subject site. It should be noted that these impacts will entail nuisance and daytime disturbance only, and that the nature of noise levels generated will be typical of urban construction works of this nature. As such, it is considered that this potentially significant, negative, residual impact on the local population is commensurate with the proposed development and acceptable considering the net merit of the proposal.

- *Significant and unavoidable, negative residual visual impacts* on surrounding areas as a result of the proposed works, as follows:
    - The visual impact from the construction phase on properties along the site boundaries, i.e. to Carrigmore to north, to Corbally to the east, to the Boherboy Road to the south and to agricultural lands and individual dwellings to the west, would be significant, negative and short-term.

No other significant, negative residual impacts are predicted in relation to population and human health.

### 3.8.2 Operational Phase

Assuming the proper and full implementation of the mitigation measures in this EIAR (summarised above in relation to population and human health), *no significant, negative, residual impacts are predicted to occur during the operational phase in the long-term*. However, as discussed below, there is the potential for *significant, negative, short-term visual impacts* to occur.

The number and quality of landscape elements shall be an addition to the built environment of Boherboy providing quality amenity for the residents.

As stated above, the net operational phase impact on population and human health is predicted to be positive, principally because the proposed development will deliver a high volume of high-quality housing in the context of an ongoing housing crisis, in a manner that is consistent with national and regional-level policy.

### 3.8.3 Conclusion

The residual effects of the construction and operational phase of the project on the socio-economic character of the area and the local community (i.e. population and human health), subject to the implementation of the various mitigation measures outlined in this EIAR are identified as follows:

- The development will facilitate the implementation of the CDP and LAP proposals for the subject lands;
- The proposed development will provide new pedestrian and cycling links through the subject site connecting to Carrigmore Park and beyond to the LAP's District Centre.

## 3.9 Interactions

As noted above, there are numerous inter-related environmental topics described in detail throughout this EIAR which are of relevance to human health. During the Construction Phase noise, air, traffic and consumption of materials will be the key environmental factors that will have an impact on population and human health.

This chapter of the EIAR has been instructed by updated guidance documents reflecting the changes within the 2014 EIA Directive. These documents are the Draft Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in August 2017 and the Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems, published by the Department of Environment, Community and Local Government in May 2017. In line with the guidance documents referred, this chapter of the EIAR focuses primarily on the potential likely and significant impact on Population and Human Health in relation to health effects/issues and environmental hazards from the other environmental factors and interactions that potentially may occur.

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.

During the Operational Phase, it is anticipated that water and traffic will be the key environmental factors impacting upon population and human health during the Operational Phase as a new residential landscape

will be created. The increase in population will result in increased traffic and increased demands on water supply and increased requirements for wastewater treatment. These are addressed in the appropriate sections of this EIAR.

### 3.10 Reinstatement

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

### 3.11 Cumulative Impacts

An increase in local housing, and some increase in employment opportunities and service provision (childcare facility) have 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 development of the proposed scheme will open up the lands to improved connectivity from the subject site to Corbally, Carrigmore, Carrigmore Park and beyond to local services and facilities e.g. Citywest Shopping Centre, Luas etc. and will require works that will likely entail some localised impacts to residents. A Construction Traffic Management Plan is submitted with the planning application, the objective of which is to minimise the short term disruption to existing local residents.

There will be some short term impacts during the construction phase as the infrastructural / site development works are undertaken, particularly in respect of traffic management with regards to sensitive receptors. This may cause local short term inconvenience and disturbance to residents 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.

### 3.12 Difficulties Encountered in Compiling

No difficulties were encountered when compiling this Chapter.

### 3.13 *'Do Nothing'* Scenario

A do-nothing scenario would result in the site remaining in greenfield use. If the proposed development were not to proceed there would be no immediate impact on the existing population, or economic activity for residents living in the area.

If the lands were to remain undeveloped, this would be an under-utilisation of zoned lands from a sustainable planning and development perspective, particularly considering the location of the lands and the objectives of both the CDP and LAP. The positive benefits to the national, regional and local community arising from implementing the residential development proposals of the CDP and LAP for the subject lands would therefore not materialize.

## 3.14 Conclusion

This Chapter has assessed the potential of the proposed development to result in significant impacts on population and human health during the construction and operational phases. It has found that, while the net impact of the proposed development is expected to be positive (in that its completion will create a high volume of high quality housing in the context of an ongoing housing crisis), it likely that negative impacts will also arise as a result of the proposal. These negative predicted impacts are commensurate with the nature and scale of the proposed development and are predominantly short-term impacts associated with the proposed construction and demolition works (such as noise, dust, and traffic). A suite of corresponding mitigation measures have been prescribed throughout the EIAR, which in most cases will ensure that significant negative impacts are avoided. The following potentially significant negative residual impacts cannot be avoided, however:

- Given the nature of the proposed works and the proximity to residential receptors; the possibility remains for *short-term, negative, slight to significant noise impacts to arise within a 40m radius*. These impacts will entail nuisance during daytime hours only, and the nature of noise levels generated will be typical of urban construction works of this nature.
- *Significant and unavoidable, negative, short-term visual impacts* on surrounding areas as a result of the proposed works.
- There is the potential for *short-term significant, negative visual impacts* to viewpoints in the surrounding area upon the completion of the proposed development, but that these are expected to ameliorate to an overall neutral to positive visual impact in the long-term, once the proposed development has become established in its surroundings.

## 3.15 References


- Central Statistics Office www.cso.ie
- CSO (2012). *Census 2011 Small Area Population Statistics (SAPS)*.
- CSO (2017). *Census 2016 Small Area Populations Statistics.*
- South Dublin County Development Plan 2016–2022
- Fortunestown Local Aea Plan 2012
- Healthy Ireland Framework 2013-2025

# 4.0. Biodiversity

## 4.1 Introduction

### 4.1.1 Background

This Biodiversity Chapter for the Environmental Impact Assessment Report (EIAR) was authored by Síofra Quigley of Scott Cawley Ltd.

This Chapter provides an assessment of the potential ecological effects of the proposed development at Saggart Strategic Housing Development (SHD) (refer to Figure 5.1 for location). The proposed development will consist of 655 no. residential units and c. 693m$^2$ of creche space and the associated ancillary roads, drainage pumping and services infrastructure. The residential units will consist of detached, semi-detached and terraced houses, duplex apartments and 9 no. apartment blocks. A detailed description of the proposed development is included in Chapter 3 of the EIAR.

The proposed development site is located in the 10km Grid Square O02 at O 04798 26372 to the west of Dublin City. The lands comprise of two agricultural grassland fields separated by hedgerows and a drainage ditch, with hedgerows and treelines surrounding the lands. Cattle regularly graze on these fields, with open cow sheds in the south of the site, adjacent to the entrance. The land is bounded by the Boherboy Road (L2008) to the south, agricultural fields to the west, and residential areas to the east. The Corbally stream runs along the eastern and southern boundary, the Coldwater flows along the western boundary, and the Cooldown is noted along the middle boundary in the site, however, both are partially dry drainage ditches in actuality (Figure 4.1).


**Fig. 4.1 The proposed development in relation to wider surroundings**

### 4.1.2 Aims

The purpose of this report is to:

- Establish and evaluate the baseline ecological environment, as relevant to the proposed development;
- Identify, describe and assess all potentially significant ecological effects associated with the proposed development;
- Set out the mitigation measures required to address any potentially significant ecological effects and ensure compliance with relevant nature conservation legislation;
- Provide an assessment of the significance of any residual ecological effects;
- Identify any appropriate compensation, enhancement or post-construction monitoring requirements.

An Appropriate Assessment (AA) Screening was prepared to be submitted with the planning application. It contains information required for the competent authority (in this instance An Bord Pleanála) to undertake a screening for AA. It provides information on and assesses the potential for the proposed development to impact on the European sites.

## 4.2 Planning, Policy and Legislation

The collation of ecological baseline data and the preparation of this assessment has had regard to the following legislation and policy documents. This is not an exhaustive list but the most relevant legislative and policy basis for the purposes of preparing this Biodiversity Chapter.

The following international legislation is relevant to the proposed development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network[5] was established and special areas of conservation (SACs) are designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.
- Directive 2009/147/EEC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which special protection areas are designated for the protection of endangered species of wild birds listed in Annex I of that directive.
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy hereafter, referred to as the 'Water Framework Directive'. The Water Framework Directive' is the legislation requiring the protection and improvement of water quality in all waters (rivers, lakes, groundwater, and transitional coastal waters) with the aim of achieving good ecological status by 2015 or, at the latest, by 2027.
- The requirement for EIA for certain types and scales of development is set out in the EIA Directives (2011/92/EU and 2014/52/EU), European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the bulk of which came into operation in September 2018), the

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

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

European Communities (Environmental Impact Assessment) Regulations 1989-2006, Planning and Development Act 2000 (as amended) and the Planning and Development Regulations2001, as amended. It should be noted that this EIA Report is prepared in accordance with the 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive.

The following national legislation is relevant to the proposed development:

- *Wildlife Acts 1976 to 2021*; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Acts are the principal pieces of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- *Planning and Development Acts 2000 to 2021*; hereafter collectively referred to as the 'Planning and Development Acts'. This piece of legislation is the basis for Irish planning. Under the legislation, development plans (usually implemented at local authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. It also sets out the requirements in relation to environmental assessment with respect to planning matters, including transposition of the Habitats and Birds Directive into Irish law.
- *European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015*; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- *European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)*. This legislation transposes the Water Framework Directive into Irish Law.
- *Flora (Protection) Order, 2015*. This lists species of plant protected under Section 21 of the Wildlife Acts.

The following plans and policies are relevant to the proposed development:

- *South Dublin County Development Plan 2016-2022 (South Dublin County Council, 2016)*
- *All-Ireland Pollinator Plan 2021-2025 (National Biodiversity Data Centre, 2021)*
- *Draft Biodiversity Action Plan for South Dublin County 2020-2026 (South Dublin County Council, 2020*). This lists South Dublin County's objectives and actions in relation to biodiversity within the county boundary and how they align with those listed in National Biodiversity Action Plan 2017-2021 (NPWS, 2017).
- National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017).

## 4.3 Methodology

### 4.3.1 Author Statement

This Biodiversity chapter was authored by Síofra Quigley, and reviewed by Maeve Maher McWilliams and Ashling Cronin of Scott Cawley Ltd.

Síofra Quigley is a Consultant Ecologist with Scott Cawley. She obtained an honours degree in Zoology, from National University of Ireland Galway, and a Masters in Wildlife Biology and Conservation from Edinburgh Napier University. She has four years' professional experience working in the UK and Ireland on large to small scale infrastructure projects, with governmental and private clients. Síofra is experienced

in carrying out field surveys in several protected species , including bat, otter, badger, red squirrel, reptile, pine marten and mountain hare. She has also been involved in radio tracking mountain hares and bats, bat call analysis, badger bait marking, acting as an Ecological Clerk of Works, Phase 1 habitat surveys and reports (Joint Nature Conservation Committee, 2010), Fossitt (2000) habitat assessments and desk top studies. Since joining Scott Cawley, Síofra's work involves the preparation of reports, including Ecological Impact Assessment and Appropriate Assessment reports for residential, commercial, and infrastructural projects across Ireland.

Maeve Maher-McWilliams is a Principal Ecologist with Scott Cawley. She holds an honours degree in Biological Sciences from Queens University Belfast and attained a distinction in her Masters in Evolutionary and Behavioural Ecology from University of Exeter. She is an Associate member of CIEEM. She has worked in ecological consultancy for over nine years and has worked on a range of large to small scale projects across Ireland and the UK. Maeve's primary technical specialism is ornithology, however her skills extend to protected mammal and habitat surveys. Her involvement extends from inception to post planning compliance, survey completion, project and survey management, carrying out of Ecological Impact Assessment, and authoring of EIAR Chapters, Appropriate Assessment Screening reports and Natura Impact Statements. She regularly undertakes surveys and prepares AA Screening, NIS and EcIA reports.

Ashling Cronin is a Technical Director with Scott Cawley Ltd. She holds a Masters in Ecological Assessment, an honours degree in Applied Ecology from University College Cork and an Advanced Diploma in Planning and Environmental Law in Kings Inns. She has over eleven years' experience in environmental management and environmental and ecological assessment across both the private and public sector. Ashling has a keen interest in both national and international environmental legislation and has extensive experience in the Appropriate Assessment (AA) process. She has been the lead ecologist for the preparation of a number of Natura Impact Statements for a range of development types and national level plans, as well Natura Impact Reports for a range of land use and non-land use plans. Ashling also provides technical review and due diligence of Appropriate Assessment documentation for public and local authorities to aid their decision-making process as well as peer review of AA documentation prior to lodgement of planning applications.

### 4.3.2 Scope of the Assessment

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

The Zone of Influence (ZoI), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present within, and in the vicinity of, the proposed development site. The ZoI and study area (i.e. the area within the red line boundary as shown on Figure 4.1) was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the proposed development.

The ZoI of habitat loss impacts will be confined to within the proposed development boundary.

The ZoI of potential impacts on surface water quality in the receiving freshwater environment could extend downstream as far as the estuary.

The ZoI of general construction activities (i.e. risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is not likely to extend more than several hundred metres from the proposed development.

### 4.3.3 Desk Study

A desk study was undertaken in June 2021 to collate available information on the local ecological environment. The following resources were used to inform the assessment presented in this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from https://www.npws.ie/protected-sites and https://www.npws.ie/maps-and-data – refer to Appendix 5.I and Figure 5.3 for descriptions and locations of protected sites in the vicinity of the proposed development.
- Records of rare and protected species for the 10km grid square(s), as held by the National Biodiversity Data Centre (NBDC) www.biodiversityireland.ie or the NPWS – refer to Appendix 5.2 for all desk study flora and fauna records.
- Spatial information relevant to the planning process including land zoning and planning applications from Department of Housing Planning, Community and Local Government web map portal. Available from https://myplan.ie/.
- Ordnance Survey Ireland mapping and aerial photography from http://map.geohive.ie/.
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from https://gis.epa.ie/EPAMaps/.
- Information on soils, geology and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx.
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland (Gilbert et al., 2021).
- Information on the location, nature and design of the proposed development supplied by the applicant's design team.
- Appropriate Assessment Screening: for Strategic Housing Development, Saggart, Dublin 24 (Scott Cawley Ltd. 2021).
- Hydrological & Hydrogeological Qualitative Risk Assessment for Proposed Residential Development at Boherboy, Saggart Co. Dublin (AWN Consulting, 2020).
- Report on Site-Specific Flood Risk Assessment, Residential Development, Boherboy, Saggart, Co. Dublin (Kilgallen & Partners Consulting Engineers, 2021).

### 4.3.4 Field Survey

Ecological field surveys were carried out following the best practice professional guidelines with respect to seasonality, timing and frequency for each survey type listed below, in February, March, June and July 2020, and in February, March, May and June 2021.

Winter bird surveys were carried out on the 25th February 2020 by Caroline Kelly BSc (Hons) MSc, and on the 19th and 23rd March 2020, 17th February and 18th March 2021 by Shane Brien BSc (Hons), both of Scott Cawley Ltd. Habitat and flora surveys, terrestrial fauna surveys, and ground-level assessments of trees and structures for potential bat roost features were undertaken on the 29th June 2020 by Síofra Quigley BSc (Hons) MSc of Scott Cawley Ltd. Update mammal and habitat surveys were undertaken by Síofra Quigley and Shane Brien on the 1st March 2021. Breeding bird surveys were undertaken on the 15th and 26th June 2020 by Brian Porter, an independent ornithologist, and on the 27th May and 18th June 2021 by Siofra Quigley of Scott Cawley Ltd.

Bat surveys were undertaken on the 25th June 2020 by Niall McHugh BSc (Hons) MSc of Scott Cawley, on the 9th July 2020 by Kevin Delahunty BSc (Hons) MSc, an independent bat surveyor, and the 26th August 2020 by Síofra Quigley and Shane Brien.

#### 4.3.4.1 Habitats and Flora Survey

A habitat survey was undertaken of the proposed development site following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*[6] on the 29th June 2020 and the 1st March 2021. All habitat types were classified using the *Guide to Habitats in Ireland*[7], recording the indicator species and abundance using the DAFOR scale[8] and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database*[9], having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*[10] and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*[11].

#### 4.3.4.2 Fauna Surveys

Terrestrial Mammals (excl. Bats)

A terrestrial fauna survey (excluding bats) for the presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation, was undertaken on the 29th June 2020 and 1st March 2021. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species. Surveys to check for the presence of badger setts and otter holts within the study area, and to record any evidence of use.

Infra-red motion-activated camera was deployed along the central hedgerow to confirm usage of certain mammal species, specifically for badger. This camera was deployed for a period of 16 nights between 26th August – 12th September 2020.

Breeding Birds

Breeding bird surveys were undertaken using a methodology adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*[12]. The study area covered the lands within the proposed development site, of which were slowly walked in a manner allowing the surveyor to come within 50m of all habitat features. Birds were identified by sight and song, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes. Any buildings/structures within the lands were assessed for nesting bird species. Survey details are provided in Table 5.1.

[6] Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

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

[8] The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

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

[10] Stace, C. (2019) *New Flora of the British Isles. 4th Edition*. C&M Floristics.

[11] Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

[12] Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

| Date (Sunrise) | Survey Time | Weather Conditions |
|---|---|---|
| 15/06/2020 (04:58) | 05:28 – 08:18 | No rain, little cloud with very good visibility. Temperatures between 11 - 16 °C. |
| 26/06/2020 (05:00) | 05:40 – 08:21 | Mild with temperatures of 18°C, no rain, overcast and excellent visibility. Gentle breeze. |
| 27/05/2021 (05:10) | 05:40 – 08:30 | Dry, mild with no clouds, temperatures of 12-16°C. |
| 18/06/2021 (04:57) | 05:30 – 08:10 | Dry, partly cloudy, temperatures of 9-14°C. Slight breeze. |

**Table 4.1 - Breeding bird survey details**

Wintering Birds

Wintering bird surveys were undertaken using a methodology based on the Bird Monitoring Methods – A Manual of Techniques for Key UK Species. The study area covered the lands within the proposed development site. Surveys consisted on vantage point surveys, each of 3-hour duration. Vantage point surveys were carried out on the 25th February and 19th and 23rd March 2020 respectively. For health and safety reasons, owing to livestock being present in one of the fields on the 19th March, only one vantage point survey was carried out on the morning of the 19th March, with the other vantage point survey being carried out on the afternoon of the 23rd March. Updated wintering bird surveys were carried out on the 17th February and 18th March 2021, and followed the same format.

Vantage point surveys involved one surveyor remaining stationary at a pre-defined vantage point location, which offered good views across the site, for a 3-hour period and recording any winter bird activity on site. Surveyors used binoculars to identify any wintering birds in the vicinity of the site. Vantage point locations are presented in Figure 4.2. The following environmental conditions were recorded for each survey: wind speed and direction, cloud cover, temperature, rain and visibility. During each vantage point survey any movements of wintering bird species were noted and any wintering birds which landed on the site were recorded using the British Trust for Ornithology (BTO) species and activity codes. The duration that wintering birds spent at the site was noted, as was their behaviour.


**Fig. 4.2 - Vantage Point (VP) locations for winter bird surveys**

Bats

A ground-level assessment of trees and structures within the subject lands, to examine their suitability to support roosting bats and potential to act as important landscape features for commuting/foraging bats, was based on guidelines (see Table 4.2) in *Bat Surveys for Professional Ecologists: Good Practice Guidance* (Collins ed., 2016) and included inspections of trees and structures for potential roost features (PRFs), and for signs of bats (staining at roost entrances, droppings, carcasses, insect remains). This was undertaken on the 29th June 2020 and 18th June 2021.

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

**Table 4.2 - Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, applied according to professional judgement. (Taken from Collins (2016))**

Three separate bat activity surveys were undertaken within the lands by surveyors who are experienced in bat transect surveys. The surveys were designed with reference to methodologies in *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn.) (Collins, 2016), and survey details are provided in Table 5.2. Surveys involved completion of a walked transect within the proposed development site. Observations of bat activity were recorded, and where necessary, data collected in the field was analysed using specialist software (Elekon BatExplorer) to aid in the identification of bat species by their calls. Data generated from the transect surveys was analysed using Elekon BatExplorer software, whereby calls were identified to species level (where this was possible), through professional judgement and with reference *British Bat Calls: A Guide to Species Identification* (Russ, 2012).

| Date (Sunset/Sunrise) | Survey Time | Survey Type | Weather Conditions |
|---|---|---|---|
| 25/06/2020 (21:57) | 21:30 – 23:52 | Dusk activity survey | Warm, humid weather (18-21°C), little wind. Very light showers. |
| 23/07/2020 (21:35) | 21:20 – 23:38 | Dusk Activity Survey | Dry and overcast, with temperatures around 19°C. Light breeze |

**Table 4.3 - Details of bat surveys undertaken within the proposed development site.**

Amphibians and Reptiles

A survey for suitable habitat for amphibians and reptiles was undertaken on the 29th June 2020. Suitable habitat for amphibians, such as ponds and wet ditches, and reptiles, such as habitats with stone walls, rocks or logs suitable for basking, were noted and mapped. Any direct observations of individuals were noted.

#### 4.3.4.3 Survey Limitations

One of the farm sheds could not be accessed fully internally due to the presence of cattle within the shed. This is not considered to be a limitation, however, as activity surveys were carried out at dusk and dawn at the peak activity season (following BCT guidelines, Collins (2016)) to determine bat usage of the sheds and if any roosting bats were present.

### 4.3.5 Ecological Evaluation and Impact Assessment

#### 4.3.5.1 Ecological Evaluation

Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2*[13] and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland*[14] – refer to Appendix 5.3 for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (ZoI) of the proposed development which are "both of sufficient value to be material in decision making and likely to be affected significantly" are deemed to be 'Key Ecological Receptors' (KERs). These are the ecological receptors which may be subject to significant effects from the proposed development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

[13] NRA (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2. National Roads Authority.

[14] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

#### 4.3.5.2 Impact Assessment

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

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

#### 4.3.5.3 Characterising and Describing the Impacts

The parameters considered in characterising and describing the potential impacts of the proposed development are per the EPA's *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*[15] and CIEEM's *Guidelines for Ecological Impact Assessment in the UK and Ireland*: whether the effect is positive, neutral or negative; the significance of the effects; the extent and context of the effect; the probability, duration and frequency of effects; and, cumulative effects.

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

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

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

#### 4.3.5.4 Significant Effects

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

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

#### 4.3.5.5 Integrity

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

[15] Environmental Protection Agency. (2017) Guidelines on the information to be contained in Environmental Impact Assessment Reports. Draft, August 2017. (refer to Table 3.3)

The term 'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA/NHAs) but can also be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

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

#### 4.3.5.6 Conservation Status

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

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

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

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

## 4.4 Baseline Ecological Environment

### 4.4.1 Designated Sites

<u>European Sites</u>

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

SACs and SPAs are offered additional protection under county development plans, as is the case for the *South Dublin County Development Plan 2016-2022* through Policy 12 on European sites which requires that planning authorities give due regard to their protection in planning policies and decisions (South Dublin County Council, 2016).

There are six European sites located within the vicinity of the proposed development. The proposed development does not overlap with any European sites. The nearest European site is Glenasmole Valley SAC, located *c.* 4.17km to the south-east of the proposed development site in the Dublin Mountains.

The Corbally Stream runs from south to north along the eastern boundary of the proposed development site. It then flows along the northern boundary westwards where two drainage ditches within the site, the Cooldown and the Coldwater (both partially dry ditches), flow into the Corbally. The Corbally then merges into the Camac River *c.* 2.5km, before joining the River Liffey *c.* 9.6km northeast of the proposed development and discharging into Dublin Bay and therefore hydrologically linking the proposed development to European sites therein.

There are six SACs and four SPAs either within the vicinity of the proposed development or downstream in Dublin Bay as follows:

- Glenasmole Valley SAC (0001209) is located *c.* 4.17km south-east of the proposed development site. This SAC has been designated for the priority Annex I habitats semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites), Petrifying springs with tufa formation (Cratoneurion), and for Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*).
- Wicklow Mountains SAC (002122), which is c. 5.3km south-east of the proposed development site and designated for freshwater, upland, and oak woodland habitats, blanket bogs, and populations of otter *Lutra lutra*.
- Wicklow Mountains SPA (004040), which is c. 8.9km south-east of the proposed development site and designated for merlin *Falco columbarius* and peregrine *Falco peregrinus*.
- Rye Water Valley/Carton SAC (001398), which is c. 10.3km north-west of the proposed development site. This SAC has been designated for the priority Annex I habitat Petrifying springs with tufa formation (Cratoneurion), and populations of the Annex II narrow-mouthed whorl snail *Vertigo angustior* and Desmoulin's whorl snail *Vertigo moulinsiana*.
- Red Bog, Kildare SAC (000397), which is c. 11.1km south-west of the proposed development site and designated for Active raised bogs, Degraded raised bogs still capable of natural regeneration, and depressions on peat substrates of the Rhynchosporion.
- Poulaphouca Reservoir SPA (004063), which is c. 11.3km south-west of the proposed development site and designated for greylag goose *Anser anser* and lesser black-backed gull *Larus fuscus*.
- South Dublin Bay SAC (000210), which is c. 15.8km north-east of the proposed development site and designated for dune and tidal habitats.
- South Dublin Bay and River Tolka Estuary SPA (004024), which is c. 15.8km north-east of the proposed development site and designated for a range of wintering wetland bird species.
- North Bull Island SPA (004006), which is c. 16.3km north-east of the proposed development site and designated for a range of wintering wetland bird species.
- North Dublin Bay SAC (000206), which is c. 19.3km north-east of the proposed development site and designated for a range of coastal habitats, and populations of petalwort *Petalophyllum ralfsii*.

The SAC and SPA sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Appendix 4.2.

The locations of those SAC and SPA sites relative to the proposed development are illustrated on Figure 4.3 over:

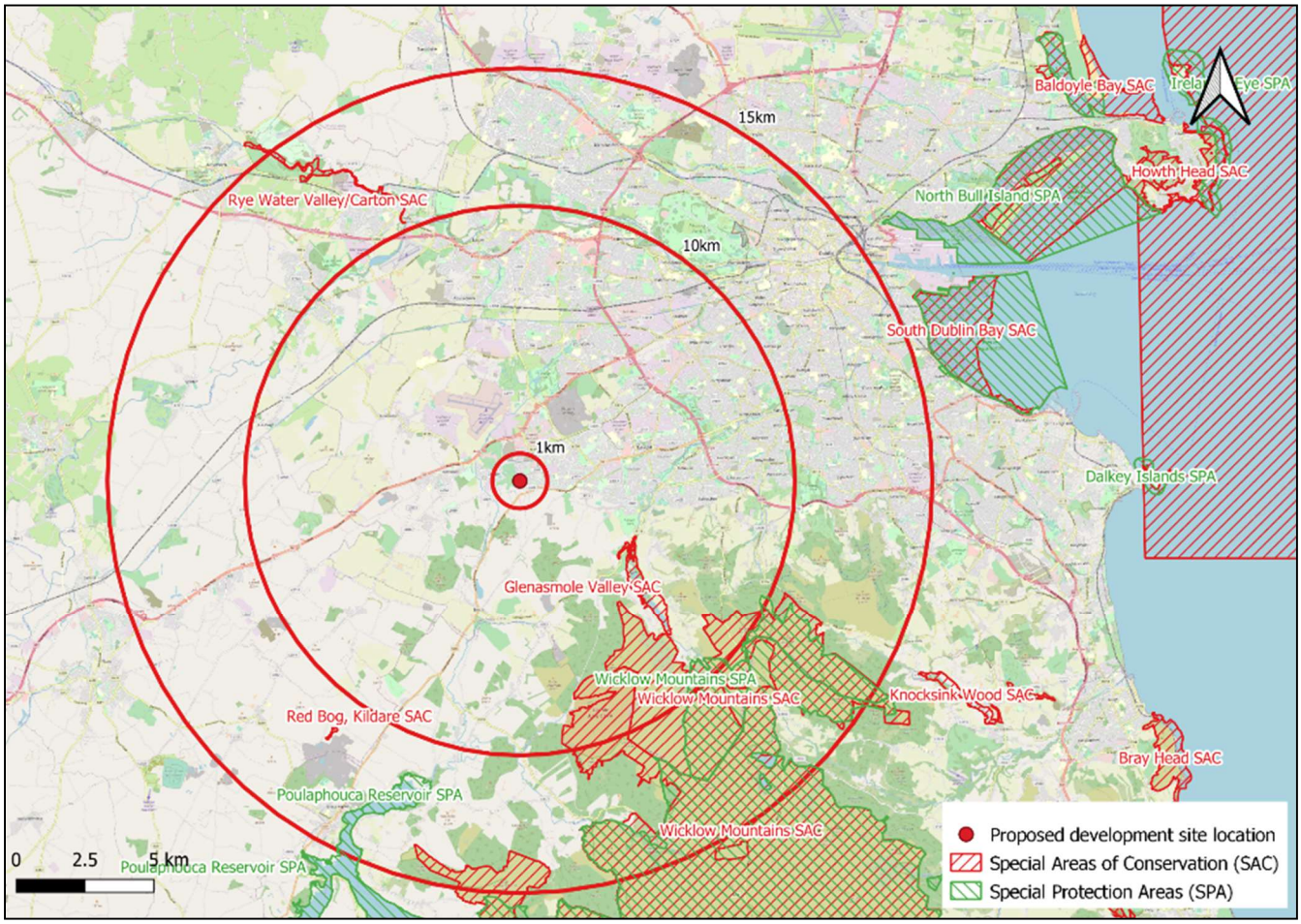



**Fig. 4.3 - European sites in the vicinity of the proposed development**

Nationally Designated Sites

Natural Heritage Areas (NHAs) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. In addition to NHAs there are proposed NHAs (referred to as pNHAs), which are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. Proposed NHAs are offered protection in the interim period under county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions. Such is the case in the *South Dublin County Development Plan 2016-2022* through Policy 13 on Natural Heritage Areas which requires that planning authorities give due regard to their protection in planning policies and decisions (South Dublin County Council, 2016).

There are 13 national sites located within the vicinity of the proposed development, of which all are pNHAs. The proposed development does not overlap with any national sites. The nearest national site is Lugmore pNHA, located *c.* 1.4km southwest of the proposed development. The pNHAs within the vicinity of the proposed development are as follows:

- Lugmole Glen pNHA, located c. 1.4km south west of the proposed development site which has been designated for its example of wooded glen habitat and a Red Data Book species *Lamiastrum galeobdolon*.
- Slade of Saggart and Crooksling Glen pNHA, located c. 1.6km south-west of the proposed development site. The site is designated for its good example of wooded river valley and wetland system, and the presence of rare flora and fauna.

- Dodder Valley pNHA, located c. 4.8km east of the proposed development site. The site is designated for its last remaining stretch of natural riverbank vegetation on the River Dodder in the built-up Greater Dublin Area and for its biodiversity.
- Glenasmole Valley pNHA, located c. 4.2km south-east of the proposed development site. There is no published information available for this designated site from the NPWS. It overlaps with the Glenasmole Valley SAC and is likely to be designated for the same reasons, e.g. for the presence priority Annex I habitats Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) and Petrifying springs with tufa formation (Cratoneurion), and for *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*).
- Grand Canal pNHA, located c. 5.5km north of the proposed development site. The site is designated for its habitats and biodiversity.
- Kilteel Wood pNHA, located c. 7.8km south-west of the proposed development site, which is designated for its fine example of a deciduous woodland.
- Liffey Valley pNHA, located c. 8.6km north of the proposed development site. The site is designated for its diversity of habitat and for rare flora.
- Rye Water Valley/Carton pNHA, located c. 10km north-west of the proposed development site. There is no published information available for this designated site from the NPWS. It overlaps with the Rye Water Valley/Carton SAC and is likely to be designated for the same reasons, e.g. the priority Annex I habitat Petrifying springs with tufa formation (Cratoneurion), and populations of the Annex II narrow-mouthed whorl snail and Desmoulin's whorl snail.
- Royal Canal pNHA, located c. 10.3km north of the proposed development site. The site is designated for its habitats and biodiversity.
- Poulaphouca Reservoir pNHA, located c. 11.3km south-west of the proposed development site. There is no published information available for this designated site from the NPWS. It overlaps with the Poulaphouca Reservoir SPA and is likely to be designated for the same reasons, e.g. wintering populations of greylag goose and lesser black-backed gull.
- Red Bog, Kildare pNHA, located c. 10.8km south-west of the proposed development site. There is no published information available for this designated site from the NPWS. It overlaps with the Red Bog, Kildare SAC and is likely to be designated for the same reasons, e.g. transition mires and quaking bogs.
- Fitzsimon's Wood pNHA, located c. 12.7km west of the proposed development site, which has been designated for its good example of birch woodland.
- Glencree Valley pNHA, located c. 13.9km south-east of the proposed development site. The site is designated for its good example of deciduous woodland and habitat diversity.
- South Dublin Bay pNHA, located c. 15.8km north-east of the proposed development site. There is no published information available for this designated site from the NPWS. It overlaps with the South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA and is likely to be designated for the same reasons, e.g. dune and tidal habitats and wintering bird populations.
- Booterstown Marsh pNHA, located c. 15.8km north-east of the proposed development., which is designated for its tidal habitats, rare flora and wintering bird populations.
- North Dublin Bay pNHA, located c. 19.3km north-east of the proposed development site. There is no published information available for this designated site from the NPWS. It overlaps with the North Dublin Bay SAC and North Bull Island SPA and is likely to be designated for the same reasons, e.g. dune and tidal habitats and wintering bird populations.

The pNHA sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Appendix 4.1.

The locations of those pNHA sites relative to the proposed development are illustrated on Figure 4.4 below.

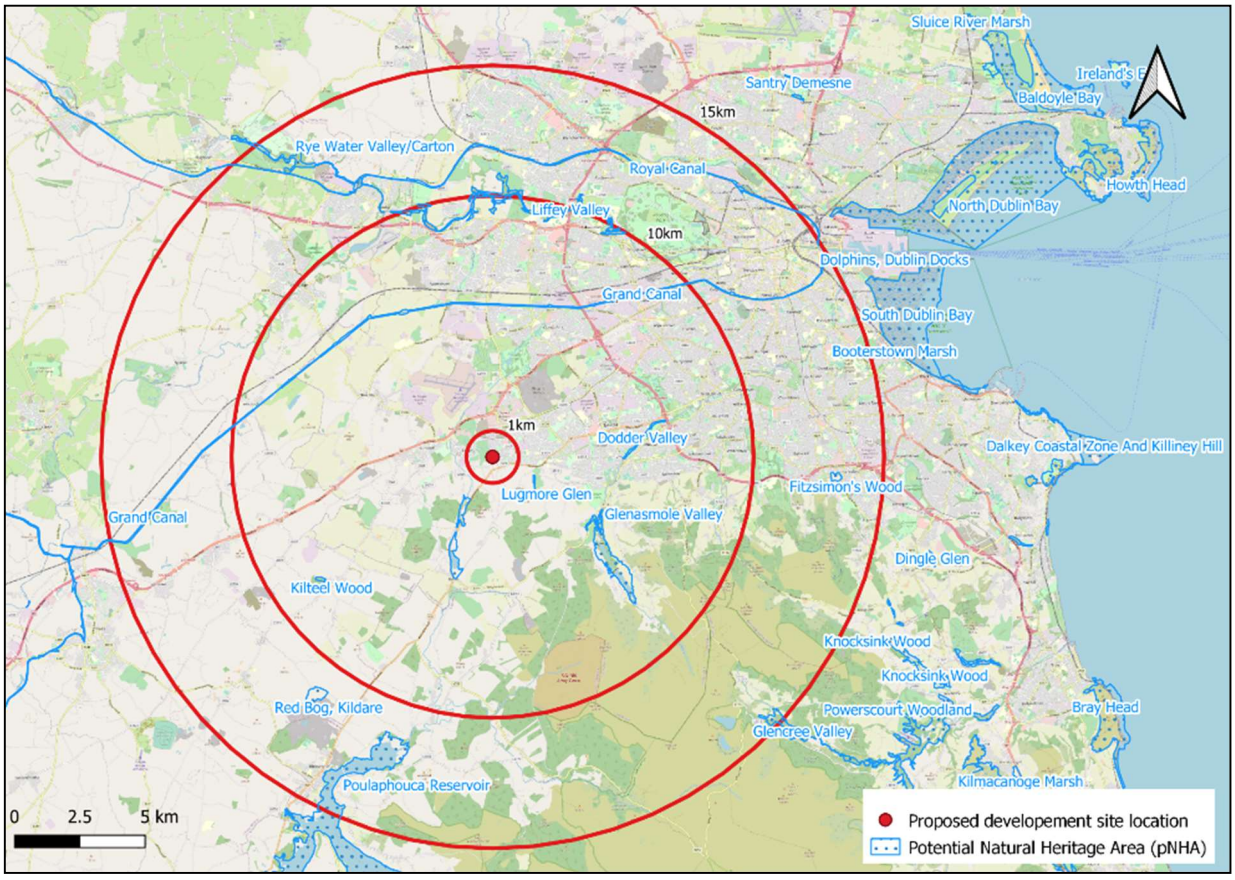



**Fig. 4.4 - National sites in the vicinity of the proposed development**

### 4.4.2 Habitats and Flora

No protected plant species contained within the Flora (Protection) Order, 2015, rare plant species contained within Ireland Red List No. 10 Vascular Plants (Wyse Jackson et al., 2016), or species listed on Irelands Red List No. 8: Bryophytes (Lockhart et al., 2012) were identified within the proposed development site during habitat surveys. There was one record of a species on the Red List No. 10 Vascular Plants, *Lamiastrum galeobdolon*, within *c.* 2km of the proposed development from a NBDC data search. This species is of Least Concern, and was not identified within the proposed development site.

No non-native, invasive plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded within the proposed development site. One record of *Fallopia japonica* (2019) was identified within c. 2km of the proposed development site from a NBDC data search. This record was from 2019 and located c. 1.2km north of the site in Citywest.

The following habitat types (and mosaics of these), assigned using the Heritage Council classification system[7], and their corresponding level of ecological importance was determined in accordance with CIEEM (2018) and NRA (2009) guidelines, were identified within the proposed development site and are mapped in Figure 4.5:

- Buildings and artificial surfaces (BL3)
- Recolonising bare ground (ED3)
- Depositing/lowland rivers (FW2)
- Drainage ditches (FW4)

- Improved agricultural grassland (GA1)
- Dry meadows and grassy verges (GS2)
- Wet grassland (GS4)
- Hedgerows (WL1)
- Treelines (WL2)
- Scattered Trees and Parkland (WD5)


**Fig. 4.5 - Habitats identified within the proposed development site**

Buildings and Artificial Surfaces (BL3)

There are four buildings/structures within the proposed development site. All of these are located in the south of the site, with three in the eastern field, and one in the western field. These buildings are a mixture of cattle sheds, and outhouses, all in various states of disrepair. Cattle were present in one of the sheds adjacent to the entrance in the south east of the site during field surveys, and consisted of stone walls with a corrugated iron roofing where cattle were kept, with the remaining section roofless and heavily encroached upon by *Hedera helix* and the surrounding vegetation. A large open corrugated structure was also present adjacent to the cattle shed, which had collapsed when repeat surveys were carried out in 2021. Two small outhouses were also present in this field, all were in a poor state of disrepair, comprised of a mixture of stone and brick walls, and corrugated roofing. Most of the roof sections were not present however and these buildings were largely open and exposed with encroachment from the surrounding vegetation. The shed in the western field comprised of concrete stone walls, with a fully intact corrugated iron roof. This building was also heavily encroached upon by the surrounding vegetation, which mainly consisted of *Hedera helix*.

This habitat is considered to be of local importance (lower value) due to its artificial nature.

**Plates 1 & 2 - Cattle shed in the south east of the site (left) and intact building in the south west of the site (right)**

Recolonising Bare Ground (ED3)

This habitat type was identified at the entrance of the site, in the south of the eastern field adjacent to the cattle shed. This habitat is severely trampled as a result of constant cattle movement over this area, resulting in bare ground. Plant species identified here include; *Persicaria maculosa, Jacobaea vulgaris, Rumex acetosa, Rumex obtusifolius*, *Cardamine hirsuta* and *Urtica dioica.* As it is a transient habitat that has developed as a result of disturbance, and is relatively species poor, this habitat is valued as being of a local importance (lower value).

**Plate 3 - Recolonising bare ground in the south of the site adjacent to the entrance**

Improved Agricultural Grassland (GA1)

This habitat type is the dominant habitat type within the proposed development site, identified in both the eastern and western fields. The western most field is ungrazed, and managed by cutting, whilst the eastern field is grazed by cattle resulting in poor quality habitat from frequent trampling. Dominant grass species in the eastern field included *Lolium perenne, Holcus lanatus,* and *Dactylis glomerata.* Other dominant forb species present included; *Rumex acetosa, Urtica dioica, Trifolium repens, Cirsium arvense, Heracleum sphondylium, Ranunculus repens, Rumex obtusifolius,* and *Jacobaea vulgaris. Cardamine hirsuta* was present in areas that were partly waterlogged due to cattle poaching, with *Sonchus arvensis* and *Potentilla reptans* occasionally identified in the north of the site. The western field was less improved, and had transitioned into dry meadows and grassy verges habitat in the south and verges of this field. The remainder of the field included similar grass species as the eastern field, with the addition of *Taraxacum officinale, Bellis perennis, Rumex crispus*, and *Potentilla anserina.* Given the common and widespread

species found within this habitat type, and managed nature, whether by grazing or cutting, this habitat is considered to be of local importance (lower value).

**Plates 4 & 5 - Improved agricultural grassland habitat in the eastern field (left) and the western field (right)**

Dry Meadows and Grassy Verges (GS2)

This habitat type was present in both a mosaic habitat with scrub (WS1) in the south west of the eastern field, and on its own in the south and along the verges of the western field. In the western field, this habitat is of good quality and species rich, and is located along the field margins, largely adjacent to treeline habitat, and whilst grass species such as *Holcus lanatus* and *Anthoxanthum odoratum* were the dominant species present, forb species were also abundant here, and included; *Cardamine pratensis, Taraxacum officinale, Ranunculus acris, Bellis perennis, Heracleum sphondylium, Prunella vulgaris, Filipendula ulmaria* and *Potentilla erecta*. Other species were identified along the verges of the field, such as; *Phleum pratense, Arrhenatherum elatius, Equisetum arvense,* and *Plantago lanceolata*. The presence of *Cardamine pratensis* in abundance in this habitat, a species typically found in wet grassland, indicates that this habitat may be inundated during wetter periods. This habitat type in the western field is valued as being of local importance (higher value) due to the range of species identified here and good quality habitat with infrequent maintenance.

This habitat present in the south of the eastern field occurs in a mosaic with scrub and is dominated by tall herbs such as *Cirsium vulgare, Cirsium arvense, Rumex crispus, Urtica dioica.* The quality of this habitat is poor, with trampling and cattle poaching evident throughout. The heavy presence of *Urtica dioica* indicates nutrient rich soils which would limit species diversity of this habitat. Due to these reasons, this habitat type in the eastern field is valued as being of local importance (lower value).

**Plates 6 & 7 - Dry meadows and grassy verges habitat in the western field of local (high) importance (left) and in the eastern field (right) of local (low) importance**

Wet Grassland (GS4)

This habitat type is present in the north east of the proposed development, where the land is level with the Corbally Stream resulting in the grassland habitat to become inundated, waterlogged and poorly drained. This habitat is in poor quality due to frequent cattle poaching degrading the habitat. Species identified here include *Juncus effusus, Juncus articulates, Ranunculus repens, Potentilla anserina), Cardamine hirsute,* and *Persicaria maculosa.*

Due to the poor quality of this habitat, and common species found here, this habitat is valued as local importance (lower value).

**Plate 8 - Wet grassland habitat in the north east of the proposed development**

Scrub (WS1)

Scrub habitat was present in the south of the site, in the south eastern corner of the western most field, adjacent to this in the eastern field in a mosaic with dry meadows and grassy verges where the grassland had transitioned into scrub, and surrounding the farm buildings in a mosaic with scattered trees and parkland habitat, beneath the canopy of the trees. Common species could be found here including; *Rubus fruticosus, Crataegus monogyna, Prunus spinosa, Sambucus nigra, Rosa canina, Urtica dioica*, and *Hedera helix*.

Due to the common nature of this habitat and the species found within, and is poorly developed in most areas, this habitat is valued as being of local importance (lower value).

Scattered Trees and Parkland (WD5)

As mentioned above, this habitat type was present in a mosaic with scrub in the eastern most field adjacent to the farm buildings. This habitat included a mixture of young and mature trees such as *Acer pseudoplatanus, Fraxinus excelsior, Sambucus nigra,* and *Fagus sylvatica.* These trees acted as a canopy cover over the scrub habitat and had started to encroach into the farm buildings.

Due to the variety in habitat this provides in a relatively species-poor area, this habitat is valued as being of local importance (higher value).

**Plate 9 - Scattered tree and parkland habitat in the south of the site**

Hedgerows (WL1)

Hedgerows were present in the north of the site along the boundary, and in a mosaic with treelines along the central and eastern boundary. The hedgerows along the northern and central boundaries were relatively young and not well established, consisting of *Crataegus monogyna* and *Rubus fruticosus,* and *Rosa canina* sparingly. The hedgerow along the eastern most boundary was well established and was beginning to transition into a treeline. Species identified here included the aforementioned species, with *Salix* spp., and *Sambucus nigra*.

The hedgerows here provide cover and shelter for the local wildlife, and due to their good condition, close association with the treeline habitat, and connection they provide to the wider landscape, this habitat is valued as being local importance (higher value).

Treelines (WL2)

Mature treelines border the proposed development site, including; in the west, along the southern boundary, and in a mosaic with hedgerows along the central border of the two fields, and the eastern boundary. This habitat is present as a well-established, mature treeline, with native and non-natives both occurring. Species found include; *Fraxinus excelsior, Fagus sylvatica, Acer pseudoplatanus, Salix cinerea,* and *Sambucus nigra*. This habitat occurs alongside hedgerow habitat in some areas, providing extensive cover and shelter for local wildlife, as well as linear commuting corridors.

Due to the mature and good condition of the treelines present within the lands, and the corridors this habitat provides to the surrounding areas, this habitat is valued as being of a local importance (higher value).

**Plates 10 & 11 - Treeline habitat along the eastern boundary in a mosaic with hedgerow habitat (left), and mature treelines along the western boundary (right)**

Depositing/Lowland Rivers (FW2)

This habitat type consisted of the Corbally Stream, which flows downstream along the eastern boundary from south to north, and along the northern boundary from east to west. This Stream is c. 1-2m wide, and 10-30cm deep at the time of the survey, and consisted of soft, silty substrate for the majority of the stream, with some sections of pebble/small gravel substrate. There was evidence of heavy poaching by cattle along the banks and through the watercourse, as well as dumping where the river was accessible from the neighbouring residential areas. Instream vegetation was not present, however fringing vegetation included *Galium aparine, Urtica dioica, Rumex obtusifolius, Rubus fruticosus, Hedera helix,* and *Rumex acetosella.*

Although this habitat is in poor condition, due to the connectivity and variety in habitat this watercourse provides in an area of poor quality dominated by agriculture, this habitat is considered to be of local ecological (higher value) importance.

**Plate 12 - Depositing/lowland river habitat along the eastern boundary of the site**

Drainage Ditches (FW4)

This habitat consisted of the Cooldown Stream which is present along the central boundary of the two fields, and the Coldwater Stream which is present along the western boundary of the lands, which are artificial in nature and were excavated to enhance the drainage of the site. The Stream along the western field was inaccessible and overgrown with the dry meadows and grassy verges habitat, however it appeared to be mostly dry during surveys of the proposed development site. The drainage ditch down the central border of the fields was dry up until approximately half way along the ditch, and the remaining section with stagnant or very slow flowing water present. Similarly to the Corbally Stream, the ditch was heavily poached by cattle and was very soft underfoot. Plant species identified here included; *Cardamine hirsuta, Rumex acetosella, Juncus conglomeratus,* and *Mentha aquatica.*

As this habitat is manmade and in poor condition and quality, this habitat is valued as being of local importance (lower value).

**Plate 13 - Drainage ditch habitat along the central border of the site**

### 4.4.3 Fauna

4.4.3.1 Terrestrial Fauna (Excluding bats)

Badger

Badger *Meles meles,* and their breeding and resting places, are protected under the Wildlife Acts. The NBDC data search returned 2 records of badger within *c.* 2km of the proposed development with the latest from 1992 (Appendix 5.2).

No evidence of badger, such as setts, snuffle holes, latrines or hair, was identified within the proposed development site during field surveys carried out. Three mammal holes were identified along the central boundary that separates the two fields, in the southern end of the site within the bank of a drainage ditch. These holes were checked for evidence of badger, however were deemed too small and narrow (20-30cm width) to be suitable for badger. Three fox *Vulpes vulpes* cubs were identified during surveys adjacent to these holes, and the camera trap deployed in this location confirmed fox usage of these holes. The habitats within the proposed development site (grassland, scrub, hedgerows) provide suitable foraging and commuting habitat for badger.

Due to their stable Irish populations, badger are considered to be of "Least concern" in terms of conservation (Nelson *et al.*, 2019). The local badger populations are valued to be of local importance (higher value), as there is suitable habitat within the proposed development site and its vicinity, and from the NBDC desk study search records within *c.* 2km of the proposed development site.

Otter

Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011. The NBDC data search returned 1 records for otter within *c.* 2km of the proposed development, from 1969, *c.* 1.9km north along the Camac River (Appendix 5.2).

The Corbally Stream which flows along the eastern and northern boundary of the site, the Coldwater Stream which begins and flows along the western site boundary, and the Cooldown Stream which begins and flows along the central border, flowing into the Corbally in the north of the site, were all checked for otter usage and habitat suitability. The Cooldown and Coldwater Streams are drainage ditches in reality and were partly dry during field surveys. No holts, couches or spraints were identified along any of these streams or in any areas of the proposed development.

The Cooldown and Coldwater Streams are unsuitable for holt/couch creation due to being mostly dry drainage ditches. The Corbally Stream has potential to be suitable for usage by otter, however this stream is very shallow with no bank in some sections (southern section), and would only be suitable for commuting otters in these areas. Where the bank is higher above the stream (central section), tree roots are present which could be utilised as holt/couch sites by local otters. Fish were not identified within any of the streams. There are two culverts in which the Corbally Stream flows further downstream to in the north of the site.

Otter is a Qualifying Interest (QI) species of the Wicklow Mountains SAC, located *c.* 5.3km south east of the proposed development site. This European site is not hydrologically connected to the proposed development, and therefore there will be no impact from the proposed development on the Wicklow Mountains SAC otter population.

Due to the desktop records of otter along the Camac River, and the potential for the site to be used by commuting and/or foraging otters throughout all of the streams within the site, the local otter population is valued as being of County Importance.

Other mammals

Red squirrel *Sciurus vulgaris*, hedgehog *Erinaceus europaeus*, Irish hare *Lepus timidus hibernicus*, pygmy shrew *Sorex minutus*, Irish stoat *Mustela erminea hibernica* pine marten *Martes martes* and red deer *Cervus elaphus* are protected under the Wildlife Acts. Pine marten are also listed on Annex V of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011. The NBDC database search identified one record of pygmy shrew, Irish stoat, red deer, and hedgehog, two records of red squirrel and pine marten, and three records of Irish stoat within *c.* 2km of the proposed development site (Appendix 5.2).

A hedgehog was identified within the proposed development during bat activity surveys carried out in September 2020. No evidence or sightings of the aforementioned species were identified within the proposed development site. Fox and rabbit have also been identified using within the proposed development site during surveys.

Red squirrels are more commonly found within mixed woodlands and/or coniferous woodlands due to a more steady food source year round (Lawton *et al.*, 2020); however they can also be found within deciduous woodlands, specifically where oak *Quercus* sp. and/or hazel *Corylus avellana* tree species are present as red squirrel are known to forage acorns and hazelnuts. Pine martens have similar habitat preferences to red squirrels, and generally avoid open un-covered habitat types[16], therefore the proposed development has limited habitat suitability for these species. Pygmy shrews, hedgehogs and Irish stoat are found in a range of habitats; however they are predominantly present in habitats with a rich ground cover, and as such the woodland, scrub and dry meadows and grassy verges habitats within the site are considered suitable for these species. In addition, the dense hedgerows and drainage ditches present would also provide cover and commuting corridors for these species. Irish hare is also found in a range of habitats, from coastal dunes to mountain tops, and densities vary from year to year and habitat to habitat[17]. Red deer are typically found in the uplands where they feed on heather and dwarf shrubs, they can also be found in lowland grassland and woodland habitats during harsh weather conditions[18].

All of the mammal species returned in the NBDC search, or identified within the proposed development site are of "Least" conservation concern (Nelson *et al.,* 2019). They are widely distributed throughout Ireland. The habitats on site and in the surrounding environs are suitable for Irish hare, pygmy shrew, hedgehog, and Irish stoat, and as such the mammal species are therefore valued as being of local importance (higher value).

Non-native Invasive Mammals

The NBDC database search returned records of two fauna species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 within c. 2km of the proposed development site, grey squirrel *Sciurus carolinensis* and sika deer *Cervus nippon.* Two sika deer were identified within the proposed development site during the first breeding bird survey in June 2020, grey squirrel were not identified within the proposed development site during surveys.

A number of European rabbit *Oryctolagus cuniculus* were identified during surveys in 2020 and 2021, and were noted entering small holes along the drainage ditch banks of the Coldwater Stream. This species is listed as a 'medium impact' species, from the Invasive Species in Ireland prioritisation risk assessment. Records of 'high impact' Brown rat *Rattus norvegicus*, and house mouse *Mus musculus,* were also returned from the NBDC search. These species were not identified within the proposed development site.

[16] *Pine Marten, Conserve Ireland.* Accessed here: https://www.conserveireland.com/mammals/pine_marten
[17] *Species Profile: Irish Hare, Vincent Wildlife Trust Ireland.* Accessed here: https://www.vincentwildlife.ie/species/irish-hare
[18] Red Deer, The Irish Deer Society. Accessed here: https://www.irishdeersociety.ie/red-deer/

Birds

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

Table 4.4 below provides a summary of the findings of the breeding bird surveys with respect breeding status of each of the species identified.

| Common name/Latin name | BoCCI | Breeding status |
|---|---|---|
| Blackbird / *Turdus merula* | Green-listed | Small numbers recorded in multiple places along all hedgerows and treelines within the site, particularly outer boundaries. Confirmed to breed within hedgerow and treeline habitats. |
| Blackcap / *Sylvia atricapilla* | Green-listed | Observed in eastern and western most hedgerows within the site during three surveys, confirmed to breed within the hedgerows and treeline habitats. |
| Blue tit / *Cyanistes caeruleus* | Green-listed | Male, female and two fledglings observed in the north eastern hedgerow of the site. Juvenile observed on the eastern hedgerow/treeline. Therefore, confirmed to breed within the hedgerows and treeline habitats. |
| Buzzard / *Buteo buteo* | Green-listed | A pair identified calling in fields west of the proposed development. Possible breeders in treelines of adjacent fields. |
| Coal tit / *Periparus ater* | Green-listed | Observed on the eastern hedgerow/treelines of the site, possible breeder within the hedgerow/treeline habitat. |
| Collared dove / *Streptopelia decaocto* | Green-listed | Observed on the eastern most hedgerow/treeline, possible breeder within this habitat. |
| Chaffinch / *Fringilla coelebs* | Green-listed | Male, female and juvenile observed in the south of the site, within the hedgerow habitat. Confirmed to be breeding within the hedgerow habitat of the proposed development. |
| Dunnock / *Prunella modularis* | Green-listed | Juvenile observed along central hedgerow. Possible breeder within this habitat of the proposed development site. |
| Goldfinch / *Carduelis carduelis* | Green-listed | Observed within central hedgerow. Possible breeder within this habitat within the proposed development site. |
| Grey wagtail / *Motacilla cinerea* | Red-listed | Observed adjacent to cowshed during one survey, not considered to breed within the proposed development site. |
| Hooded crow / *Corvus cornix* | Green-listed | Male, female and juvenile identified in the south east of the site within the treeline habitat. Confirmed breeder within this habitat in the proposed development site. |
| House sparrow / *Passer domesticus* | Amber-listed | Observed in the north of the site, possibly breeding in surrounding residential houses, not breeding within the proposed development. |
| Jackdaw / *Corvus monedula* | Green-listed | Observed flying over the site on multiple occasions, did not land within the proposed development site. Not considered to be breeding within the site. |
| Long-tailed tit / *Aegithalus caudatus* | Green-listed | Group of four observed in the east of the site within hedgerow/treeline habitat, possibly breeding within the proposed development site. |
| Meadow pipit / *Anthus pratensis* | Red-listed | Observed in the north of the eastern field in the grassland habitat. Not considered to be breeding within the proposed development site. |
| Mistle thrush / *Turdus viscivorus* | Green-listed | Observed in eastern field in multiple areas of grassland habitat foraging, and in scrub habitat. Confirmed breeding within proposed development site. |
| Pheasant / *Phasianus colchicus* | Green-listed | Single bird observed during one survey in the south of the site, not breeding within proposed development. |

| Common name/Latin name | BoCCI | Breeding status |
|---|---|---|
| Robin / *Erithacus rubecula* | Green-listed | Juveniles observed on multiple occasions in the south and western within hedgerow/treeline habitat, confirmed breeding within the proposed development site. |
| Rook / *Corvus frugilegus* | Green-listed | Observed flying over the site on multiple occasions, did not land within the proposed development site. Not considered to be breeding within the site. |
| Song thrush / *Turdus philomelos* | Green-listed | Observed singing from southern treeline habitat, possibly breeding within proposed development site. |
| Starling / *Sturnus vulgaris* | Amber-listed | Observed during multiple surveys feeding in large groups within north eastern field. Possibly breeding within the proposed development site. |
| Swallow / *Hirundo rustica* | Amber-listed | Confirmed nesting within small building in south western field. |
| Willow warbler / *Phylloscopus trochilus* | Amber-listed | Heard singing from eastern most hedgerow, possibly breeding within proposed development site. |
| wood pigeon / *Columba palumbus* | Green-listed | Observed within all hedgerows/treelines bordering fields, including central hedgerow, on multiple occasions. Confirmed breeding within proposed development site. |
| Wren / *Troglodytes troglodytes* | Green-listed | Observed singing and calling in multiple locations within hedgerows bordering site. Confirmed to be breeding within proposed development. |

**Table 4.4 - Bird species identified during surveys of the proposed development**

Grey wagtail and meadow pipit are red-listed (*i.e.* of high conservation concern) due to declines in breeding populations. Both of these species were identified as individual birds during the second breeding bird survey in June 2020, and were not identified within the proposed development site in 2021. Grey wagtail was noted in the south of the site adjacent to the barns, whilst the meadow pipit was identified flying through the northern end of the western field. Nine records of grey wagtail within c. 2km of the site were returned from an NBDC database search whilst five records of meadow pipit were returned within c. 2km of the site, both with the most recent record from 2011. Neither species are considered or identified to be nesting within the proposed development site. Grey wagtail typically nest close to fast flowing rivers beneath man-made structures on ledges of bridges or culverts, or amongst tree roots[19]. Meadow pipit are ground nesting birds, mainly found nesting in moorland, heathland and rough grassland[20]. Whilst not nesting within the proposed development site, the surrounding habitat has potential to support these red-listed species.

There are a number of habitats within the proposed development site that are suitable for breeding birds to nest in, including trees, barns, hedgerows and scrub. The proposed development site is likely to encompass and/or form part of the breeding territories of a number of bird species recorded during the surveys. Breeding behaviour of the majority of species was observed within the proposed development site, predominately along or close to hedgerows and the woodland areas within the site. Barn swallows were observed nesting in the building in the south western section of the proposed development site. A pair of buzzards were observed on surveys in 2020 soaring and calling above the western field in proposed development site. Whilst a nest was not identified, it is likely they are nesting nearby in the local area.

Although there were a number of buildings and barns within the site, there were no buildings suitable for barn owls, due to lack of potential nest places within the barns present i.e. a concave or level surface or cavity, that is elevated and well hidden. No evidence of barn owls was identified within the proposed

[19] Grey Wagtail (*Motacilla cinerea*). Birds in Cheshire and Wirral, A breeding and wintering atlas. Accessed here: http://www.cheshireandwirralbirdatlas.org/species/grey-wagtail-breeding.htm

[20] Meadow pipit. The Wildlife Trusts. Accessed here: https://www.wildlifetrusts.org/wildlife-explorer/birds/larks-sparrows-wagtails-and-dunnock/meadow-pipit

development site, with the most recent NBDC database record within c. 2km of the proposed development returned from 1991.

Due to the widespread distribution of the birds encountered on site, and the presence of a number of amber-listed species, and two red-listed species, the abundance of suitable breeding habitat in the site, the breeding birds within the proposed development site are considered to be of local importance (higher value).

Wintering birds

The desk study records from the NBDC database search include 20 species of wintering waterfowl, gull and wader species within *c.* 2km of the proposed development site. These records are present in Appendix 4.2.

Table 4.5 provides a summary of the findings of the winter bird surveys with respect to those species which are of highest conservation concern, and were recorded within winter bird survey sites:

- Special Conservation Interests (SCIs), for a wintering population, of nearby SPAs
- Species listed under Annex I of the Birds Directive (2008/144/EC)
- Red, Amber and Green BoCCI species listed for their wintering populations

| Common name/Latin name/BoCCI Code | Distribution in the study area | Peak count/Site/Date | Conservation Importance | | |
|---|---|---|---|---|---|
| | | | BoCCI (Breeding) | Annex I | SCI |
| Herring gull *Larus argentatus* (HG) | Observed flying over multiple areas of the site during three visits, did not land during any survey. | 4 birds observed in February 2021 flying over north east of the site | Amber (B/W) | - | ✓ |
| Grey heron *Ardea cinereal* (H.) | Observed flying over north east of the site during one visit, did not land. | 1 bird, south west of the site, during survey in February 2021. | Green (B/W) | - | - |
| Lesser black-backed gull *Larus fuscus* (LB) | Observed flying over the north of the site during two visits, did not land. | 1 bird observed in March 2021 and March 2020. | Amber (B/W) | - | ✓ |
| Snipe *Gallinago gallinago* (SN) | Observed in the north of the site during one visit, flushed from grassland habitat. | 2 birds in the north of the site during March 2020 visit. | Red (B/W) | - | - |
| Mallard *Anas platyrhynchos* (MA) | Observed in the north east of the site during one visit | 2 birds, in the north east during March 2020 visit. | Amber (B/W) | - | - |
| Great black-backed gull *Larus marinus* (GB) | Observed flying over the north of the site during one visit. | 2 birds in the north during February 2020 visit. | Green (B/W) | - | - |

**Table 4.5 - Details of wintering bird species found within the proposed development site**

During wintering bird surveys carried out in February and March 2020 and 2021, two SCI species from nearby European sites were identified within the lands: herring gull, an SCI species of Ireland's Eye SPA located c. 27km north east of the proposed development, and lesser black-backed gull an SCI species of Lambay Island SPA located c. 34km north east. Both of these species were identified flying over the site

and did not land, and therefore, the proposed development site is not used by SCI species from nearby European sites.

There is no suitable habitat for light-bellied Brent goose *Branta bernicla hrota*, greylag goose and/or other SCI wintering bird species such as waders onsite. Light-bellied Brent geese and wintering waders regularly use Dublin's amenity parks and sports grounds for foraging. The nearest known light-bellied Brent goose site is c. 6.1km north-east the proposed development site at Tymon Park (Scott Cawley Ltd., 2017 ). Given that there is no suitable foraging habitat, i.e. open amenity grassland onsite, the proposed development site is unsuitable for light-bellied Brent goose, and/or other SCI wintering bird species that use similar habitat for foraging within County Dublin. Greylag goose is a SCI species of the Poulaphouca Reservoir SPA located c. 11.3km south west of the proposed development, and was not identified within the proposed development during wintering bird surveys. The proposed development is not on any known migrating routes of wintering bird species or located on any flight path for ex-situ SCI species.

The wet grassland habitat provides some suitable habitat for wading species such as snipe, which was identified in the north of the site during surveys. There is limited habitat for waterfowl species however due to the lack of open waterbodies in the site.

The treelines and scrub offer suitable foraging habitat and shelter for smaller overwintering species such as passerines for example redwings *Turdus iliacus* and fieldfare *Turdus pilaris,* neither species were identified within the proposed development site.

Due to the presence of a small number of wintering bird species, and limited suitable habitat on site, the local wintering bird population are valued to be of local importance (higher value).

#### 4.4.3.2 Amphibians and Reptiles

The Wildlife Acts provide protection to Ireland's only native reptile species, common lizard, *Zootoca vivipara* and two native amphibian species, common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*.

The NBDC data search returned records (within c. 2km) of the two amphibian species, with five records of common frog, the latest being from 2020, and one record of smooth newt, from 1972.

Along the drainage ditch that separates the two fields (Cooldown Stream), water had pooled in some places. This habitat would be suitable for breeding amphibians due to the presence of invertebrates and vegetation observed within the stagnant pools. West of the proposed development is the Citywest and Hibernian Golf Course. This golf course has multiple pond features, with the closest feature being c. 100m west of the proposed development site. Whilst these areas were not surveyed, it is likely that these ponds are suitable for amphibians, and individuals could travel between the habitats within and outwith the proposed development site.

There were no records of common lizard in the NBDC database within c. 2km of the site. No individuals were observed at the time of the survey, and it is considered unlikely that reptiles are present within the site, as common lizard is typically associated with heath and coastal scrub habitat in Ireland. This species is therefore not considered further.

Local amphibian populations are of local importance (higher value), due to the presence of suitable habitat within the proposed development and in close proximity in the wider environs, and the local records of these species.

#### 4.4.3.3 White-clawed crayfish *Austropotamobius pallipes*

The NBDC database search returned one record for freshwater white-clawed crayfish within c. 2km of the proposed development site from 2013. This record was located c. 1.3km west of the proposed development, along the Camac River. The section of the Camac River where this record was located, flows

downstream and joins with the Corbally Stream c. 2.5km downstream of the proposed development site. The site is therefore connected to white-clawed crayfish habitat.

The streams within the proposed development provide little suitability for white-clawed crayfish, due to the substrate of the streams (silty and soft with heavy cattle poaching), and shallow nature (approximately 10-30cm maximum depth). The closest river station to the proposed development is along the Camac River, located c. 3km downstream of the site, and has 'moderate' ecological status or potential, however is 'at risk' of not achieving good water quality status. The water quality within the proposed development site was not measured, however with heavy cattle poaching and dumping evident within the stream, and as the streams are culverted in the north west of the site, it is unlikely that the Corbally, Coldwater and Cooldown Streams within the proposed development would support white-clawed crayfish populations.

Nevertheless, as the proposed development is connected hydrologically to white-clawed crayfish habitat and due to the presence of records within c. 2km, the white-clawed crayfish is considered to be of local importance (higher value) and is included as a KER.

#### 4.4.3.4 Bats

Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the EU Habitats Directive (with the Lesser horseshoe bat also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011. The NBDC database search returned records for the following bat species: brown long-eared bat *Plecotus auritus*, Leisler's bat *Nyctalus leisleri,* common pipistrelle *Pipistrellus pipistrellus*, and soprano pipistrelle *Pipistrellus pygmaeus.*

The review of records held by Bat Conservation Ireland returned 48 roosts within c. 10km of the proposed development site (Appendix 5.2). The closest roost to the site was a brown long-eared bat roost located c. 700m west, in Saggart Church. The next two nearest roost records were located in Rathcoole, both c. 2.9km west, and recorded as unidentified bat species. The remaining records were all over 3km from the proposed development site. The three roosts identified within 3km of the proposed development site are within the Core Sustenance Zone (CSZ) of Irish bat species[21], and therefore could use the proposed development site as foraging and commuting habitat.

There were no bat roosts identified in the buildings within the proposed development site during surveys carried out in 2020. Two of the farm sheds and buildings were deemed to have some potential roost features (PRFs), consisting of small gaps/crevices between stonework, where the roofing meets the wall, and features within dense ivy growing on the buildings themselves. They were deemed to have low potential for roosting bats due to their dilapidated nature, leaving them open and exposed, and susceptible to fluctuations in temperature, and the low number of PRFs present suitable for very small numbers of bats (1-2 bats) (Figure 4.6). The two other structures within the site were deemed to have negligible potential due to the lack of any roosting features. No evidence of bats, *i.e.* droppings, staining, live/dead bats, prey remains etc. were identified within any of the buildings/structures.

Six trees within the proposed development site were also deemed to have low potential for roosting bats, due to the presence of potential roosting features including; knot holes, dense ivy stems and branch fractures (Figure 4.6, Appendix 4.4). These trees were deemed to be of sufficient size and age to contain bat roosts but contained features of limited roosting potential.

The habitat within the lands provides good commuting and foraging routes for bats using the wider environs and its level of suitability is valued moderate as per the Bat Conservation Trust (BCT) guidelines (Collins ed., 2016). The treelines along the boundary of the site follow linear routes which are connected to mature treelines in the surrounding area, and the subject lands are largely unlit, with the northern boundary partially illuminated from streetlights and the nearby housing.

[21] *Core Sustenance Zones Determining zone size,* Bat Conservation Ireland, 2016.

The bat activity surveys carried out within the lands in June 2020 recorded five bat species: common pipistrelle, soprano pipistrelle, brown long-eared bat, Leisler's bat, and *Myotis* species[22], foraging and/or commuting within the proposed development site (Figure 4.6). Common pipistrelle had the highest number of calls recorded, followed by soprano pipistrelle and Leisler's bat. Bat activity overall was at a moderate level, with the central treeline/hedgerow and the eastern-most treeline exhibiting the highest levels of activity across the species identified. *Myotis* species had a noticeably high level of activity along the Corbally Stream, particularly in the south of the site. Surveyors followed the linear features in the lands, and moderate activity was also recorded on the treeline bordering the western field. This is most likely due to their high suitability for foraging and/commuting, and they are largely unlit, and connect the lands to semi-natural habitats within the surrounding landscape. Surveyors also surveyed the buildings/structures within the proposed development during activity surveys to identify if bats were roosting within. No bats were seen emerging or re-entering any of the buildings, however soprano and common pipistrelle calls were identified in close proximity to the farm sheds in the south of the site, likely foraging on insects as a result of the cattle being housed overnight within.

Due to the suitable commuting and/or foraging habitat within and surrounding the proposed development, the moderate levels of activity from common and widespread species (i.e. species of least concern), the local bat populations are valued as being of local importance (higher value).


**Fig. 4.6 - Bat species and locations of calls identified during bat activity surveys, and trees with potential roost features within the proposed development site**

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

### 4.4.4 Summary of Ecological Evaluation

Table 4.6 summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and TII guidelines (CIEEM, 2018 and National Roads Authority, 2009).

| Ecological Receptor | Ecological Valuation | KER? |
|---|---|---|
| **Designated Sites** | | |
| Glenasmole Valley SAC | International | **Yes** |
| Wicklow Mountains SAC | International | **Yes** |
| South Dublin Bay SAC | International | **Yes** |
| North Dublin Bay SAC | International | **Yes** |
| Wicklow Mountains SPA | International | **Yes** |
| North Bull Island SPA | International | **Yes** |
| South Dublin Bay and River Tolka Estuary SPA | International | **Yes** |
| Poulaphouca Reservoir SPA | International | **Yes** |
| All other SAC or SPA sites | International | No |
| Lugmole Glen pNHA | National | **Yes** |
| Slade of Saggart and Crooksling Glen pNHA | National | **Yes** |
| Dodder Valley pNHA | National | **Yes** |
| Glenasmole Valley pNHA | National | **Yes** |
| Grand Canal pNHA | National | **Yes** |
| Kilteel Wood pNHA | National | **Yes** |
| Liffey Valley pNHA | National | **Yes** |
| South Dublin Bay pNHA | National | **Yes** |
| North Dublin Bay pNHA | National | **Yes** |
| All other NHA or pNHA sites | National | No |
| **Habitats** | | |
| Buildings and artificial surfaces (BL3) | Local importance (lower value) | No |
| Recolonising bare ground (ED3) | Local importance (lower value) | No |
| Depositing/lowland rivers (FW2) | Local importance (higher value) | **Yes** |
| Drainage ditches (FW4) | Local importance (lower value) | No |
| Improved agricultural grassland (GA1) | Local importance (lower value) | No |
| Dry meadows and grassy verges (GS2) | Local importance (higher value) | **Yes** |
| Wet grassland (GS4) | Local importance (lower value) | No |
| Hedgerows (WL1) | Local importance (higher value) | **Yes** |
| Treelines (WL2) | Local importance (higher value) | **Yes** |
| Scattered trees and parkland (WD5) | Local importance (higher value) | **Yes** |
| Scrub (WS1) | Local importance (lower value) | No |

| Ecological Receptor | Ecological Valuation | KER? |
|---|---|---|
| **Designated Sites** | | |
| **Fauna Species** | | |
| Badger | Local importance (higher value) | **Yes** |
| Otter | County importance | **Yes** |
| Other mammals | Local importance (higher value) | **Yes** |
| Birds | Local importance (higher value) | **Yes** |
| Wintering birds | Local importance (higher value) | **Yes** |
| Amphibians | Local importance (higher value) | **Yes** |
| White-clawed crayfish | Local importance (higher value) | **Yes** |
| Bats | Local importance (higher value) | **Yes** |

**Table 4.6 - Summary of the ecological evaluation**

## 4.5 Characteristics of the Proposed Development

Kelland Homes Ltd and Durkan Estates Ireland Ltd are applying to An Bord Pleanála for permission for a strategic housing development at a site at Boherboy, Saggart, County Dublin. The development will consist of 655 no. dwellings, comprised of 257 no. 2, 3 & 4 bed, 2 & 3 storey detached, semi-detached & terraced houses, 152 no. 1, 2 & 3 bed duplex units in 17 no. 2-3, 3-4 & 4 storey blocks, and 246 no. 1, 2 & 3 bed apartments in 9 no. buildings ranging in height from 2-5 storeys, and a 2 storey crèche (693m²).

Access to the development will by via one no. vehicular access point from the Boherboy Road, along with proposed upgrade works to Boherboy Road to include the provision of a roadside footpath along the front of the site at the Boherboy Road, continuing eastwards to the junction with the N81 Blessington Road (for an overall distance of c.370m). The proposed development also provides for pedestrian and cyclist connectivity to the adjoining Carrigmore Park to the north-east, and vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north.

The proposed development provides for (i) all associated site development works above and below ground, including surface water attenuation & an underground foul sewerage pumping station at the northern end of the site, (ii) public open spaces (c.3Ha), including alongside the Corbally Stream, which will accommodate the provision of pedestrian / cyclist links to Carrigmore Park to the north-east, (iii) communal open spaces (c. 6,392m²), (iv) hard and soft landscaping and boundary treatments, (v) undercroft, basement & surface car parking (914 no. car parking spaces), (vi) bicycle parking (797 no. bicycle parking spaces), (vii) bin & bicycle storage, (viii) public lighting, and (ix), plant (M&E), utility services & 5 no. ESB sub-stations, all on an overall application site area of 18.3ha. In accordance with the Fortunestown Local Area Plan (2012) an area of approx. 1.42Ha within the site is reserved as a future school site.

The surface water drainage design has been carried out in accordance with the Greater Dublin Regional Code of Practice (GDSDS). The internal drainage system has been designed as a completely separate foul and surface water system. The surface water drainage infrastructure for the proposed development has been separated into 10no. drainage catchments, four of which outfall attenuated flows into the Corbally Stream along the eastern boundary and the other six indirectly along the northern boundary in two outfall locations to the Corbally Stream. Each outfall location includes a standard wing-wall outfall detail, and a non-return flap valve is to be included at each outfall location to prevent backflow in the event of a swamped outfall condition. The surface water infrastructure for the development will collect the rainfall on the site and convey the storm water run-off via roadside swales, tree pits, bio-retention area, rear garden filter drains, gullies, underground pipes, manholes, catchpit manholes and direct the flows via void arched attenuation

systems towards Hydrobrakes and petrol interceptors before out falling to the existing on site open watercourses.

For the foul drainage, it is proposed to service the subject lands by providing a new gravity foul sewer in the south east of the site, connecting into the existing foul infrastructure in Verschoyle Green. A foul water pumping station is proposed as part of the application to drain the apartment blocks from the lower north east corner of the site into the gravity sewer to be constructed connecting into Verschoyle Green. The minimum public sewer diameter is to be 225mm. The proposed foul pumping station is to be in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2017 – Part 5 – Pumping Stations. Peak wastewater discharge is calculated at an average wastewater discharge of 19.27 litres/sec. This network will then carry the foul water to the Ringsend Wastewater Treatment Plant (WWTP) prior to its discharge into the Liffey Estuary/Dublin Bay.

While the layout of the development is broadly cognisant of fluvial flood risk, elements of the proposed development at the northern boundary encroach on the flood risk zones[23]. This creates the potential for the proposed development to displace floodplain storage and thereby increase flood risk elsewhere. To prevent this, it is necessary to provide compensatory storage within the Site in accordance with the Flood Risk Management Guidelines. Compensatory storage is provided by reducing the existing ground level immediately adjacent to the stream to create a basin. More details on the compensatory storage area can be found in the Site-Specific Flood Risk Assessment (SSFRA) (Kilgallen & Partners, 2021).

The duration of construction activities is expected to last 5 years (+/-), completed in three phases. There will be no piling or blasting of the site, and there is no contaminated land present on site.

## 4.6 Potential Impact of the Proposed Development

### 4.6.1 Construction Stage

#### 4.6.1.1 Potential Impacts on Designated Sites during Construction

<u>European Sites</u>

This section describes and assesses the potential for the proposed development to result in likely significant effects on European sites that lie within the ZoI of the proposed development. In the context of European sites this is focussed on the habitats and species for which the sites are selected (QIs for SACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the Appropriate Assessment Screening Report for the proposed development that accompanies this application.

The assessment presented in the Appropriate Assessment Screening Report concluded that the potential impacts associated with the proposed development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites; either alone or in combination with any other plans or projects.

As the proposed development does not traverse any European sites there is no potential for habitat fragmentation to occur.

The proposed development site does not support populations of any fauna species linked with the QI/SCI populations of any European site(s).

The closest European site, Glenasmole Valley SAC is located 4.1km south east of the proposed development. Glenasmole Valley is designated for its Annex I Habitats, including Petrifying springs with tufa formation (Cratoneurion) [7220], Molinia meadows on calcareous, peaty or clayey-silt-laden soils

[23] *Report on Site-Specific Flood Risk Assessment, Residential Development, Boherboy, Saggart, Co. Dublin.* Kilgallen & Partners Consulting Engineers, 2021.

(Molinion caeruleae) [6410], and Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]. This European site is located in the same groundwater body as the proposed development site, however there will be no large excavations as part of the construction of the development, or any interactions with the groundwater regime. There is no hydrological pathway between this European site and the proposed development.

A potential source-pathway-receptor link through hydrological means has identified connectivity via the surface water and foul water networks from the proposed development site and Dublin Bay European sites. There are no other European sites hydrologically connected to the proposed development. However, effects on European sites in Dublin Bay, which are North Dublin Bay SAC, North Bull Island SPA, South Dublin Bay SAC, and South Dublin Bay and River Tolka Estuary SPA located c. 23km downstream of the proposed development site, have been excluded for the following reasons, which are discussed in more detail in the AA Screening report (Scott Cawley, 2021):

- Results of the CSM carried out by AWN[24] and which inform the AA screening report, indicate that surface run-off from the proposed development, during both construction and operational phases respectively, will not result in any perceptible impact on water quality in downstream receiving waters in Dublin Bay (and thus in the European sites therein).
- The AWN report also concludes that the cumulative or in-combination effects of effluent arising from the proposed development with that of other developments discharging to Ringsend WWTP will not be significant having regard to the size of the calculated discharge from the proposal.
- Considering the above, particularly the current unpolluted status of Dublin Bay, and that foul water discharges from the proposed development would equate to a very small percentage of the overall discharge volumes sent to Ringsend WWTP[25] for treatment, it is concluded that the proposed development will not impact on the overall water quality status of Dublin Bay.

Considering these, the following conclusions can be made:

- The effects of an accidental pollution event occurring the construction phase of the proposed development is considered not to be significant;
- Any accidental pollution event is likely to be short in duration (i.e. confined to storm events) and would only occur during the construction phase which is estimated to continue for five years, limiting the magnitude and extent of effects; and,
- The distance between the proposed development outfall of surface water runoff and the nearest European site in Dublin Bay (c. 23km), means that sediments or pollutants from the proposed development will not result in any discernible effects on European sites in Dublin Bay.
- Due to the reasons above and discussed by AWN in the Hydrological and Hydrogeological Qualitative Risk Assessment, there are no hydrological or hydrogeological risks associated with the construction stage of the proposed development, and therefore there are no European sites at risk of habitat degradation.

There are no species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 on the proposed development site. The proposed development site is hydrologically connected European sites in Dublin Bay, however, due to the absence of Third Schedule

[24] *Hydrological & Hydrogeological Qualitative Risk Assessment for Proposed Residential Development at Boherboy, Saggart, Co. Dublin.* Awn Consulting, September 2020.

[25] The plant has received planning (2019) and will be upgraded with increased treatment capacity over the next five years. The peak foul discharge calculated for the proposed amendment is well within the capacity of the WWTP. Even without treatment at the Ringsend WWTP, the peak effluent discharge, calculated for the proposed amendment as 19.27 litres/sec (which would equate to 0.174% of the licensed discharge at Ringsend WWTP [peak hydraulic capacity]), would not impact on the overall water quality within Dublin Bay and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive).

non-native invasive species within the proposed development site, there is no risk of non-native invasive species spreading from the proposed development site to any European site.

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m. For birds, disturbance effects would not be expected to extend beyond a distance of c. 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance. There are no European sites within the disturbance ZoI; the next nearest European site to the proposed development is c. 4.1km away.

There are no habitat areas within the disturbance ZoI of the proposed development that support populations of qualifying/special conservation interest species of any European site. The nearest SAC designated for otter is the Wicklow Mountains SAC, c. 5.3km south-east of the proposed development. The Corbally stream is a small order stream located in a different sub-catchment than the Wicklow Mountains SAC. Considering the size of otter territories in Ireland, and its location relative to the Wicklow Mountains SAC, any otters potentially using the Corbally stream do not form part of or support any SAC population. Therefore, as the proposed development will not result in the disturbance/displacement of the qualifying/special conservation interest species of any European site, there is no potential for any in combination effects to occur in that regard.

National Sites

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

The proposed development does not overlap with any nationally designated sites and it is not located in their immediate vicinity. The nearest national site is Lugmore pNHA, located c. 1.4km south east of the proposed development. This national site is designated for its habitats, and is not hydrologically connected to the proposed development. Therefore it is outwith the ZoI of the proposed development and does not have the potential to affect the habitats within.

As the proposed development does not traverse any nationally designated sites there is no potential for habitat fragmentation or loss to occur.

A potential source-pathway-receptor link through hydrological means has identified connectivity via the surface water and foul water networks from the proposed development site and Dublin Bay national sites. There are no other national sites hydrologically connected to the proposed development. However, effects on national sites in Dublin Bay, which are North Dublin Bay pNHA, South Dublin Bay pNHA, and Booterstown Marsh pNHA located c. 23km downstream of the proposed development site, have been excluded for the following reasons, which are discussed in more detail in the AA Screening report in relation to European sites in Dublin Bay which overlap with national sites (Scott Cawley, 2021):

- Results of the CSM carried out by AWN[24] and which inform the AA screening report, indicate that surface run-off from the proposed development, during both construction and operational phases respectively, will not result in any perceptible impact on water quality in downstream receiving waters in Dublin Bay (and thus in the national sites therein).
- The AWN report also concludes that the cumulative or in-combination effects of effluent arising from the proposed development with that of other developments discharging to Ringsend WWTP will not be significant having regard to the size of the calculated discharge from the proposal.
- Considering the above, particularly the current unpolluted status of Dublin Bay, and that foul water discharges from the proposed development would equate to a very small percentage of the overall discharge volumes sent to Ringsend WWTP for treatment, it is concluded that the proposed development will not impact on the overall water quality status of Dublin Bay.

Considering these, the following conclusions can be made:

- The likelihood of an accidental pollution event occurring during the construction phase of the proposed development is considered to be very low;
- Any accidental pollution event is likely to be short in duration (i.e. confined to storm events) and would only occur during the construction phase which is estimated to continue for five years, limiting the magnitude and extent of effects; and,
- The distance between the proposed development outfall of surface water runoff and the nearest national site in Dublin Bay (c. 23km), means that sediments or pollutants from the proposed development will not result in any discernible effects on national sites in Dublin Bay.

Due to the above reasons, there are no hydrological or hydrogeological construction risks associated with the proposed development, and therefore there are no nationally designated sites at risk of habitat degradation.

There are no species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 on the proposed development site. The proposed development site is hydrologically connected nationally designated sites in Dublin Bay, however, due to the absence of Third Schedule non-native invasive species within the proposed development site, there is no risk of non-native invasive species spreading from the proposed development site to any nationally designated site.

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m. For birds, disturbance effects would not be expected to extend beyond a distance of c. 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance . There are no nationally designated sites within the disturbance ZoI; the nearest national site to the proposed development designated for wildfowl species it Slade of Saggart and Crooksling Glen pNHA, located c. 1.5km south west of the proposed development, and therefore beyond the ZoI for disturbance related impacted from the proposed development on bird species associated with this national site.

#### 4.6.1.2 Potential Impacts on Habitats and Flora during Construction Stage

Habitat Loss

Construction of the proposed development will result in the loss of habitat area; totalling approximately 17ha. None of the habitats directly affected by the proposed development are considered to be any greater than of local biodiversity importance (higher value). The majority of the habitats within the proposed development boundary (c. 16.1ha) are of local biodiversity importance (lower value) and predominantly comprised of improved agricultural grassland and drainage ditches (c. 15.2ha), but also include buildings, artificial surfaces and recolonising bare ground (c. 0.14a), c. 0.5ha of species-poor wet grassland, and c. 0.2ha of scrub. As these habitats are of local biodiversity importance (lower value), their loss or modification will not result in a likely significant effect on biodiversity.

The habitat types within the proposed development boundary, and the area of each, that are considered to be of a higher local biodiversity value and will be lost are as follows:

- Dry meadows and grassy verges (GS2) – c. 1.2ha of this habitat will be lost
- Scattered trees and parkland (WD5) – c. 0.05ha of this habitat in a mosaic with scrub (WS1)
- Hedgerows (WL1), Treelines (WL2) - The linear length of hedgerow being lost is 575m, and 70 trees

- Lowland/Depositing Rivers (FW2) – *c.* 30m linear length of this riparian habitat along the Corbally Stream to facilitate four stream crossings (three located on the eastern boundary, and one on the northern boundary).

There will be a loss of dry meadows and grassy verges habitat, scattered trees and parkland, and treelines and hedgerows within the proposed development, as these habitats will be directly impacted by construction activities. The areas that will be lost are relatively small in the context of the site and the wider environs, with 23 'Category U' trees (Those trees in such a condition that any existing value would be lost within 10 years), 40+ 'Category C' trees (trees of low quality and value), and seven 'Category B' trees (trees of moderate quality and value) being removed[26]. Although 575m of hedgerow habitat will be removed, this encompasses c. 23.3% of the total hedgerow habitat within the site. The hedgerows on the peripheries of the site are largely being retained, whilst along the central hedgerow there will be some removal, this vegetation will be augmented and bulked up with new shrub and hedge planting which will compensate for the loss in this area.

Although a large number of trees are being removed, these are largely trees that are likely to succumb within 10 years, or are showing signs of infection by Ash dieback *Hymenoscyphus Fraxinus,* or are trees of low quality and value. The existing mature trees located along the site boundaries will be largely retained and enhanced with additional native planting. Where any removal of these features has taken place, replacement planting throughout the site of native species will occur to compensate for this loss. The main habitat being lost within the site is improved agricultural grassland. This has limited ecological value, and is a common habitat found in the wider environment. The drainage ditches within the site, along the western and central boundaries, will largely be retained, managed and enhanced, and used as swales, with additional planting proposed that includes marginal and species suited to wetland/marsh habitat. All of the ditches drain to the Corbally Stream on the northern boundary of the site. A riparian margin of at least 10m will be in place to ensure minimal impact on the stream outside of the stream crossing areas. Ditches will accommodate overflow surface water when required and a portion of the north of the site will be used as compensatory flooding storage for the site. However, in the absence of any mitigation, there is potential for the construction of the temporary outfall and the addition of four stream crossings to have an impact on water quality within local watercourses, the Corbally Stream and the receiving aquatic environment downstream of the proposed works area. Some examples by which water quality in the receiving aquatic environment could be compromised include the following:

- Entry of construction personnel and/or vehicles into the drainage ditches on site;
- Clearance of vegetation and exposure of topsoil within the vicinity of the drainage ditches;
- Storage of unbunded construction materials in the vicinity of the drainage ditches;
- Refuelling of vehicles in the vicinity of the drainage ditches; and
- Washing of equipment, or release of wheel wash and other construction process waters to the drainage ditches and the downstream watercourses.

The most likely impacts on water quality arising from the aforementioned practices would be elevated levels of suspended solids in the water column, and entry of hydrocarbon and other chemical pollutants to the watercourse. Although rivers such as the Corbally Stream are likely to undergo periods when suspended solids are elevated, such as after a storm, construction in the vicinity of the stream would result in an increase in the frequency of these periods. Silts and sediments from the construction site could potentially smother existing gravel and sand beds, and the aquatic benthic invertebrates that inhabit this habitat. Sedimentation also has the potential to affect fish species resident in the aquatic environment downstream. The introduction of pollutants such as hydrocarbons to the stream could result in both a reduction in habitat quality and a reduction in oxygen levels, affecting the aquatic species that reside in this habitat. The effects of water quality impacts on aquatic habitats during construction and operation is considered to be significant at a local to county level, in the absence of any mitigation.

[26] *An Arboricultural Assessment on Lands at 'Boherboy', Saggart, Co. Dublin.* Arborists Associates Ltd.

The proposed development will result in the loss of treelines, hedgerows, dry meadows and grassy verges habitat, all of which are valued at higher local biodiversity value. Considering the short length of treeline/hedgerow being removed in the context of the local resource of this habitat type, the native planting proposed in the landscaping design to replace the loss of habitats, and the retention and enhancement proposed of existing treelines/hedgerows, this is not likely to result in a significant negative effect, at any geographic scale.

Introducing or spreading non-native invasive plant species

Planting, dispersing, or allowing/causing the dispersal, spread or growth of certain non-native plant species is controlled under Article 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011; and refers to plant or animal species listed on the Third Schedule of those regulations. There were no non-invasive species as listed on the Third Schedule identified within the site, or any sensitive habitats within or adjacent to the site. As such, the introduction or spread of invasive species to the site and the local environs, including within watercourses, is not likely to result in a significant negative effect, at any geographical scale.

Habitat degradation from dust generated during construction

The proposed development has the potential to generate dust during construction works which could affect vegetation in habitat areas within and adjacent to the proposed development boundary. This has the potential to affect highly sensitive and ecologically-important habitat areas (e.g. designated area for nature conservation or areas of Annex I habitat), however no such designations or Annex I habitats have been identified within close proximity of the proposed development that could potentially be impacted by dust arising from the construction works. As such dust impacts could result in a likely significant negative effect, at a local geographic scale only.

An Accidental Pollution Event Affecting Surface Water Quality in the Receiving Environment

During construction, contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water feature has the potential to have a significant negative impact on water quality and consequently affect aquatic and wetland habitats in the local receiving environment.

It is considered unlikely that a pollution event of such a magnitude would occur during construction or be any more than temporary in nature, and as concluded in the AWN report, such event would not be significant should it occur. Nevertheless, a precautionary approach is being taken in assuming a level of risk of water quality impacts. Consequently, detailed mitigation measures are required to further minimise the risk of the proposed development having any perceptible effect on water quality.

Habitat degradation as a consequence of effects on surface water quality has the potential to affect the conservation status of aquatic, wetland or estuarine/marine habitats and therefore, has the potential to result in a significant negative effect at a local geographic scale.

Habitat degradation as a consequence of effects on surface water quality has the potential to affect the conservation status of aquatic, wetland or estuarine/marine habitats and therefore, has the potential to result in a significant negative effect at a local geographic scale.

#### 4.6.1.3 Potential Impacts on Fauna During Construction Stage

Potential Impacts from Habitat loss

*Badger*

Badgers, and their breeding and resting places, are protected under the Wildlife Acts. Due to their stable Irish populations, they are considered to be of "Least concern" in terms of conservation (Nelson *et al.*, 2019). The proposed development site has the potential to be used by badger due to suitable habitat for foraging and sett building, however no evidence of this species was identified during field surveys carried out within the lands. During the construction stage of the development, badgers could be impacted by the removal of foraging areas and feeding resource available. However, the overall loss of habitat is small and not significant at any scale, considering the typical badger territory size of more than 60ha in Ireland (Hayden and Harrington, 2000), and the abundance of available suitable habitat surrounding the proposed development site. Although the actual effect of foraging habitat loss cannot be quantified in terms of any threshold value that could be predicted, any affected badger groups would be expected to adapt to the changed landscape. It is therefore predicted that, despite any temporary effects, the loss of foraging habitat associated with the proposed development is unlikely to affect the conservation status of the local badger population and will not result in a likely significant negative effect, at any geographic scale.

*Otter*

No evidence of otter was noted on site, however the Corbally Stream is suitable for commuting and/or foraging otter. There are no otter holts or couch sites present within the proposed development boundary. Therefore, the proposed development will not result in the loss of any breeding or resting places and construction works will not disturb any such sites.

In the context of river systems, the Threat Response Plan Otter Lutra lutra 2009-2011 document (Department of the Environment, Heritage and the Gaeltacht, 2011) defines terrestrial otter habitat as a 10m zone of riparian habitat along the riverbanks. The proposed development will be a minimum of 15m set back from the banks of the Corbally Stream. The Corbally Stream contains c. 5.3km of suitable otter habitat, and as only c. 20-30m will be lost during construction, for the development of four stream crossings, this is not considered a likely significant effect on any geographic scale.

*Other mammals*

The proposed development site has the potential to be used by hedgehogs, pygmy shrews, Irish hare, and Irish stoat due to suitable habitat for foraging and breeding and the presence of these species from the local area from the findings of the desktop review. The construction stage of the development will reduce the amount of semi-natural habitat available for foraging in this area for small mammals, however, the overall loss of habitat is small and not significant at any scale, considering that the peripheries of the site and the drainage ditches will largely be retained and still provide commuting and/or foraging habitat for these species, and the abundance of available suitable habitat surrounding the proposed development site for all of the aforementioned species.

Given the relatively low numbers of individuals of each species that are likely to be affected, and that they are highly mobile species, vegetation clearance is unlikely to result in a level of mortality that would affect the species' conservation status, and result in a significant negative effect, even at a local geographic scale.

*Birds*

In the absence of mitigation to protect birds and their nests, there is potential for direct impacts on breeding birds due to loss of suitable breeding bird habitat and/or the risk of direct mortality and injury to birds, which may arise from the clearance of vegetation within the proposed development site. This potential impact would be most likely to arise if clearance works are undertaken during the time of year when birds are likely to be nesting (*i.e.* 1st March to 31st August, inclusive).

With the exception of treelines, hedgerows and scrub, the habitats in the lands are of low suitability for nesting bird species. Species that commonly nest in grassland vegetation were not encountered during surveys of the lands in 2020 or 2021. The bird species recorded at the proposed development site during surveys include those that are commonly found in suburban and urban habitats (*e.g.* blackbird, hooded crow, robin and wren). These habitats include hedgerows, treelines and grasslands, which can be found in the wider surrounding area, such as to the west and south of the proposed development site.

The clearance of vegetation may result in a loss of breeding bird habitat, however considering the amount of suitable foraging habitat located within the wider environs, the habitat loss will result in a significant negative effect on the populations of bird species at a local scale only.

Under the Wildlife Acts, it is an offence to disturb birds while on their nests, or to wilfully take, remove, destroy, injure or mutilate their eggs or nests. Mitigation measures have been provided to ensure adherence to the Wildlife Acts.

*Bats*

All bat species and their roost sites are strictly protected under both European and Irish legislation including: -

- Wildlife Act 1976 and Wildlife (Amendment) Act, 2000 (S.I. No. 38 of 2000)
- Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna 1992 (Council Directive 92/43/EEC)
- European Communities (Birds and Natural Habitats) Regulations, 2011

It is an offence under Section 23 of the Wildlife Acts 1976-2017 and under Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the European Communities (Birds and Natural Habitats) Regulations it is not necessary that the action should be deliberate for on offence to occur. This places an onus of due diligence on anyone proposing to carry out works that might result in such damage or destruction. Under Section 54 of S.I. 477 of 2011, a derogation may be granted by the Minister where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

The proposed development will not directly, or indirectly, affect any known bat roosts. There are trees and buildings on site with potential roost features, which could be occupied at the time of site clearance, and therefore could result in the potential for bats to be injured or killed. All the bats recorded using the site are common species in Ireland that are classified as being of “least concern” in the Ireland Red List No. 3: Terrestrial Mammals (Marnell et al., 2019). The trees and buildings within the proposed development site that have some potential for roosting bats, are not considered to be significant in size and are unlikely to hold enough space for them to be maternity or hibernation roosts. The effects of loss of these potential roost sites on bats are not considered to be significant at any geographic scale for these reasons. These trees and buildings are deemed for removal however, and so mitigation measures are provided below should the roosting features become occupied by bats prior to the commencement of works.

The proposed development will include the removal of bat foraging habitat, *i.e.* the treelines, trees and hedgerows along the southern boundary and sections of the central hedgerow. With regards to the loss of foraging habitat, majority of the treelines along the boundaries are to be retained within the design of the

scheme and will therefore continue to provide foraging opportunities for bats. The effects of loss of foraging habitats on bats are considered to be temporary until planted vegetation can be developed, and significant at a local geographic scale, due to the level of activity identified on site, and the commuting and/foraging corridors the habitats within the site provide to local bats.

Potential Impacts Arising from Disturbance, Displacement and/or Mortality

*Badger*

While the proposed development will result in increased human presence on site, the potential effects on badgers in terms of disturbance are not significant in this instance. This is because, the proposed construction works are limited in terms of scale, and as works will largely be confined to daylight hours, when badgers are least likely to forage within the proposed development site, and there was no evidence identified within the proposed development of this species. Even in the event that the construction phase of the proposal coincides with construction of other projects in the immediate vicinity, there will be no significant disturbance or displacement effects on badgers. Badgers are widespread in Ireland and found in close proximity to human settlements, including in Dublin City, and therefore are likely to adapt to changes in human activity levels in the proposed development site and surrounding area.

*Other mammals*

In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace small mammal species from both breeding/resting places and from foraging habitat. However, given the limited potential for the majority site to support small mammal species, and disturbance will be short-term, it is extremely unlikely to result in any long-term effects on the local small mammal population or their conservation status. Particularly considering the retention of a treelines and drainage ditches and the local abundance of alternative scrub and grassland habitat of a similar nature, immediately adjacent to the proposed development in the surrounding environment. Therefore, disturbance/displacement during construction is unlikely to result in a significant negative effect, at any geographic scale.

*Birds*

The potential for disturbance is likely to arise from noise associated with the construction phase of the proposed development. For birds, construction-related disturbance effects would not be expected to extend beyond a distance of c. 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance (Cutts et al., 2009). A range of bird species utilise the proposed development site to forage within. While there is some potential for short-term disturbance of bird species foraging within the lands at the early stage of construction, it is anticipated that birds will acclimatise to human presence. This is because the lands are located in a semi-urban locality, and the bird species noted onsite are generally associate with gardens and other urban habitats frequented by people. The potential for disturbance of foraging bird species during construction is not considered to be significant at any geographic scale.

Bird species are protected under the Wildlife Acts as per Section 2.1 and it is an offence to disturb birds while on their nests, or to wilfully take, remove, destroy, injure or mutilate their eggs or nests. The proposed development site contains several common species of bird, many of which are likely to nest within hedgerows, treelines, woodland and scrub. There is potential for direct impacts on nesting birds and/or mortality of birds arising from the clearance of vegetation within the site. This scenario would be most likely if works were to occur during the time of year when birds are likely to be nesting (1st March to 31st August, inclusive). The potential for disturbance of breeding bird species during construction is considered to be significant at local geographic scale.

*Amphibians*

Site clearance works have the potential to result in disturbance to, and the direct mortality of amphibians. Given the size of the suitable habitats within the site (drainage ditches), and the retention of same, the number of individuals that would potentially be at risk is considered to be very low and impacts on such individuals would be unlikely to affect the local populations in the long-term. However, common frog is protected under the Wildlife Acts and it is an offence to hunt, take or kill them, or wilfully to interfere with or destroy their breeding places. Mitigation measures have been provided to ensure adherence to the Wildlife Acts.

*Bats*

No bat roosts were found within any trees or buildings within the proposed development site; however, the buildings, farm sheds and six trees within the site were deemed to have potential roost features. Due to the presence of potential bat roost features, the removal of trees and buildings onsite to facilitate the construction of the proposed development has the potential to result in disturbance of bats or their roosts, or in a worst-case scenario, the mortality of bats that could be roosting in these features within the trees or structures. The disturbance or mortality of bat species in the absence of mitigation is considered to result in a likely significant effect, at a local scale only.

Disturbance/displacement effects may also arise from the introduction of artificial lighting during construction. However, the species recorded the most within the proposed development site (i.e. Leisler's bat, soprano pipistrelle and common pipistrelle) are some of the least sensitive species to artificial light spill, and given the presence of artificial lighting within the immediate vicinity of the proposed development area (i.e. along the northern and eastern boundary) the local bat population would be expected to be habituated to local levels of artificial light spill. In addition bats recorded using the proposed development site are widespread and common across Ireland and frequently utilise urban and sub-urban environments where they are regularly exposed to levels of noise from urban activities. It is possible that temporary lighting required during the construction stage of the proposed development may illuminate previously unlit feeding and/or commuting areas, e.g. areas away from treeline retention areas, making them unsuitable for bats. Any effects associated with artificial lighting during construction of the proposed development, is likely to be short-term (over the 5 year phased construction period) and confined to specific areas within the site. It is therefore predicted that, despite any short-term effects, disturbance from artificial lighting associated with construction of the proposed development is unlikely to affect the conservation status of the local bat population and will not result in a likely significant negative effect, at any geographic scale.

<u>Potential Impacts from Habitat degradation</u>

*Otter*

During construction, contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water feature has the potential to have a significant negative impact on water quality in the Corbally Stream, and consequently an impact on otter; either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

An accidental pollution event affecting surface water quality during construction or operation has the potential to result in a likely significant negative effect on otters, at a county geographic scale.

However, it is considered unlikely that a pollution event of such a magnitude would occur during construction or operation or be any more than temporary in nature, and as concluded in the AWN report,

would not be significant. Nevertheless, a precautionary approach is being taken in assuming a level of risk of water quality impacts and detailed mitigation measures are required to further minimise the risk of the proposed development having any perceptible effect on water quality in the local area.

*Amphibians*

During construction, contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water feature has the potential to have a significant negative impact on water quality and consequently an impact on amphibian species; either directly (e.g. species coming into direct contact with pollutants) or indirectly (e.g. acute or sub-lethal toxicity from pollutants affecting their food supply or supporting habitats). The effects of frequent and/or prolonged pollution events in a waterbody have the potential to be extensive and far-reaching and could potentially have significant long-term effects.

However, it is considered unlikely that a pollution event of such a magnitude would occur during construction or be any more than temporary in nature. Nevertheless, a precautionary approach is being taken in assuming a level of risk of water quality impacts and detailed mitigation measures are required to further minimise the risk of the proposed development having any perceptible effect on water quality during construction.

Habitat degradation as a result of effects on surface water quality during construction has the potential to affect the species' conservation status and result in a likely significant negative effect, at a local geographic scale. Mitigation measures have been designed to protect water quality during construction (see measures below in Section 4.9.1.1 below and Chapter 6 Water).

*White-clawed crayfish*

White-clawed crayfish were not identified within the proposed development site, however the NBDC database search identified records within c. 2km of the proposed development site. Whilst the habitat within the site is deemed unsuitable for this species, an accidental pollution event resulting in degradation of water quality downstream to areas of suitable habitat, could result in a significant effect on white-clawed crayfish at a local geographic scale.

### 4.6.2 Operational Stage

#### 4.6.2.1 Potential Impacts on Designated Sites during Operational Stage

<u>European Sites</u>

The assessment presented in the Appropriate Assessment Screening Report concluded that the potential impacts associated with the proposed development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites; either alone or in combination with any other plans or projects.

Chapter 6 of this EIAR submitted with this application deals with the hydrology of the proposed development site, alongside a Hydrological and Hydrogeological Risk Assessment (AWN, 2020) for the site. The chapter and risk assessment assess the hydrological and hydrogeological risks associated with the proposed development. The assessments noted that based on the potential sources of pollution from the proposed development during construction and operation phases, there is no potential for impacts to occur on European sites in Dublin Bay. This conclusion is based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This allows possible source-pathway-receptor linkages to be identified. Potential sources of impacts during construction and operation were considered in the assessments and all potential sources

of contamination were considered in relation to European sites without taking account of any measures intended to avoid or reduce harmful effects of the proposed development (mitigation measures) i.e. a worst-case scenario.

The results of the assessments carried out by AWN indicate that surface run-off from the proposed development, during both construction and operational phases respectively, will not result in any impact on water quality in downstream receiving waters in Dublin Bay (and thus in the European sites therein) due to the very low contaminant loading and distance to the Natura sites (c.18 km). It is concluded that there are no pollutant linkages as a result of the construction or operation of the Proposed Development which could result in a water quality impact which could alter the habitat requirements of the Natura sites within Dublin Bay (AWN, 2021).

Therefore, there is no possibility of the proposed development during operational stage undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Dublin Bay as a result of surface water run-off or discharges.

National Sites

Nationally designated sites would be subjected to the same potential impacts from operational stage described above with respect to potential impacts on European sites. In absence of mitigation, such potential impacts may result in a likely significant effect at the national geographic scale.

There is a hydrological connection between the proposed development site and the nearest nationally designated site, South Dublin Bay pNHA, however, the Hydrological and Hydrogeological Risk Assessment (AWN, 2020) has concluded that there is no possibility for potential impacts to occur via this hydrological connection.

#### 4.6.2.2 Potential Impacts on Habitats and Flora during Operational Stage

All of the habitats within the proposed development will be will be either removed or replaced during the construction stage, prior to operation of the proposed development. The primary remaining sensitive habitats located within the proposed development site are the hedgerows and treelines that are to be retained along the boundaries of the site. No further impacts on these habitats and flora are expected during the operational stage of the proposed development, with the exception of a likely increase in footfall and human traffic within these habitats. Despite this, the proposed development in operation will not result in a significant negative effect on habitats within the proposed development site at any geographical scale.

#### 4.6.2.3 Potential Impacts on Fauna during Operational Stage

Badger

The proposed development site has the potential to be used by badger due to suitable habitat for foraging and sett building, however no evidence of this species was identified during field surveys carried out within the lands. The conversion of the lands to buildings and artificial surfaces, with associated planting and other landscaping elements, will reduce the amount of semi-natural habitat available for foraging in this area for badgers, however, the overall loss of habitat is small and not significant at any scale, considering the typical badger territory size of more than 60ha in Ireland (Hayden and Harrington, 2000), and the abundance of available suitable habitat surrounding the proposed development site. Periphery commuting corridors will also be maintained and will be available to badger as wildlife corridors in the long-term.

Other mammals

The proposed development site has the potential to be used by hedgehogs, pygmy shrews, Irish hare, and Irish stoat due to suitable habitat for foraging and breeding and the presence of these species from the local area from the findings of the desktop review. The conversion of the lands to buildings and artificial surfaces, with associated planting and other landscaping elements, will reduce the amount of semi-natural habitat available for foraging in this area for small mammals, however, the overall loss of habitat is small and not significant at any scale, considering that the peripheries of the site and the drainage ditches will be retained and still provide commuting and/or foraging habitat for these species, and the abundance of available suitable habitat surrounding the proposed development site for all of the aforementioned species.

Given the relatively low numbers of individuals of each species that are likely to be affected, that they are highly mobile species and the suitability of the habitat in the surrounding lands in the south and west, the change in habitat is unlikely to result in a level that would affect the species' conservation status, and result in a significant negative effect, even at a local geographic scale.

Birds

With the exception of treelines, hedgerows and scrub, the habitats in the lands are of low suitability for nesting bird species. Species that commonly nest in grassland vegetation were not encountered during surveys of the lands in 2020 or 2021. The effects of habitat loss on bird species arising from the proposed development during operation will not be significant at any geographic scale for the following reasons:

- While the lands will be of lower suitability for foraging species for the duration of the construction phase of the development, during the operational phase, the landscape planting that had been carried out during construction stage will enhance the lands in terms of foraging opportunities for common garden bird species; and,
- Majority of the habitat with suitability for nesting bird species i.e. treelines, is being retained in the proposed development, and the implementation of landscape planting (incl. additional trees and treelines) will enhance the lands in terms of breeding opportunities.

Due to the aforementioned factors, the effects of habitat loss on bird species arising from the proposed development will not be significant at any geographic scale.

Bats

Bats are considered to be light-sensitive species, and increased illumination of a site can affect how bats may utilise a site (ILP, 2018). For roosting bats, increased light levels can affect predation, as avian predators tend to rely on vision to catch their prey, and increased light levels at night-time may increase bats vulnerability to predation. Illumination of foraging and commuting habitat can result of abandonment of habitat. The response to lighting in Ireland by foraging bats varies by species, with Leisler's bat, a high-flying species, as well as common pipistrelle bat and soprano pipistrelle bat appearing to be least affected by lighting (Roche et al., 2014).

The habitat within the subject lands were mostly unlit during the surveys in 2020, however the eastern and northern boundaries were partially illuminated with streetlights. During its operation, and in the absence of any mitigation, it is anticipated that the proposed development will result in an increase in lighting of the site. Light spill will originate both from installation of public lighting in the residential areas, as well as from the residential properties themselves (e.g. incidental light pollution from house windows). The increase in light spill will be minor, as the development site suffers from some light spill from the adjacent public road and adjoining properties, and commuting and foraging areas, *i.e.* treelines and hedgerows along the boundaries, are located away from any potential light spill areas. However, in the absence of mitigation this is likely to result in a likely significant effect, at a local scale.

## 4.7 Do Nothing Scenario

The continuation of the existing management practices at the proposed development site in a "do-nothing" scenario, would maintain the current habitats present. The proposed development site would continue to provide suitable foraging and breeding habitat for badgers, as well as bird and small mammal species, suitable foraging and roosting habitat for common bat species, and suitable foraging and commuting habitat for otters. The eastern field would continue to be used for cattle grazing, and the drainage ditches would likely become degraded further due to this. The western field would be cut regularly and potentially also used for grazing animals.

As set out in the South Dublin County Development Plan 2016-2022, the lands are zoned as 'R1 – New/proposed residential'. Therefore the lands would eventually be developed for residential purposes in the future, and would remain in its current state until this time.

## 4.8 Mitigation Measures

### 4.8.1 Construction Stage

#### 4.8.1.1 Mitigation Measures for Habitats during Construction Stage

Retention and Protection of Vegetation during Construction

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

- All trees along the proposed development boundary that are to be retained, both within and adjacent to the proposed development boundary (where the root protection area of the tree extends into the proposed development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist;
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it;
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines;
- A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the proposed development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist;
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged.

Protection of Vegetation from Dust during Construction

To control dust emissions during construction works standard mitigation measures shall include: spraying of exposed earthwork activities and site haul roads during dry and/or windy conditions; provision of wheel washes at exit points; control of vehicle speeds with adequate signage and speed restrictions (20 km/h on any un-surfaced site road); covering of haulage vehicles; and, sweeping of hard surface roads. These procedures will be strictly monitored and assessed on a daily basis.

Dust screens will be implemented at locations where there is the potential for air quality impacts on sensitive ecological receptors (i.e. within 100m of the works) during the construction phase.

Protection of water quality

Mitigation measures to protect surface water in the receiving environment during construction will include the following:

- Entry to the stream channel by vehicles and/or personnel will not be permitted under normal circumstances. Works will be carried out from the bank side. In-stream works are proposed however, they will be restricted to the period 1st July through 30th September, inclusive to minimise the risks to any salmonids downstream
- There will be no direct discharges to surface waters
- Prior to any machinery working on site for any purpose, the working area will be marked out with wooden stakes and where deemed necessary, hazard tape will be erected to identify the working limits
- Working limits to be checked at the end of every day by the Site Manager
- Provision of measures to prevent the release of sediment during the construction work will be installed prior to any site clearance. In respect to works adjacent to the drainage ditches with flowing water, these measures will include but not be limited to the use of silt fences, sedimentation mats etc.
- Provision of exclusion zones and barriers (sediment fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the receiving water environment
- Temporary construction surface drainage and sediment control measures will be in place before earthworks commence
- If pouring of cementitious materials is required for the works adjacent to a pond, surface water drainage features, or drainage features connected to same, this will be carried out in the dry
- Discharge water generated during placement of concrete will be removed off site for treatment and disposal
- Where stockpiling is required, temporary stockpiles will be located >50 metres from any water features. Three sides will be surrounded with silt fences with access from the fourth (uphill) side. Sides will be smoothened and collection of run-off considered i.e. discharging to a settlement pond etc.
- The contractor will avoid work involving moving of soil during heavy rainfall to minimise potential for entrainment of silt. Where forecasts indicate heavy rainfall events, works should be rescheduled accordingly
- Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to surface water. Concrete washout areas will be located remote from any surface water drainage features to avoid accidental discharge to watercourses
- No storage of hydrocarbons or any polluting chemicals will occur within 50m of the surface water network. Fuel storage tanks will be bunded to a capacity at least 110% of the volume of the storage

tank (plus an allowance of 30mm for rainwater ingress). Re-fuelling of plant will not occur within 50m of the surface water network and only in bunded refuelling areas

- Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste
- Contaminated groundwater, if encountered on site, could result in contaminated waters being discharged from the construction site. Any such contaminated waters will be treated using best practice (as described in Chapter 5 of the EIAR, Land, Soils & Geology), appropriate measures/controls dependent on the nature of the contamination prior to discharge to the surface water network
- There will be no direct pumping of contaminated water from the works to the surface water drainage/stream network at any time
- Foul drainage from site offices and compounds, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations, to prevent the pollution of watercourses
- An Emergency Response Plan detailing the procedures to be undertaken in the event of flooding, a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident will be prepared
- Ensure site staff are trained in the implementation of the Emergency Response Plan and the use of any spill control equipment as necessary
- The contractor will employ an environmental specialist who will monitor water quality upstream and downstream of the area of works. Data on pH, conductivity, and suspended solids will be collected as follows:
    - Twice weekly visits during general site works
    - Daily site visits during key construction activities (to be agreed between the environmental specialist and South Dublin County Council), e.g. during installation of the proposed outfall, during and immediately after clearance of on-site vegetation.
    - Event inspection e.g. following heavy rainfall events or during concreting works
- Monitoring will be undertaken for a period of at least two months prior to works commencing and one-month post construction. Trigger concentrations should be agreed at commencement and based on the baseline established in the two months prior to works commencing. N
- All monitoring data should be collated to show trends for indicator parameters pH, conductivity, suspended solids and hydrocarbons, and will be shared at regular intervals with South Dublin County Council.

Mitigation measures to protect surface water in the receiving local environment in the Corbally Stream during operation are detailed in Chapter 6: Water, and include:

- Continued management, monitoring and maintenance of the waste water treatment systems in accordance with the EPA licence requirements;
- Filter drains to the rear of housing;
- Permeable paving to all private parking areas;
- Rainwater butts (200l) to the rear downpipes of the houses;
- Filter swales adjacent to roadways where feasible;

- Grassed/landscaped detention basin;
- Silt-trap/catchpit manholes;
- Hydrobrake limiting flow to Qbar Greenfield rates; and
- Petrol interceptor upstream of all outfall points.

These mitigation measures are for the protection of the water quality within the Corbally Stream watercourse only, and not for the protection of European Sites downstream as there are no significant effects likely to arise on European sites as a result of water quality impacts associated with the proposed development, as discussed above in Section 4.6.

#### 4.8.1.2 Mitigation Measures for Fauna during Construction Stage

**Badgers**

The mitigation measures described below follow the recommendations set out in the Guidelines for the Treatment of badgers during the Construction of National Road Schemes (National Roads Authority, 2006). These guidelines set out the best practice approach in considering and mitigating impacts on badgers during construction works.

Whilst no badger setts were identified within the proposed development, badger could potentially establish new setts in the future within the ZoI of the proposed development. Therefore, a pre-construction check of all suitable habitat within the proposed development boundary will be required within 12 months of any constructions works commencing. Any new badger setts present will be afforded protection in line with the requirements set out in the TII/NRA guidance document as follows:

- Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage
- No heavy machinery shall be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance shall not take place within 10m of sett entrances
- During the breeding season (December to June inclusive), none of the above works shall be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of a badger ecologist
- During construction, the use of egress ramps in any pits or holes that have been dug on site is required. This will allow for any mammal species that have fallen in, to allow to escape and be unharmed by construction activities.

As the proposed development will not result in the permanent loss of any badger setts, there is no requirement to construct any artificial setts as part of the mitigation strategy.

**Otter**

The mitigation measures as described above in Section 4.9.1.1 to protect water quality within the local receiving environment, will also mitigate for habitat degradation impacts on otter species.

Where feasible, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required.

## Amphibians

Disturbance and Mortality Risk

If works to clear any of the habitat features suitable to support amphibian species are to begin during the season where frogspawn or tadpoles may be present (February – mid-summer), or where breeding adult newts, their eggs or larvae may be present (mid-March – September), a pre-construction survey will be undertaken to determine whether breeding amphibians are present.

In the case of common frog, any frog spawn, tadpoles, juvenile or adult frogs present will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat beyond the ZoI of the proposed development.

In the case of smooth newt, individuals will be captured and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of available suitable habitat, beyond the ZoI of the proposed development. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating smooth nest.

If the size or depth of the habitat feature is such that it cannot be determined whether all amphibians have been captured, it will be drained under the supervision of a suitably experienced ecologist to confirm that no amphibian species remain before it is destroyed or infilled. Any mechanical pumps used to drain the habitat feature will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism.

Any capture and translocation works shall be undertaken immediately in advance of site clearance/construction works commencing.

Protection of Water Quality

The mitigation measures as described above in Section 4.9.1.1 to protect water quality within the local receiving environment, will also mitigate for habitat degradation impacts on amphibians.

## White-clawed crayfish

The mitigation measures as described above in Section 4.9.1.1 to protect water quality within the local receiving environment, will also mitigate for habitat degradation impacts on white-clawed crayfish.

## Bats

Measures to Protect Bats during the Removal of Potential Roost Features

The following mitigation measures are proposed in relation to structures and trees considered to have the potential to support roosting bats:

- Prior to demolition, for structures which have not been confirmed as bat roosts but regarded to have potential for bats, a bat detector assessment of the property to be demolished will be carried out. If demolitions are proposed during the period May – August, this will be an all-night examination to determine if bats enter the building during the night or early morning. This will provide adequate information to proceed with demolition, unless weather conditions were unsuitable for feeding bats, and prevented a pre-demolition survey from taking place. If bats are present, then they will require exclusion from the property over several nights or if possible physical removal by hand by a licenced bat specialist to be placed in a bat box or similar for release in the evening after capture. If any roosts are identified within the buildings due for removal, a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes.

- Once structures containing roosts are deemed to be clear of bats, the bat specialist will be on site to supervise the demolition procedure until the structure is no longer deemed able to support a bat roost. Bats may re-enter a partially demolished structure overnight so the bat specialist will be required to be present during demolition works until they are completed.
- Buildings or trees confirmed as bat roosts will not be demolished during the breeding period or hibernation period (April to mid-August and November-March) as the risk of accidental death or injury is higher at this time. Bats may use roosts in smaller numbers in winter but may nevertheless be present. Outside of these periods, the approach to demolition of bat roosts will be determined on a case-by-case basis and subject to relevant licence conditions.
- Buildings confirmed as bat roosts proposed for demolition will be marked on the ground with agreed paint marking to permit identification by Contractors.

Measures to Protect Bats during Vegetation Clearance

The following mitigation measures are proposed in relation to those trees identified as having potential to support roosting bats (Figure 4.5). Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore there is an inherent risk that bats could be affected by the proposed felling works. The following mitigation procedures will be followed:

- Felling of confirmed and potential tree roosts will only be undertaken during the periods April – May or September – October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present
- Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist
- Trees should only be felled “in section” where the sections can be rigged to avoid sudden movements or jarring of the sections
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture
- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes. The specifications, type, location and number of bat boxes (at least one box per roost lost) will be advised by the site ecologist, which will be determined by the species of bat that is identified roosting within the tree deemed for removal.

Measures to Control and Reduce Light Spill During Construction

Lighting of the site during construction is designed in accordance with the following guidance:

- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2020)
- Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010)
- Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2008).

During construction, any external lighting to be installed, including facilitating night-time working or security lighting, on the site shall be sensitive to the presence of bats in the area, downlighting, and time limited. Lighting of sensitive wildlife areas and primary ecological corridors (e.g. along the central hedgerow/drainage ditch, boundaries of the site) and light pollution in general will be avoided. Light levels during construction in these areas will be maintained at baseline levels where possible.

Monitoring of light levels along the treelines and hedgerows will be undertaken pre-construction, during construction and post-construction to identify any areas where light spill is affecting background levels during construction. Where monitoring detects light spill is affecting these habitat areas, remedial measures, such as censored lighting or low column height lights, and will be implemented to ensure that background light levels are maintained.

### 4.8.2 Operational Stage

#### 4.8.2.1 Mitigation Measures for Fauna during Operation Stage

**Bats**

Any light spill affecting bat use of habitats outside of the proposed development boundary will be avoided, particularly along the boundaries of the site, and along the central boundary. Light levels during construction and operation in these areas will be maintained at baseline levels where possible.

This will be achieved through sensitive siting and design of the lighting elements. This will include careful consideration of light placement on buildings, column heights and luminaire design. Luminaires have been selected which do not emit UV light (e.g. metal halide and fluorescent light sources should be avoided), and luminaries are designed using full cut off to ensure there is no direct upward light. The threshold increment is included in the lighting calculations to that luminaries are not a glare source, with the lighting designed to dim by 25% from 00:00 to 06:00.

Monitoring of light levels along the treelines and hedgerows will be undertaken pre-construction, during-construction and post-construction to identify any areas where light spill is affecting background levels during construction or operation. Where monitoring detects light spill is affecting these habitat areas, remedial measures will be implemented to ensure that background light levels are maintained.

Reporting on the monitoring will be forwarded to the local authority for their review and any remediation required agreed between them and the applicant.

## 4.9 Enhancement

The majority of native hedgerows and trees on site be found along the boundaries, have been retained wherever possible to ensure wildlife corridors and green infrastructure is maintained. The central hedgerow/treeline will also be enhanced by the addition of native hedgerow species *Crataegus monogyna,* planted in two rows, with wetland/marginal species planted adjacent, including; *Iris pseudoacorus, Caltha palustris, Alisma plantago-aquatica, Menyanthes trifoliata, Galium palustre* and *Filipendula ulmaria*[27], proposed in the stream area to be utilised as a swale. All planting within the site has been in specific regard to the 'All Ireland Pollinator Plan 2015-2020' by planting species recommended within the plan.

The planting of native trees including; *Quercus robur, Quercus petraea, Pinus sylvestris,* and *Alnus glutinosa* is proposed throughout the main open space areas and along the peripheries of the site, where they will mature into large, parkland specimens. The retention of existing trees, and planting of additional trees will screen the development from the habitats in the surrounding lands, and will ensure nocturnal species *e.g.* bats, badgers, small mammals, can continue to use the boundaries as foraging and/or commuting areas. Planting within the site of additional trees, hedgerows and shrubs will act as 'stepping stones', allowing fauna species to pass through the site from adjoining lands. A range of tree sizes are proposed within the landscape ranging from whips to semimature trees and as these establish and grow in size, they will be continuously mitigating any negative impacts created in the first place and will enhance and secure the treescape of this area into the future.

The introduction of wildflower planting within the open space areas in the north of the site will provide new habitat for the local wildlife, and will help increase biodiversity in the local area. This will extend the whole way along the eastern boundary alongside the Corbally Stream, where mature native trees are being retained and planted, which will act as canopy cover over the ground flora planting enhancing the area further to benefit pollinators, birds, bats, and small mammals.

## 4.10 Cumulative Impacts

This section of the report presents the assessment carried out to examine whether any other proposed developments have the potential to act cumulatively with the proposed development to give rise to likely significant effects on biodiversity.

As set out in the South Dublin County Development Plan 2016-2022, the lands surrounding the site are a combination of different zoning objectives. The lands to the east and north are zoned as 'R2 - Existing residential' under Objective – to protect and-or improve residential amenity in the South Dublin County Development Plan 2016-2022 (South Dublin County Council, 2016). To the west, and partially to the north eastern corner of the site are zoned as 'G1 - Open space, park' under Objective – to preserve and provide for open space with ancillary active recreational amenities. The south of the site is zoned as 'P1 – Agriculture' under the Objective – To protect and improve rural amenity and to provide for the development of agriculture. The proposed development land itself, form an area earmarked as 'R1 – New/proposed residential' within the South Dublin County Development Plan (South Dublin County Council, 2016).

[27] *Overall Presentation Masterplan, Proposed Residential Development at Boherboy, Co. Dublin*. Ronan MacDiarmada + Associates Ltd. August 2021.

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

The most likely cumulative effect of other future development with the proposed development on the receiving environment is the potential for other pollution sources within the River Liffey catchment, to cumulatively affect water quality in the receiving surface water, estuarine and marine environments. There will be no significant cumulative impacts on water quality in the downstream surface water environment in the downstream Camac River, River Liffey or Dublin Bay as a consequence of the proposed development acting in-combination with other plans and projects, as the development itself will not have any adverse effects on the downstream surface water environment, post mitigation. The potential for in combination effects to arise in downstream environments from any existing or proposed land use plans or developments is regulated and controlled by the environmental protective policies and objectives of the *South Dublin County Development Plan 2016-2022* and any other county level land use plans which can influence conditions in Dublin Bay*: Dublin City Development Plan 2016-2022 (Dublin City Council, 2016),* the *Dún Laoghaire-Rathdown County Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016), the Fingal Development Plan 2017-2023 (Fingal County Council, 2017),* or any other county level land use plans which can influence conditions in Dublin Bay via rivers and other surface water features. Any existing/proposed plan or project that could potentially affect downstream environments, must adhere to these overarching environmental protective policies and objectives. These policies and objectives will ensure the protection of the downstream environments within the zone of influence of the proposed development and include the requirement for any proposed development to undergo Screening for Appropriate Assessment and/or Appropriate Assessment to examine and assess their effects on European sites, alone and in combination with other plans and projects. Therefore, it is considered that any other projects acting in combination with the proposed development would be unlikely to undermine the conservation objectives of any of the qualifying interests or special conservation interests of Natural Heritage Areas or European sites in, or associated with, Dublin Bay as a result of water quality effects.

There are general overarching policies in the South Dublin County Development Plan 2016-2022 to ensure that proposals for development integrate the protection and enhancement of biodiversity (Policy HCL 15) and to ensure developments do not have a significant adverse impact on rare and threatened species. There are also specific objectives to protect European sites (Policy HCL 12), prevent development that would adversely affect the integrity of any European site(s) or National site(s) (Objective 2 HCL 12), to ensure that development does not have significant impact on protected habitats and species (Objective 1 HCL 12), to encourage the retention of hedgerows and prevent the loss and fragmentation (Policy HCL 15 Objective 3). The South Dublin County Development Plan 2016-2022 also has specific policies and objectives relating to the protection of surface water and groundwater resources (e.g. Policy IE 1, 2, Policy G 5).

Considering the predicted impacts associated with the proposed development, the mitigation measures proposed to protect the local biodiversity resource and the receiving environment and the protective policies and objectives on the land-use plans that will direct future development locally, significant cumulative negative effects on biodiversity are not predicted.

### 4.11 Residual Impact of the Proposed Development

Following the implementation of the mitigation measures outlined in Section 5.9 above, the proposed development will not result in any significant residual effect on the Key Ecological Receptors identified (see Table 5.7) on its own, or cumulatively together with other proposed developments.

## 4.12 Conclusions

The proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of any European site, either alone or in combination with any other plans or projects.

The proposed development does not have the potential to result in significant negative effects on nationally designated areas for nature conservation, either alone or cumulatively, with any other plans or projects.

The proposed development has the potential to affect the surface water quality or the ecology of the adjacent waterbodies during construction. The surface water systems are designed in accordance with the principles of SUDS as recommended in the Greater Dublin Strategic Drainage Study. The implementation of mitigation measures in Section 6 to avoid or minimise the effect of the proposed development with regard to water quality impacts, will ensure there is no significant effects on the local water quality. There will be no works (e.g. piling/blasting) which may affect groundwater and groundwater-dependent terrestrial habitats.

The proposed development will result in some temporary habitat loss within the proposed development boundary, but this will not result in any significant negative effects following the implementation of mitigation and enhancement measures such as planting and strengthening existing treelines and hedgerows, as detailed in this report. The landscape design will ensure that the biodiversity value of the habitats to be retained and created as part of the proposed development, are maximised.

The proposed development does have the potential to result in significant negative effects on habitats, birds, white-clawed crayfish, amphibians and bats at local geographic levels and on otter at a county geographic scale prior to mitigation. Following the implementation of mitigation measures, no residual impacts on any key ecological receptors is predicted.

A comprehensive suite of mitigation measures are proposed, some which have been incorporated into the design of the proposed development. All of the mitigation measures will be implemented in full and are best practice, tried and tested, and effective control measures to protect biodiversity and the receiving environment. All mitigation measures included within this report must be committed to and delivered through the planning conditions.

Considering the elements included within the design of the proposed development (as described in Section 5.5), and the implementation of the mitigation measures proposed in Section 6 to avoid or minimise the effects of the proposed development on the receiving ecological environment, no significant residual ecological effects are predicted, either alone or cumulatively with any other projects. The proposed development complies with relevant biodiversity policies of the South Dublin County Development Plan 2016-2022 (South Dublin County Council, 2016) considered in this report.

**NOTE: Refer to Volume III of the EIAR for appendices associated with this chapter – i.e. Appendix 4**

**Table 4.7 Summary of the significant residual ecological effects of the proposed development**

| Ecological Receptor | Ecological Valuation | Impacts with Potentially Significant Effects | Potential Significance of Effects | Mitigation Measures | Significance of Residual Effects |
|---|---|---|---|---|---|
| **Designated Sites** | | | | | |
| Glenasmole Valley SAC | International | None | International | None | None |
| Wicklow Mountains SAC | International | None | International | None | None |
| South Dublin Bay SAC | International | None | International | None | None |
| North Dublin Bay SAC | International | None | None | None | None |
| Wicklow Mountains SPA | International | None | None | None | None |
| Poulaphouca Reservoir SPA | International | None | International | None | None |
| South Dublin Bay and River Tolka Estuaries SPA | International | None | International | None | None |
| North Bull Island SPA | International | None | International | None | None |
| Lugmore Glen pNHA | National | None | National | None | None |
| Slade of Saggart and Crooksling Glen pNHA | National | None | National | None | None |
| North Dublin Bay pNHA | National | None | National | None | None |
| South Dublin Bay pNHA | National | None | National | None | None |
| Booterstown Marsh pNHA | National | None | National | None | None |

| | | | | | |
|---|---|---|---|---|---|
| **Habitats** | | | | | |
| Dry meadows and grassy verges (GS2) | Local (High) | Permanent loss of habitat (c.1.2ha) | Local (High) | Measures to avoid the spread of non-native invasive species<br>Meadow planting | None |
| Scattered trees and parkland (WD5) | Local (High) | Permanent loss of habitat (c. 0.05ha) | Local (High) | Native tree planting | None |
| Hedgerows (WL1) | Local (High) | Permanent loss of habitat (c. 575m) | Local (High) | Native hedgerow planting and augmenting of existing hedgerows<br>Protection from dust emissions and construction activities by dust screens and fencing | None |
| Treelines (WL2) | Local (High) | Permanent loss of habitat (70 trees) | Local (High) | Native tree planting<br>Protection from dust emissions and construction activities by dust screens and fencing | None |
| Depositing/lowland Rivers (FW2) | Local (High) | Permanent loss of habitat (c. 30m)<br>Effects on water quality changes in local aquatic habitats | Local (High) | Measures to protect surface waters in the receiving environment during construction | None |
| **Fauna Species** | | | | | |
| Badger | Local (High) | Injury or mortality arising from construction | Local (high) | Pre-construction checks for new setts | None |
| Otter | County | Habitat degradation as a result of a change in water quality | Local (High) | Measures to protect surface waters in the receiving environment during construction | None |
| Birds | Local (high) | Disturbance and mortality during breeding season<br>Habitat loss | Local (high) | Seasonal vegetation clearance<br>Landscape planting | None |
| Amphibians | Local (high) | Disturbance and mortality<br>Habitat degradation as a result of a change in water quality | Local (High) | Pre-construction checks of water bodies<br>Translocation of individuals | None |
| White-clawed crayfish | Local (High) | Habitat degradation as a result of a change<br>in water quality | Local (High) | Measures to protect surface waters in the receiving environment during construction | None |
| Bats | Local (High) | Disturbance and mortality<br>Increased light levels | Local (high) | Roost presence/absence surveys prior to demolition of structures/felling of suitable bat roost trees<br>Soft felling of suitable bat roost trees<br>Directional lighting to control light spill | None |

# 5.0 Land, Soil & Geology

## 5.1 Introduction

This section of the EIAR was prepared by Roger Mullarkey *BSc.Eng.Dip.Eng,C.Eng,MIEI,Eur.Ing, FConsEI* of Roger Mullarkey & Associates Consulting Engineers (RMA). Roger Mullarkey has over 27 years of consulting civil and structural engineering experience primarily in the design of residential housing in Ireland.

This section intends to assess and evaluate the potential impact the proposed development will have on the land, soils and geology during both the construction and operational phases. This section also intends to identify the nature of any impacts and provide the necessary mitigation measures arising from the proposed development.

## 5.2 Methodology

The potential impact of the proposed development on the land, soils and geology has been carried out in accordance with the Guidelines on Information to be Contained in an Environmental Impact Statement as published by the EPA, the Advice Notes on Current Practice in preparation of Environmental Impact Statements (EMP 2003), the Draft EPA EIAR Guidelines 2017 and An Bord Pleanála on Carrying out Environmental Impact Assessments (DoECLG 22013).

The following information sources were used in the assessment of the land, soils and geology of for the proposed development site;

- Geological Survey of Ireland (GSI) website
- Teagasc soil data sets
- Ordnance Survey mapping
- Topographical survey
- Site Investigation reports
- Site walkover visits
- Discussions with SDCC Drainage Department

## 5.3 Receiving Environment

### 5.3.1 Site Description, Land Use and Topography

The area of the two subject fields is c.17.6Ha and is currently in greenfield condition with some remaining farm sheds/outbuildings. The site is located south of the Carrigmore and west of Corbally residential developments. To the north-west of the site lies the Saggart golf course and the Boherboy Road abuts the southern boundary of the subject lands.


**Fig. 5.1 - Site Location**

A topographical survey was carried out on the site and indicates that the lands slopes sharply downwards from the south end of the site towards the north. The existing ground level gradients range from 1/7 to 1/30 generally. There is an approximate drop in level of 38m from the highest portion (SW) of the site to the lowest point (NW). The site survey drawing is included in the application and can be viewed as background on the Road & Block Levels drawing RMA Dwg.No.1324B/301, 302 & 303 and is summarised in Fig 5.2 over.

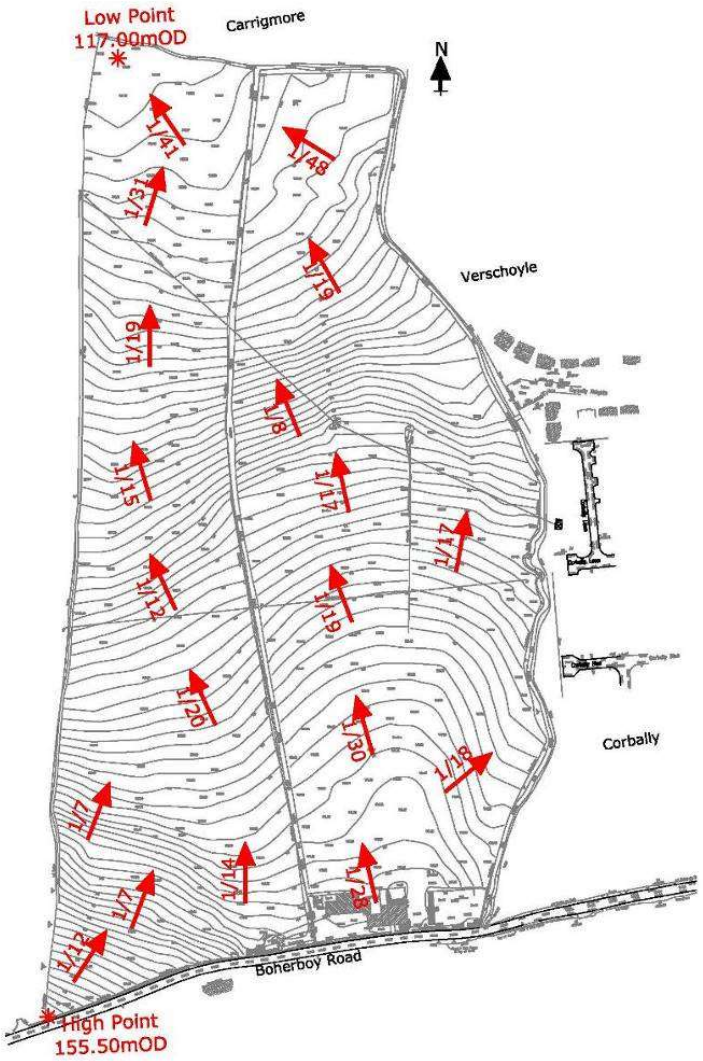



**Fig 5.2 - Site Topography**

### 5.3.2 Soils

The GSI publications and mapping indicate that the estate and surrounding area is underlain primarily by glacial till derived from Sandstone and Shale. The soils mapping indicates that glacial till derived from Limestone are present to the north of the site and rock outcrops or is very near to the surface to the north and north west of the site, coinciding with areas of extreme groundwater vulnerability and the locations of historic quarries on the historic mapping. The soil association composition as determined from the Teagasc website datasets (www.gis.teagasc.ie).

The site investigation report prepared by Ground Investigations Ltd (GII) based on their excavations described the soils as Topsoil, Cohesive Deposits and Granular Deposits. Refer to Appendix 5A for a details of the GII report.

The Topsoil was encountered in the majority of exploratory holes and was present to a maximum depth of 0.3m BGL.

The cohesive deposits were encountered beneath the topsoil and were quite variable, described typically as brown, grey brown or occasionally as black slightly sandy slightly gravelly CLAY, slightly gravelly sandy CLAY/SILT, Laminated sandy SILT and sandy gravelly slightly organic CLAY.

The granular deposits were encountered in the trial pits in the south of the site either as lenses within the cohesive deposits or as strata underlying upper cohesive deposits to the base of the trial pits. These deposits were typically described as brown or dark grey gravelly fine to coarse SAND and clayey sandy sub angular to sub rounded fine to coarse GRAVEL. These deposits had occasional cobble and rare boulder content where noted on the trial pit logs.

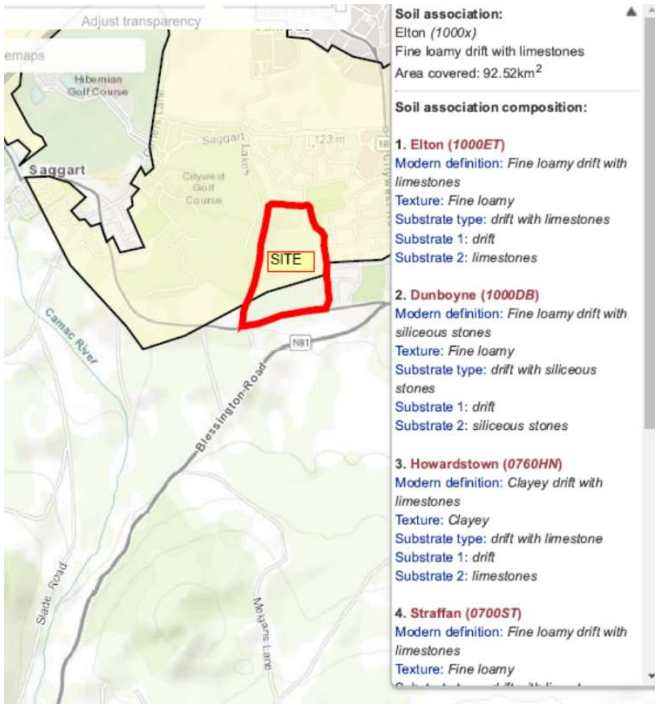



**Fig 5.3 – Subsoil mapping – Teagasc dataset – Loamy Drift**


**Fig 5.4 – Subsoil mapping – Teagasc dataset – Southern end of site**

**Geology**

The bedrock is determined from the Geological Survey of Ireland website dataset (www.gsi.ie) and is noted as being underlain by coarse greywacke and shale of the Pollaphuca Formation. The Calp or Lucan formation is present to the north of the site.

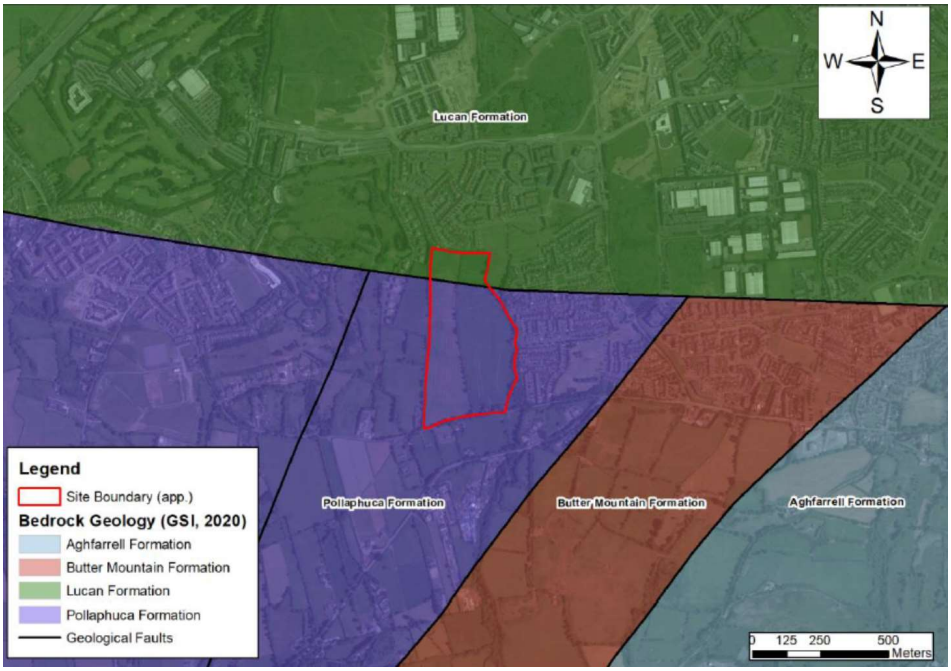



**Fig 5.5 – GSI dataset 100k Bedrock mapping – Pollaphuca Formation**

### 5.3.3 Groundwater

GSI mapping indicates that the bedrock underlying the site (Pollaphuca Formation) is classified as a Poor Aquifer (P) - bedrock which is generally unproductive except only in local zones.


**Fig 5.6 – Aquifer Vulnerability – EPA/GSI dataset**

The aquifer vulnerability for the area ranges from Low to Extreme. At the site location, the area is classified as having a Low Vulnerability. An area of Moderate and High Vulnerability is present surrounding the area of the site area. Generally, the High/Extreme Vulnerability areas are close to areas where bedrock is shallow or where sand and gravel deposits are expected and/or there is a thin cover of cohesive material above the bedrock. The Moderate/Low Vulnerability areas are likely to coincide with areas where sufficient thicknesses of cohesive glacial deposits are present above the bedrock or where deeper bedrock is expected.


**Fig 5.7 – Groundwater Vulnerability – EPA/GSI dataset**

There are no recorded mineral or aggregate extractive licences sites in the immediate vicinity of the site as shown in the GSI Quarries Database, however, there are a number of metallic and non-metallic mineral locations in Belgard to the east and in Lugmore to the south-east of the site.

No ground water was noted as encountered during the trial holes investigations but it is noted that ground water levels can vary depending on the time of year. Refer to Ground Investigations summary report in Appendix 5 of Volume III of this EIAR.

Site walkovers were carried out in varying weather conditions and the water table was not evident during of the visits.

## 5.4 Characteristics of the Proposed Development

The proposed development will comprise 655 no. residential units (257 no. houses, 246 no. apartments and 152 no. duplex units) and a c.693m$^2$ crèche, a number of new public open spaces, all associated site development works, landscaping, boundary treatments and services provision. The proposed development will include surface water attenuation measures and underground geocellular/StormTech type tanks as well as a below ground wastewater pumping station. The overall development also contains c.1.44Ha reserved for a possible future school site.
Further detailed information relating to the site developments drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report".

In accordance with best practice, appropriate SuDS features included in this development which include the following elements:

- Filter drains to the rear of the housing
- Permeable paving to all private parking areas
- Rainwater butts (200l) to the rear downpipes of the houses
- Green roofs on the Apartment buildings
- Filter Swales adjacent to roadways where feasible
- Tree Pits
- Bio-Retention Areas
- Silt-trap/catchpit manholes
- Void Arch storage systems
- Hydrobrake flow controls limited to an overall Qbar greenfield rate (59.7l/s)
- Petrol interceptors

The proposed development will include surface water attenuation measures and underground geocellular/StormTech type tanks.

The main construction activities impacting the soils and geology as follows;

- Removal of top soil and storing on site in mounds and sub soil excavation to allow the building of foundations, roads and services.

- The attenuation tanks will require significant excavation of sub-soil and temporary storing of the removed top soil.

## 5.5 Identification of Potential Impacts

### 5.5.1 Construction Phase

As noted above, the construction phase will require the removal of top soil and storing on site in mounds for reuse. It is estimated that approximately 41,000m$^3$ of top soil will be disturbed during the construction phase with c.30,000m$^3$ to be reused and the remainder to be removed to a licenced facility.

Sub-soil excavation will be required to allow the construction of the roads, building foundations, drainage and ancillary services. It is estimated that the sub-soil volume to be excavated and removed is approximately 60,000m$^3$.

Foundations for the buildings will be shallow depth (c.<1.0m below ground) strip footings, generally 3 times the width of the supported wall. The closest any house/apartment foundation will be is c.7m from the site boundary. Typical foundation details for the proposed housing are shown on the Davey Smith Architects application drawing "No.OT-03 Foundation Details " and on the RMA Dwg.No.1324B/336.

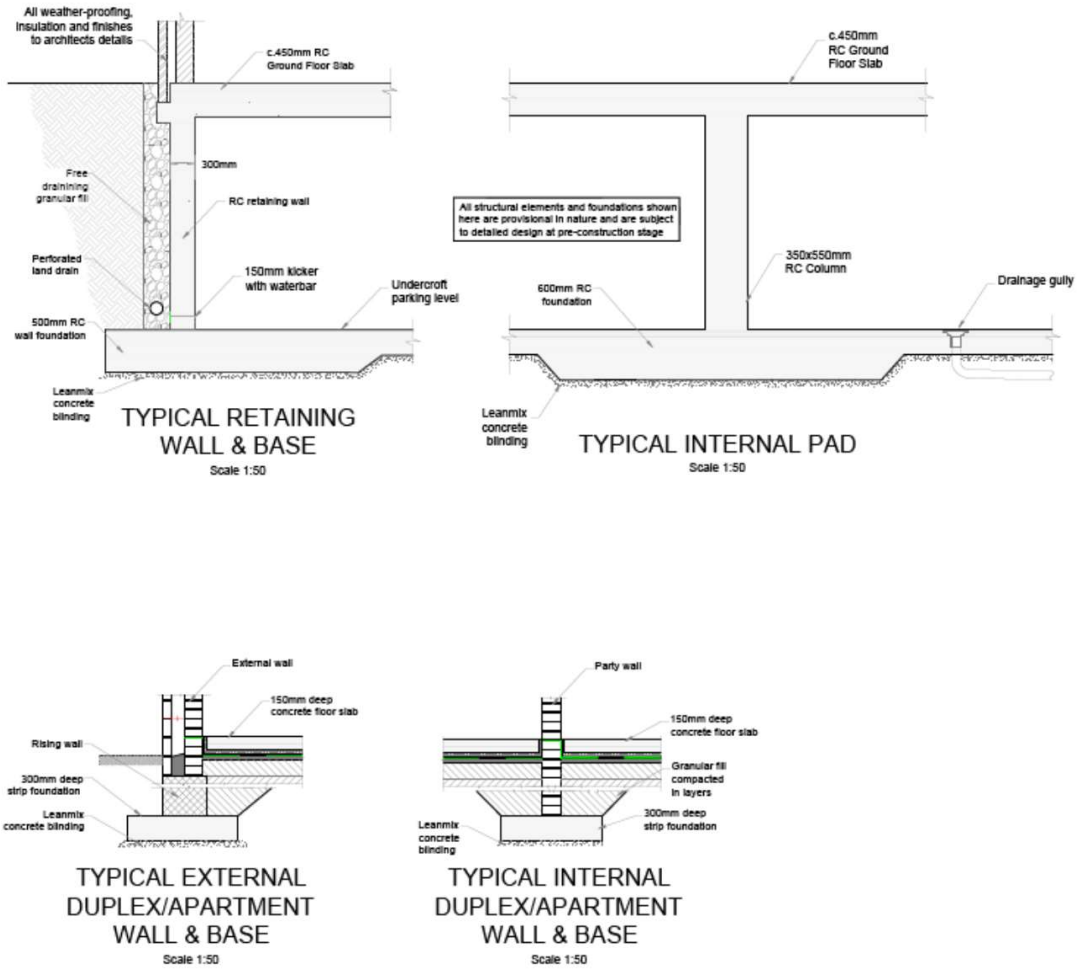



**Fig 5.8 – extract from RMA Dwg.no. 1324B/336**

Underlying subsoil layers are expected to be generally suitable for reuse as non-structural fill.

The attenuation tanks and foul pumping station will require excavation of sub-soil and temporary storing of the removed top soil for reuse in the landscaping. It is estimated that approximately 5,100$m^3$ of sub-soil will be excavated and removed from the site for construction of the attenuation tanks.

There will be stockpiling for reuse of topsoil in gardens and landscape areas and surplus to be removed to a licenced facility.

Exposure of sub soil will be temporary. There is likely impact on subsoil exposed due to vehicle tracking, weathering and rainfall but the impact will be short term and slight in nature.

Due to the use of heavy construction machinery on site during the construction phase, there will be a requirement for the onsite storage of fuels for the machinery. There is a risk associated with storing fuel on site and the impact of spillages may be characterised as having a likely, short-term, local, moderate adverse impact on the sub-soil.

There will be an increase in traffic of construction machinery across the site which will impact the sub-soil layers and discourage infiltration of rainfall to the water table. There is also an increased risk of mud and debris getting transferred to the surrounding local road network.

There will be large quantities of materials brought to site to facilitate construction such as concrete, concrete blocks, timber, reinforcement, pipework, insulation, fixings, plasterboard, etc. These deliveries will traverse above the constructed road network within the development.

In the context of materials imported to site, these will be natural stones sourced from locally available quarries in accordance with the appropriate statutory guidelines, greenfield/inert soil imported under a Waste Permit issued by the local authority; or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

Imported materials will be granular in nature and used in the construction of road pavement foundations, drainage and utility bedding and surrounds. Imported fill may be required to raise the development to the required level for drainage.

Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from the indigenous arisings from the site. All excavation to accommodate imported material will be precisely co-ordinated to ensure no surplus material is brought to site beyond the engineering requirement.

The road levels have been designed to follow as closely as possible the existing contours of the site with the design principle of a balanced cut and fill earthworks landscaping of the development will restore the removed topsoil layer where not covered by development hard covering. The impacts of the removal of the soil are deemed to be short termed and moderate in the construction phase.

The removal of hedgerows to facilitate the development is minimised in this project due to the retention of the boundary conditions and most of the internal spine of hedgerow. There will be a moderate impact to the hedgerows to facilitate the construction of roads therefore the impact is deemed to be moderate and long term but localised. There will be a minimal impact on the groundwater as there is relatively little removal of

hedgerows proposed in this development.

### 5.5.2 Operational Phase

Once the construction stage is complete and the development is in-situ and operational, the geology beneath the proposed site will remain unchanged. Subsoil will either be covered by surface hardstanding, building footprint or landscaped areas.

The operational phase of the development will have little or no impact on the soils geology for the lands. The silt/clay cohesive sub soil across the site does not allow for easy infiltration of surface water to the water table. There are several aspects to the Sustainable Urban Drainage Systems (SuDS) design features included in the development that direct surface water runoff to filtration facilities but each of these elements has an overflow feature to direct flows into the main drainage system where infiltration is possible. The SuDS features are a method of site control that reduces harmful chemical pollutants and sediment reaching the piped network. These pollutants are trapped in the grassed areas leading to the filter strips and reduce the surface water runoff rate and attenuate flows locally, therefore reducing stress on downstream facilities.

There is a moderate risk of groundwater recharge but given the vulnerability classifications of Low and Moderate of the ground water noted on the GSI datasets, the risk is deemed to be moderate and short term in nature.

There will be no significant storage or use of hazardous materials during the operational phase that could adversely impact subsoil, groundwater or surface water in the vicinity of the site. Accidental losses of oil, petrol or diesel on roadways or in car parks could cause contamination if these elements entered the underlying soil and groundwater. However, the presence of surface hardstanding throughout these areas would render this unlikely. In addition, all surface water will be routed through a suitably sized petrol interceptor before entering the public surface water network.

It is not anticipated that there will be any impacts to soils during the operational phase of the proposed development.

## 5.6 Potential Cumulative Impacts

Due to the lack of significant residual impacts from the development that would affect the wider geological environment, there will be no significant cumulative impacts to land, soil and geology resulting from this project, and other local existing/proposed developments such as the Fortunestown Centre, Cheeverstown, Saggart Cooldown Commons. All impacts on soils and geology relating to the proposed project will be localised and within the development footprint.

In the event of future development adjacent to the proposed development, it is not anticipated that there will be a significant impact on the land, soil or geology provided that the other developments implement the appropriate mitigation measures.

## 5.7 Residual Impacts

With appropriate mitigation measures implemented during the construction phase, the potential impact on land, soils and geology during construction is considered to have a short term, imperceptible significance.

There are no likely significant impacts on the land, soil or geological environment associated with the proposed operational development of the site. As such, the impact is considered to have a long term, imperceptible significance with a neutral impact on quality.

### 5.8 Risks to Human Health

The following risk to human health from soils and the geological environment can occur during construction:

- Dust generation occurring during extended dry weather periods as a result of construction traffic.

With the implementation of mitigation measures, the likelihood of such events occurring would be local and not significant.

### 5.9 Unplanned Events

The following accidents and disasters involving soils during construction could potentially give rise to a serious incident putting people at risk:

- Collapse of trench during excavation works.
- Accidental spills and leaks may result in contamination of the soils underlying the site.

With the implementation of mitigation measures, the likelihood of such events occurring would be local and not significant.

On completion of the construction phase, there will be no further unplanned events anticipated on soils and the geological environment.

### 5.10 Do Nothing Impact

Should the development not proceed the site would remain in its current state i.e. greenfield agricultural use, with the only likely impact on the underlying soil and/or aquifer due to agricultural processes. The continued use of the site for agricultural purposes is likely to have a Neutral and Imperceptible effects on the environment, as there would be no change of use of the greenfield lands and therefore no further impact to the top soil, subsoil or geology would exist.

### 5.11 Remedial & Mitigation Measures

#### 5.11.1 Construction Phase

As part of the SHD process, an Outline Construction Management Plan (OCMP) is submitted as part of the subject application, and sets out a range of mitigating measures. In addition, the following mitigation measures are also proposed:

- All fuel stored is to be bunded within a secure hardstanding area with strict management control and access to same. Bunding is to be 100% + 10% of the volume stored.
- The removal of the topsoil layer is to be carried out in a carefully managed process and in coordination with the construction phasing management of the development.

- Topsoil stockpiles are to be located in such a manner as to minimise the risk of washing away into local drainage or watercourses.
- Topsoil is to be reused in gardens and landscape areas as well as the attenuation detention basin areas.
- The design of the road and block levels on the site has been carried out in such a way as to best balance the cut/fill aspects and to follow the natural site topography where possible.
- The contractor is to have a full time site foreman responsible for the site management and is to be made fully aware of the relevance of the works in relation to the Corbally Stream. A site noticeboard is to be positioned in a suitably located prominent location on the site with the contact details of the person responsible for ensuring the pollution prevention methodology.
- The construction management of this project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and ground contamination.
- Exposed subsoil in excavations is to be backfilled as soon as possible to minimise effects of weathering.
- Surface water flows from the site will be directed to temporary siltation beds and screening before discharge to the receiving watercourse during the construction phase.
- Wherever possible, excavated material will be re-used on the project in the construction of attenuation, bunding and landscape features.
- The design of the layout has minimised the impact on the hedgerows and therefore there is little mitigation works to be implemented regarding hedgerows. The remaining central spine hedgerow is to be kept free of site storage or access and is to be appropriately cordoned off to discourage access during the construction phase. The site foreman/management will manage the protection of the remaining hedgerows and trees on the site.
- Wheel wash facilities are to be provided and implemented by the site management to minimise the uncontrolled removal of sub-soil on wheels and deposited on the local road network.
- Earthworks machinery and deliveries are to be managed in a controlled fashion and cordoned onto specific haul roads.

### 5.11.2 Reinstatement

- All temporary construction compounds are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.
- All construction waste and/or scrapped building materials are to be removed from site on completion of the construction phase.
- Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licenced facility.
- All sediment control measures (e.g. sediment retention ponds) are to be decommissioned on completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.

### 5.11.3 Operational Phase

It is not anticipated that there will be any long-term impacts on the soil during the operational phase of the development.

Any residual risk will emanate from contamination of surface water infiltrating to the subsoil via the SuDS

features incorporated within the scheme.

Regular maintenance of the SuDS features is required to maintain the quality of the run off and prevention of blockages.

The surface water collected from the project has been designed in accordance with the CIRIA SuDS Manual and the Greater Dublin Strategic Drainage Study and the appropriate treatment train process has been applied in the design.

Maintenance of all SuDS features by the development management team is required until such a stage that the Local Authority take in charge the project.

Household waste generated in the operation of the development when completed is to be securely stored within designated collection areas by licenced waste management contractors. All communal designated waste storage areas are to have gullies connected to the foul drainage network to facilitate wash down as required.

## 5.12 Predicted Impacts of the Proposed Development

### 5.12.1 Construction Phase

The current use of the lands as greenfield will be altered to a residential neighbourhood environment with associated landscape and drainage facilities. The predicted impact of fuel spillage on the soil and geology is deemed to be minimal once the mitigation measures outlined above are implemented in full. Moderate negative impacts for the construction phase will be for a short term duration only but provided that the mitigation measures are implemented, the proposed development will not have any significant adverse long term impact.

### 5.12.2 Operational Phase

There are no predicted impacts arising from the operational phase once the operational mitigation measures are implemented in full.

### 5.12.3 Worst Case Scenario

In predicting a worst-case scenario, various considerations were undertaken involving accident, fire, flood and natural disasters. In considering the worst case for the soils and geology it was determined that hazardous chemical or fuel spill was the most likely to have a deleterious effect on the land. In the event of such a fuel spill, if the hazardous material were to infiltrate through the soils it would contaminate the local ground and could enter the groundwater if not recovered promptly.

Therefore, it is imperative that effective site management of dangerous chemicals and fuels be implemented by the developer and compliance with the Construction Waste Management Plan is adhered to during the construction of the development. Responsible and competent implementation of the mitigation measures will result in making this worst-case scenario an unlikely event.

## 5.13 Monitoring

Implementation of the Construction Management Plan is necessary to protect the land, soils and geology throughout the developments construction stage. Maintenance of the mitigation measures and monitoring of the management processes is required to ensure best practice.

The following specific monitoring measures are to be implemented:

- Monitoring of the management and storage of dangerous chemicals and fuel is imperative.
- Monitoring of the quality and quantity of soil being removed from site is necessary to ensure that the most there is efficient reusing of suitable excavated soils on the site.
- Adhering to the "Construction and Demolition Waste Management Plan".
- Implementation of Inspection Management Plan to ensure the suitable level of excavation is reached in the formation of foundations of structures and sub-base level of roads.
- Monitoring and maintenance of the wheel wash facilities.
- Monitoring of the stored stock piles of top-soil and sub soil on site.
- Regular maintenance and monitoring of the sediment control measures upstream of the surface water outfall.
- Monitoring of the necessary protection measures to the existing hedgerows and mature trees on the site.

Upon completion of the construction phase, the only the monitoring of the maintenance of the SuDS features on the development will be required during the operational phase of the development.

Reinstatement of any disturbance to the open space areas will be required.

## 5.14 Reinstatement

All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.

All construction waste and/or scrapped building materials are to be removed from site on completion of the construction phase.

Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licenced facility.

All sediment control measures (e.g. sediment retention ponds) are to be decommissioned on completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.

During decommissioning of the proposed development, there is a risk of localised accidental pollution incidences from the following sources:

- Spillage or leakage of temporary oils and fuels stored on site;
- Spillage or leakage of oils and fuels from machinery or site vehicles; and
- Spillage of oil or fuel from refuelling machinery on site.

Accidental spillages may result in localised contamination of soils and groundwater underlying the proposed development site, should contaminants migrate through the subsoils and impact underlying groundwater i.e. unmitigated. Groundwater vulnerability at the proposed development site is classified as low. Therefore, this is considered the *'Worst Case'* scenario.

### 5.15 Interactions

Land, soils and geology can interact with several other environmental aspects during both the construction and operational phases of the development. These interactions are discussed below.

#### 5.15.1 Transportation

Interactions with Traffic and Transport arise during the construction phase when soil and subsoils and demolition waste are being transported to and from the site and raw materials for construction are being imported to the site. A construction traffic management plan will be implemented in order to minimise the disturbance caused by traffic.

#### 5.15.2 Water

Interactions with Water and Hydrology arise during the construction phase and the operational phase. The surface water drainage infrastructure for the development will collect the rainfall on the site and convey the storm water run-off via roadside swales, tree pits, bio-retention area, rear garden filter drains, gullies, underground pipes, manholes, catchpit manholes and direct the flows via void arched attenuation systems towards vortex flow restricting devices (Hydrobrake or similar) and petrol interceptors before outfalling to the existing on site open watercourses. During the construction phase a site-specific CEMP will manage site water and will mitigate the risk of surface contaminants infiltrating into the underlying geology and hydrogeology. Surface water drainage from the operational site has been designed in accordance with Greater Dublin Strategic Drainage Study (GDSDS) and SuDs methods will be used to manage drainage.

#### 5.15.3 Resource & Waste Management

Interactions with Waste Management arise during the construction phase when soil, subsoils and demolition waste are being transported from the site. These waste materials will require appropriate transport and disposal. A Waste Classification Report for soils and subsoils shall be prepared in order to define appropriate waste disposal outlets.

#### 5.15.4 Noise & Vibration

Development of the site will result in a level of noise and vibration related effects on the surrounding environment during the construction phase. The interaction between Soils, Land and Geology and Noise and Vibration is considered to be moderate and temporary in nature. A construction traffic management plan will be implemented in order to minimise the disturbance caused by traffic.

#### 5.15.5 Air Quality

There is a potential for soil excavation activity to impact on air quality in terms of dust generated. Dust generation can also occur during extended dry weather periods as a result of construction traffic. However, the implementation of suitable mitigation measures as outlined in a CEMP for the site will ensure a neutral impact.

### 5.15.6 Biodiversity / Species & Habitat

Removal of the existing topsoil layer will be required across the site as well as removal of some trees, hedgerows etc. Further details including any potential issues and mitigation measures are outlined in Chapter 4 (Biodiversity).

## 5.16 Difficulties Encountered in Compiling

No difficulties were encountered while compiling this chapter.

## 5.17 Conclusion

The above has detailed the assessments carried out, potential impacts and required mitigation measures to be implemented in relation to the Soils and Geology aspects of the proposed development. The GSI publications and mapping indicate that the site is underlain primarily by glacial till derived from Sandstone and Shale. The soil association composition as determined from the Teagasc website datasets on the EPA website. The site investigation report prepared by Ground Investigations Ltd (GII) based on their excavations described the soils as Topsoil, Cohesive Deposits and Granular Deposits.

The Topsoil was encountered in the majority of exploratory holes and was present to a maximum depth of 0.3m BGL. The cohesive deposits were encountered beneath the topsoil and were quite variable, described typically as brown, grey brown or occasionally as black slightly sandy slightly gravelly CLAY, slightly gravelly sandy CLAY/SILT, Laminated sandy SILT and sandy gravelly slightly organic CLAY.

During construction c. 41,000m³of topsoil will be disturbed stored on site in mounds for reuse. It is estimated that approximately c.30,000m$^3$ to be reused. Sub-soil excavation will be required to allow the construction of the roads, building foundations, drainage and ancillary services. It is estimated that the sub-soil volume to be excavated and removed is approximately 60,200m$^3$.

Foundations for the buildings will be shallow depth (c.<1.0m below ground) strip footings, generally 3 times the width of the supported wall. The closest any house/apartment foundation will be is c.7m from the site boundary and typical details of same are included in the application submission.
Implementing the mitigation measures outlined, the impacts predicted to be moderate during the construction phase and will be for a short term duration only. Therefore, the proposed development will not have any significant adverse long term impact. There are no likely significant impacts on the land, soil or geological environment associated with the proposed operational development of the site. As such, the impact is considered to have a long term, imperceptible significance with a neutral impact on quality.

## 5.18 References


- Land Surveys Topographical mapping.
- Geological datasets available at www.gsi.ie
- Subsoil datasets available at www.gis.teagasc.ie
- Ground Investigations Ireland Ltd site investigation and soakaway reports

# 6.0. Water

## 6.1 Introduction

This section of the EIAR was prepared by Roger Mullarkey *BSc.Eng.Dip.Eng,C.Eng,MIEI,Eur.Ing, FConsEI* of Roger Mullarkey & Associates Consulting Engineers (RMA). Roger Mullarkey has over 27 years of consulting civil and structural engineering experience primarily in the design of residential housing in Ireland. This chapter of the EIAR relates to the impact of the proposed development on the surrounding hydrogeological environment (including surface water drainage, foul drainage, water supply and flood risk) . This chapter will also identify the mitigation measures in order to minimise any impacts.

A Site Specific Flood Risk Assessment (SSFRA) has been completed by Kilgallen & Partners Consulting Engineers and forms part of the overall application under a separate document and reference should be made to the SSFRA for further detailed assessment.

The subject site is located at the Boherboy Road, Saggart, Co. Dublin and is currently Greenfield of 17.6Ha with some remaining farm sheds/outbuildings. The site is located just south of the Carrigmore and just west of Corbally residential developments. To the north-west of the site lies the Saggart golf course and the Boherboy Road bounds the southern elevation of the subject lands.

The proposed development will consist of 655No.residential units and a c.680m$^2$ of Crèche space. The following associated engineering infrastructure includes;

- Roads access from Boherboy Road (L2008) to the south and Carrigmore estate to the north.
- Pedestrian access to the east via Corbally estate and to the northeast via Carrigmore Park Road improvement and a new path along the Boherboy Road (L2008)
- New internal road and street network including cycle and pedestrian infrastructure
- Foul water, surface water and water supply infrastructure
- Public open spaces and associated landscaping, public lighting, etc

A full description of the application details are contained in the main application documentation prepared by Armstrong Fenton Associates Planning Consultants.


**Fig. 6.1 – Site Location Map**

## 6.2 Methodology & Sources of Information

The potential impact of the proposed development on the hydrology and water services has been carried out in accordance with the Guidelines on Information to be Contained in an Environmental Impact Statement as published by the EPA, the Advice Notes on Current Practice in preparation of Environmental Impact Statements (EMP 2003), the Draft Guidelines on the information to be contained in EIAR Reports (EPA 2017), An Bord Pleanála on Carrying out Environmental Impact Assessment (DoEHLG 2013) and the EC Guidance on the Preparation of the EIAR (2017)

The following information sources were used in the assessment of the local hydrology and water services for the proposed development site:

- Geological Survey of Ireland (GSI) website (www.gsi.ie);
- Office of Public Works (OPW) National Flood Hazard Mapping;
- OPW Catchment Flood Risk and Management Studies (CFRAM);

- Review of the Environmental Protection Agency (EPA) website (https://gis.epa.ie/EPAMaps/);
- Teagasc soil data sets (http://gis.teagasc.ie/soils/map.php);
- SDCC/Irish Water Drainage & Water Records Maps;
- SDCC County Development Plan 2016-2022;
- Discussions with SDCC Water Services Department;
- Discussions with Irish Water;
- Ordnance Survey mapping;
- Topographical survey;
- Site Investigation reports and Soakaway Testing;
- Site walkover visits;
- Hydrological & Hydrogeological Qualitative Assessment prepared by AWN Consulting;
- Site Specific Flood Risk Assessment prepared by Kilgallen and Partners Consulting Engineers.

The surface water and foul water drainage infrastructure and the water supply infrastructure is to be in accordance with the requirements of South Dublin County Council (SDCC) and the following documents:

- Part H Building Regulations;
- Irish Water Code of Practice for Waster water and Water Infrastructure;
- South Dublin County Development Plan 2016 –2022;
- CIRIA Report c753 "The SuDS Manual" 2015;
- Greater Dublin Strategic Drainage Study (GDSDS) 2005;
- The Greater Dublin Regional Code of Practice for Drainage Works;
- DOELG Recommendations for Site Development Works for Housing Areas.

Information noted in this chapter is also supported by multiple site visits carried out over a period of years by Roger Mullarkey & Associated Consulting Engineers. Several meetings and discussions were held with members of the SDCC Drainage Department in preparation of the design development for this site. Furthermore, reference is to be made to the Hydrological & Hydrogeological Qualitative Assessment prepared by AWN Consulting and submitted with this planning application. Reference is also drawn from the Site Specific Flood Risk Assessment prepared by Kilgallen and Partners Consulting Engineers which forms part of this application.

## 6.3 Receiving Environment (Baseline Situation)

### 6.3.1 Hydrology

There is a stream bounding the subject site along the east and northern boundaries which is a tributary of the Camac River and is named as the Corbally Stream on the EPA website (https://gis.epa.ie/EPAMaps/Water ). The EPA designation code 09C10. There are 2No. local field ditches on the subject site that drain into this stream along the northern boundary, one located centrally, known as the Cooldown (EPA code 09C60) and the other along the western boundary, known as the Coldwater (EPA code 09C62) The Corbally Stream outfalls into the Camac River c.2.1km to the north of the site. The Coldwater begins and flows along the western site boundary and joins the Corbally Stream at the north-western corner of the site. The centrally located Cooldown ditch begins within the site and connects to the Corbally Stream at the northern end of the site. Both the Cooldown and Coldwater are inactive until heavy rainfall events occur and in turn drain only the northern flatter end the subject lands into the Corbally Stream.

The Camac River discharges to the River Liffey c.12km northeast of the site which finally outfalls into South Dublin Bay (SPA/SAC/pNHA) c.18km from the site.

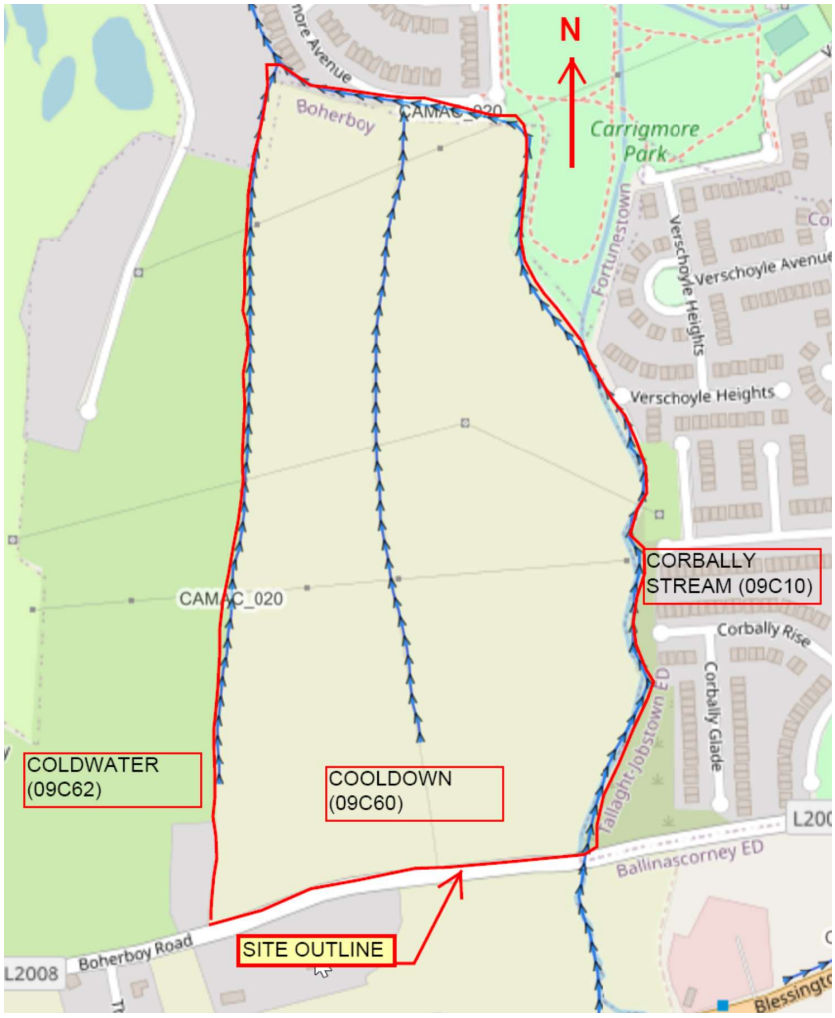



**Fig.6.2 – extract from GSI/EPA website**

A review of the available datasets within the Environmental Protection Agency (EPA) web portal https://gis.epa.ie/EPAMaps/Water was carried out in preparation of this chapter.

A topographical survey was carried out on the site and indicates that the lands slopes sharply downwards from the south end of the site towards the north. The existing ground level gradients range from 1/7 to 1/30 generally. There is an approximate drop in level of 38m from the highest portion (SW) of the site to the lowest point (NW). The site survey drawing is included in the application and can be viewed as background on the submitted Road & Block Levels drawing RMA Dwg.No.s1324B/301, 302 & 303 and is summarised in Fig. 6.3 below.

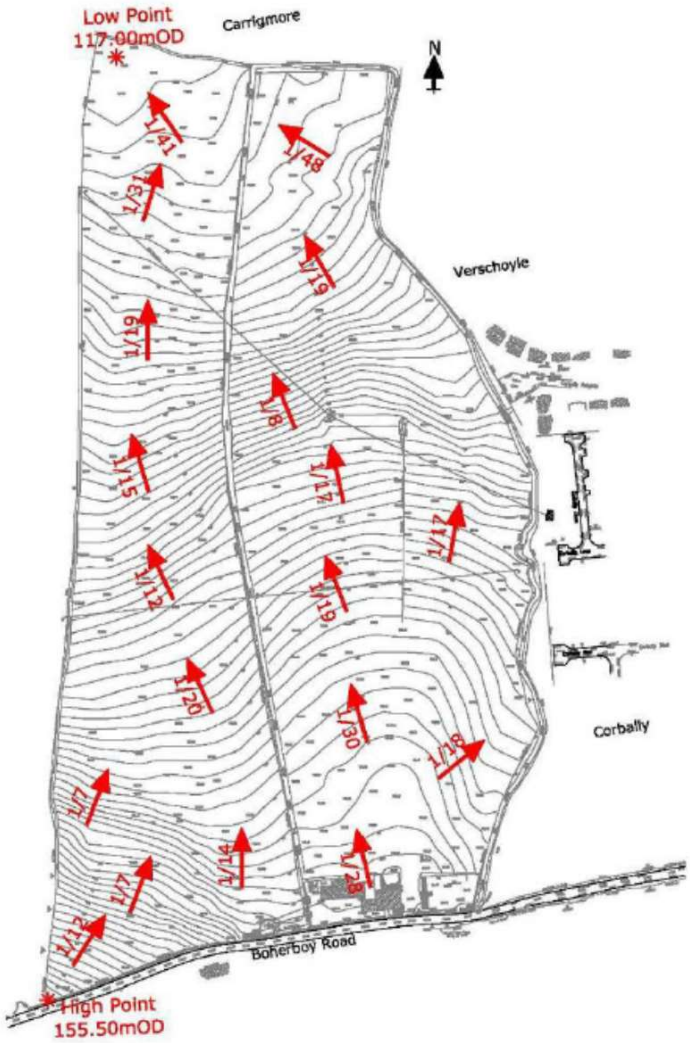



**Fig. 6.3 – Site Topography**

### 6.3.2 Hydrogeology and Geology

A review of the Geological Survey of Ireland web portal database at https://gis.epa.ie/EPAMaps classifies the groundwater vulnerability as Code L – Low vulnerability in the northern half of the site and as Code M – Moderate vulnerability in the southern half of the site. The 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. All land area is assigned one of the following groundwater vulnerability categories: Rock near surface or karst (X) Extreme (E) High (H) Moderate (M) Low (L).


**Fig.6.4 – Groundwater vulnerability (Green = Low, Yellow = Medium)**

GSIs Aquifer classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. Review of the GSI data base reveals that the vast majority of the subject site's local aquifer is classified as PI - Poor Aquifer Bedrock which is generally Unproductive except for local zones. Also, the northern section of the lands has the groundwater classification of LI - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones.


**Fig. 6.5 – GSI Aquifer (South 4/5 = PI, North 1/5= LI)**

### 6.3.3 Surface Water Quality

As a background identifier, the EPA online mapping tool presents the available water quality status for water bodies in Ireland. The proposed site lies within the Liffey and Dublin Bay Catchment (Hydrometric Area 09) and River Liffey sub-catchment (Water Framework Directive (WFD 2000/60/EC) Liffey_SC_090, ID09_1.5)(EPA, 2021). The Corbally Stream is a tributary of the Camac River some 2.1km in a northerly direction from the site. The Camac River flows northeast for c.10.7km before discharging into the Liffey Estuary upper transitional waterbody which in turn discharges into Dublin Bay costal waterbody which includes Special Area of Conservation (SAC)/proposed Natural Heritage Area (pNHA).

The Corbally Stream and the downstream Camac River have a Water Framework Directive (WFD) status of "Moderate" and a WFD risk score of " At risk of not achieving good status" Chemical conditions have been classified as "good" or "high". The most recent (2019) quality data for the Camac River indicate that it is "Slightly polluted" but there is no available data for the Corbally Stream local to the subject site.

### 6.3.4 Flood Risk

In accordance with the OPW's *The Planning System and Flood Risk Management- Guidelines for Local Authorities 2009* (the Guidelines), Kilgallen & Partners Consulting Engineers have assessed and prepared a Site Specific Flood Risk Assessment (SSFRA) which forms part of the planning application. The SSFRA determined that the site was not subject to flooding from either Pluvial or Groundwater flooding. However, it was determined that there was a risk of Fluvial flooding from the Corbally Stream along the northern boundary of the site and thus that part of the site is categorised under the Guidelines as being in a flood risk zone A & B. It was also identified in the SSFRA that there is a flood risk of the Corbally Stream overtopping the bank in the northeast portion of the site.

Mitigation measures proposed in detail in the SSFRA include the development of a flood compensatory area along the northern site boundary and the raising of the stream bank along the north-eastern boundary. Those mitigation measures are summarised in Sections 6.4.2 and 6.6.1 and the reader is also referred to the accompanying SSFRA for specific details of the mitigation measures.

The SSFRA concluded that implementation of the mitigation measures will increase the available flood storage capacity, that the application was subject to and passed the Development Management Justification Test as required under the Guidelines, that the proposed development will not be at risk of flooding and will not increase flood risk elsewhere and that the development is therefore appropriate from a flood risk perspective.

Reference can be made to the separate SSFRA document that forms part of the overall planning submission documentation for greater detail in this regards.

### 6.3.5 Surface Water Drainage

In reference to the South Dublin County Council and Irish Water drainage records maps there are no known surface water drainage pipelines on the subject site. Site investigation excavations and archaeological investigations slit trenching did not uncover any drainage piped services on the site. Furthermore, site walkover visits by Roger Mullarkey & Associates Consulting Engineers and topographical surveys did not locate any visible manhole covers or pipe outfalls on the site.

Therefore, it is concluded that there is no piped surface water drainage infrastructure on the subject site.

There is an existing centrally located field drainage ditch (Cooldown) and a similar, but separate, field drain along the western boundary of the site (Coldwater), both of which are at a downwards gradient from south to north draining into the Corbally Stream along the northern boundary of the site. No flowing water was noted in these local field drains during site visits or on the topographical surveys. The topography of the land does not slope directly towards these ditches except for a portion of the northern end of the site and it is concluded that these drains operate as drainage channels only during occasional high rainfall events.

### 6.3.6 Foul Drainage

Similar to paragraph 6.3.5, in reference to the South Dublin County Council and Irish Water drainage records maps there are no known foul drainage pipelines on the subject site. Site investigation excavations and archaeological investigations slit trenching did not uncover any drainage piped services on the site. Furthermore, site walkover visits by Roger Mullarkey & Associates Consulting Engineers and topographical surveys did not locate any visible manhole covers on the site.

Therefore, it is concluded that there is no piped foul drainage infrastructure on the subject site.

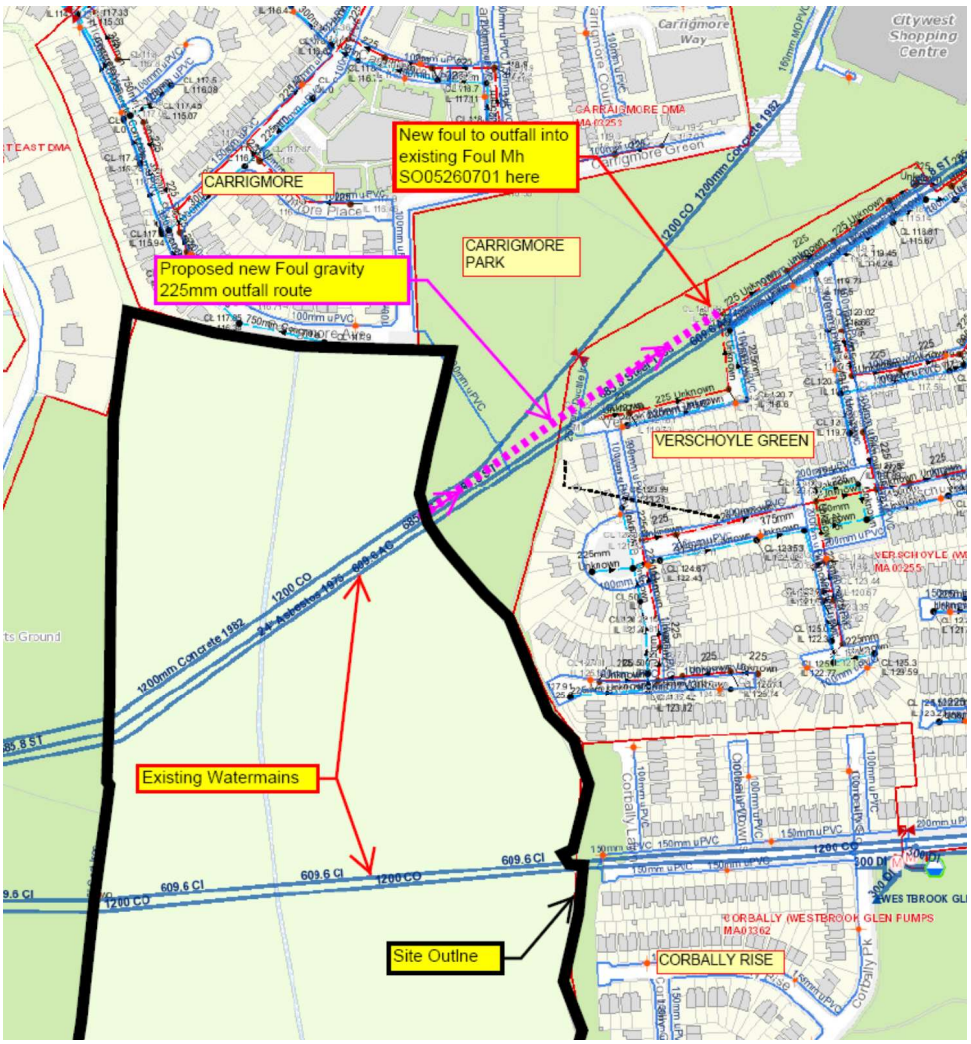



**Fig. 6.6 – extract from Irish Water Webmap**

There are existing foul drainage infrastructure networks in the housing estates to the north and east of the subject site. Due to the steep topographical nature of the site with the gradient falling from south to north, a new gravity foul connection to the north or northeast is feasible. During pre-planning consultations with the owners of the foul sewerage network, Irish Water, it was concluded that the gravity sewer outfall to the northeast was the preferred route.

A Pre-Connection enquiry was submitted to Irish Water (IW) and the subsequent Confirmation of Feasibility (CoF) letter (25/08/20) from IW concluded that a connection to the network is "Feasible subject to upgrades" to existing pipelines and the cost of same is to be agreed at connection application stage. A copy of the CoF

letter can be viewed in Appendix 6A in Volume III of this EIAR.

Further to the CoF stage of the engagement with IW, comprehensive discussions were held between the Applicants and IW to agree the technical details of the proposed foul drainage infrastructure and connection. As a result of those engagements the relevant foul drainage drawings were submitted to Irish water for technical review and subsequently, they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The Statement of Acceptance letter can be viewed in Appendix 6A in Volume III of this EIAR.

### 6.3.7 Potable Water Supply

Reference to the South Dublin County Council and Irish Water records maps identified 5 no. existing watermains crossing the site in a west to east direction approximately. The surveyed location of the existing watermains are as shown on the submission drawings 1324B/301-312 and are summarised in Fig. 6.6 above.

In order to precisely locate these existing watermains, excavation of silt trenches was carried out with the permission of the then overseeing authority of Dublin City Council and South Dublin County Councils Water Departments. All mains were located, surveyed, mapped and the results issued to both SDCC, DCC and Irish Water for their records. Furthermore, recent GPR(ground penetrating radar) surveys were carried confirming the watermain locations offsite through the SDCC owned Carrigmore Park to the NE of the subject lands.

Comprehensive pre-planning discussions were held with Irish Water to ascertain their set-back and road crossing separation requirements. Subsequently detailed cross sections were prepared (Dwg.No. 1324B/316) identifying all crossings of the existing watermains and submitted to Irish Water for their review. On completion of their assessments, Irish Water then issued a Statement of Design Assessment dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals".

The proposed water supply for the development is to be made by connecting to an existing 400mm diameter main located in the Boherboy Road to the south of the site. A Pre-Connection enquiry was submitted to Irish Water (IW) and the subsequent Confirmation of Feasibility (CoF) letter (25/08/20) from IW concluded that a connection to the water network is "Feasible without infrastructure upgrade by Irish Water". A copy of the CoF letter can be viewed in Appendix 6A in Volume III of this EIAR.

Subsequently a full set of watermain design drawings (Dwg.'s 1324B/310-312) were submitted to Irish Water for their technical review and as a result they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The Statement of Acceptance letter can be viewed in Appendix 6A in Volume III of this EIAR.

## 6.4 Characteristics of the Proposed Development

The proposed development will comprise 655 no. residential units (257 no. houses, 246 no. apartments and 152 no. duplex units) and a c.693m$^2$ crèche, a number of new public open spaces, all associated site development works, landscaping, boundary treatments and services provision. The proposed development will include surface water attenuation measures and underground geocellular/StormTech type tanks as well as a below ground wastewater pumping station. The overall development also contains c.1.4Ha reserved for a possible future school site.

### 6.4.1 Hydrology and Geology

The bounding Corbally Stream to the east and north is the principle hydrological feature of the site. Site investigations were undertaken including trial hole opening and soakaway testing. Refer to Appendix 6.A in Volume III of this EIAR for the SI results.

The sub-soil conditions as determined by trial hole opening noted topsoil over variable cohesive and granular deposits of clays and silts overlying above the course greywacke and shale bedrock.

In total 4No.soakaway tests were carried out in accordance with BRE Digest 365 and the results indicated infiltration rates varied between unobtainable f values up to 1.38x10$^{-5}$ mm/s. These results indicate limited but some availability for infiltration across the site. Refer to the soakaway test results in Appendix 6.A of this report for further information.

The site investigation report noted that some of the trial pits had slow seepage of ground water encountered at depths between 2-3m below ground.

As is required under the Greater Dublin Strategic Drainage Study (GDSDS), the proposed development requires a Sustainable Urban Drainage Systems (SuDS) treatment train approach to be undertaken as part of the surface water drainage infrastructure design. Integral to that design approach is to implement source control measures to detain or infiltrate surface water run-off as close as possible to the point of origin.

The site investigation results (see Appendix 6.A of this report) suggest that in one location there is some but limited (1.38x10$^{-5}$ mm/s) scope for infiltration of surface water flows. Of the 4No.tests carried out, only 1No.yielded a positive infiltration value. Even if the infiltration is limited there is still scope to provide some level of interception storage, time delay and treatment as the surface water flows through the stone medium of the following SuDS features in accordance with the UKSuDS.com. The infiltrating SuDS features used in the drainage design include Permeable Paving, Swales, Tree Pits and Filter Swales, all of which are discussed in detail in Chapter 7 of the RMA Drainage Infrastructure Report included in this application and the reader is referred to that document for more information.

As the depth of ground water encountered was slow seepage at 2-3m below ground, the poor permeability of the overlying soils and the low/medium aquifer vulnerability, it is not anticipated that the proposed development will have a direct impact on the hydrogeology and geology.

### 6.4.2 Flood Risk

As noted previously in section 3.3.4, in accordance with "The Planning System and Flood Risk Management Guidelines for Planning Authorities", a full Site Specific Flood Risk Assessment (SSFRA) has been carried out by Kilgallen & Partners Consulting Engineers and is submitted as a separate stand alone document as part of the subject planning application.

The proposed development includes the construction of a deepened flood compensatory area along the northern boundary of the site to provide an area for the Corbally Stream to expand into during times of extreme rainfall events. The volume of flood compensatory storage is estimated to be 870**m³** greater than the volume generated by the 1%AEP (Annual Exceedance Probability) event, otherwise known as the 1 in 100 year event. Fig.7.7 below outlines the proposed flood storage compensatory area and illustrates the top water level of the 1%AEP event to **be 118.02mOD**. Noting that the lowest proposed finished floor level of the development is 120.50mOD which will provide a freeboard of **2.48m** between the highest 1%AEP flood level and the lowest house level on the site. The SSFRA also assessed the 1 in 1000 year (0.1%AEP) extreme rainfall event and determined the top water level will by **118.05mOD** and therefore the freeboard to the lowest floor level will be **2.45m.** The Guidelines recommended minimum freeboard is 500mm for the 1%AEP event and the proposed development will provided significantly (c.5 times) more than the required minimum freeboard.

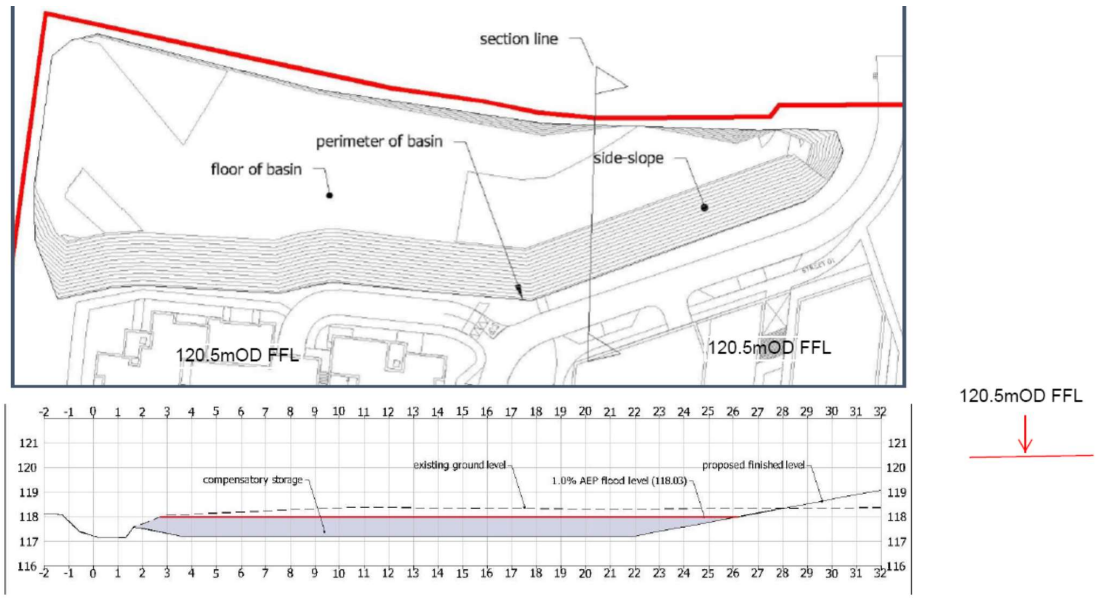



**Fig. 6.7 – Extract from SSFRA fig.5.2 Plan and Typical Section for Compensatory Basin**

As was determined necessary in the SSFRA Section 5.4, the proposed development will raise the ground level along the western edge of the Corbally Stream in the north-eastern portion of the site to provide a minimum freeboard of 750mm above the calculated 1%AEP event. This will eliminate the risk of overland flow and keep the flow within the channel through this area. Fig. 6.8 below indicates the extent of the localised raising of the stream embankment.

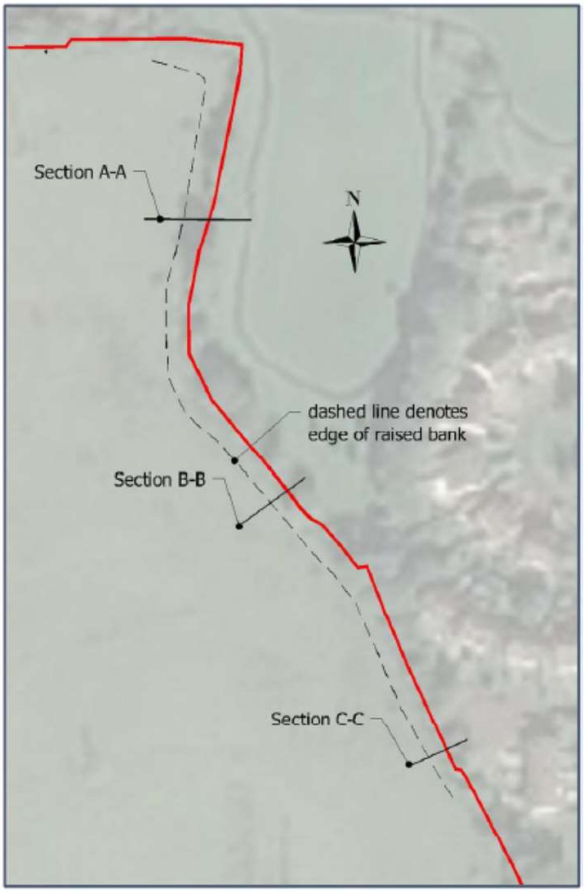



**Fig. 6.8 – Extract from SSFRA fig.5.4 – Raised Bank at east Boundary**

The above characteristics of the proposed development form part of the mitigation measures and are summarised in Section 6.6 of this chapter. The reader is referred to the SSFRA for specific details of the mitigation measures.

The proposed development includes 4 no. crossings of the Corbally Stream connecting the proposed development with the adjoining Corbally and Carrigmore housing estates and the public Carrigmore Park, as illustrated in Fig. 6.9 below.

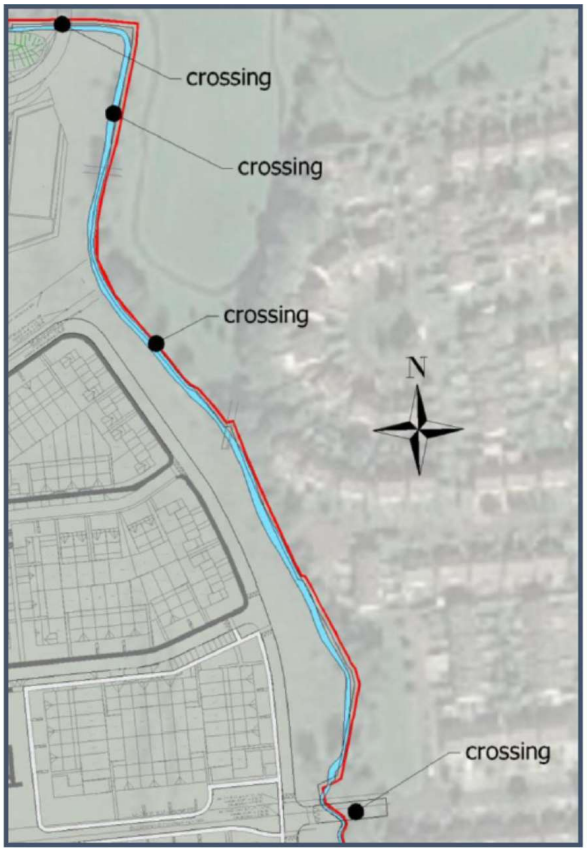



**Fig. 6.9 – Extract from SSFRA fig.5.7 – Stream Crossings**

The SSFRA has determined the top water level in the Corbally Stream for the 1%AEP rainfall event and is summarised in Fig. 6.10 below;

| Crossing | 1.0% AEP water level (m OD) | min. soffit Level m OD |
|---|---|---|
| 1 | 118.84m | 119.44m |
| 2 | 120.29m | 120.79m |
| 3 | 124.64m | 125.14m |
| 4 | 132.88m | 133.38m |

**Fig. 6.10 – Extract from SSFRA Table 5.2 – Crossing Details**

The OPW requires that there be a minimum of 300mm freeboard between the estimated top water level during the 1%AEP event and the soffit of the inlet to the culvert conveying the flow. The SSFRA has calculated the top water level at all crossings for the 1%AEP event and determined that the soffit levels of the proposed crossings are a more that 500mm above the 1%AEP top water level and therefore comfortably comply with the recommendations given in the Guidelines. Fig. 6.11 over illustrates a typical crossing detail to the north of the site.

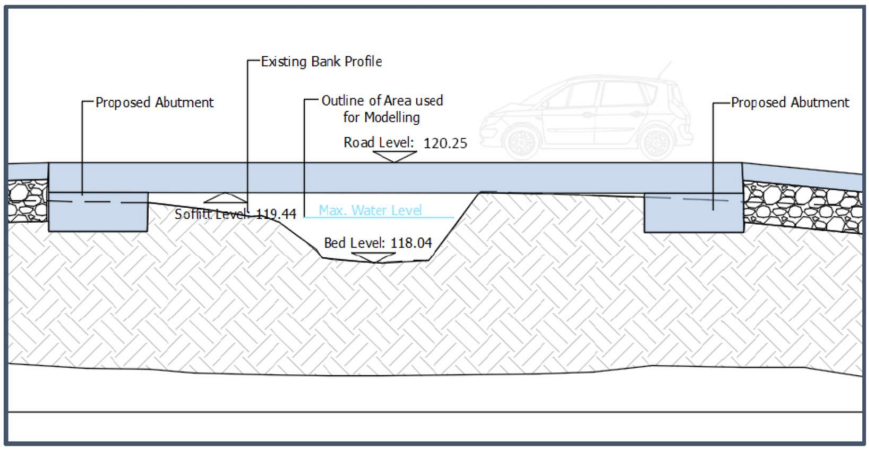



**Fig. 6.11 – Extract from SSFRA fig.5.8 – Typical section at Stream Crossing**

The SSFRA concluded that implementation of the mitigation measures will increase the available flood storage capacity, that the application was subject to and passed the Development Management Justification Test as required under the Guidelines, that the proposed development will not be at risk of flooding and will not increase flood risk elsewhere and that the development is therefore appropriate from a flood risk perspective.

### 6.4.3 Surface Water Drainage

A full and comprehensive SuDS treatment train approach has been implemented in accordance with the CIRIA SuDS Manual as described in Chapter 7 of the main RMA Drainage and Water infrastructure Report included with the planning application. With agreement in principle from the SDCC Water Services Department, it is proposed to outfall the treated surface water from the proposed development into the Corbally stream along the eastern and northern boundary of the subject site.

In accordance with best practice, appropriate SuDS features included in this development which include the following elements:

- Filter drains to the rear of the housing
- Permeable paving to all private parking areas
- Rainwater butts (200l) to the rear downpipes of the houses
- Green roofs on the Apartment buildings
- Filter Swales adjacent to roadways where feasible
- Tree Pits
- Bio-Retention Area
- Silt-trap/catchpit manholes
- Void Arch storage systems
- Hydrobrake flow controls limited to an overall Qbar greenfield rate (59.7l/s)
- Petrol interceptors

The use of SuDS features in combination with traditional drainage methods is in accordance with the SDCC County Development Plan 2016-2022 and encourages replication of the natural drainage systems in recharging the groundwater where possible via filter drains, filter swales and the detention basin.

The surface water runoff from the site is to be limited to the greenfield runoff rate (59.7l/s) and the attenuated flows are to be stored in a belowground geocellular system such as the GeoTech MC4500 system for storms up to the Q100 year event with a 10% allowance for climate change.

For flows generated by storm events greater than the Q100 +10%, the development has been designed to convey overland flood routes along roads and direct water away from houses towards the green areas.

The calculated Qbar greenfield runoff rate for the entire site was determined to be 59.7 l/s in accordance with the Institute of Hydrology Report IH 124 which is in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and in agreement with SDCC Drainage Department. The site is divided into a number of sub-catchments each with a Hydrobrake flow limiting vortex control device. The total flow rate is sub divided between each separate catchment but the total outfall rate is designed not to exceed the greenfield run off rate. The attenuated storage models were generated using the MicroDrainage software common to the profession. The total attenuated storage requirement was determined to be **5,201m$^3$** which is stored across 7 separate catchments. The attenuation storage volume provided **(5,549m$^3$)** exceeds required volume and is considered a safer approach to volume estimation.

In accordance with the GDSDS and the SSFRA, the floor levels are to be a minimum of 500mm above the highest predicted storage level. Further detailed information relating to the site developments drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report".

### 6.4.4 Foul Drainage

As noted in section 6.3.6 above, there are no existing foul sewers on the site. Due to the steep topographical nature of the site with the gradient falling from south to north, a new gravity foul connection to the north or northeast is feasible. During pre-planning consultations with the owners of the foul sewerage network, Irish Water, it was concluded that the gravity sewer outfall to the northeast was the preferred route.

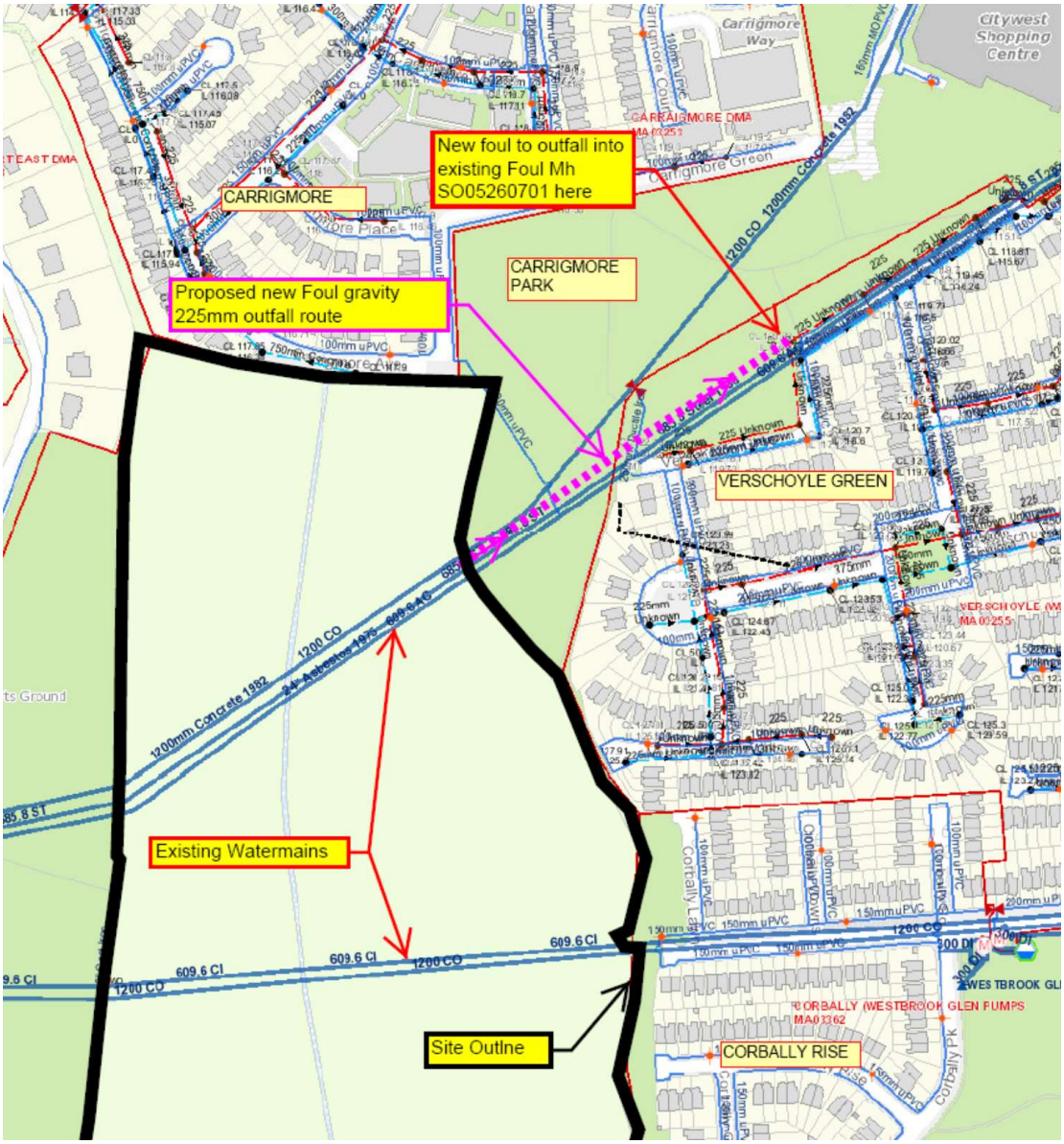



**Fig. 6.12 – extract Irish Water Webmap**

The minimum public sewer diameter is to be 225mm and the foul drains/sewer have been designed in accordance with the following:

- Irish Water Code of Practice for Wastewater Infrastructure & Standard Details for Wastewater Infrastructure;
- Department of the Environment's Recommendations for Site Development Works for Housing Areas;
- Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Wastewater Disposal";
- BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

It is not feasible to drain the northern located apartment Blocks A and C or the potential future school site by gravity. Therefore, a below ground foul water pumping station is proposed as part of this application to drain the above blocks from lower northeast corner of the site into the gravity sewer to be constructed connecting

into Verschoyle Green.

The proposed foul pumping station is to be in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2017 – Part 5 – Pumping Stations. The details of which can be viewed on the submitted drawing no.1324B/321.Please note that the foul pumping station is below ground and is proposed to have only 2 no. above ground kiosks visible as per the IW standards as per the below extracts from IW STD-WW-30A and 31A.

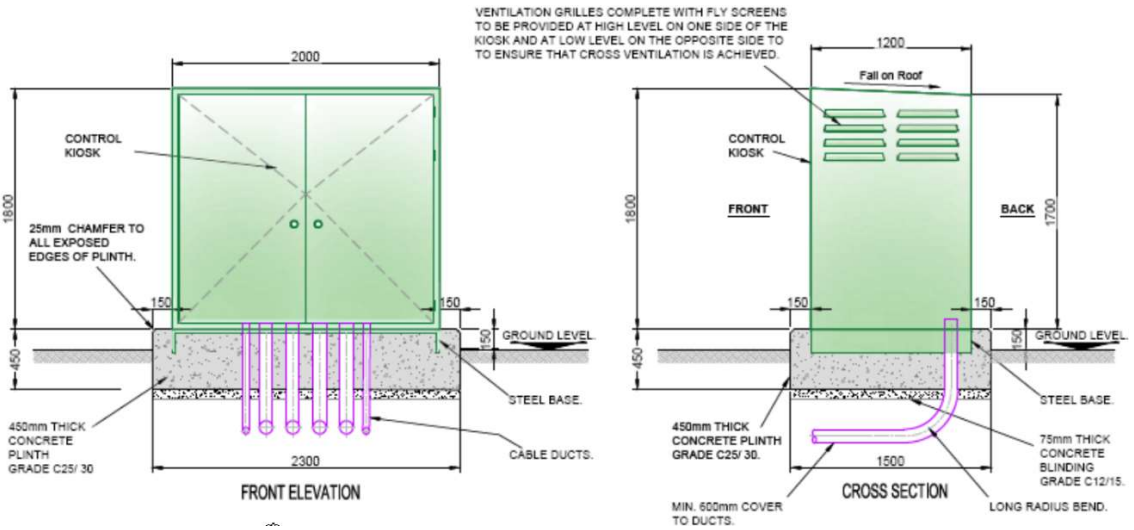



**Fig. 6.13 – ex.Irish Water STD WW 30A**

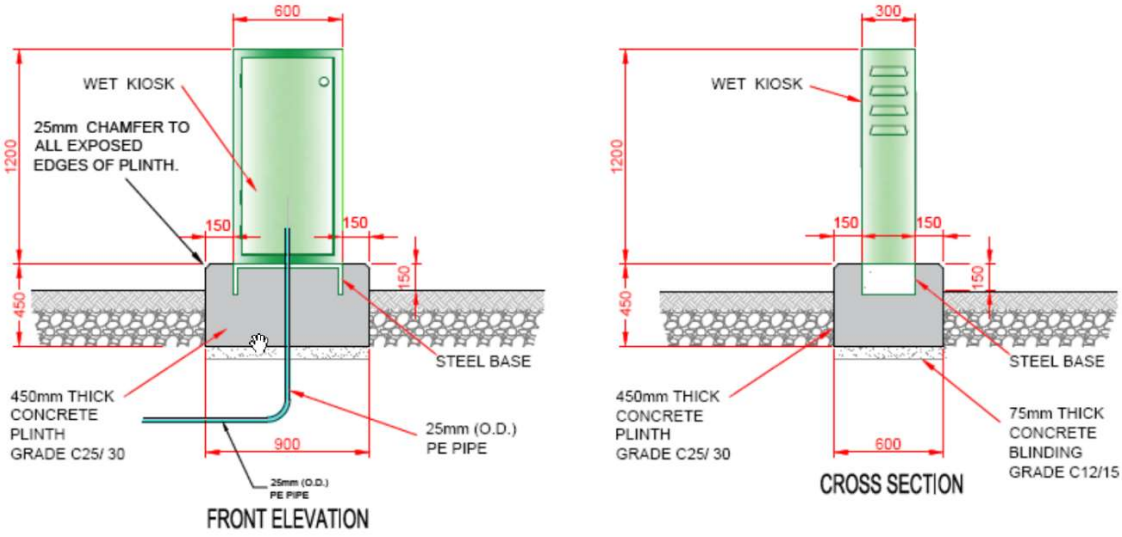



**Fig 6.14 – ex.Irish Water STD WW 30A**

The pumping station has been located to provide c.40m separation distance to the nearest existing habitable building and c.22m to the nearest proposed building. The separation distances provided exceed the Irish Water recommended 15m and have been approved by Irish Water as part of the Statement of Design Acceptance dated 19/08/21 and agreed in principle with South Dublin County Councils Water Services Department as part of the pre-planning process.

A peak foul outflow rate of 13.4l/s has been calculated in accordance with the Irish Water Code of Practice for Wastewater Infrastructure & Standard Details for Wastewater Infrastructure. This equates to a peak outfall volume of 1,158m$^3$ per day. In accordance with the EPA Wastewater Treatment Manual, a Biochemical Oxygen Demand (BOD) for the proposed development, using the EPA recommended loading of 60g per person, to be 112kg per day.

A Pre-Connection enquiry was submitted to Irish Water (IW) and the subsequent Confirmation of Feasibility (CoF) letter (25/08/20) from IW concluded that a connection to the network is "Feasible subject to upgrades" to existing pipelines and the cost of same is to be agreed at connection application stage. A copy of the CoF letter can be viewed in Appendix 6A of this report.

Further to the CoF stage of the engagement with IW, comprehensive discussions were held between the Applicants and IW to agree the technical details of the proposed foul drainage infrastructure and connection. As a result of those engagements the relevant foul drainage drawings were submitted to Irish water for technical review and subsequently, they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The Statement of Acceptance letter can be viewed in Appendix 6A in Volume III of this EIAR.

Layout, levels, gradients, pipe sizes and details of the proposed foul drainage infrastructure can be viewed on the planning submission drawing no.s 1324B/307-309, 321-329.

### 6.4.5 Potable Water Supply

The proposed water supply for the development is to be made by connecting to an existing 400mm diameter main located in the Boherboy Road (L2008) to the south of the site.

A single 200mm diameter connection has been approved by Irish Water and will supply the proposed development via a 200mm diameter spine watermain with interconnecting 150mm and 100mm diameter looped branch watermains connected to it. Individual houses are to be supplied with a 25mm connection. In reference to the Irish Water Code of Practice for Water Infrastructure (July 2020) document, each individual residential dwelling within the development is to be provided with a boundary box. Each dwelling will be fitted with a cold-water storage tank to provide 24 hours of supply. Apartments will be supplied via a centralised water tanks and system per apartment block.

In accordance with best practice, the use of water conservation appliances in the buildings are to be employed as part of this scheme to reduce the water demand. As a further measure of demand reduction, it is proposed to provide 200l **rainwater butts** to the rear of each gabling property. This will collect rainwater from the house roofs for use in garden irrigation, therefore reducing potable water demand and decreasing run-off from the site.

All watermain layout, connections, hydrants, valves and details have been designed in accordance with the Irish Water Code of Practice for Water Infrastructure 2020 and the Water Infrastructure Standard Details 2020.

In accordance with the IW CoP for Water Infrastructure 2020 the average daily domestic and commercial water demand for the proposed development was calculated as 270m$^3$.

Refer to the submitted drawing no.s 1324B/310-312 for the watermain layout and to drawing no. 1324B/316 for sections across the existing trunk watermains which have been reviewed and approved by Irish Water.

A Pre-Connection enquiry was submitted to Irish Water (IW) and the following that a Confirmation of Feasibility (CoF) letter (25/08/20) was received from IW and concluded that a connection to the water network is "Feasible without infrastructure upgrade by Irish Water". Subsequently a full set of watermain design drawings (Dwg. no.s 1324B/310-312) were submitted to Irish Water for their technical review and as a result they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The CoF and Statement of Acceptance letters can be viewed in Appendix 6A in Volume III of this EIAR.

## 6.5 Potential Impacts of the Proposed Development

### 6.5.1 Construction Phase

The following paragraphs describe possible causes and impacts on the hydrogeology and water services as a result of the proposed development if the specific mitigation measures are not implemented. Refer to section 6.6 for the proposed necessary mitigation measures that form part of this application.

In order to construct the development, significant amounts of the top-soil will be removed and stored on the site for future use. When the topsoil has been removed the sub soil layers will be exposed to weathering and there is a potential for erosion of this layer from the inevitable rainfall and runoff. It has been estimated that c.40,700m$^3$ of topsoil will be disturbed during the construction phase.

Potential sources and impacts that may occur during the construction stage are as follows;

- Surface water runoff during the development's construction stage can cause silt from the exposed sub-soil be washed into the Corbally Stream causing excess siltation downstream;
- There is a risk that site contaminants from cement/concrete generated during wash down of concrete delivery trucks could enter the Corbally Stream causing pollution;
- There is a possibility that accidental fuel leaks/spills could be washed into the Corbally Stream or leak into the exposed sub-soil which could result in an increased risk of contamination to the receiving watercourses and groundwater;
- Over pumping of rainwater from foundation excavations could contain excess silt levels and could have a potential impact on the on the existing hydrology cause increased silt levels in the surrounding watercourse;
- Improper discharge of foul drainage from the contractors site compound could have an impact on the existing hydrology.

As a background identifier, the EPA online mapping tool presents the available water quality status for water bodies in Ireland. The proposed site lies within the Liffey and Dublin Bay Catchment (Hydrometric Area 09) and River Liffey sub-catchment (Water Framework Directive (WFD 2000/60/EC) Liffey_SC_090, ID09_1.5)(EPA, 2021). The Corbally Stream is a tributary of the Camac River some 2.1km in a northerly direction from the site. The Camac River flows northeast for c.10.7km before discharging into the Liffey Estuary upper transitional waterbody which in turn discharges into Dublin Bay costal waterbody which includes Special Area of Conservation (SAC)/proposed Natural Heritage Area (pNHA).

The Corbally Stream and the downstream Camac River have a Water Framework Directive (WFD) status of "Moderate" and a WFD risk score of " At risk of not achieving good status" Chemical conditions have been classified as "good" or "high". The most recent (2019) quality data for the Camac River indicate that it is "Slightly polluted" but there is no available data for the Corbally Stream local to the subject site.

There is no direct open-water pathway between the site and Dublin Bay. However, there is an indirect pathway through the stormwater drainage which directly discharges into the Corbally Stream. Should any silt-laden stormwater from construction or hydrocarbon-contaminated water from a construction vehicle leak or manage to enter the watercourse, the suspended solids will naturally settle withing the stream. However, in the event of a worst case hydrocarbon leak of 1000 litres this would be diluted to background levels (water quality objectives as outlined in S.I. No.272 or 2009, S.I. No.386 of 2015 and S.I. No.77 of 2019) by the time the stormwater reaches the nearest Natura 2000 site (18km downstream).

The potential for impact on the aquifer is low based on the absence of any bulk storage of chemicals on the site. The overburden thickness, low permeability nature of the till sub-soil and lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect discharges to ground at the site. As such the is no potential for a change in the ground water body status or significant source pathway linkage through the aquifer to any Natura 2000 site.

The wastewater discharge from the site during construction stage is to be managed by a licenced waste disposal contractor in accordance with the agreement of Irish Water. As construction sites have managed toilet blocks there is a minimal risk of contamination by direct pathway to the Corbally Stream. The overburden thickness, low permeability nature of the till sub-soil and lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect discharges of leaking toilet blocks to ground at the site. As such the is no potential for a change in the ground water body status or significant source pathway linkage through the aquifer to any Natura 2000 site.

In the absence of the proposed mitigation measures, construction activity could have a slight, adverse, temporary, residual impact on receiving watercourses.

### 6.5.2 Operational Phase

In the absence of the specified mitigation measures, the potential operational phase impacts to the hydrology are outlined below:

- Unless the surface water outflow is restricted to the current greenfield rates there will be an increase in the surface water run-off due to the increase of the impermeable surfacing and a reduction of the ground water recharge.
- Increase of the wastewater discharge to the receiving network is calculated to be peak 1,158m$^3$ per day.
- Increase of the potable water consumption to an Average daily Domestic Demand of 270m$^3$.
- Accidental leak of hydrocarbon and subsequent discharge into piped surface water drainage network and downstream into the Corbally Stream.

During operation, the potential for a release is low as there is no bulk fuel/chemical storage and no silt laden run-off. Stormwater will be collected by the SuDS intercepting systems which includes interception measures to capture initial run-off. Furthermore, there are petrol interceptors located upstream of all discharge locations to the Corbally Stream. The potential for hydrocarbon discharge is minimal based on an individual vehicle (70l) leak being the only source for hydrocarbon release. However, even if the operation of the SuDS and interceptor systems are excluded from consideration, there is likely no impact above water quality objectives as outlined in S.I. Non 272 of 2009 and S.I. No.77 of 2019 in the worst case scenarios described above. The volume of contaminant release is low and combined with the significant attenuation within the Corbally

Stream, hydrocarbons will dilute to background levels with no likely impact above water quality objectives as outlined in S.I. Non 272 of 2009, S.I. Non 3865 of 2015 and S.I. Non 77 of 2019 at any Natura 2000 sites.

The wastewater is to be discharged to the Irish Water infrastructure and ultimately treated downstream at the Ringsend Wastewater Treatment Plant (WWTP) prior to discharge to Dublin Bay. It is noted that an application for a new upgrade to this facility is currently in planning. The plant operates under an EPA licence (D0034-01) and is currently in the process of being upgraded to a PE of 2.4 million. The most recent Annual Environmental Report (AER 2020) shows it is currently operating for a peak loading of 2.27million PE while originally designed for 1.64million PE. However, the current maximum hydraulic load (832,269m3/day) is less than the Peak hydraulic capacity as constructed (959,040m3/day), i.e., prior to any upgrade works. These upgrade works have commenced and are expected to be fully complete by 2025. The upgrade works to Ringsend WWTP will result in a higher quality of effluent discharge to Dublin Bay and will comply with the Urban wastewater Treatment Directive towards the end of 2023. A detailed EIAR was carried out as part of the application to upgrade the Ringsend WWTP which included hydrodynamic and chemical modelling of water quality/dispersion in Dublin Bay. The most recent water quality assessment of Dublin Bay WFD waterbody undertaken by the EPA (Water Quality in 2020: An Indicator Report 2021) also shows that Dublin Bay on the whole, currently has an "Unpolluted" water quality status (refer to AWN report and to www.catchments.ie for further detail).

Even without upgrade to the WWTP, the peak effluent discharge calculated (13.4l/s) for the proposed development (which equates to c.0.12% of the peak hydraulic capacity), would not impact on the overall water quality within Dublin Bay and therefore would not have an impact on the current Water Body Status (as defined in the Water Framework Directive).

It is concluded that the proposed development will have no impact on the water quality discharge at the Ringsend WWTP. Assessment was considered the effect of cumulative events such as release of sediment laden water combined with a hydrocarbon leak (1000l as worst case scenario during construction phase). As there is adequate assimilation and dilution between the site and the Natura 2000 18km downstream of Boherboy, it is concluded that there will be no perceptible impact on water quality would occur at the Natura 2000 site as a result of construction or operation arising from the proposed development or with that of other proposed developments or planned development pursuant to statutory plans in the Greater Dublin, Meath and Kildare areas discharging to Ringsend WWTP will not be significant having regard to the size of the calculated discharge from the proposed development (13.4l/s) which includes wastewater flows from domestic, commercial and the possible future school site.

In summary, recent water quality assessments show that Dublin Bay meets the criteria for "unpolluted" water quality status (EPA, data until July 2021).

The currently under construction upgrade works to the Ringsend WWTP will result in improved water quality by the end of 2023 to ensure compliance with Water Framework Directive requirements.

All new developments are required to comply with SuDS which ensures management of run-off rate within the catchment of Ringsend WWTP.

The natural characteristics of Dublin Bay result in enriched water rapidly mixing and degrading such that the plume has no appreciable effect on water quality at Natura sites.

The proposed development will have no additional surface water runoff during a storm event over and above the current greenfield run-off rate and will therefore have no impact on the current water quality in any

overflow situation at Ringsend WWTP.

In a worst case scenario of an unmitigated leak and not considering the operation of the designed SuDS elements and petrol interceptors upstream of all outfall points, there will be no perceptible risk to any Natura 2000 sites given the distance from source to Dublin Bay (c.18km). Potential contaminant loading will be attenuated, diluted and dispersed near the source area.

Implementation of the mitigation measures described in section 6.6.2 will prevent and minimise the potential impacts of the above risk sources.

- **"Do Nothing" Scenario**

There are no predicted impacts should the proposed development not proceed.

### 6.5.4 Potential Cumulative Impacts

In reference to the submitted Hydrological & Hydrogeological Qualitative Assessment prepared by AWN Consulting and based on the implementation of the suitable mitigation measures, such as using the appropriate SuDS designs and proper planning compliance, within the on this and other development sites (Fortunestown Centre, Cheeverstown, Saggart Cooldown Commons), it can be concluded that the in-combination effects of surface water arising from the proposed development taken together with that from other developments, will not be significant based on the low potential chemical and sediment loading.

Therefore, due to the low possible loading of any hazardous material during construction and operation there is subsequently no potential for impact on downstream Natura 2000 habitat in Dublin Bay located some 18km from the subject site.

## 6.6 Mitigation Measures

### 6.6.1 Construction Phase

An Outline Construction Management Plan has been prepared to include the following construction stage mitigation measures. These will be implemented in full.

The implementation of the following measures will minimise the impact on the Hydrology and Water Services in the area of the proposed development during the construction phase:

- Surface water runoff from topsoil stripped areas is to be directed towards on-site settlement ponds. Upstream of the piped surface water outfalls, temporary settlement ponds/filter trench are to be constructed consisting of a geotextile lined stone filled trench with a further inclusion of baled straw filter at the inlet – all to catch any site washed silt during the construction process and before the development is completed. This filter trench is to be inspected and maintained regularly by the contractor throughout the construction stage. Such measures are to be taken to capture, remove and treat sediment prior to discharge of the filtered runoff to the receiving watercourses.

- To minimise the adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the stripping back of the topsoil. For example, by avoiding excavation and movement of topsoil ahead of any known upcoming heavy rainfall event.

- The removal of the topsoil layer will be carried out in a carefully managed process and in coordination with the construction phasing management of the development.

- A flood storage compensatory area is to be constructed along the northern boundary of the site to provide an area for the Corbally Stream to overspill into during the 1%AEP rainfall event. This area is specified in detail the SSFRA and summarised in Section 6.4.2 of this chapter. In providing the flood storage compensatory area there will be a **2.48m** freeboard provided to the lowest finished floor level on the site which is significantly greater than the Guidelines recommended 0.5m. Fig.6.7 indicates the proposed flood storage compensatory area and illustrates the top water level of the 1%AEP event to be **118.02mOD.**

- The existing ground level along the western edge of the Corbally Stream in the north-eastern portion of the site will be raised to provide a minimum freeboard of 750mm above the calculated 1%AEP event. This will eliminate the risk of overland flow and keep the flow within the channel through this area. Fig.6.8 indicates the extent of the localised raising of the stream embankment.

- The SSFRA has calculated the top water level at all crossings of the Corbally Stream for the 1%AEP event and determined that the soffit levels of the proposed crossings are a more that 500mm above the 1%AEP top water level and therefore comfortably comply with the recommendations given in the Guidelines.

- Sand, gravel or other loose materials brought to the site shall be stored in locations a minimum of 10m from the Corbally Stream and are not to be positioned where rainfall run-off could wash silt towards the watercourse. Any cement is to be stored in bags under cover from the elements at a location remote from the watercourse.

- The site layout shall be such that it includes a dedicated set down area for deliveries to the site and temporary storage of construction materials. The area is to be clearly demarcated and managed to avoid haphazard placement of materials throughout the site .

- The set down location shall be managed to ensure it is well ordered and tidy in line with good site management practice.

Use construction best practices and the implementation of the Construction Management Plan is to take place to avoid the risk of contamination of the receiving watercourses or ground water. Pre-construction meetings to be held with all sub-contractors to explain works method statements and site management practices. Periodic, documented inspections of the site and subcontractor activities are to be carried out to improve overall site safety, efficiency and mitigate the risk of pollution of the stream or groundwater. Subcontractor method statements will be formally reviewed to ensure that comply with the requirements of the Construction Regulations 2006 and the Construction Management Plan. The site supervisor will conduct documented site inspections, using a Site Inspection Checklist on a weekly basis, or greater to ensure compliance. Potential spillages from storage tanks must not be allowed to seep into the ground and Spill kits are to be made available.

- An Outline Construction Management Plan (OCMP) has been developed and will be implemented during the construction phase.

- This will include Site personnel inductions to ensure all site personnel are made aware of the procedures and best practice with regards to the management of surface water runoff and ground water protection.

- Concrete batching will take place off site and wash out of concrete trucks will take place off site (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).

- Wheel wash down facilities will be provided in specifically designated areas and managed in accordance with the OCMP. Discharge from these areas will be directed into settlement/treatment areas and this will prevent uncontrolled runoff site.

- All fuel stored will be bunded within a secure hardstanding area with strict management control and access to same. Bunding is to be 100% + 10% of the volume stored.
- Fuel spill clean-up kits will be kept in the designated re-fuelling areas.

- Topsoil stockpiles will be located in such a manner as to minimise the risk of washing away into local drainage or watercourses.

- The contractor will have a full time Site Manager f responsible for the site management. The Manager will be fully aware of the relevance of the works in relation to the watercourse and will ensure all staff on site are made aware. A site noticeboard will be positioned in a suitably located prominent location on the site with the contact details of the person responsible for ensuring the pollution prevention methodology.

- The construction management of this project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and ground contamination.

- Dewatering of trenches should be used where deemed necessary and cannot be avoided and all run off from dewatering areas is to be directed to the designated settlement/treatment areas.

### 6.6.2 Operational Phase

The implementation of the following measures will minimise the impact on the Hydrology and Water Services in the area of the proposed development during the operational phase of the development;

- The surface water collected from the project has been designed in accordance with the CIRIA SuDS Manual and the Greater Dublin Strategic Drainage Study and the appropriate treatment train process has been applied in the design.

- Regular maintenance of all SuDS features by the development management team will be carried out until such a stage that the Local Authority take in charge the project.

- The road/house/apartment floor levels have been designed to provide a greater than minimum 500mm freeboard above the highest estimated flood levels. The top of water level for the Q100+10% event has been estimated in the SSFRA to be **118.02mOD** and the lowest floor slab level on the site is 120.50mOD which is **2.48m** above the highest flood event for that 1%AEP event.

- In accordance with best practice, appropriate SuDS features included in this development include filter drains, roadside filter swales, permeable paving in parking bays, green roofs, tree pits, bio-retention area, buildings, silt-trap/catchpit manholes, permeable geocellular attenuation storage, vortex flow control limiting devices and petrol interceptors.

- The surface water drainage infrastructure has been designed to allow for a 10% increase in rainfall due to climate change in accordance with the GDSDS.

- The surface water runoff from the site will be limited to the greenfield runoff rate (59.7l/s) and the attenuated flows are to be stored in below ground geocellular systems in accordance with the GDSDS. Further detailed information relating to the site development drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report".

- All communal designated waste storage areas will have gullies connected to the foul drainage network to facilitate wash down as required.

- Operational waste will be removed from the completed development using only licenced contractors to appropriately licensed facilities.

- The wastewater drainage infrastructure has been designed in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2020 and has been approved by Irish Water (refer to IW Statement of Design Acceptance letter Ref.CDS20004359 in Appendix 6A).

- The pumping station at the north of the site has been designed in accordance with the IW COP and includes real time remote monitoring, alarms and telemetry connected to the SDCC pumping station control centre using a "SCADA" system. The pumping station has also been designed to incorporate a duty and stand-by duty pump in case if failure of any single pump. Furthermore, the pumping station can accommodate 24hrs overflow storage below ground in the chamber designed. Refer to Dwg.No.1324B/321 for further detail. Watermain supply to the site is to be monitored by Irish Water using the required and designed flow meters as have been approved under the IW SDC design review. Refer to the submitted engineering drawing no.s 1324B/310-312 for location of same.

- Watermain supply to the site is to be monitored by Irish Water using the required and designed bulk flow meters as have been approved under the IW CDS design review. Refer to the submitted engineering drawing no.s 1324B/310-312 for location of same.

## 6.7 Residual Impact of the Proposed Development

This section describes the predicted impact of the proposed development following the implementation of the mitigation measures, as set out above.

### 6.7.1 Construction Phase

Implementation of the measures outlined in Section 6.6.1 will ensure that the potential impacts of the proposed development on water and the hydrogeological environment do not occur during the construction phase and that any residual impacts will be negligible.

### 6.7.2 Operational Phase

Surface water drainage design has been carried out in accordance with the GDSDS, and Suds methodologies implemented as part of a treatment train approach. The foul drainage and watermain infrastructure has been designed in accordance with Irish Water Code of Practice and has already been approved by Irish Water

under the CoF and Statement of Design confirmations issued (see Appendix 6A) As a result, the predicted residual impacts on the water and hydrogeological environment arising from the operational phase will be negligible.

### 6.7.3 "Do Nothing" Scenario

There are no predicted impacts should the proposed development not proceed.

## 6.8 Monitoring and Reinstatement

Implementation of the Site-Specific Construction & Environmental Management Plan will be carried out to protect the hydrology and water services throughout the development's construction stage. Maintenance of the mitigation measures and monitoring of the management processes is required to ensure best practice.

The following specific monitoring measures are to be implemented:

- Monitoring of the management and storage of dangerous chemicals and fuel is imperative;
- Monitoring and maintenance of the wheel wash facilities;
- Regular maintenance and monitoring of the sediment control measures upstream of the surface water outfall;
- Monitoring of SuDS features, road gullies, attenuation storage and flow control device is imperative both during the construction and operational phases of the development.

The following reinstatement measures are to be implemented:

- Landscaping disturbance of the existing Carrigmore Park due to the laying of the wastewater pipe outfall Park will be remediated in accordance with the requirements of the SDCC Public Realm (Parks) Department.

- The watermain connection into the existing 400mm diameter main in Boherboy Road will require the road crossing to be reinstated and will be done in accordance with the requirements of the SDCC Roads Department.

- All surface water outfalls to the existing Corbally Stream have been designed and agreed in principle with SDCC Water Services Department and are detailed on the submitted engineering drawing no.1324B/18. Localised reinstatement of the landscaping will be in accordance with the Ronan Mac Diarmada Landscape Architects details as agreed with the Public Realm (Parks) Department of SDCC.

## 6.9 Difficulties in Compiling Information

There were no particular difficulties encountered in compiling this section of the EIAR.

## 6.10 Conclusion

The above has detailed the assessments carried out, potential impacts and required mitigation measures to be implemented in relation to the hydrological, water and drainage elements of the proposed development. The primary hydrological feature of the development is the Corbally Stream and aspects relating to the water quality and flood risk have been discussed and concluded that by implementing the noted designs and mitigation measures during and post construction the proposed development will have no additional surface water runoff during a storm event over and above the current greenfield run-off rate and will therefore have no impact on the flood risk.

The SSFRA concluded that implementation of the mitigation measures will increase the available flood storage capacity, that the application was subject to and passed the Development Management Justification Test as required under the Guidelines, that the proposed development will not be at risk of flooding and will not increase flood risk elsewhere and that the development is therefore appropriate from a flood risk perspective.

It has been assessed and concluded that if any silt-laden stormwater during construction or hydrocarbon-contaminated water accidentally enters the watercourse, the suspended solids will naturally settle withing the stream and any hydrocarbon leak (1000 litres) would be diluted to background levels by the time the stormwater reaches the nearest Natura 2000 site (18km downstream).

In reference to the Ringsend WWTP and the AWN Hydrological & Hydrogeological Qualitative Assessment, implementation of the mitigation measures described in section 6.6 will prevent and minimise the potential impacts of the above risk sources. As such the is no potential for a change in the ground water body status or significant source pathway linkage through the aquifer to any Natura 2000 site.

The potential for impact on the aquifer is low based on the absence of any bulk storage of chemicals on the site. The overburden thickness, low permeability nature of the till sub-soil and lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect discharges to ground at the site. As such the is no potential for a change in the ground water body status or significant source pathway linkage through the aquifer to any Natura 2000 site.

**NOTE: Refer to Volume III of the EIAR for appendices associated with this chapter – i.e. Appendix 6**

## 6.11 References


- Land Surveys Topographical mapping.
- Geological datasets available at www.gsi.ie
- Environmental Protection Agency web portal available at https://gis.epa.ie/EPAMaps/
- Subsoil datasets available at http://gis.teagasc.ie/soils/map.php
- Ground Investigations Ireland Ltd site soakaway report
- SDCC County Development Plan 2016-2022
- Hydrological & Hydrogeological Qualitative Assessment prepared by AWN Consulting
- Site Specific Flood Risk Assessment prepared by Kilgallen and Partners Consulting Engineers
- Office of Public Works (OPW) National Flood Hazard Mapping
- OPW Catchment Flood Risk and Management Studies (CFRAM)
- SDCC/Irish water Drainage & Water Records Maps

- SDCC County Development Plan 2016-2022
- Discussions with SDCC Drainage Department
- Discussions with Irish Water
- Ordnance Survey mapping
- Site Investigation reports and Soakaway Testing
- Site walkover visits

# 7.0. Air Quality and Climate

## 7.1 Introduction

This chapter assesses the likely air quality and climate impacts associated with the proposed development at a site at Boherboy, Saggart, Co. Dublin. A full description of the development is available in Chapter 2.

This chapter was completed by Ciara Nolan, an environmental consultant in the air quality section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. in Energy Systems Engineering. She is an Associate Member of both the Institute of Air Quality Management (AMIAQM) and the Institution of Environmental Science (AMIEnvSc). She has been active in the field of air quality for 5 years,with a primary focus on consultancy. She has prepared the air quality & climate EIAR chapters for numerous developments including residential, industrial, data centre and commercial developments.

## 7.2 METHODOLOGY

### 7.2.1 Criteria for Rating of Impacts

#### 7.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 7.1 and Appendix 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 Air Quality Standards Regulations 2011, which incorporate European Commission Directive 2008/50/EC which has set limit values for a number of pollutants with the limit values for $NO_2$, $PM_{10}$ and $PM_{2.5}$ being relevant to this assessment (see Table 7.1). Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC).

| Pollutant | Regulation Note 1 | Limit Type | Value |
|---|---|---|---|
| Dust Deposition | TA Luft (German VDI 2002) | Annual average limit for nuisance dust | 350 mg/(m$^2$*day) |
| Nitrogen Dioxide | 2008/50/EC | Hourly limit for protection of human health - not to be exceeded more than 18 times/year | 200 µg/m$^3$ |
| | | Annual limit for protection of human health | 40 µg/m$^3$ |
| Particulate Matter (as $PM_{10}$) | 2008/50/EC | 24-hour limit for protection of human health - not to be exceeded more than 35 times/year | 50 µg/m$^3$ $PM_{10}$ |
| | | Annual limit for protection of human health | 40 µg/m$^3$ $PM_{10}$ |
| Particulate Matter (as $PM_{2.5}$) | 2008/50/EC | Annual limit for protection of human health | 25 µg/m$^3$ $PM_{2.5}$ |

**Table 7.1 - Ambient Air Quality Standards**

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

#### 7.2.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust which are less than 10 microns and the EU ambient air quality standards outlined in section 7.2.1.1 have set ambient air quality limit values for $PM_{10}$ and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m$^2$*day) averaged over a one year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006). The document recommends that the Bergerhoff limit of 350 mg/(m$^2$*day) be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development. Dust impacts from the construction phase are likely to be equivalent or lesser than those emitted from a quarry development and therefore the potential for nuisance dust soiling impacts and the Bergerhoff standard are applicable in this case.

### 7.2.1.3 Climate Agreements

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement on elevating adaption onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013* (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

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

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019a). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a). The plan contains similar elements as the 2019 CAP and aims to set out how Ireland can reduce our greenhouse gas emissions by 51% by 2030 (compared to 2018 levels) which is in line with the EU ambitions, and a longer-term goal of to achieving net-zero emissions no later than 2050. The 2021 CAP outlines that emissions from the Built Environment sector must be reduced to 4 -5 $MtCO_2e$ by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland 2019b) followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (hereafter referred to as the 2021 Climate Act) in July 2021 (Government of Ireland, 2021b). The 2021 Climate Act was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act is to provide for the approval of plans '*for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'*. The 2021 Climate Act will also '*provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'*. The 2021 Climate Act defines the carbon budget as '*the total amount of greenhouse gas emissions that are permitted during the budget period*'. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a '*local authority climate action plan'* lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

The South Dublin County Council Climate Change Action Plan published in 2019 (South Dublin County Council and Codema, 2019) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management. Some of the measures promoted within the Action Plan under the 5 key areas involve building retrofits, energy master-planning, development of segregated cycle routes, the promotion of bike share schemes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the South Dublin County Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognizant of the Action Plan and incorporate climate friendly designs and measures where possible.

### 7.2.2 Construction Phase

#### 7.2.2.1 Air Quality

The current assessment focuses on identifying the existing baseline levels of $PM_{10}$ and $PM_{2.5}$ in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the proposed development.

Construction phase traffic also has the potential to impact air quality and climate. The use of UK guidance is recommended by the TII (2011) in the absence of specific Irish guidance. The UK Highways Agency Design Manual for Roads and Bridges (DMRB) guidance (UK Highways Agency, 2019a), states that road links meeting one or more of the criteria set out below can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. This approach is considered best practice and can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;

- A change in speed band;
- A change in carriageway alignment by 5m or greater

The construction stage traffic does not meet the above criteria. Therefore, a detailed air quality modelling assessment has been scoped out as there is no potential for significant impacts to air quality during construction as a result of traffic emissions.

#### 7.2.2.2 Climate

The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the proposed development.

### 7.2.3 Operational Phase

#### 7.2.3.1 Air Quality

Operational phase traffic has the potential to impact air quality. The air quality assessment has been carried out following procedures described in the publications by the EPA (2015; 2017) and using the methodology outlined in the guidance documents published by the UK Highways Agency (2019a) and UK Department of Environment Food and Rural Affairs (DEFRA) (2016; 2018). TII reference the use of the UK Highways Agency and DEFRA guidance and methodology in their document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011). This approach is considered best practice in the absence of Irish guidance and can be applied to any development that causes a change in traffic.

In 2019 the UK Highways Agency DMRB air quality guidance was revised with *LA 105 Air Quality* replacing a number of key pieces of guidance (HA 207/07, IAN 170/12, IAN 174/13, IAN 175/13, part of IAN 185/15). This revised document outlines a number of changes for air quality assessments in relation to road schemes but can be applied to any development that causes a change in traffic. Previously the DMRB air quality spreadsheet was used for the majority of assessments in Ireland with detailed modelling only required if this screening tool indicated compliance issues with the EU air quality standards. Guidance from TII (TII, 2011) recommends the use of the UK Highways Agency DMRB spreadsheet tool for assessing the air quality impacts from road schemes. However, the DMRB spreadsheet tool was last revised in 2007 and accounts for modelled years up to 2025. Vehicle emission standards up to Euro V are included but since 2017, Euro 6d standards are applicable for the new fleet. In addition, the model does not account for electric or hybrid vehicle use. Therefore, this is a somewhat outdated assessment tool. The LA 105 guidance document states that the DMRB spreadsheet tool may still be used for simple air quality assessments where there is unlikely to be a breach of the air quality standards. Due to its use of a "dirtier" fleet, vehicle emissions would be considered to be higher than more modern models and therefore any results will be conservative in nature and will provide a worst-case assessment.

The 2019 UK Highways Agency DMRB air quality revised guidance *LA 105 Air Quality* states that modelling should be conducted for $NO_2$ for the base, opening and design years for both the do minimum (do nothing) and do something scenarios. Modelling of $PM_{10}$ is only required for the base year to demonstrate that the air quality limit values in relation to $PM_{10}$ are not breached. Where the air quality modelling indicates exceedances of the $PM_{10}$ air quality limits in the base year then $PM_{10}$ should be

included in the air quality model in the do minimum and do something scenarios. Modelling of $PM_{2.5}$ is not required as there are currently no issues with compliance with regard to this pollutant. The modelling of $PM_{10}$ can be used to show that the project does not impact on the $PM_{2.5}$ limit value as if compliance with the $PM_{10}$ limit is achieved then compliance with the $PM_{2.5}$ limit will also be achieved. Historically modelling of carbon monoxide (CO) and benzene was required however, this is no longer needed as concentrations of these pollutants have been monitored to be significantly below their air quality limit values in recent years, even in urban centres (EPA, 2021). The key pollutant reviewed in this assessment is $NO_2$. Concentrations of $PM_{10}$ have been modelled for the base year to indicate that there are no potential compliance issues. Modelling of operational $NO_2$ concentrations has been conducted for the do nothing and do something scenarios for the opening year (2027) and design year (2042).

The TII guidance (2011) states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills etc).

The UK Highways Agency guidance *LA 150* (2019) scoping criteria outlined in Section 7.2.2.1 was used to determine the road links required for inclusion in the modelling assessment. Sensitive receptors within 200m of impacted road links are included within the modelling assessment. Pollutant concentrations are calculated at these sensitive receptor locations to determine the impact of the proposed development in terms of air quality. The guidance states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling (UK Highways Agency, 2019a). The TII guidance (2011) defines sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of the public are likely to be regularly present. A total of 2 no. high sensitivity receptors (R1 and R2) were included in the modelling assessment and are detailed in Figure 7.1.

The following model inputs are required to complete the assessment using the DMRB spreadsheet tool: road layouts, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles (%HGV), annual average traffic speeds and background concentrations. Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptors using generic meteorological data. The DMRB model uses conservative emission factors, the formulae for which are outlined in the DMRB Volume 11 Section 3 Part 1 – HA 207/07 Annexes B3 and B4. These worst-case road contributions are then added to the existing background concentrations to give the worst-case predicted ambient concentrations. The worst-case ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. The TII significance criteria have been adopted for the proposed development and are detailed in Appendix 8.2 Table A8.2.1 and Table A8.2.2. The significance criteria are based on $NO_2$ and $PM_{10}$ as these pollutants are most likely to exceed the annual mean limit values (40 µg/m$^3$).

Conversion of NOx to $NO_2$

$NO_X$ (NO + $NO_2$) is emitted by vehicles exhausts. The majority of emissions are in the form of NO, however, with greater diesel vehicles and some regenerative particle traps on HGV's the proportion of $NO_X$ emitted as $NO_2$, rather than NO is increasing. With the correct conditions (presence of sunlight and $O_3$) emissions in the form of NO, have the potential to be converted to $NO_2$.

Transport Infrastructure Ireland states the recommended method for the conversion of NOx to $NO_2$ in "*Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes*" (2011). The TII guidelines recommend the use of DEFRAs NOx to $NO_2$ calculator (2020) which was originally published in 2009 and is currently on version 8.1. This calculator (which can be downloaded in the form of an excel spreadsheet) accounts for the predicted availability of $O_3$ and proportion of NOx emitted as NO for each local authority across the UK. $O_3$ is a regional pollutant and therefore concentrations do not vary in the same way as concentrations of $NO_2$ or $PM_{10}$.

The calculator includes Local Authorities in Northern Ireland and the TII guidance recommends the use of 'Armagh, Banbridge and Craigavon' as the choice for local authority when using the calculator. The choice of Craigavon provides the most suitable relationship between $NO_2$ and NOx for Ireland. The "All Other UK Traffic" traffic mix option was used.

Update to $NO_2$ Projections using DMRB

In 2011 the UK DEFRA published research (Highways England, 2013) on the long term trends in $NO_2$ and $NO_X$ for roadside monitoring sites in the UK. This study marked a decrease in $NO_2$ concentrations between 1996 and 2002, after which the concentrations stabilised with little reduction between 2004 and 2010. The result of this is that there now exists a gap between projected $NO_2$ concentrations which UK DEFRA previously published and monitored concentrations. The impact of this 'gap' is that the DMRB screening model can under-predict $NO_2$ concentrations for predicted future years. Subsequently, the UK Highways Agency published an Interim advice note (IAN 170/12) in order to correct the DMRB results for future years. This methodology has been used in the current assessment to predict future concentrations of $NO_2$ as a result of the proposed development.

Traffic Data Used in Modelling Assessment

Traffic flow information was obtained from Pinnacle Consulting Engineers on 07/01/2022 for the purposes of the operational phase assessment. Data for the Do Nothing and Do Something scenarios for the base year 2020, opening year 2027 and design year 2042 were provided. The traffic data is detailed in Table 7.2 with the %HGV shown in parenthesis beside the AADT. Only road links that met the DMRB scoping criteria outlined in Section 7.2.2.1 and that were within 200m of receptors were included in the modelling assessment. Background concentrations have been included as per Section 8.3.2 of this chapter based on available EPA background monitoring data (EPA, 2021a). This traffic data has also been used in the operational stage climate impact assessment.

### 7.2.3.2 Climate

Ireland has annual GHG targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under *Regulation (EU) 2018/842 on binding annual greenhouse gas*

*emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*. Which has set a target of a 30% reduction in non-ETS sector emissions by 2030 relative to 2005 levels.

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established by reference to EPA data on annual GHG emissions (see Section 7.3.3). Thereafter the impact of the proposed development on climate is determined. Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide ($CO_2$) which will impact climate.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There are a small number of road links that will experience a change in AADT of over 10% and therefore a detailed climate assessment is required. The impact of the proposed development at a national / international level has been determined using the procedures given by Transport Infrastructure Ireland (2011) and the methodology provided in Annex D in the UK Design Manual for Roads and Bridges (UK Highways Agency, 2007). The assessment focused on determining the resulting change in emissions of carbon dioxide ($CO_2$). The Annex provides a method for the prediction of the regional impact of emissions of these pollutants from road schemes and can be applied to any development that causes a change in traffic. The inputs to the dispersion model consist of information on road link lengths, AADT movements and annual average traffic speeds (see Table 7.2).

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. The Energy Statement in relation to the proposed development has been reviewed and used to inform the operational phase climate assessment. This report outlines a number of measures in relation to energy usage from the proposed development primarily in relation to heat and electricity. A number of measures have been incorporated into the overall design of the development to reduce the impact to climate where possible.

| Road Name | Speed (kph) | Base Year 2020 | Opening Year 2027 | | Design Year 2042 | |
|---|---|---|---|---|---|---|
| | | | Do Nothing | Do Something | Do Nothing | Do Something |
| Link B - Carrigmore | 30 | 3,501 (1.5%) | 5,481 (1.3%) | 6,639 (1.2%) | 4,130 (1.5%) | 5,288 (1.3%) |
| Link C - Boherboy Road W | 60 | 14,883 (6.2%) | 16,279 (6.2%) | 17,413 (5.9%) | 17,556 (6.2%) | 18,071 (6.1%) |

**Table 7.2- Traffic Data used in Air and Climate Modelling Assessments**


**Fig. 7.1 - Location of Sensitive Receptors used in Air Quality Assessment**

## 7.3 RECEIVING ENVIRONMENT

### 7.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to $PM_{10}$, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - $PM_{10}$) will actually increase at higher wind speeds. Thus, measured levels of $PM_{10}$ will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Casement Aerodrome meteorological station, which is located approximately 2 km north of the site. Casement Aerodrome met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 7.2). For data collated during five representative years (2016 - 2020), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.5 m/s over the

period 1981 - 2010 (Met Eireann, 2022).

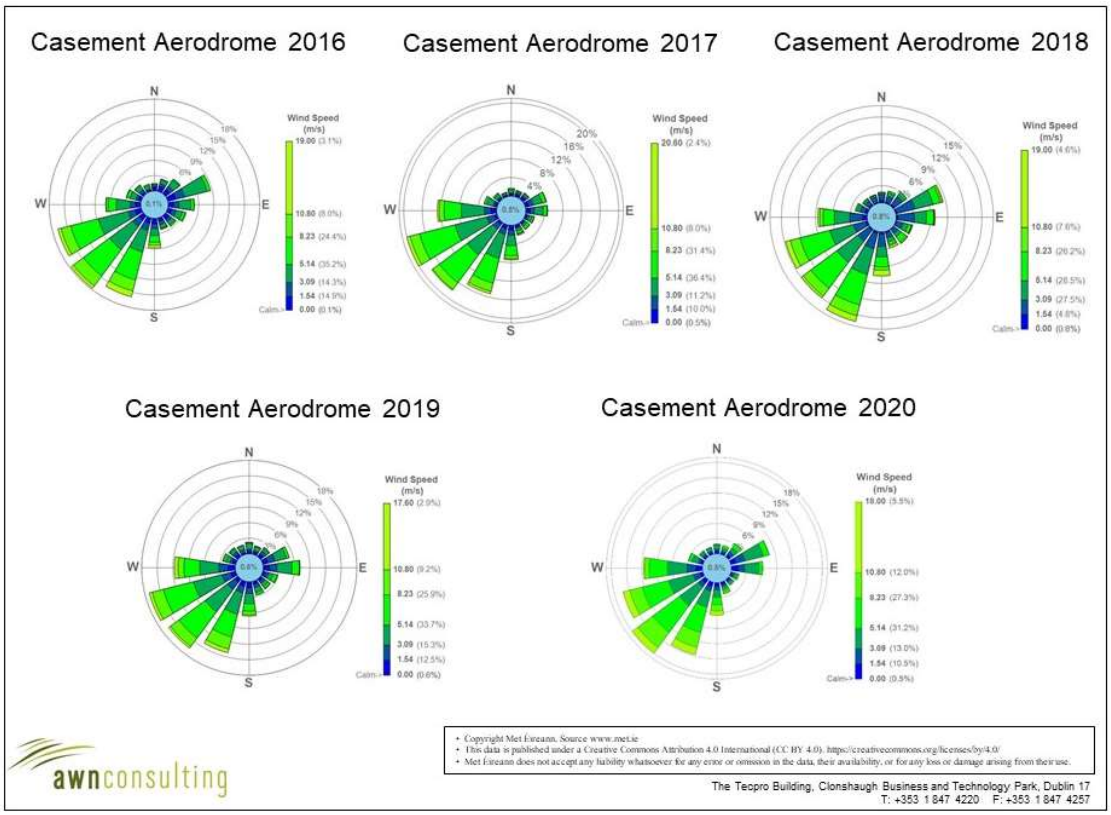



**Fig. 7.2 - Casement Aerodrome Windrose 2016 – 2020 (Met Eireann, 2022)**

### 7.3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent EPA published annual report on air quality "Air Quality In Ireland 2020" (EPA 2021, 2021a) details the range and scope of monitoring undertaken throughout Ireland.

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes as outlined within the EPA document titled 'Air Quality In Ireland 2019' (EPA 2020). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D. In terms of air monitoring, the area of the proposed development is categorised as Zone A.

In 2020 the EPA reported (EPA, 2021a) that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA *Air Quality in Ireland 2020* report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore

predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the baseline section and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

### $NO_2$

Long-term $NO_2$ monitoring was carried out at the Zone A suburban locations of Rathmines, Ballyfermot, Dun Laoghaire and Swords for the period 2015 - 2019 (EPA, 2021). Long term average concentrations are significantly below the annual average limit of 40 µg/m$^3$ for the suburban locations. Average results range from 13 – 22 µg/m$^3$. The $NO_2$ annual average for this five year period suggests an upper average limit of no more than 22 µg/m$^3$ (Table 7.3) as a background concentration for the suburban locations. Based on the above information and keeping regard for the site's location further from the city centre, a conservative estimate of the current background $NO_2$ concentration for the region of the proposed development is 18 µg/m$^3$.

| Station | Station Classification | Averaging Period [Note 1] | Year | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2015 | 2016 | 2017 | 2018 | 2019 |
| Rathmines | Suburban Background | Annual Mean $NO_2$ (µg/m$^3$) | 18 | 20 | 17 | 20 | 22 |
| | | 99.8$^{th}$%ile 1-hr $NO_2$ (µg/m$^3$) | 105 | 88 | 86 | 87 | 102 |
| Ballyfermot | Suburban Background | Annual Mean $NO_2$ (µg/m$^3$) | 16 | 17 | 17 | 17 | 20 |
| | | 99.8$^{th}$%ile 1-hr $NO_2$ (µg/m$^3$) | 127 | 90 | 112 | 101 | 101 |
| Dun Laoghaire | Suburban Background | Annual Mean $NO_2$ (µg/m$^3$) | 16 | 19 | 17 | 19 | 15 |
| | | 99.8$^{th}$%ile 1-hr $NO_2$ (µg/m$^3$) | 91 | 105 | 101 | 91 | 91 |
| Swords | Suburban Background | Annual Mean $NO_2$ (µg/m$^3$) | 13 | 16 | 14 | 16 | 15 |
| | | 99.8$^{th}$%ile 1-hr $NO_2$ (µg/m$^3$) | 93 | 96 | 79 | 85 | 80 |

[Note 1] Annual average limit value of 40 µg/m$^3$ and hourly limit value of 200 µg/m$^3$ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

**Table 7.3 - Background $NO_2$ Concentrations In Zone A Locations (µg/m$^3$)**

### $PM_{10}$

Continuous $PM_{10}$ monitoring was carried out at the Zone A locations of Rathmines, Dun Laoghaire, Ballyfermot and Phoenix Park from 2015 - 2019. These showed an upper average limit of no more than 15 µg/m$^3$ (Table 7.4). Levels range from 9 – 16 µg/m$^3$ over the five year period with at most 9 exceedances of the 24-hour limit value of 50 µg/m$^3$ in Rathmines in 2019 (35 exceedances are permitted per year) (EPA, 2021). Sufficient data is available for the urban background location in the Phoenix Park to observe long-term trends in the data. Data from 2015 – 2019 suggests an upper average annual mean value of at most 12 µg/m$^3$ as a background concentration at the Phoenix Park location. Based on the EPA data, a conservative estimate of the current background $PM_{10}$ concentration in the region of the proposed development is 14 µg/m$^3$.

| Station | Station Classification | Averaging Period | Year | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2015 | 2016 | 2017 | 2018 | 2019 |
| Ballyfermot | Suburban Background | Annual Mean $PM_{10}$ (µg/m$^3$) | 12 | 11 | 12 | 16 | 14 |
| | | 24-hr Mean > 50 µg/m$^3$ (days) | 3 | 0 | 1 | 0 | 7 |
| Dún Laoghaire | Suburban Background | Annual Mean $PM_{10}$ (µg/m$^3$) | 13 | 13 | 12 | 13 | 12 |
| | | 24-hr Mean > 50 µg/m$^3$ (days) | 3 | 0 | 2 | 0 | 2 |
| Rathmines | Suburban Background | Annual Mean $PM_{10}$ (µg/m$^3$) | 15 | 15 | 13 | 15 | 15 |
| | | 24-hr Mean > 50 µg/m$^3$ (days) | 5 | 3 | 5 | 2 | 9 |
| Phoenix Park | Urban Background | Annual Mean $PM_{10}$ (µg/m$^3$) | 12 | 11 | 9 | 11 | 11 |
| | | 24-hr Mean > 50 µg/m$^3$ (days) | 2 | 0 | 1 | 0 | 2 |

Note 1 Annual average limit value of 40 µg/m$^3$ and 24-hour limit value of 50 µg/m$^3$ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

**Table 7.4 - Background $PM_{10}$ Concentrations In Zone A Locations (µg/m$^3$)**

**$PM_{2.5}$**

Monitoring of both $PM_{10}$ and $PM_{2.5}$ takes place at the station in Rathmines which allows for the $PM_{2.5}/PM_{10}$ ratio to be calculated. Average $PM_{2.5}$ levels in Rathmines over the period 2015 - 2019 ranged from 9 - 10 µg/m$^3$, with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.60 – 0.68 (EPA, 2021a). Based on this information, a conservative ratio of 0.7 was used to generate an existing $PM_{2.5}$ concentration in the region of the development of 9.8 µg/m$^3$.

Background concentrations for Opening Year 2027 and Design Year 2042 have been calculated. These have used current estimated background concentrations and the year on year reduction factors provided by Transport Infrastructure Ireland in the *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011) and the UK Department for Environment, Food and Rural Affairs LAQM.TG(16) (2018).

### 7.3.4 Climate Baseline

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details provisional emissions up to 2020 (EPA, 2021b). The data published in 2021 states that Ireland will exceed its 2020 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.73 Mt. For 2021, total national greenhouse gas emissions are estimated to be 57.70 million tonnes carbon dioxide equivalent (Mt $CO_2$eq) with 44.38 Mt$CO_2$eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2021 at 37.1% of the total, with the transport sector accounting for 17.9% of emissions of $CO_2$.

GHG emissions for 2020 are estimated to be 3.6% lower than those recorded in 2019. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for five years in a row. Emissions from 2016 – 2020 exceeded the annual EU targets

by 0.29 $MtCO_2eq$, 2.94 $MtCO_2eq$, 5.57 $MtCO_2eq$,6.85 $MtCO_2eq$ and 6.73 $MtCO_2eq$ respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2020 GHG Emissions Projections Report for 2020 – 2040 (EPA, 2021c) notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan (NDP) which was published in 2018 and the Climate Action Plan published in 2019. Implementation of these are classed as a "*With Additional Measures scenario*" for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2013 to 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 12.2$MtCO_2eq$ under the "With Existing Measures" scenario and under the "With Additional Measures" scenario. The projections indicate that Ireland can meet its non-ETS EU targets over the period 2021 – 2030 assuming full implementation of the 2019 Climate Action Plan and the use of the flexibilities available (EPA, 2021c).

## 7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is located at a site in Boherboy, Saggart, Co. Dublin. A full description of the development is available in Chapter 2.

Impacts to air quality and climate can occur during both the construction and operational stages of the development. During the construction stage the main source of air quality impacts will be as a result of fugitive dust emissions from site activities. Emissions from construction vehicles and machinery have the potential to impact climate. The primary sources of air and climatic emissions in the operational context are deemed long term and will involve the change in traffic flows or congestion in the local areas which are associated with the development. The following describes the primary sources of potential air quality and climate impacts which have been assessed as part of this EIAR.

## 7.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

### 7.5.1 Construction Phase

#### 7.5.1.1 Air Quality

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Casement Aerodrome meteorological data (see Section 7.3.1) indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30 year average data for Casement Aerodrome indicates that on average 183 days per year have rainfall over 0.2 mm (Met Eireann, 2021) and therefore it can be determined that approximately 50% of the time dust generation will be reduced.

The proposed development can be considered large in scale and therefore there is the potential for significant dust soiling 100 m from the source (TII, 2011) (Table 7.5). There are a number of high sensitivity residential receptors in high density housing estates to the direct north and east of the site. There are also residential properties to the direct east and south of the site boundary. In the absence of mitigation there is the potential for significant, negative, short-term impacts to nearby sensitive receptors as a result of dust emissions from the proposed development.

| **Source** | | **Potential Distance for Significant Effects (Distance from source)** | | |
|---|---|---|---|---|
| **Scale** | **Description** | **Soiling** | **$PM_{10}$** | **Vegetation Effects** |
| Major | Large construction sites with high use of haul routes | 100m | 25m | 25m |
| Moderate | Moderate sized construction sites with moderate use of haul routes | 50m | 15m | 15m |
| Minor | Minor construction sites with limited use of haul routes | 25m | 10m | 10m |

Source: Appendix 8: Assessment of Construction Impacts taken from "Guidelines for the treatment of Air Quality During the Planning & Construction of National Road Schemes" (TII, 2011)

**Table 7.5 - Assessment Criteria for the Impact of Dust Emissions from Construction Activities with Standard Mitigation in Place**

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the DMRB assessment criteria in Section 7.2.2.1. It can therefore be determined that the construction stage traffic will have an imperceptible, neutral and short-term impact on air quality.

#### 7.5.1.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to $CO_2$ and $N_2O$ emissions. The Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the impact on climate is considered to be neutral, imperceptible and short term.

#### 7.5.1.3 Human Health

Dust emissions from the demolition and construction phase of the proposed development have the potential to impact human health through the release of $PM_{10}$ and $PM_{2.5}$ emissions. As per Table 7.5 potential $PM_{10}$ emissions can occur within 25 m of the site for a development of this scale. There are a number of high sensitivity residential receptors in high density housing estates to the direct north and east of the site. There are also residential properties directly to the east and south of the site boundary. A number of these properties are within 25m of the site boundary. Therefore, in the absence of mitigation there is the potential for slight, negative, short-term impacts to human health as a result of the proposed development.

### 7.5.2 Operational Phase

#### 7.5.2.1 Air Quality

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The impact of $NO_2$ emissions for the opening and design years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

TII's document *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes* (2011) detail a methodology for determining air quality impact significance criteria for road schemes and this can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

The results of the assessment of the impact of the proposed development on $NO_2$ in the opening year 2027 are shown in Table 8.6 and for design year 2042 are shown in Table 7.7. The annual average concentration is in compliance with the limit value at all worst-case receptors in 2027 and 2042. Concentrations of $NO_2$ are at most 56% of the annual limit value in 2027 and at most 55% in 2042. The decrease in concentrations between the opening and design years is due to decreasing background concentrations. In addition, the hourly limit value for $NO_2$ is 200 µg/$m^3$ and is expressed as a 99.8$^{th}$

percentile (i.e. it must not be exceeded more than 18 times per year). The maximum 1-hour $NO_2$ concentration is not predicted to be exceeded in any modelled year (Table 7.8).

The impact of the proposed development on annual mean $NO_2$ concentrations can be assessed relative to "Do Nothing (DN)" levels. Relative to baseline levels, there are predicted to be some imperceptible increases in $NO_2$ concentrations at receptors R1 and R2. Concentrations will increase by at most 0.8% of the annual limit value in 2027 and by 1.0% in 2042 at worst-case receptor R1. Receptor R2 will experience a 0.1% increase in concentrations in 2027 and a 0% increase in 2042. Using the assessment criteria outlined in Appendix 7.2, Table A7.2.1 and Table A7.2.2 the impact of the proposed development in terms of $NO_2$ is considered negligible. Therefore, the overall impact of $NO_2$ concentrations as a result of the proposed development is long-term, negative and imperceptible.

Concentrations of $PM_{10}$ were modelled for the baseline year of 2020. The modelling showed that concentrations were in compliance with the annual limit value of 40 µg/m$^3$ at all receptors assessed, therefore, further modelling for the opening and design years was not required. Concentrations reached at most 0.77 µg/m$^3$. When a background concentration of 14 µg/m$^3$ is included the overall impact is 33% of the annual limit value at the worst case receptor.

The potential impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, negative and imperceptible and therefore, no mitigation is required.

| Receptor | Opening Year 2027 | | | | |
|---|---|---|---|---|---|
| | DN | DS | DS-DN | Magnitude | Description |
| R1 | 19.5 | 19.8 | 0.33 | Imperceptible Increase | Negligible |
| R2 | 22.5 | 22.5 | 0.02 | Imperceptible Increase | Negligible |

**Table 7.6 - Predicted Annual Mean $NO_2$ Concentrations – Opening Year 2025 (µg/m$^3$)**

| Receptor | Design Year 2042 | | | | |
|---|---|---|---|---|---|
| | DN | DS | DS-DN | Magnitude | Description |
| R1 | 18.7 | 19.1 | 0.39 | Imperceptible Increase | Negligible |
| R2 | 22.2 | 22.2 | 0.00 | Imperceptible Increase | Negligible |

**Table 7.7 - Predicted Annual Mean $NO_2$ Concentrations – Design Year 2040 (µg/m$^3$)**

| Receptor | Opening Year 2027 | | Design Year 2042 | |
|---|---|---|---|---|
| | DN | DS | DN | DS |
| R1 | 68.1 | 69.3 | 65.4 | 66.7 |
| R2 | 78.7 | 78.8 | 77.6 | 77.6 |

**Table 7.8 - Predicted 99.8$^{th}$ percentile of Daily Maximum 1-hour $NO_2$ Concentrations (µg/m$^3$)**

### 7.5.2.2 Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years (see Flood Risk Assessment). However, adequate attenuation and drainage have been provided for to account for increased rainfall in future years as part of the design of this development. In addition the finished floor levels of the buildings have been raised to the required level to prevent potential flooding issues (see Chapter 6). Therefore, the impact will be long-term, localised, neutral and imperceptible.

There is also the potential for increased traffic volumes to impact climate. The predicted concentrations of $CO_2$ for the future years of 2027 and 2042 are detailed in Table 7.9. These are significantly less than the 2027 and 2030 targets set out under EU legislation. Targets past 2030 are not available, therefore, the 2042 impact is assessed against the 2030 target. It is predicted that in 2027 the proposed development will increase $CO_2$ emissions by 0.0001% of the EU 202 target. Similarly low increases in $CO_2$ emissions are predicted to occur in 20402 with emissions increasing by 0.00006% of the EU 2030 target. Therefore, the potential climate impact of the proposed development is considered negative, long-term and imperceptible.

The proposed development has been designed to reduce the impact to climate where possible. A number of measures have been incorporated into the design of the development to ensure the operational phase emissions are minimised. These are outlined fully within the Energy Statement prepared by BBSC and are summarised briefly below.

The proposed development will meet or exceed, where feasible, the requirements of the Part L building regulations. These regulations stipulate the requirements on minimum renewable contribution, minimum fabric and air permeability requirements, maximum energy use and carbon dioxide emissions. All buildings will be Nearly Zero Energy Building (NZEB) compliant. The proposed development will aim to achieve a Building Energy Rating (BER) of A2 at a minimum for the residential units. Solar PV panels will be incorporated into the scheme to fulfil the renewable energy requirement. In addition, the apartment units will include heat pumps for heating or cooling. Lighting will primarily be in the form of energy efficient LED lighting. Parking for electric vehicles (EVs) will be incorporated into the development along with the infrastructure for future charging areas. Overall, these measures will help in reducing the operational phase impact to climate as a result of the proposed development.

| **Year** | **Scenario** | **$CO_2$** |
|---|---|---|
| | | **(tonnes/annum)** |
| 2027 | Do Nothing | 507 |
| | Do Something | 543 |
| 2042 | Do Nothing | 523 |
| | Do Something | 543 |
| Increment in 2027 | | 36.6 Tonnes |
| Increment in 2042 | | 20.9 Tonnes |
| Emission Ceiling (kilo Tonnes) 2027 | | 36,747 Note 1 |
| Emission Ceiling (kilo Tonnes) 2030 | | 33,381 Note 1 |
| Impact in 2027 (%) | | 0.0001 % |
| Impact in 2042 (%) | | 0.00006 % |

Note 1 Target under Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council.

**Table 7.9 - Climate Impact Assessment**

Traffic related air emissions have the potential to impact human health if they do not comply with the ambient Air Quality Standards detailed in Table 7.1. However, air dispersion modelling of traffic emissions has shown that levels of all pollutants are below the ambient air quality standards set for the protection of human health (see Table 7.1). It can be determined that the impact to human health during the operational stage is long-term, negative and imperceptible and therefore, no mitigation is required.

### 7.5.3 Do Nothing Scenario

Under the Do Nothing Scenario no construction works will take place and the previously identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. Impacts from increased traffic volumes and associated air emissions will also not occur. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from new developments in the surrounding area, changes in road traffic, etc.). Therefore, this scenario can be considered neutral in terms of both air quality and climate.

## 7.6 REMEDIAL AND MITIGATION MEASURES

### 7.6.1 Construction Phase

A detailed dust minimisation plan associated with a high level of dust control is outlined in Appendix 7.3. This plan draws on best practice mitigation measures from Ireland, the UK and the USA in order to ensure the highest level of mitigation possible.

In summary the measures which will be implemented will include: -

- 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.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads and footpaths outside the site will be regularly inspected for cleanliness and cleaned as necessary. If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used.
- 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.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

- Hoarding or screens shall be erected around works areas to reduce visual impact. This will also have an added benefit of preventing larger particles of dust from travelling off-site and impacting receptors.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

### 7.6.2 Operational Phase

No mitigation is proposed for the operation phase of the proposed development as it is predicted to have an imperceptible impact on air quality and climate.

## 7.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

### 7.7.1 Construction Phase

#### 7.7.1.1 Air Quality

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a dust minimisation plan which will be incorporated into the outline construction management plan (OCMP) for the site. Provided the dust minimisation measures outlined in the plan (see Appendix 7.3 and Section 7.6.1) are adhered to, the air quality impacts during the construction phase will be short-term, negative, localised and imperceptible.

#### 7.7.1.2 Climate

According to the IAQM guidance (2014) site traffic and plant are unlikely to make a significant impact on climate during the construction phase. Therefore, the potential impact on climate is considered to be imperceptible and short-term.

#### 7.7.1.3 Human Health

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.

### 7.7.2 Operational Phase

#### 7.7.2.1 Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the UK DMRB model. The modelling assessment determined that the change in emissions of $NO_2$ at nearby sensitive receptors as a result of the proposed development will be imperceptible. Therefore, the operational phase impact to air quality is long-term, localised, negative and imperceptible.

#### 7.7.2.2 Climate

Modelling of operational phase $CO_2$ emissions as a result of the traffic associated with the proposed development was carried out to determine the impact to climate. It was found that emissions of $CO_2$ will increase by an imperceptible amount as a result of the proposed development and are significantly below the EU 2025 and 2030 GHG targets. The operational phase impact to climate is long-term, negative and imperceptible.

In addition, the proposed development has been designed to reduce the impact to climate where possible through incorporated design measures. Full details of all measures included are outlined within the Energy Statement submitted as part of this planning application.

#### 7.7.2.3 Human Health

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are long-term, negative and imperceptible.

## 7.8 Cumulative Impacts

### 7.8.1 Construction Phase

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction phase of any other development within 350m then there is the potential for cumulative construction dust impacts. However, a high level of dust control will be implemented across the site which will avoid significant dust emissions. With these mitigation measures are in place for the duration of the demolition and construction phase cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant. Cumulative impacts to air quality will be short-term, localised, negative and imperceptible.

Due to the short-term duration of the construction phase and the low potential for significant $CO_2$ and $N_2O$ emissions cumulative impacts to climate are considered neutral.

There are no significant cumulative impacts to air quality or climate predicted for the construction phase.

### 7.8.2 Operational Phase

The traffic data reviewed for the operational stage impacts to air quality and climate included the cumulative traffic associated with other existing and permitted developments in the local area. Therefore,

the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term, negative and imperceptible with regards to air quality and climate due to the low level changes in traffic on the surrounding road network and the low level changes in $NO_2$ and $CO_2$ emissions predicted.

## 7.9 MONITORING

### 7.9.1 Construction Phase

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/($m^2$*day) during the monitoring period between 28 - 32 days.

### 7.9.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

## 7.10 REINSTATEMENT

Not applicable to air quality and climate.

## 7.11 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered when compiling this assessment.

## 7.12 INTERACTIONS

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term, negative and imperceptible with respect to the construction phase and long-term, negative and imperceptible with respect to the operational phase in terms of human health impacts.

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils and the water environment (hydrology) in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that interactions between air quality and land and soils and hydrology will be short-term and imperceptible.

Dust emissions have the potential to settle on plants causing impacts to local ecology. Mitigation measures during the construction phase of the proposed development will ensure that dust generation is minimised and the effect on biodiversity will be short term, imperceptible and neutral.

## 7.13 Conclusion

Once the dust mitigation measures outlined in Section 7.6.1 and Appendix 7.3 are implemented, construction dust emissions are predicted to be short-term, negative, localised and imperceptible and will not cause a nuisance at nearby sensitive receptors. The best practice dust 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 short-term, localised, negative and imperceptible with respect to human health.

Potential impacts to air quality and climate during the operational phase of the proposed development are as a result of increased traffic volumes on the local road network. Air dispersion modelling of $NO_2$ and $CO_2$ emissions determined that impacts to air quality and climate will be imperceptible as a result of changes in traffic in the local area. The operational phase of the proposed development will have an imperceptible, negative and long-term impact on air quality and climate. In addition, the proposed development has been designed to reduce the impact on climate where possible during operation. The proposed development will comply with the NZEB standards.

There are no significant impacts to air quality or climate predicted as a result of the proposed development once the mitigation measures outlined in this chapter are implemented

**NOTE: Refer to Volume III of the EIAR for appendices associated with this chapter – i.e. Appendix 7**

## 7.14 REFERENCES


BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites

Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements – Draft

Environmental Protection Agency (2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft

Environmental Protection Agency (2022) EPA website Available at: http://www.epa.ie/whatwedo/monitoring/air/

Environmental Protection Agency (2021a) Air Quality Monitoring Report 2020 (& previous annual reports)

Environmental Protection Agency (2021b) Ireland's Provisional Greenhouse Gas Emissions 1990 – 2020

Environmental Protection Agency (2021c) GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2020 - 2040

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

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft Government of Ireland (2015)

Climate Action and Low Carbon Development Act

Government of Ireland (2019a) Climate Action Plan 2019

Government of Ireland (2019b) Draft General Scheme of the Climate Action (Amendment) Bill 2019

Government of Ireland (2021a) Climate Action Plan 2021

Government of Ireland (2021b) Climate Action and Low Carbon Development (Amendment) Act 2021

Institute of Air Quality Management (IAQM) (2016) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1

Met Éireann (2022) Met Eireann website: https://www.met.ie/

South Dublin County Council and Codema (2019) South Dublin County Council Climate Change Action

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

UK Highways Agency (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 - HA207/07 (Document & Calculation Spreadsheet)

UK Highways Agency (2019a) UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality

UK Highways Agency (2019b) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)

# 8.0. Noise

## 8.1 Introduction

This EIAR Chapter has been prepared by AWN Consulting Ltd. (AWN) to assess the potential noise and vibration effects of the proposed development in the context of current relevant standards and guidance as detailed in relevant sections below. A full description of the development can be found in Chapter 2 of this EIAR.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impact on the surrounding environment associated with the proposed development, during both the short-term construction phase and the permanent operational phase. The assessment of direct, indirect and cumulative noise and vibration effects on the surrounding environment have been considered in this chapter.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

This assessment has been prepared by Dr. Aoife Kelly BSc PhD MIOA (Senior Acoustic Consultant) at AWN, who has worked in the field of acoustics for over 7 years. She has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, energy, industrial, commercial and residential.

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration, which are set out within the relevant sections of this chapter and included in the references section. In addition to specific noise guidance documents, the following guidelines were considered and consulted for the purposes of this chapter:

- EC 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) (EU, 2017);
- EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002);
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003);
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017), and;
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

## 8.2 Characteristics of the Proposed Development

The proposed development will consist of 655 no. dwellings, comprised of 257 no. 2, 3 & 4 bed, 2 & 3 storey detached, semi-detached & terraced houses, 152 no. 1, 2 & 3 bed duplex units in 17 no. 2-3, 3-4 & 4 storey blocks, and 246 no. 1, 2 & 3 bed apartments in 9 no. buildings ranging in height from 2-5 storeys, and a 2 storey crèche (693m²).

Access to the development will by via one no. vehicular access point from the Boherboy Road, along with proposed upgrade works to Boherboy Road to include the provision of a roadside footpath along the front of the site at the Boherboy Road, continuing eastwards to the junction with the N81 Blessington Road (for

an overall distance of c.370m). The proposed development also provides for pedestrian and cyclist connectivity to the adjoining Carrigmore Park to the north-east, and vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north.

The proposed development provides for (i) all associated site development works above and below ground, including surface water attenuation & an underground foul sewerage pumping station at the northern end of the site, (ii) public open spaces (c.3Ha), including alongside the Corbally Stream, which will accommodate the provision of pedestrian / cyclist links to Carrigmore Park to the north-east, (iii) communal open spaces (c. 6,392m²), (iv) hard and soft landscaping and boundary treatments, (v) undercroft, basement & surface car parking (914 no. car parking spaces), (vi) bicycle parking (797 no. bicycle parking spaces), (vii) bin & bicycle storage, (viii) public lighting, and (ix), plant (M&E), utility services & 5 no. ESB sub-stations, all on an overall application site area of 18.3ha. In accordance with the Fortunestown Local Area Plan (2012) an area of approx. 1.42Ha within the site is reserved as a future school site.

The potential noise and vibration impact on the surroundings are considered for the construction and operational phases of this development.

During the construction phase the main site activities will include site clearance, foundation works, building construction, road works, and landscaping. This phase has the greatest potential noise and vibration impacts on its surrounding environment. Potential vibration impacts are associated with ground excavation works if required. The construction will be short-term.

During the operational phase of the development, the primary source of outward noise in the operational context relates to any changes in traffic flows along the local road network, operational plant noise and noise breakout from Creche Playground activities.

The potential associated with each phase is assessed in the following sections.

## 8.3 STUDY METHODOLOGY

The study has been undertaken using the following methodology:

- Detailed baseline noise monitoring has been undertaken across the development site to determine the range of noise levels at varying locations across the site;
- Typical ambient noise levels across the local area have been measured, and these are used to identify appropriate construction phase noise criteria at the closest noise sensitive locations (NSLs);
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the project at the NSLs to the development site;
- Predictive calculations have been performed to assess the potential impacts associated with the operational phase of the development at the most sensitive locations surrounding the development site;
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development.

## 8.4 Potential Impacts of the Proposed Development

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. In addition to specific noise and vibration guidance documents, the following Environmental Protection Agency (EPA) guidelines were considered and consulted in the preparation of this Chapter:

- Draft Advice Notes for Preparing Environmental Impact Statements (EPA 2015); and
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2017).

There are no statutory standards in Ireland relating to noise and vibration limit values for construction works or for environmental noise relating to the operational phase of the proposed development. In the absence of specific statutory Irish guidelines, the assessment has made reference to non-statutory national guidelines, where available, in addition to international standards and guidelines relating to noise and / or vibration impact for environmental sources. These are summarised below:

- British Standard Institute (BSI) British Standard (BS) 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound (hereafter referred to as BS4142) (BSI 2019);
- BS 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (hereafter referred to as BS 5228–1) (BSI 2014a);
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (hereafter referred to as BS 5228 – 2) (BSI 2014b);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (hereafter referred to as BS 8233–2) (BSI 2014c);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (hereafter referred to as BS 6472–1) (BSI 2008);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (hereafter referred to as BS 7385–2). (BSI 1993);
- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (hereafter referred to as ISO 1996 – 2) (ISO 2017);
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (hereafter referred to as ISO 1996 – 1) (ISO 2016);
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (hereafter referred to as the Noise Regulations);
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- The UK Department of Transport Calculation of Road Traffic Noise (hereafter referred to as the CRTN) (UK Department of Transport 1998), and;
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability & Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB) (UKHA 2020).

### 8.4.1 Noise Criteria

#### 8.4.1.1 Construction Phase

There is no published statutory Irish guidance relating to the maximum permissible noise and vibration levels that may be generated during the construction phase of a project. It is common practice to use BS 5228:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites* with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible Construction Noise Threshold (CNT) values are taken from Part One of the standard Noise.

**ABC Method**

The approach adopted here calls for the designation of a noise sensitive location into a specific category (A, B or C) based on exiting ambient noise levels in the absence of construction noise. This then sets a CNT value that, if exceeded at this location, indicates a significant noise impact is associated with the construction activities. Note that, in accordance with the BS5228 guidance, this assessment criteria is only applicable to residential receptors.

The closest neighbouring noise sensitive properties to the proposed development are the residential dwellings that bound the site, these are located approximately 10m from the development site at their closest point.

BS 5228-1:2009+A1:2014 sets out guidance on permissible CNT values relative to the existing noise environment. Table 8.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

| **Assessment category and threshold value period ($L_{Aeq}$)** | **Threshold value, in decibels (dB)** | | |
|---|---|---|---|
| | **Category A** Note A | **Category B** Note B | **Category C** Note C |
| Night-time (23:00 to 07:00hrs) | 45 | 50 | 55 |
| Evenings and weekends Note D | 55 | 60 | 65 |
| Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00) | 65 | 70 | 75 |

**Table 8.1 - Example Threshold of Potential Significant Effect at Dwellings**

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

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

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

Note D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined and rounded to the nearest 5 dB. If the construction noise exceeds the appropriate CNT value, then a significant effect is deemed to occur. It should be noted that this assessment method is only valid for residential properties and if applied to commercial premises without consideration of other

factors may result in an excessively onerous thresholds being set.

### Interpretation of the CNT

In order to assist with interpretation of CNTs, Table 8.2 includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of *DMRB: Noise and Vibration* and adapted to include the relevant significance effects from the EPA Guidelines (EPA 2017).

| Guidelines for Noise Impact Assessment Significance (DMRB) | CNT per Period | EPA EIAR Significance Effects | Determination |
|---|---|---|---|
| Negligible | Below or equal to baseline noise level | Not Significant | Depending on CNT, duration & baseline noise level |
| Minor | Above baseline noise level and below or equal to CNT | Slight to Moderate | |
| Moderate | Above CNT and below or equal to CNT +5 dB | Moderate to Significant | |
| Major | Above CNT +5 to +15 dB | Significant, to Very Significant | |
| | Above CNT +15 dB | Very Significant to Profound | |

**Table 8.2 - Construction Noise Significance Ratings**

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

### Construction Traffic Noise Impacts

In order to assist with the interpretation of construction traffic noise, Table 8.3 includes guidance as to the likely magnitude of impact associated with changes in traffic noise levels along an existing road. This is taken from Table 3.17 of the DMRB.

| Magnitude of Impact | Increase in Traffic Noise Level (dB) |
|---|---|
| Negligible | Less than 1.0 |
| Minor | Greater than or equal to 1.0 and less than 3.0 |
| Moderate | Greater than or equal to 3.0 and less than 5.0 |
| Major | Greater than or equal to 5.0 |

**Table 8.3 - Likely Effect Associated with Change in Traffic Noise Level – Construction Phase**

In accordance with the DMRB, construction traffic shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- Ten or more days or nights in any 15 consecutive day or nights;
- A total number of days exceeding 40 in any six consecutive months.

The guidance outlined in Table 8.3 will be used to assess the predicted increases in construction traffic levels on public roads associated with the proposed development and comment on the likely short-term impacts during the construction phase.

### 8.4.1.2 Operational Phase

The main potential source of outward noise from the proposed development will relate to traffic flows to and from the development site onto the public roads, mechanical and electrical services used to service the residential properties and the creche external play area. The relevant guidance documents used to assess potential operational noise and vibration impacts are summarised in the following section.

### Change in Traffic Noise Levels

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

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 8.4 offers guidance as to the likely impact associated with any particular change in traffic noise level for the short-term period (i.e. the year of opening) (Source DMRB, 2020). For this assessment year, a 1 dB change between the Do Minimum and Do Something scenarios is the smallest that is considered perceptible.

| Change in Sound Level (dB $L_{A10}$) | Subjective Reaction | DMRB Short-Term Magnitude of Impact | EPA Classification Magnitude of Impact |
|---|---|---|---|
| 0 | Inaudible | No Change | Neutral |
| <1.0 | Barely Perceptible | Negligible | Imperceptible |
| 1 – 2.9 | Perceptible | Minor | Slight |
| 3 – 4.9 | Up to a doubling of loudness | Moderate | Moderate |
| 5+ | Doubling of loudness and above | Major | Significant |

**Table 8.4 - Likely Impact Associated with Short Term Change in Traffic Noise Level**

Further consideration of the magnitude of change in noise levels are determined for the long-term period (i.e. between the Do Minimum and Do Something scenarios for future assessment year). For this assessment year (design year 2045), a 3 dB change is the smallest that is considered perceptible. Table 8.5 summarises the likely impact associated with defined changes in traffic noise level between the Do Minimum and Do Something scenarios during the long-term period.

| Change in Sound Level (dB $L_{A10}$) | DMRB Long-Term Magnitude of Impact | EPA Classification Magnitude of Impact |
|---|---|---|
| <3 | Negligible | Imperceptible |
| 3.0 – 4.9 | Minor | Slight |
| 5.0 – 9.9 | Moderate | Moderate |
| 10+ | Major | Significant |

**Table 8.5 - Likely Impact Associated with Long Term Change in Traffic Noise Level**

## Noise from Creche Play Area

For other non-traffic related sources, e.g. creche play areas, reference is made to appropriate guidance on internal noise levels for dwellings is contained within British Standard BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* (BSI 2014c). This British Standard sets out recommended noise limits for indoor ambient noise levels in dwellings as summarised in Table 8.6 below.

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

**Table 8.6 - Indoor ambient noise levels for dwellings from BS8233:2014**

For the purposes of this study, it is appropriate to derive external limits based on the internal criteria noted in the paragraph above. This is done by factoring in the degree of noise reduction afforded by a partially open window and typical 15 dB attenuation is noted in this British Standard. Using this correction value across an open window, the following external noise levels would achieve the internal noise levels noted in Table 8.6 above.

- Daytime / Evening (07:00 to 23:00 hours) 50 – 55 dB $L_{Aeq,1hr}$
- Night-time (23:00 to 07:00 hours) 45 dB $L_{Aeq,15min}$

## Outward Noise Impacts

External mechanical plant is not proposed for this development and as such noise impacts from mechanical and electrical plant will be negligible. Notwithstanding this it is appropriate to set noise limit criteria for any noise emissions that may occur from internally located plant using the British Standard BS 4142: 2014: *Methods for Rating and Assessing Industrial and Commercial Sound.*

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background noise level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where noise emissions are found to be tonal, impulsive in nature or irregular enough to attract attention, BS 4142 also advises that a penalty be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal noise characteristics outlined in BS 4142 recommends the application of a 2dB penalty for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

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

| | |
|---|---|
| "ambient noise level, $L_{Aeq,T}$" | is the noise level produced by all sources including the sources of concern, i.e. the residual noise level plus the specific noise of mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]. |
| "residual noise level, $L_{Aeq,T}$" | is the noise level produced by all sources excluding the sources of concern, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]. |
| "specific noise level, $L_{Aeq,T}$" | is the sound level associated with the sources of concern, i.e. noise emissions solely from the mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]. |
| "rating level, $L_{Ar,T}$" | is the specific sound level plus any adjustments for the characteristic features of the sound (e.g. tonal, impulsive or irregular components); |
| "background noise level, $L_{A90,T}$" | is the sound pressure level of the residual noise that is exceeded for 90% of the time period T. |

If the rated plant noise level is +10 dB or more above the pre-existing background noise level then this indicates that complaints are likely to occur and that there will be a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

### 8.4.2 Vibration Criteria

#### 8.4.2.1 Construction Phase

Vibration standards address two aspects: those dealing with cosmetic or structural damage to buildings and those with human comfort. For the purpose of this scheme, the range of relevant criteria used for surface construction works for both building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

#### Building Damage

With respect to vibration, British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking the above into consideration the vibration criteria in Table 8.7 are recommended.

**Table 8.7 - Recommended Vibration Criteria During Construction Phase**

| **Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:** | | |
|---|---|---|
| Less than 15Hz | 15 to 40Hz | 40Hz and above |
| 12 mm/s | 20 mm/s | 50 mm/s |

Expected vibration levels from the construction works will be discussed further in Section 8.5.

#### Human Perception

People are sensitive to vibration stimuli at levels orders of magnitude below those which have the potential to cause any cosmetic damage to buildings. There are no current standards which provide guidance on typical ranges of human response to vibration in terms of PPV for continuous or intermittent vibration sources.

BS5228-2:2009+A1:2014, provides a useful guide relating to the assessment of human response to vibration in terms of the PPV. Whilst the guide values are used to compare typical human response to construction works, they tend to relate closely to general levels of vibration perception from other general sources.

Table 8.8 below summarises the range of vibration values and the associated potential effects on humans.

| Vibration Level, PPV | Effect |
|---|---|
| 0.140mm/s | Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration. |
| 0.3mm/s | Vibration might be just perceptible in residential environments. |
| 1mm/s | It is likely that a vibration level of this magnitude in residential environments will cause complaint. |

**Table 8.8: Guidance on Effects of Human Response to PPV Magnitudes**

Vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin and or the duration of vibration is known. For example, ground breaking can typically be tolerated at vibration levels up to 2.5 mm/s if adequate public relations are in place and timeframes are known. These values refer to the day-time periods only.

During surface construction works (ground breaking etc.) the vibration limits set within Table 8.7 would be perceptible to building occupants and have the potential to cause subjective effects. The level of effect is, however, greatly reduced when the origin and time frame of the works are known and limit values relating to structural integrity are adequately communicated. In this regard, the use of clear communication and information circulars relating to planned works, their duration and vibration monitoring can significantly reduce vibration effects to the neighbouring properties.

### Interpretation of the Human Response to Vibration

In order to assist with interpretation of vibration thresholds, Table 8.9 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS5228-2:2009+A1:2014.

| Criteria | Impact Magnitude | Significance Rating |
|---|---|---|
| ≥10 mm/s PPV | Very High | Very Significant |
| ≥1 mm/s PPV | High | Moderate to Significant |
| ≥0.3 mm/s PPV | Medium | Slight to Moderate |
| ≥0.14 mm/s PPV | Low | Not significant to Slight |
| Less than 0.14 mm/s PPV | Very Low | Imperceptible to Not significant |

**Table 8.9: Human Response Vibration Significance Ratings**

### 8.4.2.2 Operational Phase

It is considered that the proposed development will not give rise to any significant levels of vibration in the receiving environment. Vibration criteria are therefore not deemed to be necessary for the operational phase of this development and therefore not been addressed further in this chapter.

## 8.5 Receiving Environment

### 8.5.1 Site Area Description

The proposed development comprises a mix of residential and a creche. The total gross application site area comprises 18.3 hectares, which includes part of the Boherboy Road to enable the provision of a footpath continuing eastwards to the N81 Blessington Road junction. Also included is the provision of pedestrian and cycle lanes to the adjoining District Park to the north-east, and vehicular connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north. This is a greenfield site. The residential area is bounded by Carrigmore residential estate to the north, agricultural lands and a single dwelling to the west, Corbally residential estate to the east and the Boherboy Road to the south as detailed in Chapter 2.0. This Noise and Vibration Chapter is focused on the residential development area and ancillary works outlined above, the school site (1.4ha) is not included in the assessment.

### 8.5.2 Receptors

The existing noise and vibration environments across the development site and in the vicinity of the nearest existing NSLs are dictated by transportation sources in the study area including the existing N81 and local Boherboy Road to the south, N82 to the east, and local road movements in the adjoining estate to the north of the proposed development.

The nearest existing residential NSLs to the proposed development are those located in the Carrigmore Avenue estate and Corbally estate some 10m beyond the northern and eastern site boundaries, respectively. In addition there are two residential properties aligning Saggart Lakes some 25m beyond the north-western boundary and the cluster of residential properties offset from the Boherboy Road some 35m from the southern boundary.

### 8.5.3 Desktop Study of Published Data

#### 8.5.3.1 Current Baseline Scenario

Reference has been made to the strategic noise maps produced by the EPA as part of the Round 3 noise mapping study in accordance with the requirements of the Environmental Noise Regulations (S.I. No. 140/2006) to review published data relating to noise sources in the area.

As part of the mapping round, roads with >3 million vehicle movements per annum are modelled and noise contours produced in terms of two noise indicators, $L_{den}$ and $L_{night}$. These are defined as follows:

- $L_{den}$ is the day-evening-night noise indicator based on year-long averages of the day (07:00-19:00), evening (19:00-23:00) and night (23:00-07:00) time periods. It is 'weighted' to account for extra annoyance in the evening and night periods.
- $L_{night}$ is the night time noise indicator over the night-time period (23:00-07:00hrs).

As part of the noise mapping process for the Round 3 study sections of the N81 have been modelled and mapped using traffic flow data for the year 2016.

Figure 8.1 presents the noise mapping for the long-term day-evening-night ($L_{den}$) period in the vicinity of the development site, identified in yellow. Reference to Figure 8.1 indicates that road traffic noise across the site is in the range of <55 dB $L_{den}$.


**Fig. 8.1 - Road Traffic $L_{den}$ Noise Contours (Source epa.ie)**

Figure 8.2 presents the noise mapping for the night-time period ($L_{night}$) period in the vicinity of the development site, identified in yellow. Reference to Figure 8.2 indicates that road traffic noise across the site is <45 dB $L_{night,}$.


**Fig. 8.2 - Road Traffic $L_{night}$ Noise Contours (Source epa.ie)**

As demonstrated in Figure 8.1 and 8.2, the site is not excessively influenced by the N81 and as a result an inward noise impact is not required as part of this development.

### 8.5.4 Environmental Noise Survey

Baseline noise monitoring has been undertaken in the vicinity of the proposed development site to determine the range of noise levels at varying locations across the site and to establish the existing noise climate the nearest NSLs. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*. Specific details are set out below.

#### 8.5.4.1 Choice of Measurement Locations

Measurement locations were selected as shown in Figure 8.3 below. The locations were chosen to characterise the baseline noise environment at locations representative of the environment close to the N81 and also at locations located away from the roads where noise levels are quieter. Three attended locations AN1, AN2 and AN3 were positioned close to the three major boundaries of the site while the unattended location UN1 was positioned on the development site overlooking the main noise source in

the area of the N81. The purpose of UN1 was to measure the noise levels incident on the development itself.


**Fig. 8.3: Noise Survey Locations (Source : Google Earth)**

The unattended noise survey was conducted between the following periods:

- UN1 between 11:49 hrs on 05 March 2020 to 08:04 hrs on 09 March 2020.

The attended noise survey was conducted between the following periods:

- AN1 to AN3 between 11:37 hrs to 14:51 hrs on 05 March 2020.

The measurements cover a period that was selected in order to provide a typical snapshot of the existing noise climate, with the primary purpose being to ensure that the proposed noise criteria associated with the development are commensurate with the prevailing environment. The weather during the survey period was mild and dry with wind speeds up to 3 m/s.

From 13 March 2020 the Irish Government stated that all schools, colleges and childcare facilities in Ireland would be shut. The baseline survey was completed prior to Covid-19 travel restrictions.

### 8.5.4.2 Personnel and Instrumentation

Donal Heavey (AWN) performed the measurements during the survey periods. Attended and unattended measurements were made using a Rion NL-52 Sound Level Meter. Sample periods were 15-minutes for attended noise measurements and 5-minutes for unattended noise measurements.

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

### 8.5.4.3 Measurement Parameters

The noise survey results are presented in terms of the following parameters.

$L_{Aeq}$ is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

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

$L_{A90}$ is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

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

### 8.5.4.4 Survey Results and Discussion

The results of the noise monitoring completed at the various locations are discussed in the following sections.

### Location UN1

The results of the surveys at the unattended monitoring location are summarised in Table 8.10 over, which align closely with those discussed in Section 8.4.3 desktop study of published data.

| Day | Sound Pressure Level (dB re. 2x10-5 Pa) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Daytime (07:00 to 19:00 hrs) | | | Evening (19:00 to 23:00 hrs) | | | Night (07:00 to 23:00 hrs) | | |
| | $L_{Aeq}$ | $L_{A90}$ | $L_{AFMax}$ | $L_{Aeq}$ | $L_{A90}$ | $L_{AFMax}$ | $L_{Aeq}$ | $L_{A90}$ | $L_{AFMax}$ |
| Thurs, 05 March 2020 | 54 | 47 | 92 | 52 | 44 | 64 | 51 | 40 | 78 |
| Fri, 06 March 2020 | 55 | 50 | 78 | 51 | 45 | 67 | 50 | 42 | 79 |
| Sat, 07 March 2020 | 56 | 51 | 90 | 56 | 49 | 85 | 49 | 41 | 77 |
| Sun, 08 March 2020 | 55 | 49 | 76 | 53 | 48 | 85 | 52 | 44 | 79 |
| Mon, 09 March 2020 | 57 | 52 | 90 | | | | | | |
| Average | 56 | 50 | -- | 53 | 47 | -- | 51 | 42 | -- |

**Table 8.10 - Unattended Survey Results**

***Note 1: Logarithmically averaged***

***Note 2: Arithmetically averaged***

## Location AN1

Table 8.11 reviews the measured noise levels at Location AN1. Road traffic noise from the Boherboy Road was the dominant noise source noted at this location, however background road traffic noise from the N81 was also audible during the measurements.

| Date | Period | Time | Measured Noise Levels, dB | | |
|---|---|---|---|---|---|
| | | | $L_{Aeq}$ | $L_{AFmax}$ | $L_{A90}$ |
| 05 March 2020 | Day | 11:37-11:52 | 61 | 78 | 43 |
| | | 12:44-12:59 | 70 | 88 | 46 |
| | | 13:54-14:09 | 72 | 89 | 47 |

**Table 8.11 - Noise Monitoring Results at Location AN1**

Daytime ambient noise levels at this location were dominated by road traffic noise from the Boherboy Road. Noise levels were in the range of 61 to 72 dB $L_{Aeq,15min}$ and in the range 43 to 47 dB $L_{A90,15min}$ during the measurement periods.

No significant level of vibration was noted at this location during site attendance.

## Location AN2

Table 8.12 reviews the measured noise levels at Location AN2. Local road traffic within nearby estate was the dominant noise source noted at this location, however intermittent aircraft flyover, dogs barking and distant road traffic noise from N81 were also present during the measurements. During lulls in road traffic noise running water in a nearby culvert was audible.

| Date | Period | Time | Measured Noise Levels, dB | | |
|---|---|---|---|---|---|
| | | | $L_{Aeq}$ | $L_{AFmax}$ | $L_{A90}$ |
| 05 March 2020 | Day | 12:00-12:15 | 49 | 62 | 45 |
| | | 13:07-13:22 | 50 | 65 | 46 |
| | | 14:15-14:30 | 48 | 59 | 45 |

**Table 8.12 -Noise Monitoring Results at Location AN2**

Daytime ambient noise levels at this location were dominated by local estate road traffic noise. Noise levels were in the range 48 to 50 dB $L_{Aeq,15min}$ and in the range 45 to 46 dB $L_{A90,15min}$ during the measurement periods.

No significant level of vibration was noted at this location during site attendance.

### Location AN3

Table 8.13 reviews the measured noise levels at Location AN3. Local road traffic within nearby estate was the dominant noise sources noted at this location, however intermittent aircraft flyover, dogs barking and distant road traffic noise from N81 were also present during the measurements. During lulls in road traffic noise running water in a nearby culvert was audible.

| Date | Period | Time | Measured Noise Levels, dB | | |
|---|---|---|---|---|---|
| | | | $L_{Aeq}$ | $L_{AFmax}$ | $L_{A90}$ |
| 05 March 2020 | Day | 12:20-12:35 | 50 | 65 | 48 |
| | | 13:28-13:43 | 51 | 68 | 47 |
| | | 14:36-14:51 | 59 | 70 | 54 |

**Table 8.13 - Noise Monitoring Results at Location AN3**

Daytime ambient noise levels at this location were dominated by local estate road traffic noise. Noise levels were in the range 50 to 59 dB $L_{Aeq,15min}$ and in the range 48 to 54 dB $L_{A90,15min}$ during the measurement periods.

No significant level of vibration was noted at this location during site attendance.

### 8.5.5 Do Nothing Scenario

The Do Nothing scenario is expected to be largely the same as the current baseline scenario in terms of noise and vibration.

## 8.6 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

### 8.6.1 Do Nothing Impact

The Do Nothing scenario includes retention of the current site without the proposed residential development in place. In the absence of the proposed development being constructed, the noise environment at the nearest NSLs and across the development site itself will remain largely unchanged. The noise and vibration levels measured/noted during the baseline studies are considered representative of the Do-Nothing scenario. The Do-Nothing scenario is therefore considered neutral impact.

### 8.6.2 Construction Phase

#### 8.6.2.1 Construction Noise Impacts

It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, rock breakers, lifting equipment, dumper trucks, compressors, and generators.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the nature of the construction works on site there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

Due to the fact that the construction programme has been established in outline form only, it is difficult to calculate the actual magnitude of noise emissions to the local environment. However, it is possible to predict typical noise levels using guidance set out in BS5228-1:2009+A1:2014. Table 8.14 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme at a standard reference distance of 10 metres from the various plant items.

| Phase | Item of Plant (BS 5228-1:2009+A1:2014 Ref.) | Construction Noise Level at 10m Distance (dB $L_{Aeq}$) |
|---|---|---|
| Site Preparation | Wheeled Loader Lorry (D3 1) | 75 |
| | Track Excavator (C2 22) | 72 |
| | Dozer (C2.13) | 78 |
| | Dump Truck (C4.2) | 78 |
| Rock Breaking & Excavation | Excavator Mounted Rock Breaker (C9.11) | 93 |
| | Tracked Excavator (C3.24) | 74 |
| | Dump Truck (C4.2) | 78 |
| Foundations | Tracked Excavator (C3.24) | 74 |
| | Concrete Pump (C3.25) | 78 |
| | Compressor (D7 6) | 77 |
| | Poker Vibrator (C4 33) | 78 |
| General Construction | Hand tools | 81 |
| | Tower Crane (C4.48) | 76 |
| | Pneumatic Circular Saw (D7.79) | 75 |
| | Internal fit – out | 70 |
| Road Construction Works | Road Roller (C5.19) | 80 |
| | Asphalt Paver (+Tipper Lorry) (C5.30) | 75 |
| Landscaping | Dozer (C2.13) | 78 |
| | Dump Truck (C4.2) | 78 |
| | Surfacing (D8.25) | 68 |

**Table 8.14 - Typical Noise Levels Associated with Construction Plant Items**

Reference to the noise baseline survey results (Section 8.3) and guidance contained in BS 5228 Part 1 for construction noise levels discussed in Table 9.2, the threshold for significance from construction activities is set as follows for the closest residential NSLs facades is Category A:

- Daytime (08:00 – 19:00hrs)/ Saturdays (08:00 – 14:00hrs) 65 dB $L_{Aeq,1hr}$
- Evening and Weekends 55 dB $L_{Aeq,1hr}$

The nearest existing residential NSLs facades to the proposed development construction works are those located in the Carrigmore Avenue estate and Corbally estate some 10m beyond the northern and eastern site boundaries, respectively. The next nearest NSLs are located some 25m to the north-western boundary and some 35m to the southern boundary. The remainder of construction works will take place across the site at varying distances.

For the purposes of the assessment we have assumed that standard good practice measures for the control of noise from construction sites will be implemented. These issues are commented upon in further detail in the mitigation section of this chapter.

Table 8.15 presents the predicted daytime noise levels from an indicative construction period on site at distances of 10m to 50m. These distance bands have been selected to represent the typical distance of construction work from surrounding residential dwellings. Note construction noise sources for site are assumed to be running 50% of the time over soft ground. The predictions have been prepared at various distances to provide an overview of how construction works will affect noise sensitive at various locations across the site. The distance of 10m is representative of the worst-case situation when construction work is ongoing on the site boundaries closest to existing residential dwellings. For the purpose of the assessment, a standard site hoarding of 2.4m high has been included in the calculations for noise sensitive boundaries.

| **Activity** | **Predicted Construction Noise Level $L_{Aeq(1hour)}$ (dB) at the nearest permitted or existing facades** | | | |
|---|---|---|---|---|
| | **10m** | **25m** | **35m** | **50m** |
| Site Preparation | 72 | 62 | 59 | 55 |
| Rock Breaking & Excavation | 83 | 73 | 70 | 66 |
| Foundations | 73 | 63 | 59 | 56 |
| General Construction | 73 | 63 | 60 | 56 |
| Road Construction | 71 | 61 | 58 | 54 |
| Landscaping | 71 | 61 | 58 | 54 |

**Table 8.15 - Predicted Potential Construction Noise Levels**

Construction predictions indicate that a significant impact may temporarily occur when works are on-going at the boundaries to the dwellings bounding the site, this is when works will be at 10m distance to the noise sensitive receptors. However, the vast majority of the construction works will take place at distances from the receptors where no significant impacts are predicted, for instance at distances of 25m and greater there are no significant impacts predicted with the exception of the rock breaking phase which will be limited to a temporary period.

It should be noted that where significant impacts are predicted, these are worst case scenarios that assume all plant for an activity will operate along the boundary line opposite a sensitive receptor, under real world conditions this is unlikely to occur. Construction noise levels will be lower than these levels for the majority of the time at the majority of properties in the vicinity of the proposed development. It should also be noted that blasting is not proposed at any stage of the project and rock will be extracted via mechanical means. Where necessary on the site, the duration of rock breaking activity will be measured in weeks rather than months with the exact duration dependant on ground conditions and the contractor's approach.

Notwithstanding, suitable noise mitigation measures must be adopted to reduce the noise exposure at locations less than 25m from the site works and at locations less than 50m from rock breaking activities. Further discussion on mitigation measures are included in Section 8.7.

### Construction Traffic

No construction traffic information has been made available but it has been assumed that the haul route is most likely to use the already heavily trafficked N81. An increase of 25% in traffic is required to increase overall traffic noise levels by 1dB, which is insignificant in the overall context of the noise environment along the N81 and local roads in the vicinity of the site. Therefore, the medium-term noise environment assumed for this project is expected to be within at least 1dB of the baseline scenario, which would give a magnitude of increase in traffic noise that is negligible and is not significant.

#### 8.6.2.2 Construction Vibration Impacts

Potential for vibration impacts during the construction phase programme is greatest during rock breaking activity. Empirical data for this activity is not provided in the BS 5228-2:2009+A1:2014 standard, however the likely levels of vibration from this activity is expected to be significantly below the vibration criteria for building damage on experience from other sites. AWN Consulting have previously conducted vibration measurements under controlled conditions, during trial construction works, on a sample site where breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

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

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.25 to 0.48 PPV (mm/s) at distances of 10m to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 0.24 to 1.49 PPV (mm/s) at distances of 10m to 50m, respectively.

Whilst these measurements relate to a breaking of concrete, the range of values recorded provides some context in relation to typical ranges of vibration generated by construction breaking activity. Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Table 8.7 and in accordance with the general good-practice procedures and recommendations to minimise vibration emissions as outlined in Section 8.10.

Vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 8.7 to avoid any cosmetic damage to buildings. Vibration levels are also expected to be below a level that would cause disturbance to building occupants. The impacts are predicted to be short-term, negative and not significant.

### 8.6.3 Operational Phase Noise Impacts

Due consideration must be given to the nature of the primary noise sources when setting criteria. Potential noise impacts during the operational phase include the following:

- Vehicular traffic accessing and moving around the site;
- Building and mechanical services plant; and
- Creche playground noise breakout.

Each is assessed in the following sections.

### 8.6.3.1 Additional Traffic on Surrounding Roads

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the development given that traffic from the development will make use of the existing road network.

A traffic impact assessment relating to the proposed development has been prepared by the traffic consultants as part of this EIAR. Figure 8.4 presents the road links A-G, as labelled in Chapter 10 Transportation).

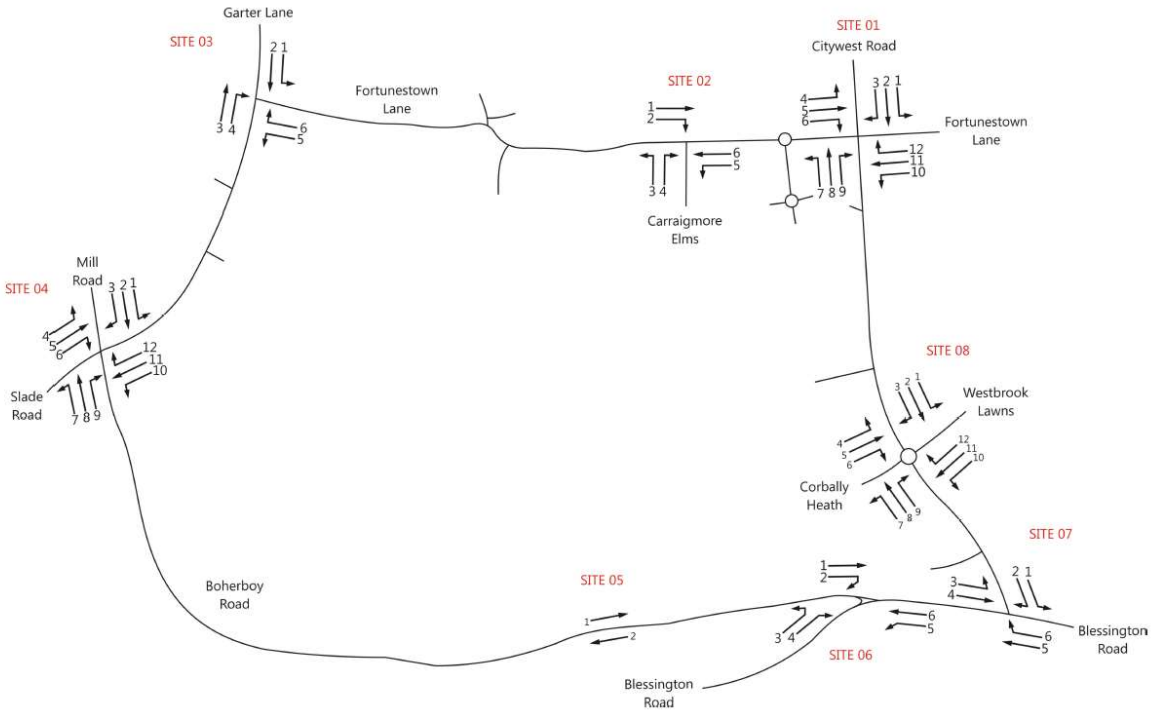



**Fig. 8.4 - Road Links for Presented for Traffic Assessment (Source: Pinnacle Consulting Engineers)**

The results of this assessment have been reviewed to predict any impact of the development on traffic flows in the area. The calculated change in noise levels during Opening Year (2027) and Future Design Year (2042) are summarised in Tables 8.16 and 8:17.

| Location | Link | AADT Do Nothing | AADT Do Something | Change in Noise Level, dB (all vehicles) |
|---|---|---|---|---|
| | | Opening Year | | |
| Site 01 | Link A | 10,513 | 11,094 | 0.2 |
| | Link B | 8,444 | 8,547 | 0.1 |
| | Link C | 10,447 | 10,827 | 0.2 |
| | Link D | 10,998 | 11,096 | 0.0 |
| Site 02 | Link A | 14,511 | 15,092 | 0.2 |
| | Link B | 5,481 | 6,639 | 0.8 |
| | Link C | 12,025 | 12,602 | 0.2 |
| Site 03 | Link A | 16,403 | 16,516 | 0.0 |
| | Link B | 23,118 | 23,604 | 0.1 |
| | Link C | 28,649 | 29,023 | 0.1 |
| Site 04 | Link A | 16,274 | 16,582 | 0.1 |

| | | | | |
|---|---|---|---|---|
| | Link B | 13,135 | 13,209 | 0.0 |
| | Link C | 15,262 | 15,654 | 0.1 |
| | Link D | 9,134 | 9,143 | 0.0 |
| Link 05 | Link A | 0 | 2,060 | N/A |
| Location | Link | AADT Do Nothing | AADT Do Something | Change in Noise Level, dB (all vehicles) |
| | | **Opening Year** | | |
| | Link B | 16,279 | 17,205 | 0.2 |
| | Link C | 16,279 | 17,413 | 0.3 |
| Site 06 | Link A | 25,600 | 25,891 | 0.0 |
| | Link B | 14,688 | 14,708 | 0.0 |
| | Link C | 11,528 | 11,839 | 0.1 |
| Site 07 | Link A | 15,145 | 15,330 | 0.1 |
| | Link B | 24,946 | 25,255 | 0.1 |
| | Link C | 25,849 | 26,343 | 0.1 |
| Site 08 | Link A | 21,926 | 22,324 | 0.1 |
| | Link B | 12,036 | 12,225 | 0.1 |
| | Link C | 15,273 | 15,441 | 0.0 |
| | Link D | 4,397 | 4,524 | 0.1 |

**Table 8.16 - Summary of Change in Noise Level (Opening Year 2027)**

| **Location** | **Link** | **AADT Do Nothing** | **AADT Do Something** | **Change in Noise Level, dB (all vehicles)** |
|---|---|---|---|---|
| | | **Future Design Year** | | |
| Site 01 | Link A | 11,237 | 11,818 | 0.2 |
| | Link B | 9,101 | 9,204 | 0.0 |
| | Link C | 11,190 | 11,570 | 0.1 |
| | Link D | 11,841 | 11,939 | 0.0 |
| Site 02 | Link A | 14,620 | 15,201 | 0.2 |
| | Link B | 4,130 | 5,288 | 1.1 |
| | Link C | 12,216 | 12,793 | 0.2 |
| Site 03 | Link A | 16,205 | 16,318 | 0.0 |
| | Link B | 24,195 | 24,681 | 0.1 |
| | Link C | 29,005 | 29,378 | 0.1 |
| Site 04 | Link A | 17,149 | 17,458 | 0.1 |
| | Link B | 13,963 | 14,037 | 0.0 |
| | Link C | 15,793 | 16,185 | 0.1 |
| | Link D | 9,788 | 9,797 | 0.0 |
| Link 05 | Link A | 0 | 820 | N/A |
| | Link B | 17,556 | 17,861 | 0.0 |
| | Link C | 17,556 | 18,071 | 0.1 |
| Site 06 | Link A | 27,256 | 27,547 | 0.0 |
| | Link B | 15,814 | 15,834 | 0.0 |
| | Link C | 12,054 | 12,365 | 0.1 |
| Site 07 | Link A | 15,837 | 16,023 | 0.1 |
| | Link B | 26,502 | 26,811 | 0.1 |
| | Link C | 26,980 | 27,474 | 0.1 |
| Site 08 | Link A | 23,365 | 23,763 | 0.1 |
| | Link B | 12,498 | 12,687 | 0.1 |
| | Link C | 15,561 | 15,729 | 0.0 |
| | Link D | 4,172 | 4,300 | 0.1 |

**Table 8.17 - Summary of Change in Noise Level (Future Design Year 2042)**

The Site 5 road link A will be further assessed in the internal roads assessment as this is a proposed new road internally within the proposed development.

The predicted increase in AADT traffic levels associated with the development is between 0.0-0.8 dB(A) in the vicinity of the roads assessed for the opening year and between 0.0-1.1 dB(A) during the future design year. This is largely due to the existing volume of traffic along the surrounding road network onto which the development traffic will travel. Reference to Tables 8.4 and 8.5 confirms that this increase is imperceptible and will not generate a significant noise impact.

In summary, the predicted increase in noise levels associated with vehicles at road junctions in the vicinity of the proposed development is of long-term not significant impact.

### 8.6.3.2 Internal Roads

The noise level associated with an event of short duration, such as a passing vehicle movement, may be expressed in terms of its Sound Exposure Level ($L_{AX}$). The mean value of Sound Exposure Level for a car at low to moderate speeds (i.e. 15 to 45km/hr) is of the order of 68 dB $L_{AX}$ at a distance of 10 metres from the vehicle. The $L_{AX}$ can be used to calculate the contribution of a series of events to the overall noise level in a given period.

It is possible to calculate the noise levels associated with the passing vehicle using the following formula.

$L_{Aeq,T} = L_{AX} + 10log_{10}(N) - 10log_{10}(r_1/r_2)\ dB$

where:

$L_{Aeq,T}$ is the equivalent continuous sound level over the time period T in seconds);
$L_{AX}$ is the "A-weighted" Sound Exposure Level of the event considered(dB);
N is the number of events over the course of time period T;
$r_1$ is the distance at which $L_{AX}$ is expressed;
$r_2$ is the distance to the assessment location.

It has been assumed by the traffic engineer than no HGV movements will be generated.

| Road Name | Speed (kph) | Distance to Closest Receiver (m) | Opening Year 2027 | | | | Design Year 2042 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Do Nothing | | Do Something | | Do Nothing | | Do Something | |
| | | | Peak AM | Peak PM | Peak AM | Peak PM | Peak AM | Peak PM | Peak AM | Peak PM |
| Site 2 | 50 | 25 | 221 | 198 | 393 | 343 | 235 | 211 | 436 | 383 |
| Site 5 | 50 | 40 | 23 | 4 | 174 | 140 | 18 | 3 | 142 | 110 |
| Site 8 | 50 | 35 | 160 | 68 | 160 | 68 | 172 | 72 | 219 | 88 |

**Table 8.18 - Internal Road Traffic Data used in Modelling Assessment**

The calculated change in noise levels during Opening Year (2027) and Future Design Year (2042) are summarised in Tables 8.19 and 8.20 for Peak AM vales, which are higher than the Peak values in all instances i.e. the worst case scenario.

| Road Name | NSL Location | $L_{Aeq, 1hr}$ Do Nothing | $L_{Aeq, 1hr}$ Do Something | Change in Noise Level, dB (all vehicles) |
|---|---|---|---|---|
| | | Opening Year | | |
| Site 2 | North | 48 | 50 | 2 |
| Site 5 | South | 34 | 43 | 9 |
| Site 8 | East | 44 | 44 | 0 |

**Table 8.19 - Summary of Change in Noise Level Based on AM Values (Opening Year 2027)**

| Road Name | NSL Location | $L_{Aeq, 1hr}$ Do Nothing | $L_{Aeq, 1hr}$ Do Something | Change in Noise Level, dB (all vehicles) |
|---|---|---|---|---|
| | | Opening Year | | |
| Site 2 | North | 48 | 51 | 3 |
| Site 5 | South | 33 | 42 | 9 |
| Site 8 | East | 44 | 45 | 1 |

**Table 8.20 - Summary of Change in Noise Level Based on AM Values (Future Year 2042)**

The predicted changes in noise level at the nearest residential properties to the north and east are between 0 to +3dB, which based on Tables 9.4 and 9.5 are not significant. These levels are within the residential daytime criterion of 50dB $L_{Aeq,15min}$ and lower than the expected ambient noise levels at these locations.

The predicted changes in noise level at the nearest residential properties to the south are in the order of +9 dB which based on Tables 9.4 and 9.5 are moderate to major. However, these levels are within the residential daytime criterion of 50dB $L_{Aeq,15min}$ and lower than the measured ambient noise level at this location (AN1) by more than 10 dB. As a result the actual change in the existing noise level with the addition of the Peak AM traffic at Site 5 is below 1dB and would not be perceptible.

In summary, the predicted increase in noise levels associated with vehicles at the internal road junctions in the vicinity of the proposed development is of long-term, not significant impact.

### 8.6.3.3 Building Services Plant

Once operational, there will be building services plant items required to serve the commercial and residential aspect of the development. The specific requirements for mechanical and electrical plant items for each element of the residential buildings or creche buildings has not yet been progressed at this stage of the design. Most of this plant will be capable of generating noise to some degree and may operate 24 hours a day. It would therefore be most noticeable during quiet periods (i.e. overnight). Noisy plant with a direct line-of-sight to noise sensitive properties as well as louder plant areas on roof would potentially have the greatest impact.

Whilst general locations for residential plant (air source heat pumps and solar panels), and ESB substations have been established (ground level) particular details of items of plant are as yet unknown, therefore it is not possible to calculate noise levels to the surrounding environment. Depending on the operational plant requirements, if plant rooms are proposed, these will likely require ventilation to atmosphere via louvered areas and or wall ventilation. In this instance, it is best practice to set appropriate noise limits that will inform the detailed design during the selection and layout of building services for the development.

As the plant will be selected at a later stage, they will be designed and located so that there is no negative impact on sensitive receivers within the development itself. The cumulative operational noise level from building services plant at the nearest NSL within the development (e.g. houses / apartments, etc.) will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods as set out in this assessment.

Based on the baseline noise data collected for this assessment it is considered an appropriate design criterion is the order of **45 dB $L_{Aeq,15min}$** during daytime periods and **40 dB $L_{Aeq,15min}$** at night at the nearest sensitive receptors. This limit is set in order to achieve acceptable internal noise levels within residential spaces based on prevailing noise levels in the area.

Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site.

In summary, the predicted increase in noise levels associated with building services plant in the vicinity of the proposed development is of long-term, not significant impact.

#### 8.6.3.4 Creche playground noise breakout

Measurement of noise levels generated by children playing outdoors made at several crèches and kindergartens indicate typical noise levels are of the order of 56 dB $L_{Aeq,1hr}$ at distance of 5m. The nearest off-site NSLs to the east are some 130m distance from the Crèche play area. Considering the distance and screening from proposed operational activities from the crèche are calculated to be below 30 dB $L_{Aeq,1hr}$ at the nearest NSLs. The predicted values are also below the range of baseline noise levels recorded to the east of the site (Location AN2). The resultant noise impact is therefore not significant.

Within the development, Housing Cell 9 and Cell 10 are at a 20m distance from the creche play area. Considering a minimum 10m distance between residential facades and creche play area and screening from the perimeter walls, the proposed operational activities from the crèche are calculated to be below 50 dB $L_{Aeq,1hr}$at the nearest onsite residential development and hence, is within the recommended daytime criterion of 50 dB $L_{Aeq,1hr}$ .

In summary, the predicted increase in noise levels associated with creche playground noise breakout in the vicinity of the proposed development is of long-term, not significant impact.

## 8.7 Mitigation Measures

### 8.7.1 Construction Phase

Mitigation measures for the construction phase are set out below in order to reduce potential impacts as far as practicable to within the adopted design goals for noise and vibration.

#### 8.7.1.1 Noise and Vibration

Best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid significant impacts at the nearest sensitive NSLs. The best practice measures set out in BS *5228 (2009 +A1 2014)* Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening,
- liaison with the public, and;
- project programme.

Further comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring, where required.

**Selection of Quiet Plant**

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

**Noise Control at Source**

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

The following best practice migration measures should be considered:

- Site compounds should be located away from noise sensitive boundaries within the site constraints. The lifting of bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as cranes, dump trucks, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation. Mobile plant should be switched off when not in use and not left idling.

- For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system.
- For percussive tools such as pneumatic breakers, noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are sealed. Localised screens should be erected around breaker or drill bits when in operation in close proximity to noise sensitive boundaries.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Compressors, generators and pumps should be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- All items of plant should 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.

**Screening**

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Standard construction site hoarding (2.4m in height) with a mass per unit of surface area greater than 7 kg/m$^2$ can provide adequate sound insulation. This will be implemented, as a minimum, around the site perimeter.

**Liaison with the Public**

A designated noise liaison officer will be appointed to site during construction works. Any noise complaints shall be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

**Project Programme**

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. If ground breaking works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to ensure noise limits are not exceeded due to cumulative activities. This will be reviewed in relation to other potential cumulative works occurring on adjacent construction sites in close proximity to noise sensitive properties, which have the potential to lead to significant construction noise impacts. To date no other construction sites nearby have been identified.

### 8.7.2 Operational Phase Noise Mitigation

#### 8.7.2.1 Additional Traffic on Adjacent Roads

During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary.

#### 8.7.2.2 Building Services Plant

The noise impact assessment outlined previously has demonstrated that once the mechanical plant is selected to have cumulative noise emissions lower than 45 dB $L_{Aeq,15min}$ during daytime periods and 40 dB $L_{Aeq,15min}$ at night at the facades of the nearest NSLs, specific mitigation measures are not required in order to avoid a significant noise impact at the nearest noise sensitive locations.

Notwithstanding this, the following practices are recommended for all plant items in order to minimise potential noise disturbance for neighbours:

- all mechanical plant items shall be regularly maintained to ensure that excessive noise generated by any worn or rattling components is minimised;
- any new or replacement mechanical plant items, including plant located inside new or existing buildings, shall be designed so that all noise emissions from site do not exceed the noise limits outlined in this document; and,
- Installed plant will have no tonal or impulsive characteristics when in operation.

#### 8.7.2.3 Internal Roads

During the operational phase of the development, noise mitigation measures with respect to the internal roads on site are not deemed necessary.

#### 8.7.2.4 Creche playground noise breakout

During the operational phase of the development, noise mitigation measures with respect to the creche playground on site are not deemed necessary.

### 8.7.3 Operational Phase Vibration Mitigation

Operational vibration impacts are expected to be within acceptable levels, therefore no mitigation measures are required.

## 8.8 Residual Impacts

### 8.8.1 Construction Phase

During the construction phase of the project there is the potential for short-term noise impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

For the duration of the construction period, construction noise impacts will be short-term and negative, depending on the proximity of the works to the site boundary. It should be noted that the assessment can be considered “worst case” and it is unlikely that all items of plant assessed will be in operational near the neighbouring properties all of the time.

Noise impacts during the construction phase will be short-term and moderate.

| *Quality* | *Significance* | *Duration* |
|---|---|---|
| Negative | Moderate | Short-term |

Vibration impacts during the construction phase will be short-term and not significant.

| *Quality* | *Significance* | *Duration* |
|---|---|---|
| Negative | Not Significant | Short-term |

### 8.8.2 Operational Phase

#### 8.8.2.1 Additional Traffic on Roads

The predicted change noise levels associated with additional traffic is predicted to be not significant impact along the existing road network.

The impacts are predicted to be as follows:

| *Quality* | *Significance* | *Duration* |
|---|---|---|
| Neutral | Not Significant | Long-Term |

#### 8.8.2.2 Operational Outward Noise Impact

Cumulative noise levels associated with outward noise from the development are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences.

The impacts are predicted to be as follows:

| *Quality* | *Significance* | *Duration* |
|---|---|---|
| Neutral | Not Significant | Long-Term |

## 8.9 MONITORING

### 8.9.1 Construction Phase

During the construction phase noise monitoring will be undertaken at the nearest sensitive locations to ensure construction noise limits outlined in Table 8.2 are not exceeded. Noise monitoring will be conducted in accordance with the International Standard ISO 1996: *Acoustics – Description, measurement and assessment of environmental noise Part 1 (2016) and Part 2 (2017).* The selection of monitoring locations will be based on the nearest sensitive buildings to the working areas.

It is recommended that noise control audits are conducted at regular intervals throughout the construction programme in conjunction with noise monitoring. The purpose of the audits will be to ensure that all appropriate steps are being taken to control construction noise emissions and to identify opportunities for improvement, where required.

### 8.9.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to noise and vibration are predicted to be imperceptible.

## 8.10 CUMULATIVE IMPACTS

### 8.10.1 Construction Phase

There are a number of approved applications in the local area as outlined in Chapter 14 (section 14.4) of this EIAR. Depending on the proximity of the construction works to the nearest NSLs it is possible that cumulative impacts could occur at the nearest receptors to the proposed site should all sites progress construction simultaneously. In this scenario elevated construction noise emissions due to cumulative noise are potentially likely to occur at receptor locations as well as a potential increase in the length of time that the receptor will be exposed to construction noise. Hence, cumulative construction impacts will need to be considered and managed during the construction phase. It is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors. Cumulative construction noise impacts are expected to be negative, moderate and short-term.

### 8.10.2 Operational Phase

During the operational phase any cumulative impacts will be due to an increase in road traffic noise. However, given the insignificant levels of noise increase as a result of the traffic associated with this proposed development, it is not expected that cumulative traffic noise will increase by any significant margin as a result of this proposed development.

## 8.11 Difficulties Encountered

There were no difficulties encountered in the compilation of this chapter.

## 8.12 References

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 – Draft (EPA, 2017);

BSI (1993). BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;

BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound;

BSI (2014). BS 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise;

BSI (2014). BS 5228-2:2009+A:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration;

DCC; FCC; SDCC; DLRCC (2018). Dublin Agglomeration Third Environmental Noise Action Plan December 2018 – July 2023;

Fingal County Council (FCC) (2017). Fingal Development Plan Policy on Aircraft Noise.

Fingal County Council (FCC) (2019). Noise Action Plan for Dublin Airport 2019-2023.

EPA (2015). Advice Notes for Preparing Environmental Impact Statements. Draft. September 2015;

EPA (2017). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Draft. August 2017;

EPA (2020). EPA Maps [Online] Available from gis.epa.ie/EPAMaps;

ISO (2016). ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures;

UK Department of Transport (1998). Calculation of Road Traffic Noise;

UKHA (2020). Design Manual for Roads and Bridges Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2; and

(IoA, 2017). Professional Practice Guidance on Planning & Noise (ProPG).

# 9.0. Material Assets: Built Services

## 9.1 Introduction

This chapter of the EIAR assesses and evaluates the likely impact of the proposed development on existing surface water and foul drainage, and utility services in the vicinity of the site during both the construction and operational phases, as well as identifying the nature of any impacts and provide the necessary mitigation measures arising from the proposed development. The material assets considered in this chapter include Surface Water Drainage, Foul Drainage, Water Supply, Power, Gas and Telecommunications.

This chapter was prepared by Roger Mullarkey & Associates Consulting Engineers BScEng, DipEng, CEng, EurIng, MIEI, FConsEI for Roger Mullarkey & Associates Consulting Civil & Structural Engineers and Barry O'Neill CEng.BEng(Hons) of BBSC Consulting Mechanical & Electrical Engineers. Both Roger and Barry each have over 27 years of consulting engineering experience in civil/structural and mechanical/electrical primarily in the design of residential housing in Ireland.

## 9.2 Assessment Methodology

The methodology followed for this section is in accordance with the Guidelines on Information to be Contained in an Environmental Impact Statement as published by the EPA, the Advice Notes on Current Practice in preparation of Environmental Impact Statements (EMP 2003), the Draft Guidelines on the Information to be contained in EIAR reports (EPA 2017) ,An Bord Pleanála on Carrying out Environmental Impact Assessments (DoEHLG2013) and the EC Guidance on the Preparation of the EIAR (2017).

The following legislation, standards and guidelines were consulted to inform the assessment:

As part of assessing the likely impact of the proposed development, surface water runoff, foul drainage discharge and water usage calculations were carried out in accordance with the following guidelines:

- Irish Waters Code of Practice for Water Infrastructure;
- Irish Waters Code of Practice for Wastewater Infrastructure;
- Greater Dublin Strategic Drainage Study, (DCC 2005);
- Regional Code of Practice for Drainage Works, (DCC 2005).

Assessment of the potential impacts of the proposed development on existing built services in the vicinity of the site included:

- Review of Irish Water utility plans (foul drainage and water supply);
- Review of South Dublin County Council utility plans (surface water drainage);
- Receipt of Confirmation of Feasibility (CoF) letter from Irish Water;
- Review of ESB Network Utility Plans;
- Review of Gas Networks Ireland Service Plans;
- Review of EIR E-Maps;
- Review of Ordnance Survey mapping ;
- Review of South Dublin County Development Plan 2016-2022;
- Topographical survey;
- Site Investigation reports;

- Site walkover visits;
- Consultation with South Dublin County Council and Irish Water including the receipt of a Confirmation OF Feasibility (CoF) letter and a Statement of Design Acceptance from Irish Water;
- As part of assessing the likely impact of the proposed development, surface water runoff, foul drainage discharge and water usage calculations were carried out in accordance with the following guidelines;

    - Greater Dublin Strategic Drainage Study (GDSDS)
    - SuDS Manual
    - Irish Water's Code of Practice

## 9.3 Existing Receiving Environment (Baseline Scenario)

The lands are situated in the townland of Boherboy, with an application site area measuring approximately 18.3Ha. The site is located c. 1.3km east of Saggart Village and south of Citywest. It consists of two fields under pasture with a significant topographical variation. Site levels range from 155mOD in the southwest corner to 117.5mOD in the northwest corner, a difference of c. 37 metres. The site lies c. 14km south-west of the centre of Dublin and c. 4.5km west of the centre of Tallaght. The northern boundary of the site is c. 500m south-west of the Luas stop on Fortunestown Lans and local centre at Fortunestown / City west Shopping Centre. The adjoining land to the north and east of the site has been developed for housing at the Carrigmore and Corbally estates respectively.

The Corbally Stream runs along the eastern boundary of the site in a north-south axis, turning in a westerly direction at the northeast boundary before exiting the site at the northwest corner. The site is bordered on all sides by mature hedgerow and trees. There is a field boundary hedgerow and ditch traversing the centre of the site in a north south axis. There are some ruinous agricultural structures to the south of the site close to the Boherboy Road.

The north-eastern corner of the site adjoins a district park, known as Carrigmore Park. The southern site boundary has c. 360m frontage onto the Boherboy Road, which has a junction with the N81 Blessington Road c. 500m east of the site boundary. The N81 provides links to Blessington and Tallaght, while the Boherboy Road leads to Saggart to the west.

There are ESB lines that traverse the site, as well as are 5 no. trunk watermains crossing the subject lands.


**Fig. 9.1 – Site Location**

### 9.3.1 Existing Surface (Storm) Water Infrastructure

There is a watercourse known as the Corbally Stream (EPA Ref; IE_EA_09C02025) along the eastern and northern boundaries of the subject lands. There are 2 no. locally draining but dry field ditches on the site. Refer to Figure 9.2 below, taken from EPA mapping outlines the water systems in the vicinity of the site.

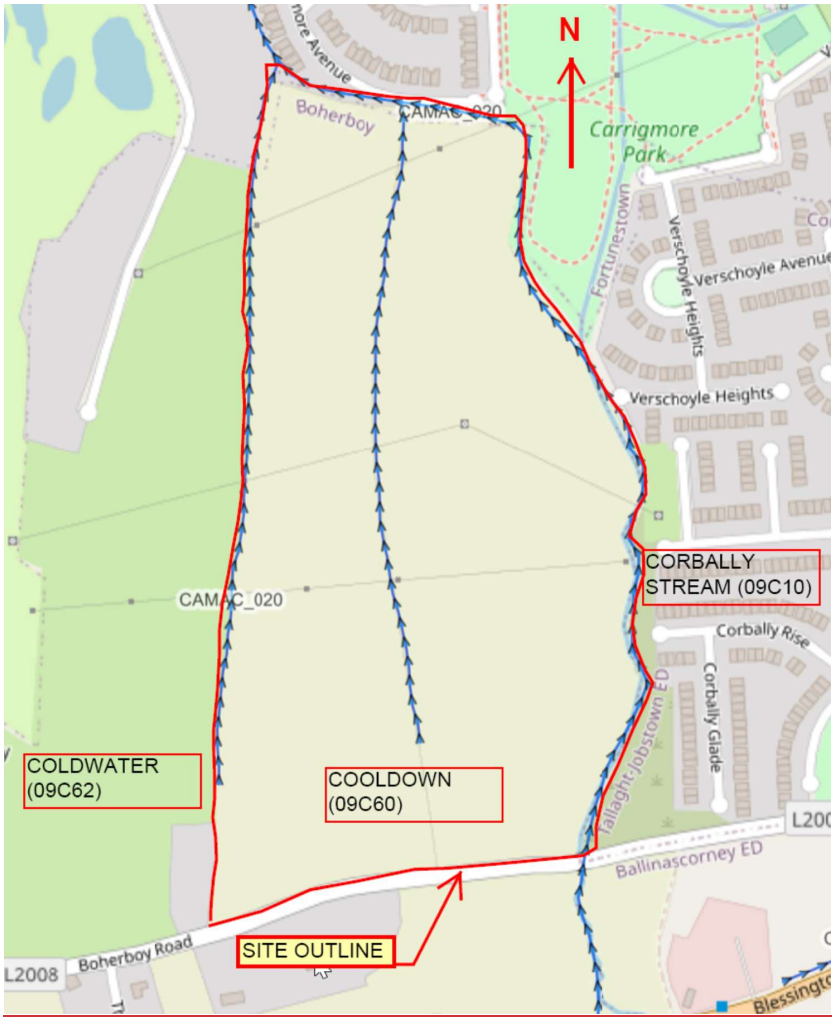



**Fig 9.2 – Existing watercourses extract GSI/EPA Website**

There are no existing piped/below ground surface water sewer infrastructure within the site.

Downstream of the subject lands, the Corbally stream drains through a piped culvert which is discussed in greater detail in the Site Specific Flood Risk Assessment report prepared by Kilgallen & Partners Consulting Engineers as part of the overall planning submission.

The surface water drainage infrastructure for the proposed development has been separated into 8 no. drainage catchments (refer to the Fig.3 contained in the submitted "Drainage and Water Infrastructure Engineering Report" and to drawing no. 1324B/318). Please also refer to drawing no.s 1324B/304-306 for the surface water general arrangement layouts and to drawing no.s 1324B/317-319 for attenuation and SuDS details. Also refer to Chapter 6.0 – Water of this EIAR for further information on the surface water infrastructure impacts and mitigation measures.

### 9.3.2 Existing Foul Water Infrastructure

There are no foul sewers on the subject lands as was confirmed by review of the available drainage records drawings by South Dublin County Council/Irish water.

There are existing piped foul sewers in the adjacent housing estates of Corbally/Verschoyle/Carrigmore but none of which are available to connect into.

A Confirmation of Feasibility of connection and a Statement of Design Acceptance were both received from Irish Water after submission of a pre-connection enquiry and design calculations/drawings – these are included in Appendix 6A of Volume III the EIAR and in in the submitted engineering details by Roger Mullarkey & Associates Consulting Engineers.

It is proposed to service the subject lands by providing a new gravity foul sewer across Carrigmore Park (in the charge of the Local Authority, SDCC) to the south-east of the site connecting into the existing Irish Water foul infrastructure in Verschoyle Green. This has been agreed with Irish Water and approved by them under Ref. CDS20004359 – please refer to the submitted Confirmation of Feasibility and Statement of Design Acceptance details from Irish Water (enclosed with the Roger Mullarkey & Associates' Consulting Engineers package).

Due to the sloping topography of the subject lands it is not feasible to drain the apartment Blocks A and C or the potential future school site by gravity. Therefore, a foul water pumping station is proposed to drain the aforementioned buildings/areas from the lower north-east corner of the site into the gravity sewer to be constructed connecting into Verschoyle Green. The proposed underground foul pumping station is to be in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2017.

Please refer to the enclosed drawing no.s 1324B/307-309 and 323 for details of the proposed foul sewer infrastructure.

### 9.3.3 Existing Potable Water Infrastructure

There are three existing watermains (4inch uPVC/400mmDI/600mmDI) in Boherboy Road along the site frontage, and it is proposed to make a new water connection to the Boherboy watermain in the Boherboy Road.

There are five existing trunk watermains crossing the subject lands. A 1.2m Ø (1982 Concrete), a 27inch Ø (1938 Steel) and a 24inch (AC 1975) lie approximately parallel to each other in the northern third of the site and also a 1.2m Ø (1983 Concrete) and 24inch Ø (1952 Cast Iron) lie parallel approximately in the middle of the site. Please refer to the submitted drawing no.1324/201-203 by Roger Mullarkey & Associates' Consulting Engineers for location of these existing trunk watermains. The submitted "Drainage and Water Infrastructure Engineering Report" (section 11) clearly sets out details of the surveys undertaken to precisely locate said watermains, and of the overall proposals regarding potable water – please refer to same. Please also refer to the submitted drawing no.s 1324B/310-312 for the watermain layout and to 1324B/316 for sections across the existing trunk watermains. Supervised excavations were carried out to precisely confirm the exact location of these watermains and the results were then surveyed and are accurately represented on the aforementioned submitted drawings.

A Confirmation of Feasibility of connection and a Statement of Design Acceptance (Ref. CDS20004359) were both received from Irish Water after submission of a pre-connection enquiry and design calculations/drawings. This approval correspondence from Irish Water can be viewed in Appendix 12.12 of RMA Drainage & Water Infrastructure Engineering Report included with the overall planning submission. Also refer to Chapter 6.0 Water of this EIAR for further information on the drinking water infrastructure impacts and mitigation measures. Refer to Figure 9.3:

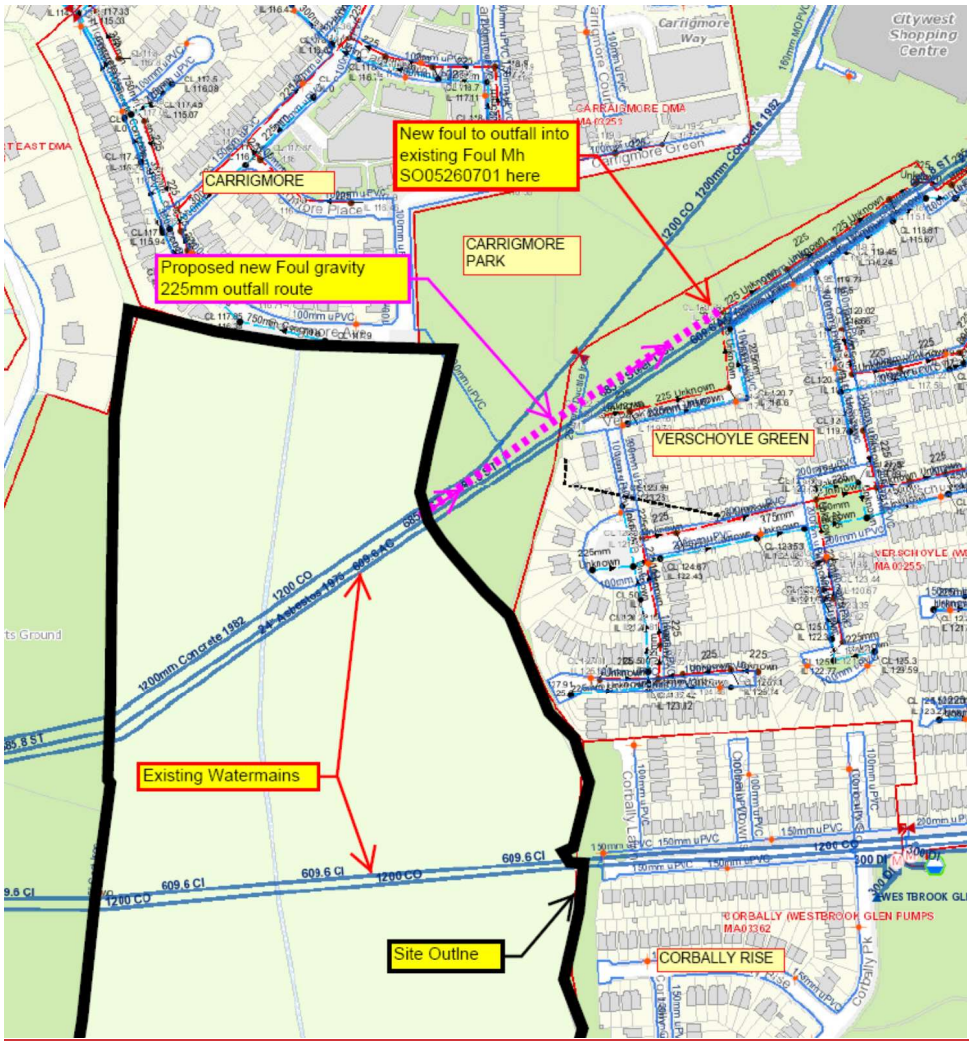



**Fig 9.3 – Extract Irish Water Webmap**

### 9.3.4 Existing ESB Infrastructure

The current electricity facilities near the site of the proposed development are supplied by Electricity Supply Board Networks (ESBN) through a ring network arrangement.

There are 3 no. overhead power lines crossing the subject lands (10kV-38kV).

Records drawings were obtained from ESB Networks Ireland in preparation of this chapter and can be viewed in Figure 9.4:

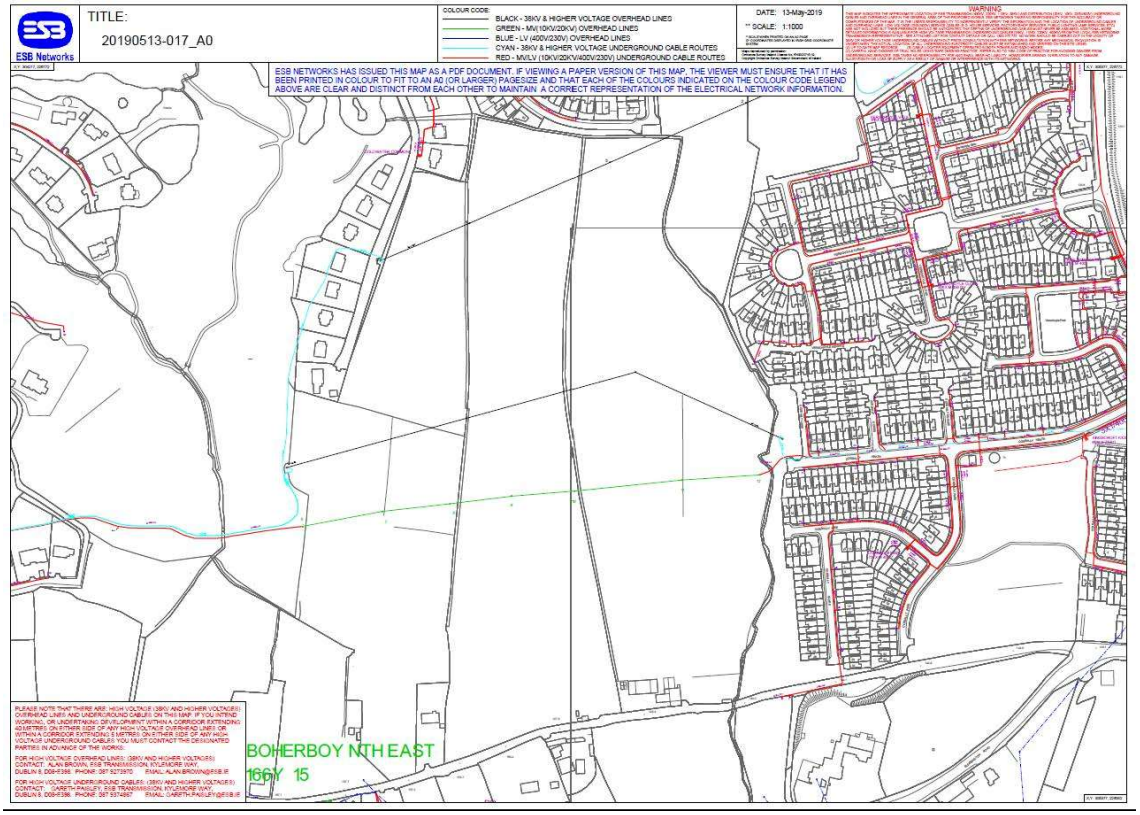



**Fig 9.4 – ESB Networks**

### 9.3.5 Existing Telecoms Infrastructure

Records drawings were obtained from both Eir and Virgin Networks in preparation of this chapter and can be viewed in Figure 9.5 overleaf.

Postal services to this area are provided by An Post.

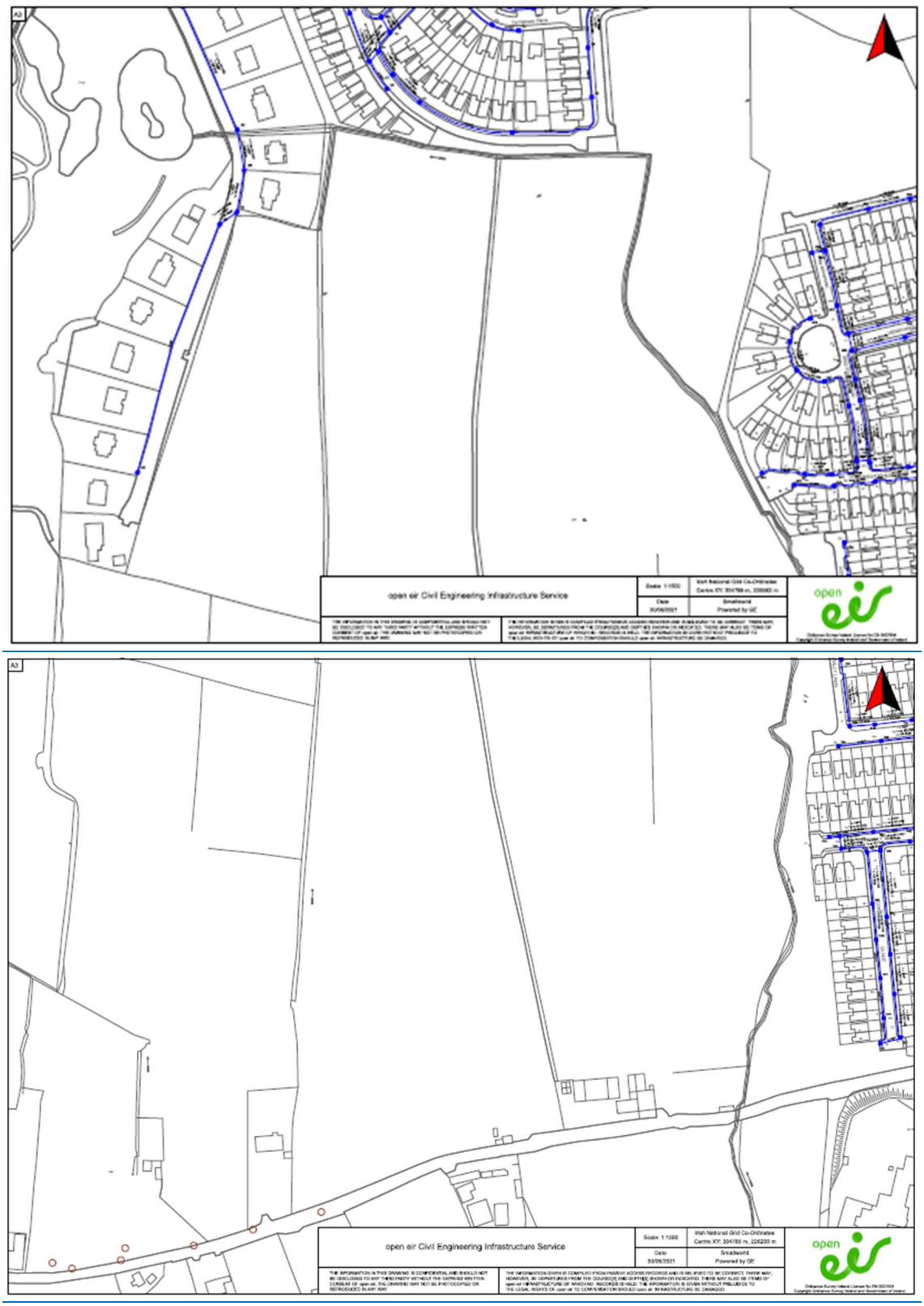



**Fig. 9.5 - In ground ducted services on the Eir network**

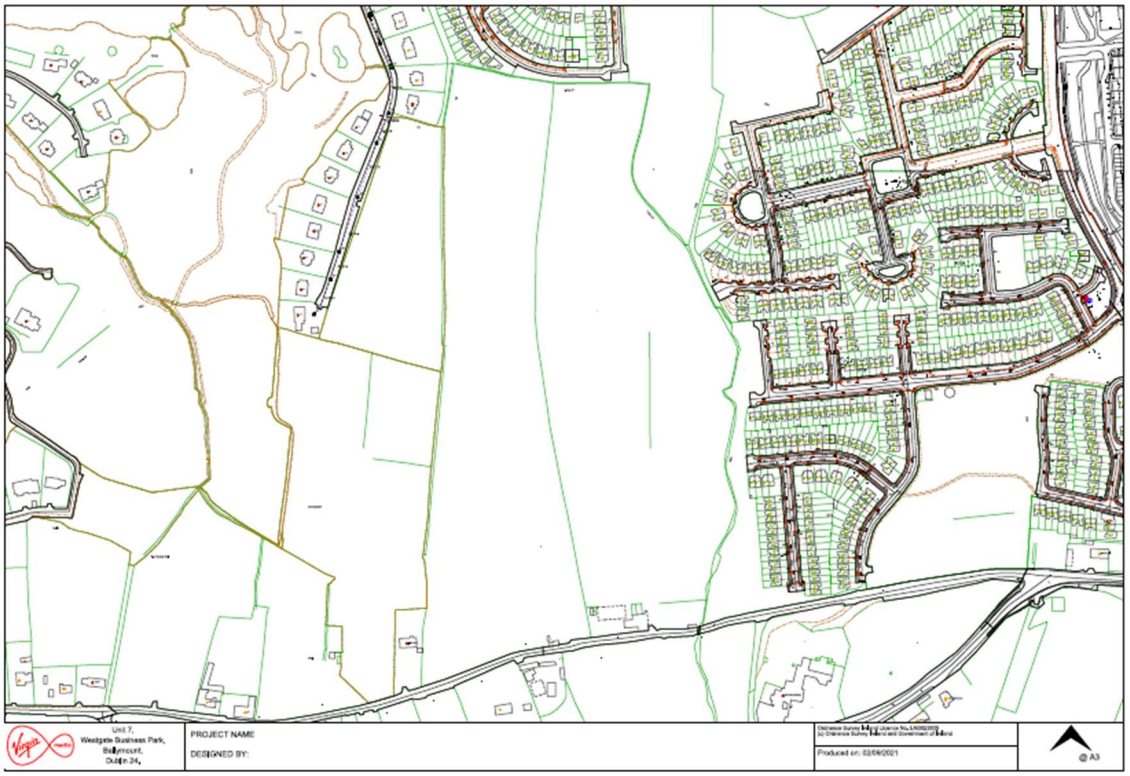



**Fig. 9.6 - In ground ducted services on the Virgin network**

### 9.3.6 Existing Gas Infrastructure

There are no known gas network pipes on the subject lands as was verified by the records drawings obtained from Gas Networks Ireland.

It is intended that a gas distribution network will be Gas Networks Ireland from their existing gas supply network on the Blessington Road.

This will be achieved via a 180 4 bar GNI mains pipe interconnecting with the existing Gas network. Records drawings were obtained from Gas Networks Ireland in preparation of this chapter and can be viewed in Figure 9.5 overleaf:

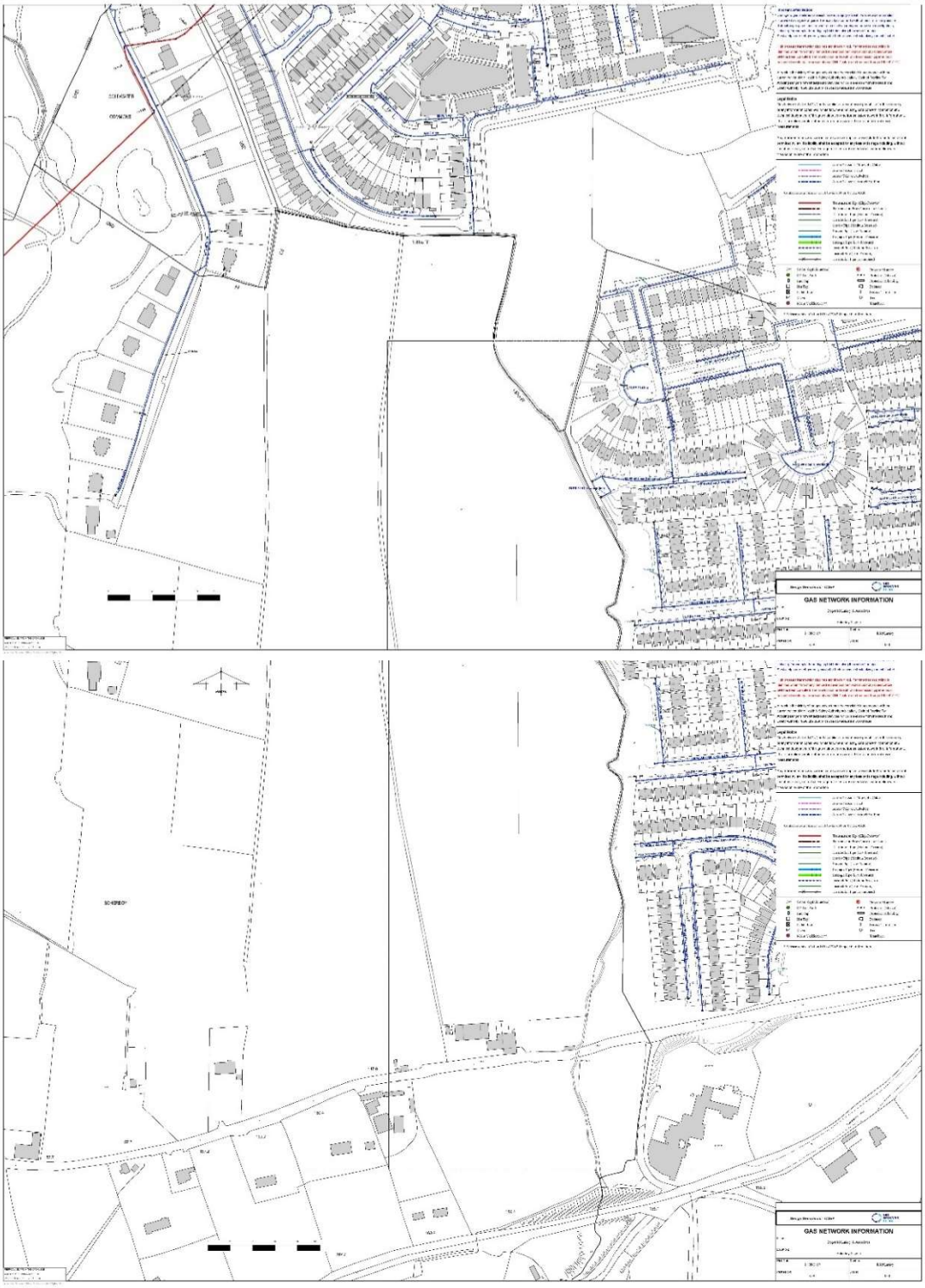



**Fig. 9.7 – Gas Networks Ireland**

## 9.4 Characteristics of the Proposed Development

The proposed development will comprise 655 no. residential units (257 no. houses, 152 no. duplex units and 246 no. apartments) and a c.693m$^2$ crèche, a number of new public spaces, all associated site development works, landscaping, boundary treatments and services provision. The proposed development will include surface water attenuation measures and underground geocellular/StormTech type tanks as well as a below ground wastewater pumping station. The overall development also contains a c.1.4Ha reserved for a possible future school site.

Further detailed information relating to the site developments drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report".

### 9.4.1 Proposed Surface (Storm) Water Design

The surface water drainage infrastructure for the proposed development has been separated into 8 no. drainage catchments (refer to the Fig.3 contained in the enclosed "Drainage and Water Infrastructure Engineering Report" and to Roger Mullarkey & Associates drawing no. 1324B/318). Please refer to drawing no.s 1324B/304-306 for the surface water general arrangement layouts and to drawing no.s 1324B/317-319 for attenuation and SuDS details.

The surface water drainage infrastructure for the development will collect the rainfall on the site and convey the storm water run-off via roadside swales, tree pits, bio-retention area, rear garden filter drains, gullies, underground pipes, manholes, catchpit manholes and direct the flows via void arched attenuation systems towards vortex flow restricting devices (Hydrobrake or similar) and petrol interceptors before outfalling to the existing on site open watercourses.

Inclusion of SuDS measures is discussed in detail in the enclosed "Drainage and Water Infrastructure Engineering Report" with a variety of SUDS features proposed including *inter alia* filter drains to the rear of housing, permeable paving to all private parking areas, house rainwater butts, tree pits, roadside filter swales, green roofs, attenuation storage, greenfield run off, etc. Full details of the propose surface water management strategy for the development is outlined in the submitted report by by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report". Also refer to Chapter 6.0 Water of this EIAR for further information on the surface water infrastructure impacts and mitigation measures.

### 9.4.2 Proposed Foul Drainage Design

The foul/wastewater water management strategy for the proposed development is outlined in the submitted report by by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report".

There is no foul water sewer located on the subject lands, therefore it is proposed to service the subject lands by providing a new gravity foul sewer across Carrigmore Park (in the charge of the Local Authority, SDCC) to the south-east of the site connecting into the existing Irish Water foul infrastructure in Verschoyle Green. This has been agreed with Irish Water and approved by them under Ref. CDS20004359 – please refer to the submitted Confirmation of Feasibility and Statement of Design Acceptance details from Irish Water in Appendix 6A in Volume III of this EIAR (also enclosed with the

Roger Mullarkey & Associates' Consulting Engineers package).

Due to the sloping topography of the subject lands it is not feasible to drain the apartment Blocks A and C or the potential future school site by gravity. Therefore, a foul water pumping station is proposed to drain the aforementioned buildings/areas from the lower north-east corner of the site into the gravity sewer to be constructed connecting into Verschoyle Green. The proposed underground foul pumping station is to be in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2020.

Irish Water have issued a Confirmation of Feasibility letter (refer to same in the appendix of the enclosed "Drainage and Water Infrastructure Engineering Report") for this proposed development noting that the water connection is "*feasible without infrastructure upgrade*" and the wastewater connection is "*feasible subject to upgrades*".

Please refer to the submitted RMA drawing no.s 1324B/307-309 and 323 for details of the proposed foul sewer infrastructure.

### 9.4.3 Proposed Water Supply

The drinking water supply/management strategy for the proposed development is outlined is outlined in the submitted report by by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report". Also refer to Chapter 6.0 Water of this EIAR for further information on the drinking water infrastructure impacts and mitigation measures.

All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Irish Water's Code of Practice / Standard Details and the Department of the Environment's Building Regulations *"Technical Guidance Document Part B Fire Safety"*.

An average daily domestic demand of approx. 3.07l/s has been calculated for the 655 no. dwellings as outlined in Irish Water's Pre-Connection Enquiry Application Form. In addition, for the possible school site as well as the proposed creche, 0.64l/s average daily demand has been calculated.

A Pre-Connection Enquiry was submitted to Irish Water CDS20004359and subsequent confirmation of feasibility letter states that connection is feasible.

### 9.4.4 Proposed ESB Infrastructure

It is intended that electrical power will be delivered by ESBN from their existing supply network and will require the construction of separate ESB sub-stations on the proposed development – these are identified on the submitted architects' drawings no's PL02-04., 8 number stations are proposed as outlined on figure 9.8 overleaf.

The High Voltage 38KVA lines and other lesser voltage lines, present a risk to the development and the public as a result these lines shall be rerouted via the sub-terranean 125mm red ducting, between 4 and 8nr duct, to ESB National Standards, installed in a proposed wayleave, under the direction and ownership of the ESB.

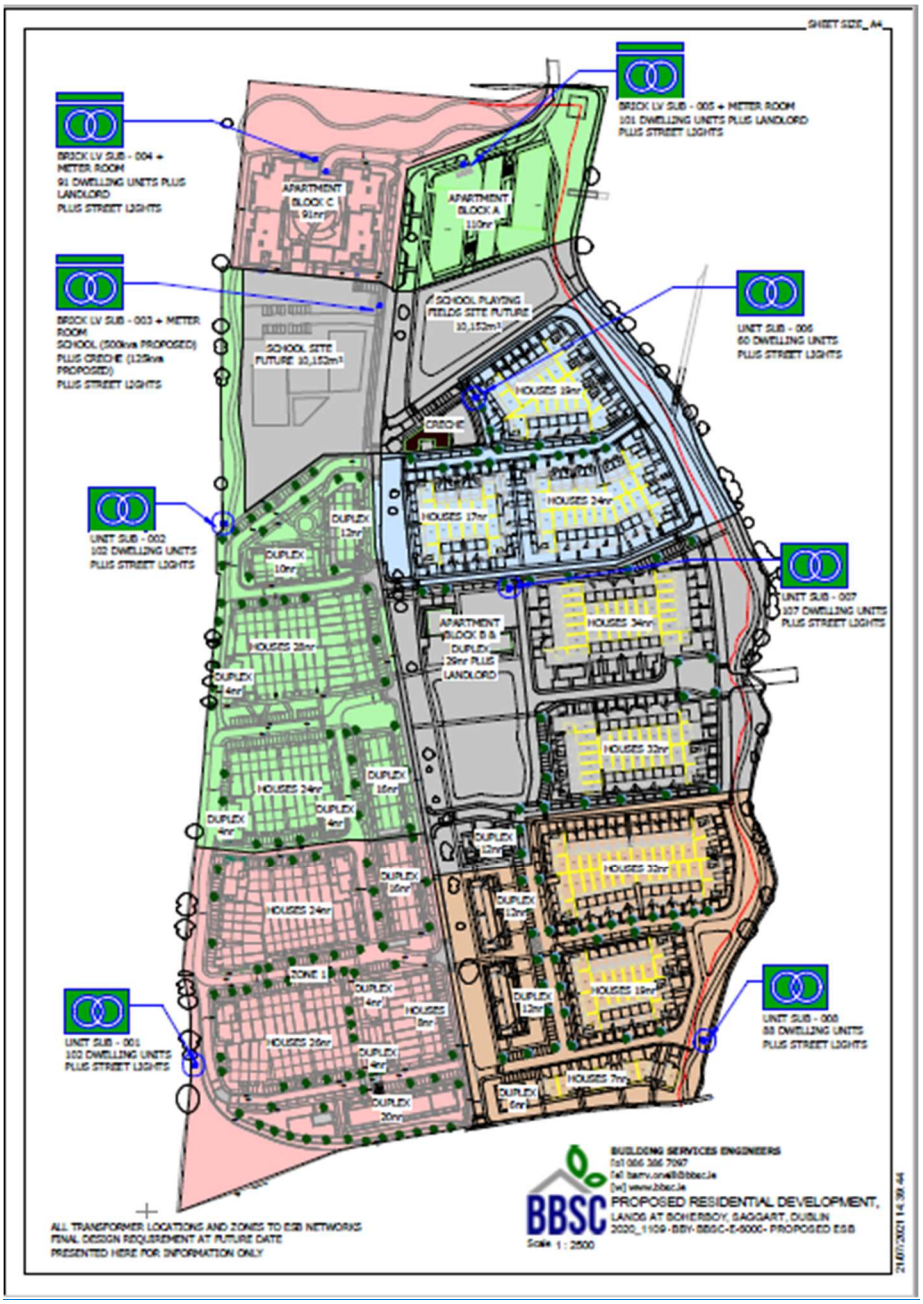



**Fig. 9.8 - Proposed Site Electrical Sub Station from BBSC report "ENVIRONMENTAL IMPACT ASSESSMENT**

Power supply, and the requirement for any alterations to the existing power supply network for the development of the subject site, will be agreed with ESB Networks in advance of construction.

Power will be supplied from the national grid to local sub stations for transforming power to 400V/ 230V for supply via in ground ducts to each dwelling or via cable trays to service apartments as is standard practice.

All power supply related works will be carried out in accordance with ESB Networks relevant guidelines.

An Electrical Diversified Load of between 2.8MVA and 3.5MVA is expected subject to ESB standard load estimation internal modelling.

It is estimated that at a minimum 8 nr sub stations of between 350KVA and 750KVA will be required to be supplied subject to ESB calculations, diversity, geography, routing, redundancy etc. Two no. sub-stations are to be accommodated within Blocks A and C with 6 no. further sub-stations dispersed through the site and can be identified on the architects submitted suite layout plan.

### 9.4.5 Proposed Telecoms Infrastructure

The existing housing estates to the east and north of the developments, existing infrastructure shall be extended into the proposed development as is normal practice for developments of this type.

For network integrity and security, the development will install, in ground, vendor neutral ducting to allow for any user to be provided by any vendor. It is proposed to provide up to 4nr 125mm Green Ducts. Access to the ducts will be by means of manhole cover junction relay boxes, mounted in ground.

Telecommunications supply, and the requirement for any alterations to the existing telecommunications network for the proposed development, will be agreed in advance of construction with the relevant telecommunications providers.

- All telecommunications related works will be carried out in accordance with relevant guidelines such as PAS 2016:2010, Next generation access for new build homes – Guide to telecommunications.
- EIR National standards "Duct Access Technical & Operational Manual"
- Virgin National Standards "New Build Handbook"

In order to allow for the connection of fibre broadband local street mounted cabinets will be required, as is typical for such installations, as these allow for wiring terminations and other equipment to allow for connection to the internet. These are typically 850x350x1250mm high and are site agreed once application to connect has been lodged with the users.

### 9.4.6 Proposed Gas Infrastructure

As the development relies on Electrically powered heat pumps for water heating and space heating, and with all cooking in dwellings being electrically powered also, the demand for Gas will be limited to cooking in for example school kitchens, cafes, restaurants etc. It is expected that the demand will be low.

However, the gas may be required to supply hydrogen for space heating or vehicle purposes and as a result limited infrastructure will be provided for technology not yet fully developed or in development.

Gas supply, and the requirement for any alterations to the existing gas supply network for the development of the subject site, will be agreed in advance of construction with Gas Networks Ireland.

All gas supply related works will be carried out in accordance with Gas Networks Ireland relevant guidelines.

For future proofing the development a Gas diversified load of 2.5MW is required to accommodate the site via in ground piped systems. This will be developed by Bord Gais based on there operational needs and not on the development.

### 9.4.7 Rules for road opening and site works

The works where so required, will follow standard rules of work as per HSA "Code of Practice For Avoiding Danger From Underground Services" which details all requirements to ensure a safe and continued supply of Utility being amended and extended from an existing source.

Works to be carried out to Guidelines for Managing Openings in Public Roads, 2017, as published by Department of Transport, Tourism and Sport.

**Figure 6.2.1 NSAI Summary of Colour Code for Buried Plastic Piping**

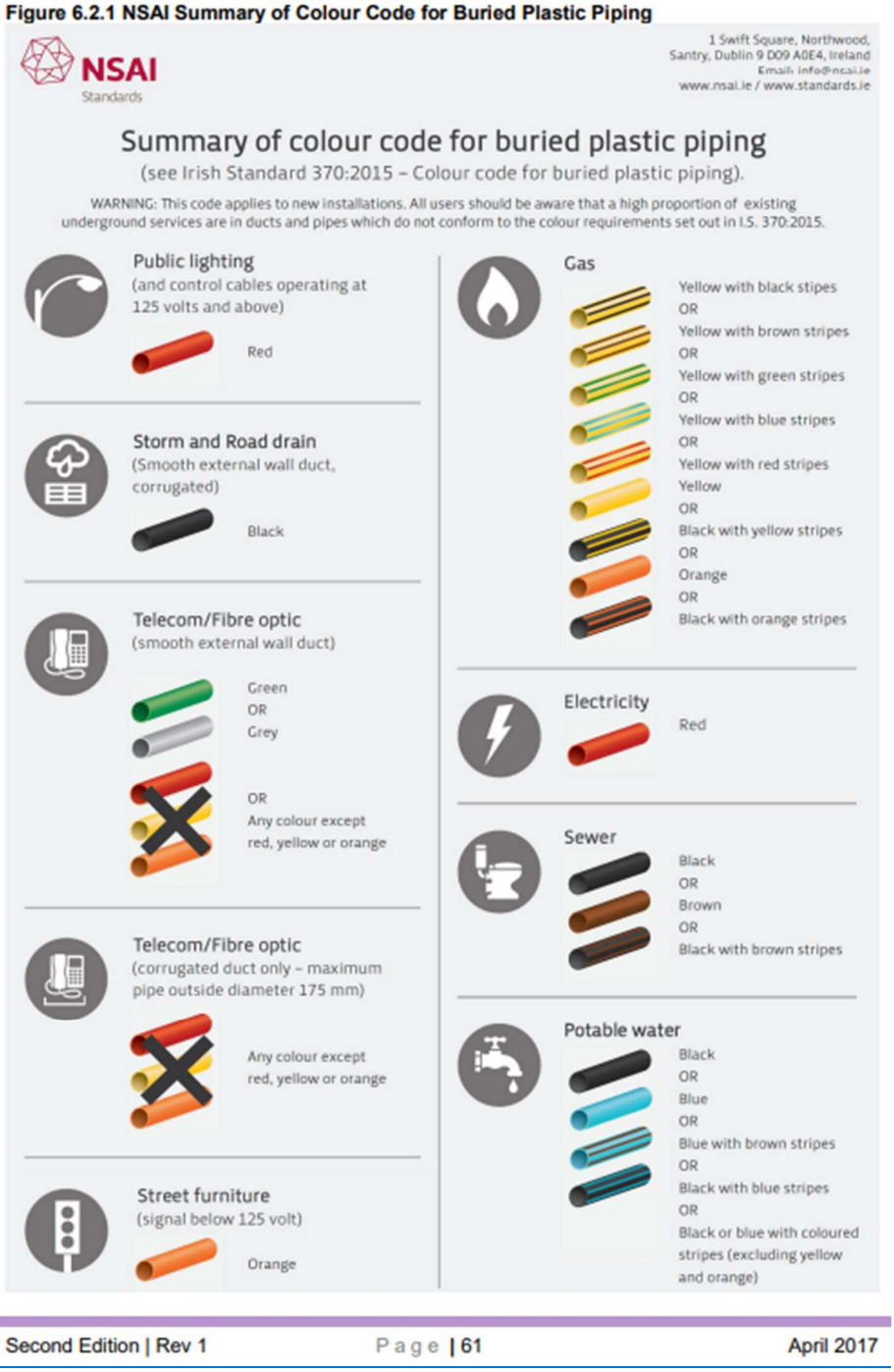



**Fig. 9.9 - Figure 2 Extract from "Guidelines for Managing Openings in Public Roads"**

## 9.5 Potential Impacts

### 9.5.1 Construction Phase

Potential impacts of the proposed development during the construction phase include:

#### 9.5.1.1 Surface Water

Potential impacts due to the proposed water and drainage elements have been assessed in detail as part of Chapter 6 "Water" and the reader is referred to that chapter for more in-depth information. The reader is also referred to the AWN Consulting Report entitled "Hydrological and Hydrogeological Qualitative Risk Assessment".

In order to construct the development, significant amounts of the top-soil will be removed and stored on the site for future use. When the topsoil has been removed the sub soil layers will be exposed to weathering and there is a potential for erosion of this layer from the inevitable rainfall and runoff. It has been estimated that c.40,700m$^3$ of topsoil will be disturbed during the construction phase.

Potential sources and impacts that may occur during the construction stage are as follows;

- Surface water runoff during the development's construction stage can cause silt from the exposed sub-soil be washed into the Corbally Stream causing excess siltation downstream;
- There is a risk that site contaminants from cement/concrete generated during wash down of concrete delivery trucks could enter the Corbally Stream causing pollution;
- There is a possibility that accidental fuel leaks/spills could be washed into the Corbally Stream or leak into the exposed sub-soil which could result in an increased risk of contamination to the receiving watercourses and groundwater;
- Over pumping of rainwater from foundation excavations could contain excess silt levels and could have a potential impact on the on the existing hydrology cause increased silt levels in the surrounding watercourse;
- Improper discharge of foul drainage from the contractors site compound could have an impact on the existing hydrology.

There is no direct open-water pathway between the site and Dublin Bay. However, there is an indirect pathway through the stormwater drainage which directly discharges into the Corbally Stream. Should any silt-laden stormwater from construction or hydrocarbon-contaminated water from a construction vehicle leak or manage to enter the watercourse, the suspended solids will naturally settle withing the stream. However, in the event of a worst case hydrocarbon leak of 1000 litres this would be diluted to background levels (water quality objectives as outlined in S.I. No.272 or 2009, S.I. No.386 of 2015 and S.I. No.77 of 2019) by the time the stormwater reaches the nearest Natura 2000 site (18km downstream).

The potential for impact on the aquifer is low based on the absence of any bulk storage of chemicals on the site. The overburden thickness, low permeability nature of the till sub-soil and lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect discharges to ground at the site. As such the is no potential for a change in the ground water body status or significant

source pathway linkage through the aquifer to any Natura 2000 site.

In the absence of the proposed mitigation measures, construction activity could have a slight, adverse, temporary, residual impact on receiving watercourses.

#### 9.5.1.2 Foul Water

The construction of the foul drainage system on the site will be carried out at the same time as the other drainage/services for the development. This will mainly involve construction of pipes and manholes using trench excavation. An underground foul pumping station is to be constructed at the lowest elevation point on the site in the north-east corner of the subject lands and is proposed to have only 2 no. above ground kiosks visible as per the Irish Water standard.

The wastewater discharge from the site during construction stage is to be managed by a licenced waste disposal contractor in accordance with the agreement of Irish Water. As construction sites have managed toilet blocks there is a minimal risk of contamination by direct pathway to the Corbally Stream. The overburden thickness, low permeability nature of the till sub-soil and lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect discharges of leaking toilet blocks to ground at the site. As such the is no potential for a change in the ground water body status or significant source pathway linkage through the aquifer to any Natura 2000 site.

As there is no interface with the existing local foul drainage infrastructure, the potential impact of the proposed development on the local foul sewerage network during the construction phase of the development would be negligible.

#### 9.5.1.3 Watermain

Provision of a new water main distribution network will involve construction activities within the subject lands mainly involving trench excavations conducted in parallel with the other services. Water will be required during construction activities and servicing of the temporary site compound. The development site will be connected to the local mains water supply. Given the scale and transient nature of construction works, the water demand on the local mains water systems would not be considered significant and would not be anticipated to impact upon local power or water supply. The potential impact on the local public water supply network would be short term and imperceptible.

#### 9.5.1.4 Telecoms

Telecommunications requirements during the construction phase will be primarily provided by means of mobile phones and or fixed line broadband.

The site compound will require a power and telecommunications connection, which comprise of connecting to the existing network. These connections shall be temporary and negligible in nature.

Fixed telecoms will not be operational during the construction phase.

The construction phase is unlikely to give rise to the requirement to divert fixed telecom lines but extend the existing infrastructure to suit site temporary construction requirements.

The local telecom ducted service may require to be extended into the site to facilitate telecoms on very focused and limited manner.

These works are normally characterised as a temporary, regionally short term, with minimal impact to existing users.

#### 9.5.1.5 Natural Gas Supply

The supply of gas to the proposed development site will not be operational during the construction phase.

The proposed works will involve a live tap into the existing infrastructure carried out in accordance with standard rules relating to these works as outlined under Bord Gais requirements for same.

It is expected that there will be no potential loss of supply from the Gas Networks Ireland infrastructure while carrying out works to provide service connections.

These works are normally characterised as a temporary, regionally short term, with minimal impact to existing users.

#### 9.5.1.6 Electrical Supply

Construction related activities will require temporary connection to the local electrical supply network, for the servicing of the temporary site compound.

The development site will be connected to the local electricity network system but given the scale and transient nature of construction works, the power demand on the local electricity systems is not considered significant and is not anticipated to impact upon local power supply.

These works are normally characterised as a temporary, regionally short term, with minimal impact to existing users or to the local electrical grid.

The diversion of the overhead power lines to sub-terrain ducting will be carried out by ESB under planned outages conditions, as a result these works are normally characterised as a temporary, regionally short term, with minimal impact to existing users or to the local electrical grid.

There is a potential for the connecting to ESB cable routes which could result in the 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 Eirgrid/ ESBN to minimise impact on neighbouring properties and as per the Commission for Regulation of Utilities and as per COMMISSION REGULATION (EU) 2017/1485, power loss may not exceed set time limits as outlined in national requirements imposed on Eirgrid by CRU. It is noted that planned outages and servicing of overhead lines typically occurs every 4 to 5 years and is normal practice within Eirgrid and ESBN networks with no loss of power from the national grid to local sub systems.

### 9.5.2 Operational Phase

#### 9.5.2.1 Surface Water

In the absence of the specified mitigation measures identified in Chapter 6, Section 6.6.2, the potential operational phase impacts are outlined below:

Unless the surface water outflow is restricted to the current greenfield rates there will be an increase in the surface water run-off due to the increase of the impermeable surfacing and a reduction of the ground water recharge.

During operation, the potential for a release is low as there is no bulk fuel/chemical storage and no silt laden run-off. Stormwater will be collected by the SuDS intercepting systems which includes interception measures to capture initial run-off. Furthermore, there are petrol interceptors located upstream of all discharge locations to the Corbally Stream. The potential for hydrocarbon discharge is minimal based on an individual vehicle (70l) leak being the only source for hydrocarbon release. However, even if the operation of the SuDS and interceptor systems are excluded from consideration, there is likely no impact above water quality objectives as outlined in S.I. Non 272 of 2009 and S.I. No.77 of 2019 in the worst case scenarios described above. The volume of contaminant release is low and combined with the significant attenuation within the Corbally Stream, hydrocarbons will dilute to background levels with no likely impact above water quality objectives as outlined in S.I. Non 272 of 2009, S.I. Non 3865 of 2015 and S.I. Non 77 of 2019 at any Natura 2000 sites.

It is not anticipated that there will be any long-term impacts on the hydrology or water services during the operational phase of the development. Any residual risk will emanate from contamination of surface water infiltrating to the subsoil via the SuDS features incorporated within the scheme. The surface water drainage has been designed to maintain the flows from the site at the greenfield run-off rates. Refer also to Chapter 7 Water Services for more information.

Refer also to Chapter 6 Water for more information.

#### 9.5.2.2 Foul Water

Increase of the wastewater discharge to the receiving network is calculated to be peak 1,158$m^3$ per day.

The wastewater is to be discharged to the Irish Water infrastructure and ultimately treated downstream at the Ringsend Wastewater Treatment Plant (WWTP) prior to discharge to Dublin Bay. It is noted that the application for a new upgrade to this facility is currently in planning. The plant operates under an EPA licence (D0034-01) and is currently in the process of being upgraded to a PE of 2.4 million. The most recent Annual Environmental Report (AER 2020) shows it is currently operating for a peak loading of 2.27million PE while originally designed for 1.64million PE. However, the current maximum hydraulic load (832,269$m^3$/day) is less than the Peak hydraulic capacity as constructed (959,040$m^3$/day), i.e., prior to any upgrade works. These upgrade works have commenced and are expected to be fully complete by 2025. The upgrade works to Ringsend WWTP will result in a higher quality of effluent discharge to Dublin Bay and will comply with the Urban wastewater Treatment Directive towards the end of 2023. A detailed EIAR was carried out as part of the application to upgrade the Ringsend WWTP which included hydrodynamic and chemical modelling of water quality/dispersion in Dublin Bay. The most recent water quality assessment of Dublin Bay WFD waterbody undertaken by the EPA (Water Quality in 2020: An

Indicator Report 2021) also shows that Dublin Bay on the whole, currently has an "Unpolluted" water quality status (refer to AWN report and to www.catchments.ie for further detail).

Even without upgrade to the WWTP, the peak effluent discharge calculated (13.4l/s) for the proposed development (which equates to c.0.12% of the peak hydraulic capacity), would not impact on the overall water quality within Dublin Bay and therefore would not have an impact on the current Water Body Status (as defined in the Water Framework Directive).

It is concluded that the proposed development will have no impact on the water quality discharge at the Ringsend WWTP. Assessment was considered the effect of cumulative events such as release of sediment laden water combined with a hydrocarbon leak (1000l as worst case scenario during construction phase). As there is adequate assimilation and dilution between the site and the Natura 2000 18km downstream of Boherboy, it is concluded that there will be no perceptible impact on water quality would occur at the Natura 2000 site as a result of construction or operation arising from the proposed development or with that of other proposed developments or planned development pursuant to statutory plans in the Greater Dublin, Meath and Kildare areas discharging to Ringsend WWTP will not be significant having regard to the size of the calculated discharge from the proposed development (13.4l/s) which includes wastewater flows from domestic, commercial and the possible future school site.

In summary, recent water quality assessments show that Dublin Bay meets the criteria for "unpolluted" water quality status (EPA, data until July 2021).

The currently under construction upgrade works to the Ringsend WWTP will result in improved water quality by the end of 2023 to ensure compliance with Water Framework Directive requirements.

All new developments are required to comply with SuDS which ensures management of run-off rate within the catchment of Ringsend WWTP.

The natural characteristics of Dublin Bay result in enriched water rapidly mixing and degrading such that the plume has no appreciable effect on water quality at Natura sites.

The proposed development will have no additional surface water runoff during a storm event over and above the current greenfield run-off rate and will therefore have no impact on the current water quality in any overflow situation at Ringsend WWTP.

In a worst case scenario of an unmitigated leak and not considering the operation of the designed SuDS elements and petrol interceptors upstream of all outfall points, there will be no perceptible risk to any Natura 2000 sites given the distance from source to Dublin Bay (c.18km). Potential contaminant loading will be attenuated, diluted and dispersed near the source area.

Confirmation of the capacity feasibility was received from Irish Water as part of the preparation of this application and can be viewed in Appendix ^A of Volume III of this EIAR and the Roger Mullarkey & Associates main report entitled "Drainage and Water Infrastructure Engineering Report".

The development will add to the environmental and financial costs associated with treatment and disposal before final discharge at the WWTP.

The potential impact from the operational phase of the development is therefore likely to be long term and negligible.

Refer also to Chapter 6 Water for more information.

#### 9.5.2.3 Potable Watermains

The impact of the operational phase of the proposed development on the water supply network will be the increased demand on the local system. That increase is estimated to be an Average daily Domestic Demand of 270m$^3$.

A Pre-Connection enquiry was submitted to Irish Water (IW) and the following that a Confirmation of Feasibility (CoF) letter (25/08/20) was received from IW and concluded that a connection to the water network is "Feasible without infrastructure upgrade by Irish Water". Subsequently a full set of watermain design drawings (Dwg.'s 1324B/310-312) were submitted to Irish Water for their technical review and as a result they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The CoF and Statement of Acceptance letters can be viewed in Appendix 6 of Volume III of this EIAR.

As such additional water quantities will need to be treated and supplied through the existing network to the site. This will require extra cost as well as increasing abstraction volumes from the existing source. The potential impact of the proposed development on the public water supply network is likely to be long term and minimal given that Irish water have assessed and approved the water capacity for the development.

Refer to the submitted engineering drawing no.s 1324B/310-312 for the watermain layout and to drawing no.1324B/316 for sections across the existing trunk watermains which have been reviewed and approved by Irish Water.

#### 9.5.2.4 Telecoms

The impact of the operational phase of the proposed development will increase demand on the existing local systems, however by means of increasing bandwidth on the existing system there will be a minor impact on the existing telecoms network(s).

The potential impact from the operational phase on the telecoms network is likely minimal.

#### 9.5.2.5 Natural Gas Supply

The development will be connected to the Gas Networks Ireland national gas supply network. The impact of the operational phase of the proposed development on the gas supply network is not likely to increase the demand on the existing supply. The potential impact from the operational phase on the gas supply network is minimal due to policy changes expected and being enacted to reduce societies demand on fossil fuels.

Provision for a new c.200mm 4bar GNI mains pipe shall be extended into the proposed development. Details of possible district regulation installation (DRI) units will be determined by GNI in advance of construction commencing to allow for future hydrogen distribution and meet current demands as outlined under 9.4.6 above.

#### 9.5.2.6 Electrical Supply

The impact of the operational phase of the proposed development on the electrical supply network is likely to increase the demand on the existing supply.

Electrical supply will be by means of a number of in ground 125mm red coloured ductwork which will be provided to allow for ESB services to be distributed across the proposed development based on engineering requirements to be agreed with ESB.

Up to approximately 7 no. ESB sub-stations is expected to be required to serve the development, with an additional sub-station expected to serve a future school, should it materialise.

Each unit sub will be centrally located to the surrounding areas to limit ESB runs. A 125mm ESB duct will be provided from the unit sub to the ESB mini-pillars to feed dwellings and public lighting.

Services to the home will be via a minipillar (1 no, minipillar serves up to 8 no. homes). Services shall terminate with the ESB meters positioned on the external walls of each house within recessed wall cabinets.

The necessary cabling infrastructure will be provided as part of the development and provision will be made within each dwelling for ducting from the distribution board to an external box; this will allow the homeowner the installation of an e-car charging point.

The potential impact from the operational phase on the electricity supply network is long term in nature and will require additional power from the national grid. The additional load falls within the expected simulation of future energy needs as per of CRU's "Tomorrow's Energy Scenarios (TES) publications" requirements up to the year 2040.

There are no predicted cumulative impacts arising from the construction or operational phase.

## 9.6 Mitigation Measures

### 9.6.1 Construction Phase

An Outline Construction Management Plan is submitted with this application, which includes the following construction stage mitigation measures. These mitigation measures are tried and tested and proven to be effective and will be implemented in full.

Prior to and during the construction, the contractor will liaise with the each of the relevant utilities provider. The contractor will apply for the relevant permit/licence to and comply with each utility providers requirements.

Unless this has been agreed in advance with the relevant service provider, the Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services.

All works near any existing utilities will be carried out in ongoing consultation with the relevant utility company or Local Authority and will be in compliance with any requirements or guidelines they may have. The implementation of the following measures will minimise the impact on the Material Assets/Built

Services in the area of the proposed development during the construction phase:

#### 9.6.1.1 Surface Water Infrastructure

- Surface water runoff from topsoil stripped areas is to be directed towards on-site settlement ponds. Upstream of the piped surface water outfalls, temporary settlement ponds/filter trench are to be constructed consisting of a geotextile lined stone filled trench with a further inclusion of baled straw filter at the inlet – all to catch any site washed silt during the construction process and before the development is completed. This filter trench is to be inspected and maintained regularly by the contractor throughout the construction stage. Such measures are to be taken to capture, remove and treat sediment prior to discharge of the filtered runoff to the receiving watercourses.

- To minimise the adverse effects, the prevailing weather conditions and time of year is to take into account when the site development manager is planning the stripping back of the topsoil. For example, by avoiding excavation and movement of top soil ahead of any known upcoming heavy rainfall event.

- The removal of the topsoil layer will be carried out in a carefully managed process and in coordination with the construction phasing management of the development.

- Sand, gravel or other loose materials brought to the site shall be stored in locations a minimum of 10m from the Corbally Stream and are not to be positioned where rainfall run-off could wash silt towards the watercourse. Any cement is to be stored in bags under cover from the elements at a location remote from the watercourse.

- The site layout shall be such that it includes a dedicated set down area for deliveries to the site and temporary storage of construction materials. The area is to be clearly demarcated and managed to avoid haphazard placement of materials throughout the site.

- The set down location shall be managed to ensure it is well ordered and tidy in line with good site management practice.

- Use construction best practices and the implementation of the Construction Management Plan is to take place to avoid the risk of contamination of the receiving watercourses or ground water. Pre-construction meetings to be held with all sub-contractors to explain works method statements and site management practices. Periodic, documented inspections of the site and subcontractor activities are to be carried out to improve overall site safety, efficiency and mitigate the risk of pollution of the stream or groundwater. Subcontractor method statements will be formally reviewed to ensure that comply with the requirements of the Construction Regulations 2006 and the Construction Management Plan. The site supervisor will conduct documented site inspections, using a Site Inspection Checklist on a weekly basis, or greater to ensure compliance. Potential spillages from storage tanks must not be allowed to seep into the ground and Spill kits are to be made available.

- An Outline Construction Management Plan has been developed and will be implemented during the construction phase.

- This will include Site personnel inductions to ensure all site personnel are made aware of the procedures and best practice with regards to the management of surface water runoff and ground

water protection.

- Concrete batching will take place off site and wash out of concrete trucks will take place off site (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).

- Wheel wash down facilities will be provided in specifically designated areas and managed in accordance with the OCMP. Discharge from these areas will be directed into settlement/treatment areas and this will prevent uncontrolled runoff site.

- All fuel stored will be bunded within a secure hardstanding area with strict management control and access to same. Bunding is to be 100% + 10% of the volume stored.

- Fuel spill clean-up kits will be kept in the designated re-fuelling areas.

- Topsoil stockpiles will be located in such a manner as to minimise the risk of washing away into local drainage or watercourses.

- The contractor will have a full time Site Manager responsible for the site management. The Manager will be fully aware of the relevance of the works in relation to the watercourse and will ensure all staff on site are made aware. A site noticeboard will be positioned in a suitably located prominent location on the site with the contact details of the person responsible for ensuring the pollution prevention methodology.

- The construction management of this project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and ground contamination.

- Dewatering of trenches should be used where deemed necessary and cannot be avoided and all run off from dewatering areas is to be directed to the designated settlement/treatment areas.

#### 9.6.1.2 Foul/Wastewater Infrastructure

- The wastewater discharge from the site during construction stage is to be managed by a licenced waste disposal contractor in accordance with the agreement of Irish Water.

- As construction sites have managed toilet blocks, foul drainage from the construction compound will be removed off site to a licensed facility until the connection to the public foul drainage network has been established.

- The overburden thickness, low permeability nature of the till sub-soil and lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect discharges of leaking toilet blocks to ground at the site.

- There is a minimal risk of contamination by direct pathway to the Corbally Stream.

- As such the is no potential for a change in the ground water body status or significant source pathway linkage through the aquifer to any Natura 2000 site.

- Construction of the proposed new foul outfall pipe across Carrigmore Park will be fully coordinated with Irish Water to ensure there is no disruption to the users of the existing infrastructure.

- All new wastewater pipes/manholes will be laid in accordance with the Irish Water Code of Practice for Wastewater Infrastructure & Standard Details for Wastewater Infrastructure.

- All foul drainage infrastructure will be pressure tested and CCTV surveyed in order to reduce the risk of defective or leaking sewers.

- The proposed foul pumping station to serve the northern located apartment Blocks A and C or the potential future school site is to be in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2017 – Part 5 – Pumping Stations. The details of which can be viewed on drawing No.1324B/321.Please note that the foul pumping station is below ground and is proposed to have only 2No.above ground kiosks visible as per the IW standards as per the below extracts from IW STD-WW-30A and 31A.
- The pumping station has been located to provide c.40m separation distance to the nearest existing habitable building and c.22m to the nearest proposed building. The separation distances provided exceed the Irish Water recommended 15m and have been approved by Irish Water as part of the Statement of Design Acceptance dated 19/08/21 and agreed in principle with South Dublin County Councils Water Services Department as part of the pre-planning process.

- A Pre-Connection enquiry was submitted to Irish Water (IW) and the subsequent Confirmation of Feasibility (CoF) letter (25/08/20) from IW concluded that a connection to the network is "Feasible subject to upgrades" to existing pipelines and the cost of same is to be agreed at connection application stage. A copy of the CoF letter can be viewed in Appendix 6A of Volume III of this EIAR.

- Further to the CoF stage of the engagement with IW, comprehensive discussions were held between the Applicants and IW to agree the technical details of the proposed foul drainage infrastructure and connection. As a result of those engagements the relevant foul drainage drawings were submitted to Irish water for technical review and subsequently, they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The Statement of Acceptance letter can be viewed in Appendix 6A of Volume III of this EIAR.

- Layout, levels, gradients, pipe sizes and details of the proposed foul drainage infrastructure can be viewed on the planning submission drawing no.s 1324B/307-309, 321-329.

#### 9.6.1.3 Potable Water Infrastructure

The proposed water supply for the development is to be made by connecting to an existing 400mm diameter main located in the Boherboy Road (L2008) to the south of the site.

The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.

A single 200mm diameter connection has been approved by Irish Water and will supply the proposed development via a 200mm diameter spine watermain with interconnecting 150mm and 100mm diameter looped branch watermains connected to it. Individual houses are to be supplied with a 25mm connection. In reference to the Irish Water Code of Practice for Water Infrastructure (July 2020) document, each individual residential dwelling within the development is to be provided with a boundary box. Each dwelling will be fitted with a cold-water storage tank to provide 24 hours of supply. Apartments will be supplied via a centralised water tanks and system per apartment block.

All watermain layout, connections, hydrants, valves and details have been designed in accordance with the Irish Water Code of Practice for Water Infrastructure 2020 and the Water Infrastructure Standard Details 2020.

Refer to the submitted engineering drawing no.s 1324B/310-312 for the watermain layout and to drawing no. 1324B/316 for sections across the existing trunk watermains which have been reviewed and approved by Irish Water.

A Pre-Connection enquiry was submitted to Irish Water (IW) and the following that a Confirmation of Feasibility (CoF) letter (25/08/20) was received from IW and concluded that a connection to the water network is "Feasible without infrastructure upgrade by Irish Water". Subsequently a full set of watermain design drawings (Dwg.'s 1324B/310-312) were submitted to Irish Water for their technical review and as a result they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The CoF and Statement of Acceptance letters can be viewed in Appendix 6A of Volume III of this EIAR.

Exclusion zones and setback requirements to the existing trunk watermains have been established in consultation and agreement with Irish Water at pre-application design stage. Construction method statements are to be agreed with IW in advance of a connection agreement or commencement of works.

Specific and detailed cross sections of all built assets crossing the existing watermains have been agreed with Irish Water Asset Management section and are shown on the submitted RMA Dwg.No.13214B/316 included in the application.

The construction compound's potable water supply will be protected from contamination by any construction activities or materials.

#### 9.6.1.4 Electrical Supply

In advance of construction commencing, the Contractor will prepare Method Statement detailing proposals for works in the vicinity of existing overhead electrical cables.

The contractor is to carry out scanning/GPR surveys in advance of site excavations.

Connections to the existing electrical networks will be coordinated with the relevant utility provider and carried out by approved contractors.

Contractor to comply with HSA Code of Practice for Avoiding Danger from Underground Services.

The Contractor will coordinate with ESB Networks Ireland regarding the relocation of the existing overhead power lines to ensure minimal interruption to the existing electricity network.

All ducting, cable installation and placement of new poles will be constructed in advance of decommissioning of existing overhead electricity lines.

As the time frames for planned outages is required to be planned the ESB will be engaged at an early stage to ensure any potential issues with utility connections are reviewed and mitigated as early in the process as possible. ESB will not engage with design process until such time as planning has been approved, and an application for power has been made with the scheme name and numbering has been approve by the local County Council.

#### 9.6.1.5 Utilities Infrastructure

All connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

The Site Manager will be responsible for establishing a protocol of communication with nearby residents in the event of unavoidable temporary disruption to material assets and be the single contact point. Leaflet drops, publicly visible signboard and advertisements in local news bulletins will form part of the communication strategy between the development and locality.

On completion of the construction phase of the development, there are no further mitigation measures required in relation to the telecoms, gas and electrical infrastructure.

### 9.6.2 Operational Phase

As detailed in Chapter 6 – Water, the implementation of the following measures will minimise the impact on the Hydrology and Water Services in the area of the proposed development during the operational phase of the development;

- The surface water collected from the project has been designed in accordance with the CIRIA SuDS Manual and the Greater Dublin Strategic Drainage Study and the appropriate treatment train process has been applied in the design.

- Regular maintenance of all SuDS features by the development management team will be carried out until such a stage that the Local Authority take in charge the project.

- The road and block levels design has been carried out following the existing natural site contours and replicating where possible the natural flow paths. The road and block levels along the northern boundary of the site have been raised above the Flood Zone A & B levels as per the SSFRA recommendations.

- The house/apartment floor levels have been designed to provide a greater than minimum 500mm freeboard above the highest estimated flood levels. The top of water level for the Q100+10% event has been estimated in the SSFRA to be **118.02mOD** and the lowest floor slab level on the site is 120.50mOD which is **2.48m** above the highest flood event for that 1%AEP (1 in 100 year) event.

- In accordance with best practice, appropriate SuDS features included in this development include filter drains, roadside filter swales, permeable paving in parking bays, green roofs, tree pits, bio-retention area, buildings, silt-trap/catchpit manholes, permeable geocellular attenuation storage, vortex flow control limiting devices and petrol interceptors.

- The surface water drainage infrastructure has been designed to allow for a 10% increase in rainfall due to climate change in accordance with the GDSDS.

- The surface water runoff from the site will be limited to the greenfield runoff rate (59.7l/s) and the attenuated flows are to be stored in below ground geocellular systems in accordance with the GDSDS. Further detailed information relating to the site development drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled "Drainage and Water Infrastructure Engineering Report".

- All communal designated waste storage areas will have gullies connected to the foul drainage network to facilitate wash down as required.

- Operational waste will be removed from the completed development using only licenced contractors to appropriately licensed facilities.

- The wastewater drainage infrastructure has been designed in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2020 and has been approved by Irish Water (refer to IW Statement of Design Acceptance letter Ref.CDS20004359 in Appendix 6A of Volume III of this EIAR).

- The pumping station at the north of the site has been designed in accordance with the IW COP and includes real time remote monitoring, alarms and telemetry connected to the SDCC pumping station control centre using a "SCADA" system. The pumping station has also been designed to incorporate a duty and stand-by duty pump in case if failure of any single pump. Furthermore, the pumping station can accommodate 24hrs overflow storage below ground in the chamber designed. Refer to Dwg.No.1324B/321 for further detail. Watermain supply to the site is to be monitored by Irish Water using the required and designed flow meters as have been approved under the IW SDC design review. Refer to the submitted engineering drawing no.s 1324B/310-312 for location of same.

- Usage of low flush toilets in the residences and installation of rainwater butts as identified on the RMA drainage drawings will reduce the demand on the public water supply infrastructure and the wastewater infrastructure.

- Implementation of photovoltaic solar panels on the roofs of the buildings will reduce the potential demand on the electrical network.

On completion of the construction phase of the development, there are no further mitigation measures required in relation to the telecoms, gas and electrical infrastructure.

## 9.7 Cumulative Impacts

In reference to the submitted Hydrological & Hydrogeological Qualitative Assessment prepared by AWN Consulting, the RMA Drainage and Water Infrastructure Report and based on the implementation of the suitable mitigation measures, such as using the appropriate SuDS designs and proper planning compliance, within this and on other local development sites (Fortunestown Centre, Cheeverstown, Saggart Cooldown Commons), it can be concluded that the in-combination effects of surface water arising from the proposed development taken together with that from other developments, will not be significant

based on the low potential chemical and sediment loading.

Therefore, due to the low possible loading of any hazardous material during construction and operation there is subsequently no potential for impact on downstream Natura 2000 habitat in Dublin Bay located some 18km from the subject site.

Recent water quality assessments show that Dublin Bay meets the criteria for "unpolluted" water quality status (EPA, data until July 2021). The currently under construction upgrade works to the Ringsend WWTP will result in improved water quality by the end of 2023 to ensure compliance with Water Framework Directive requirements.

The proposed development will have no additional surface water runoff during a storm event over and above the current greenfield run-off rate and will therefore have no impact on the current water quality in any overflow situation at Ringsend WWTP.

In applying similar restrictions to the above named other local development sites and in compliance with the GDSDS and SuDS treatment train design philosophy, the combined greenfield run-off rates will have a negligible effect on the receiving waters.

The wastewater from the proposed development is to be discharged to the Irish Water infrastructure and ultimately treated downstream at the Ringsend Wastewater Treatment Plant (WWTP) prior to discharge to Dublin Bay. Environmental Report (AER 2020) shows it is currently operating for a peak loading of 2.27million PE while originally designed for 1.64million PE. However, the current maximum hydraulic load (832,269$m^3$/day) is less than the Peak hydraulic capacity as constructed (959,040$m^3$/day), i.e., prior to any upgrade works. These upgrade works have commenced and are expected to be fully complete by 2025.

Even without upgrade to the WWTP, the peak effluent discharge from the site is calculated at 13.4 l/s (which equates to c.0.12% of the peak hydraulic capacity at Ringsend) for the proposed development, would not impact on the overall water quality within Dublin Bay and therefore would not have an impact on the current Water Body Status (as defined in the Water Framework Directive).

Implementation of the mitigation measures described in section 6.6.2 will prevent and minimise the potential impacts of the above risk sources.

Assessment was considered the effect of cumulative events such as release of sediment laden water combined with a hydrocarbon leak. As there is adequate assimilation and dilution between the site and the Natura 2000 18km downstream of Boherboy, it is concluded that there will be no perceptible impact on water quality at the Natura 2000 site as a result of construction or operation arising from the proposed development or with that of other proposed developments or planned development pursuant to statutory plans in the Greater Dublin, Meath and Kildare areas discharging to Ringsend WWTP.

In the received Irish Water (IW) Confirmation of Feasibility letter, it is noted that connection can be provided without upgrade to the watermain network. IW have assessed this application and other local developments in combination and it can be concluded that is sufficient capacity within the network to minimise the cumulative impacts.

## 9.8 Predicted Impacts

### 9.8.1 Construction Phase

Implementation of the measures outlined in Section 9.6 will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term.

### 9.8.2 Operational Phase

#### 9.8.2.1 Surface Water Infrastructure

In providing the proposed SuDS measures and interception of the "first flush" rainfall events, there will be a reduction in the S/W run-off in extreme events. This will therefore increase the capacity of the receiving waters, i.e., the Corbally Stream. The use of SuDS systems will remove polluting matter from the first flush of rainfall event, which will improve the overall storm water quality leaving the site.

In providing the flood compensatory area detailed in the Kilgallen & Partners Site Specific Flood Risk Assessment, there will be an increased storage area for the Q100 + 10% Climate Change storm event and therefore reduce the risk of overtopping in extreme events.

#### 9.8.2.2 Foul Drainage

Subject to the local infrastructure upgrades requested by Irish Water, there is sufficient capacity in the foul drainage network as confirmed in the IW issued Confirmation of feasibility and subsequent Statement of Design Acceptance (refer to Appendix 7A).

At peak flows there will be a c.0.12% increase in the peak hydraulic capacity of wastewater to be treated in the Ringsend WWTP.

#### 9.8.2.3 Potable Water

The proposed development will reduce the spare capacity in the local water network, but as with the wastewater, Irish Water have assessed the infrastructure and have determined that there is sufficient capacity in the network to accommodate the proposed development. Connection to the network is "*Feasible without infrastructure upgrade by Irish Water*" has been confirmed in the Irish Water Confirmation of Feasibility and the Statement of Design Acceptance reports issued (refer to Appendix 6A of Volume III of this EIAR for further details).

#### 9.8.2.4 ESB Infrastructure

The proposed development has been designed in accordance with the ESB Networks requirements. The predicted impacts on power and electrical supply will be long-term, neutral and imperceptible.

It is noted in the CRU "Tomorrow's Energy Scenarios 2019 Ireland System Needs Assessment Planning our Energy Future" outlines the impact of power in the Dublin Region and the Eirgrid requirement to ensure that sustainable energy is provided.

#### 9.8.2.5 Telecoms Infrastructure

Potential impact for telecoms is considered to be negligible as the broadband capacity of the additional 655nr dwellings will not, on a diversity basis, exceed the current networks of Virgin, Eir and Siro fibre networks to be exceeded. On a simple basis 655GB/s would be required if all units are streaming large files at the same time, in practical terms the network switches for development of this size would equal a large office building housing 1,400 persons which requires 2 nr 10GB fibre connections to meet the demand of the building

## 9.9 "Do Nothing" Scenario

The "Do Nothing" scenario would involve no change of use of the greenfield lands, and therefore no further impact to the material assets – built services would exist.

## 9.10 Residual Impacts

### 9.10.1 Construction Phase

Implementation of the mitigation measures as discussed in Section 9.6 above will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term and negligible.

### 9.10.1 Operational Phase

Due to the development of the lands, there will be an increase in demand for water, wastewater, electrical power, gas and telecommunications supply.

There is existing infrastructure network available local to the site and available capacity, subject to upgrades, to facilitate the demands this development will impose.

The development of the lands will be constructed in phases, with the final phase being due for completion circa 2027.

## 9.11 Monitoring

Proposed monitoring during the operational phase in relation to the material assets/built services are as follows:

Upon completion and handover of the development, the surface water infrastructure will be taken in charge by SDCC and maintained, monitored and inspected going into the future.

The water use withing the development will be monitored by Irish Water using the required bulk water meters and will be maintained and monitored for leaks by IW.

The foul pumping station will be monitored by IW/SDCC via the SCADA telemetry system already in place for pumping stations (refer to Chapter 6.6.2). The foul drainage infrastructure will be owned, inspected, maintained and managed by Irish Water when handed over at completion stage.

The electricity network will be monitored by ESB networks. Telecoms will be monitored by EIR and Gas Networks Ireland will monitor the existing gas network.

## 9.12 Reinstatement

The S/W outfalls to the Corbally Stream will require localised landscaping reinstatement and reseeding. Specific details of which will be agreed between the Landscape Architects and the SDCC Public Realm Department in advance of works commencing.

The installation of the offsite foul sewer outfall pipe crossing Carrigmore Park will necessitate localised landscaping and reseeding of grass along the pipeline route. Specific details of which will be agreed between the Landscape Architects and the SDCC Public Realm Department in advance of works commencing.

The potable water connection in Boherboy Road will require localised road reinstatement is accordance with the requirements of SDCC Roads Department.

New road connections into Corbally and Carrigmore will require localised reinstatement of the tie-in points with existing kerbs/paths and surfacing. These will be carried out in accordance with the requirements of SDCC Roads Department.

Withing the boundary of the site is considered new construction and no reinstatement will be required.

## 9.13 Difficulties in Compiling Information

There were no particular difficulties encountered in compiling this chapter of the EIAR.

## 9.14 Conclusion

The above has detailed the assessments carried out, potential impacts and required mitigation measures to be implemented in relation to the Material Assets: Built Services for the proposed development.

Baseline status for all the drainage, water, power and utilities have been assessed and the relevant impacts and ,where necessary, mitigation measures have been identified.

Irish Water (IW) are the owners/key stakeholders of the existing potable water and foul drainage infrastructure on and near the site. IW have been extensively consulted with and their specific requirements ascertained and have been complied with in the submission documents. Subsequently Irish Water have received the technical submissions in advance of planning lodgement and they have reviewed, assessed and approved the foul drainage and potable water in terms of capacity and compliance with the IW codes of practice and standard details. The CoF and Statement of Design Acceptance letters can be viewed in Appendix 6A of Volume III of this EIAR.

The mitigation measures proposed will be implemented as part of the obligations arising of a successful planning application and connection agreements with Irish Water, ESB Networks and the relevant utility companies.

There are no significant impacts arising from the assessment of the Material Assets: Built Services.

## 9.15 References


- Land Surveys Topographical mapping.
- Geological datasets available at www.gsi.ie
- Environmental Protection Agency web portal available at https://gis.epa.ie/EPAMaps/
- Subsoil datasets available at http://gis.teagasc.ie/soils/map.php
- Ground Investigations Ireland Ltd site soakaway report
- SDCC County Development Plan 2016-2022
- OPW Eastern CFRAM study available at https://www.cfram.ie/pfra/
- OPW Flood Hazard Mapping website available at http://www.floodmaps.ie/
- RMA - "Drainage and Water Infrastructure Engineering Report"
- Kilgallen & Partners – Site Specific Flood Risk Assessment
- Gas Networks Ireland - Cork Design Office
- ESB Networks
- CRU "Tomorrow's Energy Scenarios 2019 Ireland System Needs Assessment Planning our Energy Future"
- COMMISSION REGULATION (EU) 2017/1485
- architects' drawings no's PL02-04
- All Reports as referenced in the application document by all members of the developer's design team.
- HSA "Code of Practice For Avoiding Danger From Underground Services"
- Guidelines for Managing Openings in Public Roads, 2017, as published by Department of Transport, Tourism and Sport.

# 10.0 Material Assets: Transportation

## 10.1 Introduction

This chapter of the EIAR 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 EIAR has been prepared by:

**Ronan Kearns**, BA, BAI, MSc, MBA, CEng MIEI, Chartered Engineer

Ronan is a Chartered Engineer with 17 years' post graduate experience. Projects worked on include roads, drainage and civil infrastructure design and project management for residential, retail, data centres and commercial developments from feasibility through to construction.

Since graduating, Ronan has worked in civil engineering primarily focused on development planning, design and management. Ronan led numerous planning applications and infrastructure designs for a variety of developments. These developments have ranged from small scale residential projects to Strategic Housing Developments for up to 650 units.

| From | To | Qualification | University / Institute |
|---|---|---|---|
| Sept 2013 | June 2015 | **Master of Business Administration (MBA) (2.1)** | Dublin Institute of Technology |
| Sept 2007 | June 2009 | **MSc in Engineering Science (2.1)** | Trinity College Dublin |
| Sept 2000 | June 2004 | **B.A, B.A.I in Civil, Structural & Environmental Engineering (2.1)** | Trinity College Dublin |
| 2009 | To present | **Chartered Member** | Engineers Ireland |

This chapter outlines the following:

- the methodology utilised in preparing this assessment;
- the receiving environment at the application site and surroundings;
- the characteristics of the proposal in terms of physical infrastructure;
- the potential impact that the proposed development is likely to produce;
- the predicted impact of the proposal and its effects on the local road network; and
- the remedial or reductive measures required to prevent, reduce or offset any significant adverse effects.

### 10.1.1 Background

As part of the SHD planning process numerous meetings, both statutory (Section 247) and non- statutory, where held with the Senior Executive Engineer, Transportation of South Dublin County Council in addition to the formal Pre-Application Consultation Meeting with An Bord Pleanála.

### 10.1.2 Methodology

The approach to this assessment accords with policy and guidance both at a national and local level. Accordingly, the adopted methodology responds to best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate this method of analysis.

The methodology adopted for this report can be summarised as follows:

**Existing Traffic Flow Assessment**: - Baseline traffic counts were undertaken on the in March 2020 prior to the first Covid 19 lockdown.

**Existing Transport Infrastructure**: - Pinnacle Consulting Engineering collected information on public transport, walking and cycling in the area of the proposed development.

**Development Proposals**: - Description of proposed development, including proposed improvements to the road accesses to the site and a review of parking and servicing provisions, and facilities for pedestrians and cyclists.

**Development Trip Generation Figures**: - Based on the schedule of accommodation of the proposed development, Pinnacle Consulting Engineering derived trip rate data and developed development traffic flows, which were assigned to the existing network having regard for traffic patterns on Boherboy Road and the surrounding network.

**Percentage Impact**: - The development traffic impact on key junctions was considered, taking account for traffic growth and committed development traffic.

**Assessment of Junction Capacity**: - The operation of key junction, with and without the proposed development, was undertaken, to determine future operation and any requirements for mitigation measures.

The following documents are referenced in this report.

- Environmental Protection Agency (EPA) Guidelines on the information to be contained in the EIAR;
- Transport Infrastructure Ireland (TII) (Formerly National Roads Authority) Traffic and Transportation Assessment Guidelines;
- Traffic and Transport Assessment Guidelines' (May 2014) National Road Authority;
- 'Traffic Management Guidelines' Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- 'Guidelines for Traffic Impact Assessments' The Institution of Highways and Transportation;
- South Dublin County Development Plan 2016-2022;
- Review of relevant available information including where available Development Plans, existing traffic information and other relevant studies;
- Site visit to gain an understanding of the site access and observe the existing traffic situation;
- Consultations with South Dublin County Council (SDCC) Roads Department to agree the site access arrangements and determine the scope of the traffic analysis required to accompany a planning application. Detailed estimation of the transport demand that will be generated by the development. The morning and evening peak times are assessed as well as an estimation of the construction stage traffic;
- Assessment of the percentage impact of traffic on local junctions, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport.

## 10.2 Receiving environment

This section considers the baseline conditions, providing background information for the site in order to determine the significance of any traffic implications. This section also considers the existing accessibility of the site by sustainable modes of transport.

### 10.2.1 Site location

The application site is located approximately c. 13.7 Km southwest of Dublin City Centre and is bounded to the north by Carrigmore Estate; Corbally Estate to the east; agricultural land to the west and Boherboy Road to the south.

### 10.2.2 Local road network

The road network surrounding the site provides a variety of movement functions. Boherboy Road links Tallaght in the east with Saggart in the West. The N82 provides access to Dublin via the M7/N7 and to other inter urban motor ways via the M50.

Boherboy Road, Corbally Estate and Carrickmore Estate will be the primary access points into the proposed development.


**Fig. 10.1 – Site Location and Local Road Network**

These routes provide for pedestrians, cyclists and motorists alike and a general commentary on these facilities is presented below:

**Boherboy Road**

Boherboy Road is a local country road forming a priority-controlled junction with the N81 to the east and a signal-controlled junction with Church Street/Castle Street to the west.

The carriageway width is approximately c6.0m along the site frontage with no footpaths along the site frontage

Boherboy Road has a country road character providing access to Saggart from the N81. A speed limit of 60km/h was noted on Boherboy Road along the site frontage.

No cycle facilities are provided along Boherboy Road.

**Fig. 10.2 – Boherboy Road (looking west)**

**Fig. 10.3 – Boherboy Road (looking east)**

### N81

The N81 road is a national secondary road starting at the M50 motorway and ending in Tullow, County Carlow.

The carriageway width is approximately 11.0m at the junction with the Boherboy Road. As the N81 leaves

Tallaght the speed limit increases to 80km/h.

There is limited pedestrian infrastructure adjacent to the junction with the Boherboy Road. No cycle facilities are provided along the R147 Dublin Road.

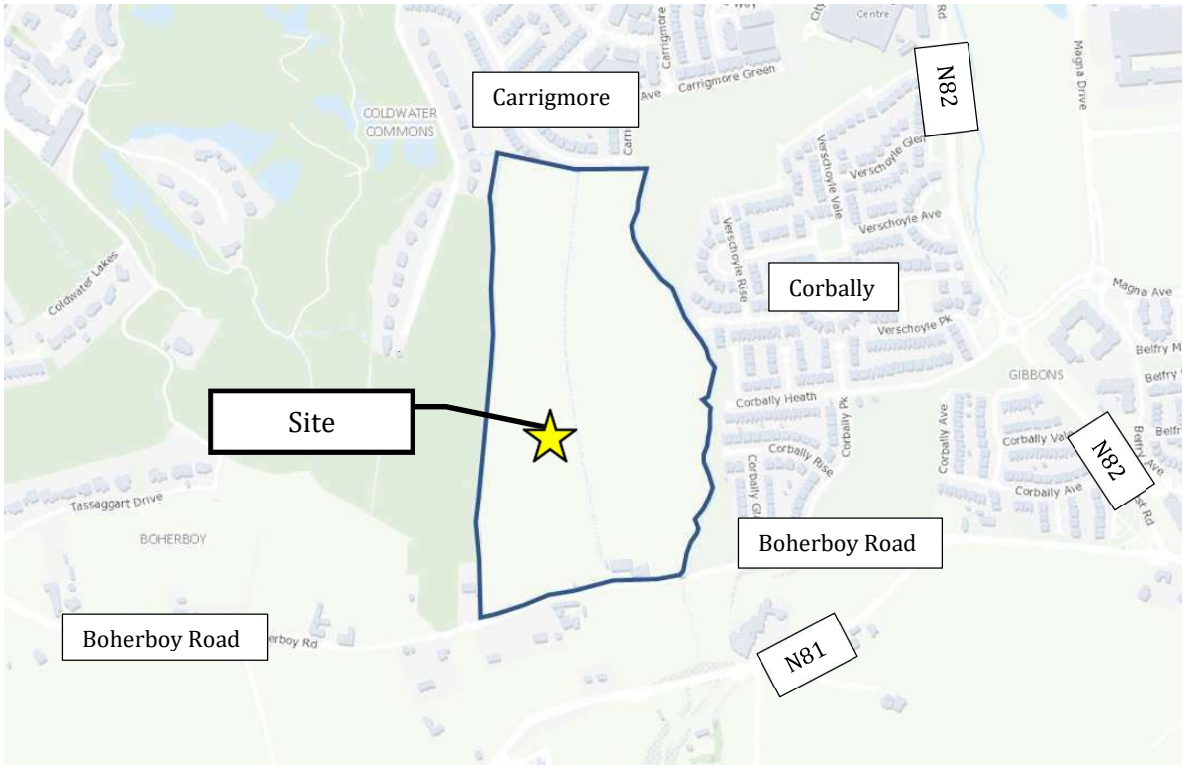



**Fig. 10.4 - Site location and local road network (Source: GeoHive)**

### 10.2.3 Potential/Proposed/Committed Infrastructure Works

There are several potential new infrastructure schemes in the vicinity of the proposed development site. Consideration has been given to the impact that these infrastructure schemes may have on the development. This will ensure that provision is allowed for these schemes to be delivered in the future.

A summary of the potential road infrastructure schemes is outlined below.

**Bus Connects**

The emerging Bus Connects Dublin plan (Ref: Core Bus Corridors Project Report June 2018) proposes revisions to Dublin's bus system through:

- building a network of new bus corridors on the busiest bus routes to make bus journeys faster, predictable and reliable;
- completely redesigning the network of bus routes to provide a more efficient network, connecting more places and carrying more passengers;
- developing a state-of-the-art ticketing system using credit and debit cards or mobile phones to link with payment accounts and making payment much more convenient;
- implementing a cashless payment system to vastly speed up passenger boarding times;
- revamping the fare system to provide a simpler fare structure, allowing seamless movement between different transport services without financial penalty;
- implementing a new bus livery providing a modern look and feel to the new bus system;

- rolling out new bus stops with better signage and information and increasing the provision of additional bus shelters; and
- transitioning - starting now - to a new bus fleet using low emission vehicle technologies.

The Dublin Area Bus Network Redesign (which is currently under review following the public consultation stage) aims "to provide a network designed around the needs of Dublin today and tomorrow, rather than based on the past".

Figure 10.5 below presents the proposed public transport provision in the vicinity of the subject site compared to the existing provision. The main difference between the existing and proposed is the inclusion of a new bus interchange within the Citywest Shopping Centre located in the immediate vicinity of the subject development site. The details of this potential future bus stop will be decided on a tri-party negotiation between the landowner, the NTA and the bus operator. As the bus stop is a terminus, in addition to operating as an interchange, a layover demand will be placed on it where a driver can rest and take a break. The location / layout of the terminus is yet to be confirmed but it is not expected to be at the expense of car parking.

As part of the Dublin Area Bus Network Redesign Dublin Bus routes 65B and 77a will be replaced by a new Route W8 between Citywest and Tallaght which is also proposed to provide a direct service to Maynooth / Celbridge. Improved service frequencies are proposed to destinations to the east via several proposed new routes.

The existing 77x bus route will be replaced by new orbital routes (S6 / S7) which will provide direct Dublin Bus route 69 is proposed to be replaced by a new route 63 which does not result in a change to the existing service between Citywest and the City Centre.

Go-Ahead Bus route 175 is not proposed to be subject to change as part of the Bus Connects scheme.

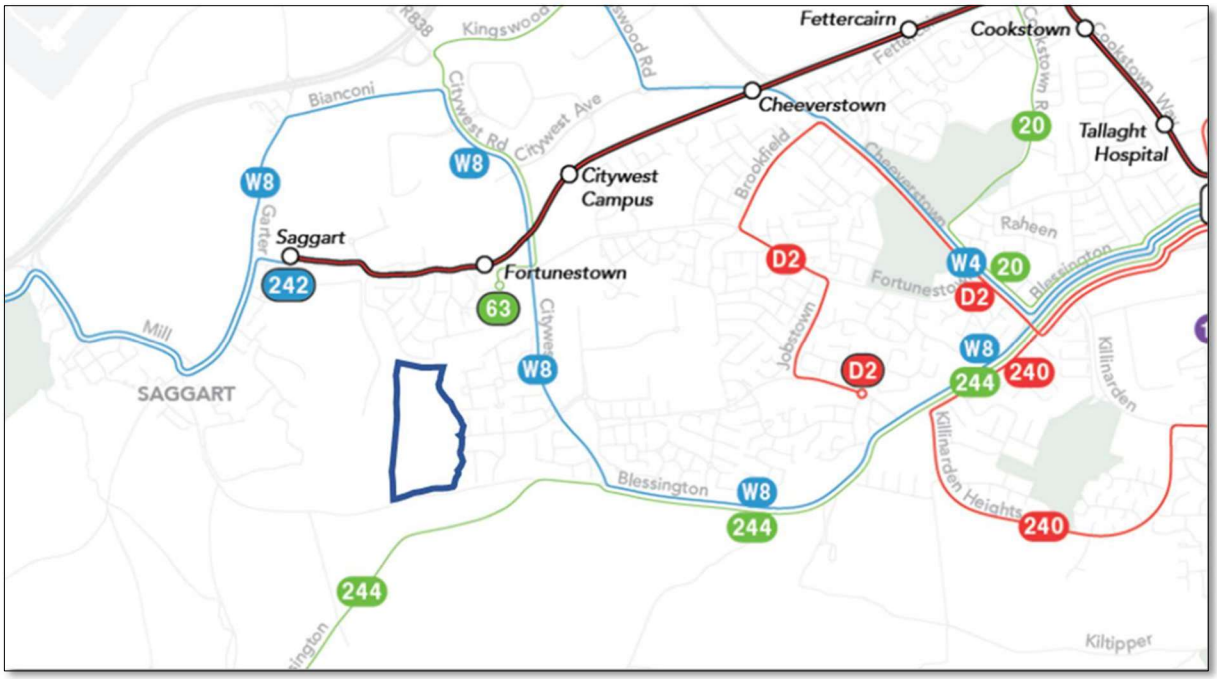



**Fig. 10.5 - Bus Connects (Source: Map 2 of Bus Connects)**

**Road Improvement Schemes**

Citywest Avenue Extension

Primary Road which will run in an east-west direction from Fortunestown Way to Citywest Road.

This is illustrated in Figure 10.6 below.

Objective AM10 states:

"That Citywest Avenue (and its extension when constructed) will act as a primary movement corridor that bypasses the District Centre and allows the junction between Fortunestown Way/Lane and Citywest Road to be upgraded to a pedestrian and cyclist friendly junction."

A significant section of the Citywest Avenue Road was completed as part of a previous planning application (Ref. SD/04A/0099). The remaining section is proposed to be completed as part of the approved Cooldown Commons Strategic Housing Development scheme (Pl. Ref. SHD3ABP-302398-18).

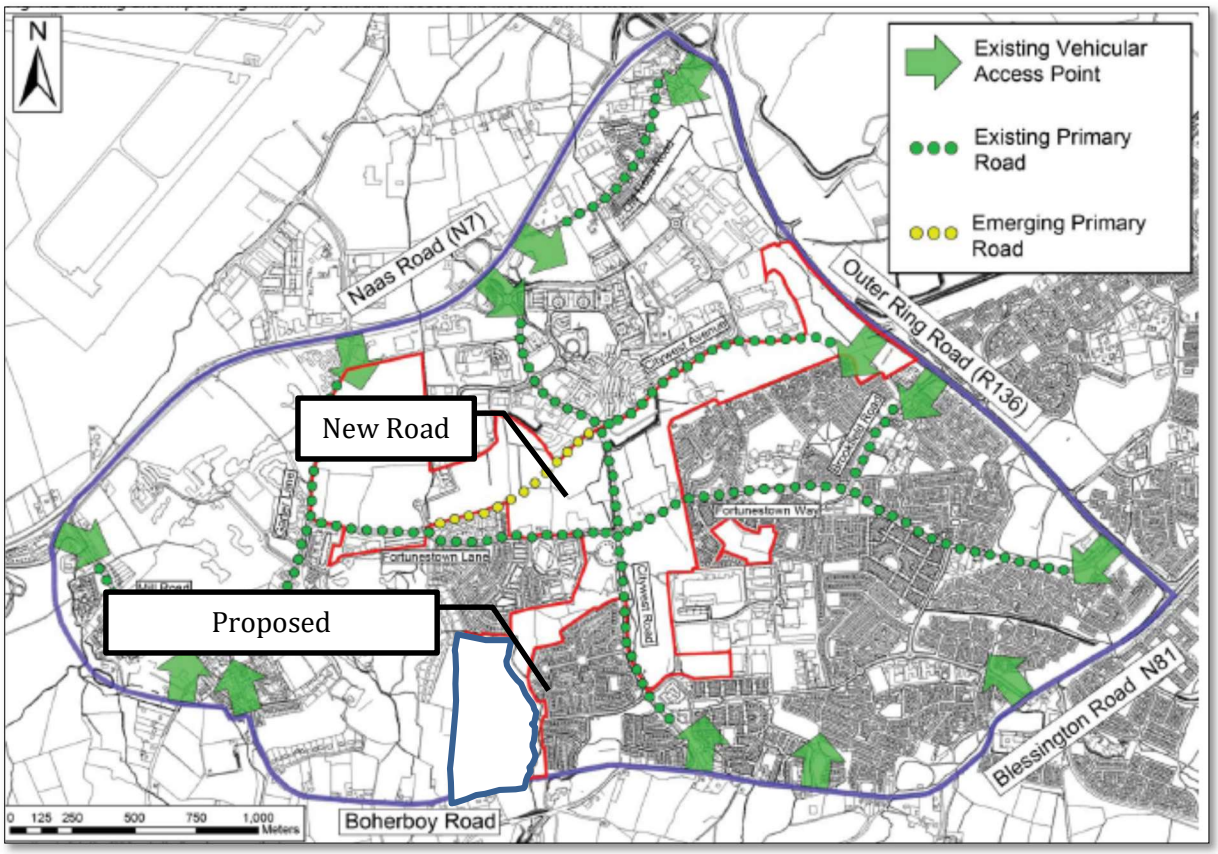



**Fig. 10.6 - Proposed Road Infrastructure (Extract of Fig 4.2 Fortunestown LAP)**

N81 Upgrade

Kildare NRDO recently published a route corridor option for the N81 Hollywood Cross to Tallaght Road Improvement Scheme. The road improvement scheme was not included in the Government's Capital Investment Plan (CIP), which provides the financial and strategic framework for TII's activities until 2021.

During the route selection process, the Applicant met with Kildare NRDO to discuss options and how it may affect either project. The Applicant is not proposing any changes to the carriageways of the N81 or Boherboy Road. Therefore, there is the potential to connect into the proposed roundabout on Boherboy Road as part of the Kildare NRDO scheme in the future.

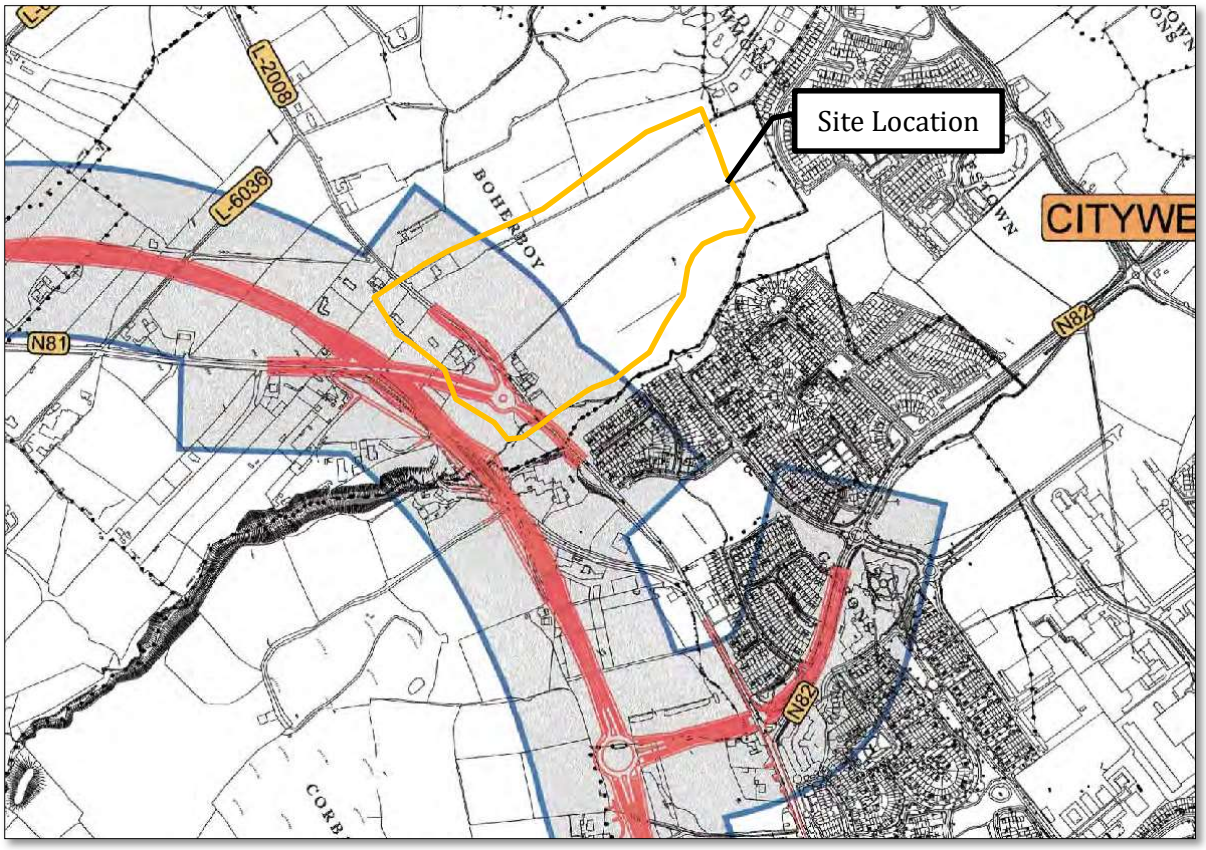



**Fig. 10.7 - Hollywood Cross to Tallaght Road Improvement Scheme Extract**

### 10.2.4 Baseline traffic data

It is proposed that the subject site will be accessed directly from the Boherboy Road with 3 No. vehicular access points and a pedestrian access on the southern end of the site.

The proposed site access points are illustrated in the figure 10.8 over.


**Access No. 1 is from the Boherboy Road**

**Access No. 2 connects into Corbally**

**Access No. 3 connects into Carrigmore**

**Fig. 10.8 – Proposed Access (Source: Davey-Smith & MCORM Architects)**

Primary vehicular access to the development will be via Boherboy Road (Access No. 1), via Corbally Estate (Access No. 2) and via Carrigmore (Access No. 3). These access points coincide with the pedestrian access points. Additional pedestrian access points are located through the district park and onto Boherboy Road.

In order to quantify the volumes of traffic movements at key points on the road network adjacent to the site, a set of classified turning movement traffic counts were commissioned. The location of these counts was agreed in consultation with the senior executive engineer of South Dublin Council's Transportation Department.

Accordingly, classified counts were carried out on the 3rd of March at the following junction locations:

- Site 1 – Site Access
- Site 2 – Boherboy Road/N81
- Site 3 – N81/N82 Signal Controlled Junction
- Site 4 – N82/Corbally Heath Roundabout
- Site 5 – N82/ Fortunestown Land Signal Controlled Junction
- Site 6 – Carrigmore Estate/Fortunestown Lane Priority Controlled Junction.
- Site 7 – Church Road/Fortunestown Signal Controlled Junction
- Site 8 – Boherboy Road/Saggart Signal Controlled Junction.

The surveys were carried out on the dates identified above to ensure that flows were representative of normal term time and hence not affected by school holidays or other public holidays or events. As such they provide an appropriate and robust representation of a neutral month during a period of normal school and employment activity. The surveys are designed to provide representative values encompassing AM and PM peak periods during normal traffic conditions.

The locations of the surveys are each pertinent to the proposal in terms of being at key nodes in the road network that would be affected by traffic assignment and distribution of flows associated with the development site.

The location of the survey points is depicted in Figure 10.9 over.


**Fig. 10.9 - Survey Location**

A planning search was undertaken to identify any developments that have planning permission but are not yet implemented or any schemes that are implemented but are as of yet un-let or empty.

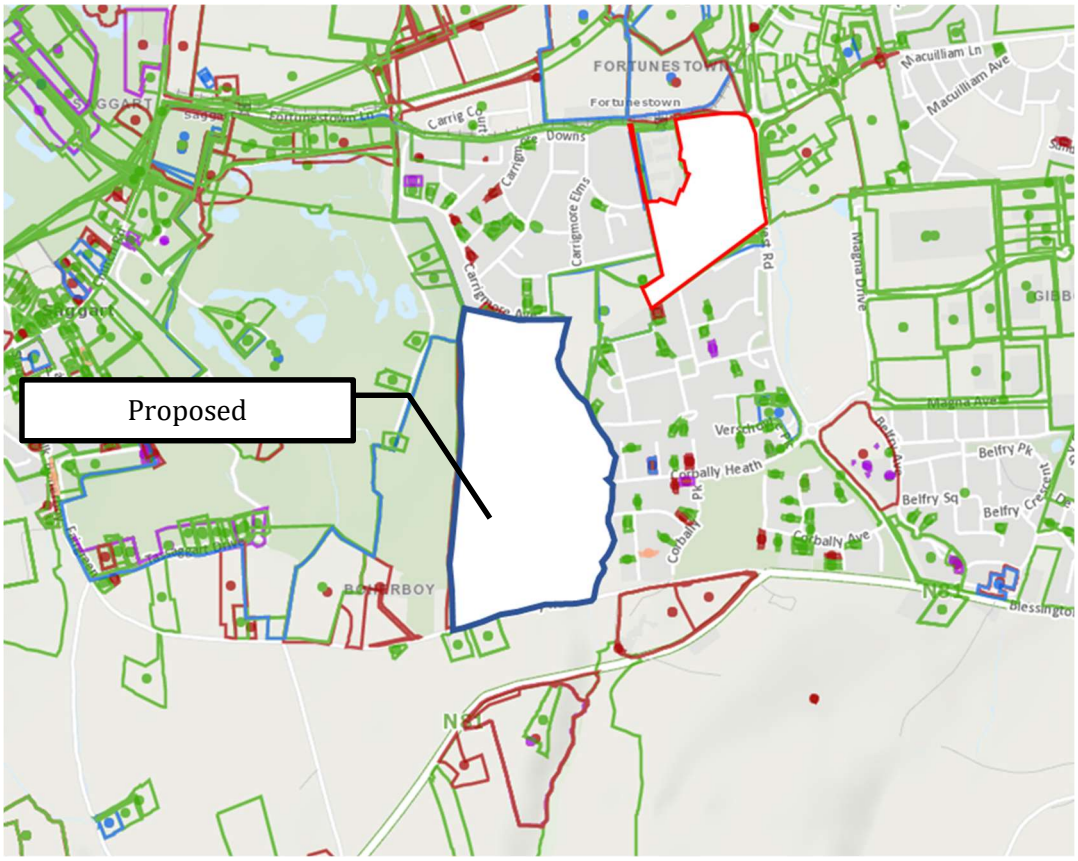



**Figure 10.10 - Planning Applications Overview (Source: South Dublin County Council)**

The following applications were deemed the influence the study area of the proposed site:

**Register Reference:** SHD3ABP-305556-19

**Status:** Granted subject to conditions

**Development Description:** '*Mixed use residential scheme (total GFA 26,929sq.m) comprising 6 blocks with balconies/terraces to be provided on all elevations at all levels for each block, to provide 290 apartment units and associated residential amenity facilities, a childcare facility, 4 retail units and 2 café/restaurant units. A total of 153 car parking spaces (including 2 car club spaces) are proposed at surface level and existing basement level of the Citywest Shopping Centre to serve the development to include the reallocation of 37 existing surface level spaces; 67 new surface level spaces and the reallocation of 49 spaces from commercial to residential use at existing basement level of the Citywest Shopping Centre*.'

**Register Reference: SHD3AP-306602-20**

**Status:** Granted subject to conditions

**Development Description:** **'***Construction of a residential development of 463 dwellings comprising 353 apartments, 89 houses and 21 duplex apartments, creche (c.587.8sq.m) and community building (c.141sq.m) as follows: (A) 353 apartments in 7 apartment buildings (with balconies or terraces [including communal terraces] as follows: Block 1 (6 storeys with a part 7 storey level) of 57 apartments; Block 2(6 storeys with a part 7 storey level) of 47 apartments; Block 3 (6 storeys over undercroft/semi-basement with a part 7 storey level) of 56 apartments with car parking and ancillary plant/storage at basement level; Block 4 (6 storeys over undercroft/semi-basement with a part 7 storey level) of 56 apartments with car parking and ancillary plant/storage at basement level; Block 5 (6 storeys with a part 7 storey level) of 47 apartments; Block 6 (6 storeys over undercroft/semi-basement with a part 7 storey level) of 58 apartments with car parking and ancillary plant/storage at basement level; Block 7 is 6 storeys of 32 apartments (creche at ground and first floor) with outdoor play area. (B) 89 houses; House types 1A, 2A, 4, 4A- 3 storey to front [2 storey to rear] remainder of house types 2 storey. (C) 21 duplex apartments in 2 3-storey buildings. (D) Single storey community building including management office, 3 single storey ESB substations, single storey bicycle and bin stores. (E) 401 car parking spaces (including 3 car sharing spaces) to serve overall development and 364 bicycle spaces ([for apartments] with apartment bicycle storage provided internally at ground floor level for apartment blocks 1-7). (F) Provision of public open space areas within the development (including playground areas and communal open space areas); all ancillary landscape works, public lighting, planting and boundary treatments including regrading/re-profiling of site where required as well as provision of footpaths and cycle paths. (G) Vehicular access to the proposed development will be from the Citywest Road (N82) and will include pedestrian crossings and works to facilitate access (including vehicular and footpath/bridges over stream/ditch), secondary vehicular and pedestrian access to boundary to lands to north (currently under construction) and pedestrian to boundary to Magna Drive. (H) Provision of surface water and underground attenuation and all ancillary site development work. The application contains a statement setting out how the proposal will be consistent with the objectives of the relevant SDCC Development Plan.'*

**Register Reference: SHD3ABP- 305563-1**

**Status:** Granted subject to conditions

**Development Description:** **'***(1) The demolition of 5 structures on site, total area measuring 359sq.m, comprising 2 habitable dwellings and 3 associated outbuildings/sheds located to the northwest of the site; (2) development of 406 residential homes; (3) a childcare facility (518sq.m*

*GFA); (4) 1 commercial unit (67.7sq.m GFA); (5) reservation of a school site (1.5ha); (6) new vehicular, cycle and pedestrain access from Main Street; (7) continuation of Newcastle Boulevard forming part of a new east-west link street; (8) a new Public Park (2ha); (9) pocket parks and greenway together with associated internal access roads, pedestrain and cycle paths and linkages; (10) 1 single storey marketing suite (81sqm) and signage (including hoarding) during the construction phase of development only and (11) all associated site and development works.The overall site comprises lands to the south of Main Street (c.15ha) together with 3 additional infill sites at the corner of Burgage Street and Newcastle Boulevard (c. 0.8ha); No. 32 Ballynakelly Edge (c.0.05ha); and Ballynakelly Rise (c.0.18ha)'*

**Register Reference: SHD3ABP-308088-20**

**Status:** Granted subject to conditions

**Development Description:** **'***Demolition of 5 existing residential properties and associated outbuildings and the construction of a residential development of 204 units, comprising 151 Houses (including Duplexes) and 53 Apartments. The basement for the apartment block includes 49 car parking spaces, 87 bicycle parking spaces, circulation, plant areas, refuse storage areas and other associated facilities. There are an additional 12 visitor bicycle parking spaces for the apartment block provided at surface level. Access to the apartment block is directly from Stoney Hill Road via a new access from an existing dropped kerb. The development also includes 306 surface car parking spaces, 169 bicycle parking spaces (comprising of 99 spaces at basement and surface for the apartment block, 60 secure spaces for the apartments in the duplex units and 10 visitor parking spaces at surface level), communal open space for the apartments, public open space including a childrens playground and a linear park to the south of the site. New vehicular entrances from Stoney Hill Road (one to the apartment building to the north of Stoney Hill Road and a second to the remainder of the development further south on Stoney Hill Road). The proposed development also includes a 2 storey creche building plus and outdoor play area located on an existing undeveloped portion of the Peyton site located to the west of Stoney Hill Road.'*

Note that the above SHD applications take into account the majority of the recently permitted developments in the Boherboy, Saggart and Citywest area.

An allowance has been made for the school site, with appropriate linked trip reduction has also been allowed for.

These developments will be included the modelling of the impacted junctions. Where a Traffic & Transport Statement is available the figures will be taken directly. If no Traffic & Transport Statement is available TRICS will be used to estimate flows from the development and traffic surveys used for distribution.

These trips were assigned to the local road network and combined with the traffic counts referenced above to form the baseline traffic data.

### 10.2.5 Pedestrian and cycling facilities

There is no footpath located along the site frontage. The public footpath terminates at the junction between the N81/Boherboy Road.

There is no cycle network located along the site frontage. Existing cycle routes identified by the National Transport Authority (NTA) in the vicinity of the site are indicated in Figure 10.11 over.


**Fig. 10.11 - Existing Cycle Routes (Source: NTA)**

### 10.2.5.1 Proposed cycle improvements

Under the National Transport Authority's Cycle Network Plan for the Greater Dublin, the Dublin South West Sector extends outward from the twin corridors of Camden Street and Clanbrassil Street in the city centre, through the inner suburbs of Rathmines and Harold's Cross, to serve the areas of Terenure, Kimmage, Walkinstown, Tallaght, Firhouse and Rathfarnham. There is considerable overlap between the West and South West sectors, with interconnecting routes between the two. Some radial cycle routes originate in one sector at the city centre but end up in the neighbouring sector

In accordance with the National Transport Authority's Cycle Network Plan for the Greater Dublin area the following improvements to the local cycle networks are proposed:

- Route 8A follows Crumlin Road past the Children's Hospital, Bunting Road to Walkinstown, through Ballymount to cross the M50 at Junction 10 and out to Citywest / Fortunestown via Belgard; Route 8B

- Route 9C is an alternative to the Harold's Cross route from Route 8C at Clogher Road via Stannaway Road west of Kimmage and then along Wellington Lane to join Route 9A at Spawell to connect to Tallaght. It also provides a continuation from Route 9A west of Tallaght via Fortunestown and Citywest to Saggart.
- Route 9D would provide a traffic-free option branching off Route 9A at Kimmage Cross Roads and following the River Poddle Greenway to Tymon Park where a new bridge is required over the M50 in the centre of the park to connect with Castletymon Road and rejoin Route 9A. West of Tallaght it provides a loop through Jobstown along the N81 and then northward into Citywest
- Slade Valley Trail: a potential route southward from the villages of Rathcoole and Saggart along the upper reaches of the Camac River to Brittas at the edge of the Dublin Mountains. This route is an alternative to the very busy N81 Blessington Road and opens up access to a network of quiet rural roads in West Wicklow.
- Saggart / Rathcoole / Newcastle: These 3 villages at the south-western edge of the city have grown substantially in recent decades and now form moderately significant dormitories. There is also a large logistics and warehouse park at Greenogue between Rathcoole and Newcastle that attracts trips by staff as well as numerous truck movements. Rural cycle route D5 is shown on Map RN10 as a link between these 3 satellite settlements along the R120 road and onward via city Route 8A to the greater Tallaght area at Fortunestown. This route continues north-westward along the R405 road from Newcastle to Hazelhatch railway station on the Dublin to Cork line, and from there connects into Celbridge in County Kildare. Route D6 links Newcastle northeastward along the R120 road to Grange Castle and onward to either Clondalkin via Route 8C2 or to Lucan via Route SO7. These two regional roads (R120 and R405) are not comfortable for cycling due to narrow carriageway, bendy alignment and busy traffic including many trucks. Segregated cycle tracks would be required.

The proposed cycle routes are illustrated in Figure 10.12 overleaf:

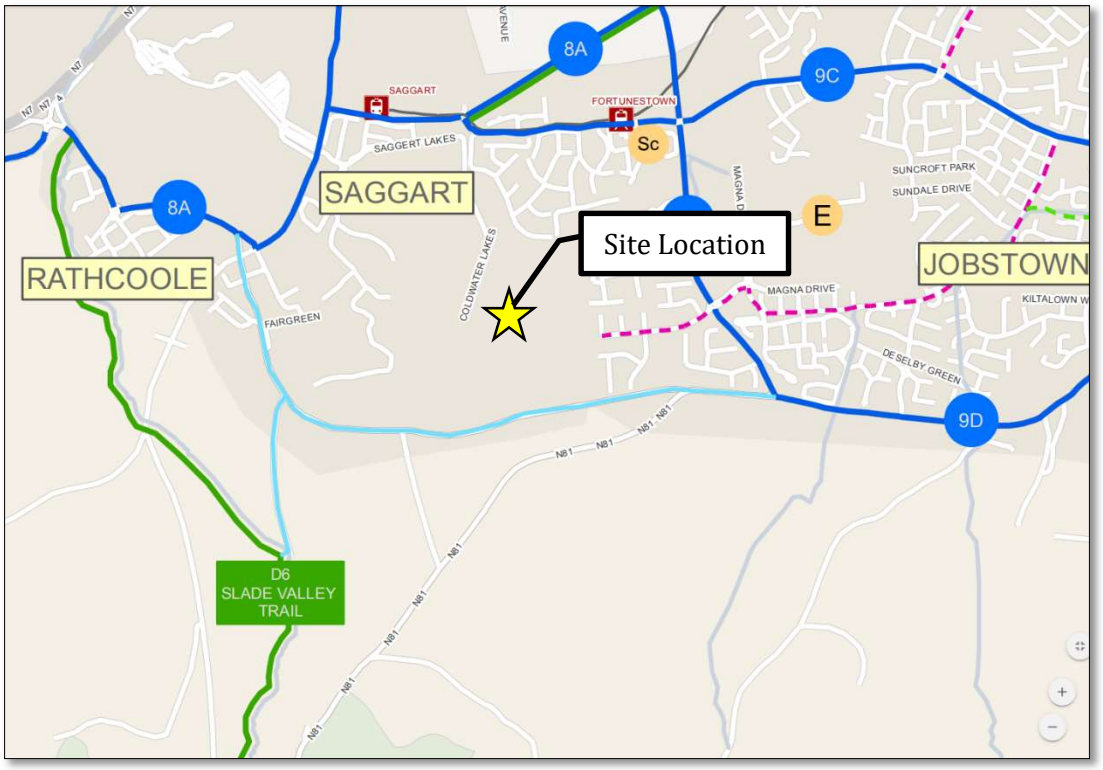



**Fig. 10.12 - Proposed Cycle Network Upgrades (Source: NTA)**

### 10.2.6 Public transport accessibility

#### Background

Local public transport infrastructure is illustrated in the figure below.

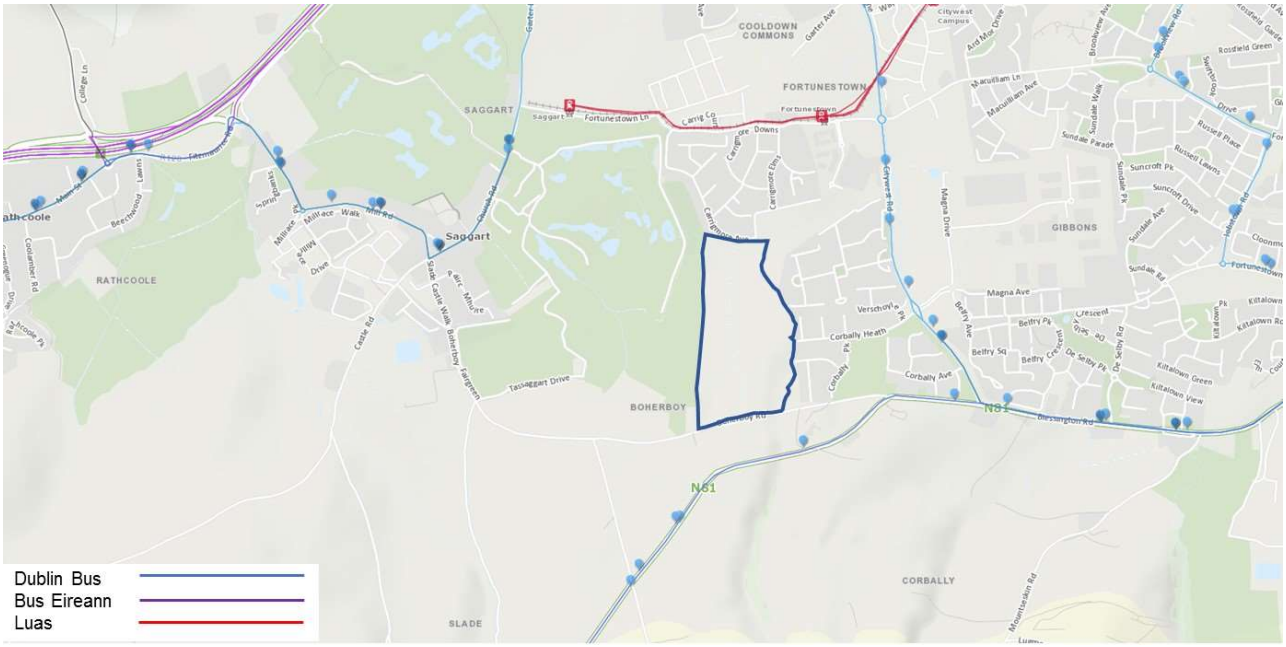



**Fig. 10.13 - Local Public Transport Infrastructure**

## Bus

There are numerous bus operators providing a bus service locally and within walking distance to the site, with further details shown in Table 10.1 below.

| No. | Route | Service | | Mon-Fri | Sat | Sun |
|---|---|---|---|---|---|---|
| 65 | Poolbeg Street - Valleymount Road | Poolbeg Street | First | 05:30 | 05:40 | 08:00 |
| | | | Last | 23:0 | 23:15 | 23:15 |
| | | Valleymount Road | First | 06:30 | 07:10 | 09:30 |
| | | | Last | 00:15 | 00:20 | 00:20 |
| | | Frequency | | Up to 15/day | Up to 112/day | Up to 10/day |
| 65b | Poolbeg Street -Citywest | Poolbeg Street | First | 05:50 | 05:50 | 09:00 |
| | | | Last | 23:30 | 23:30 | 23:30 |
| | | Citywest | First | 06:50 | 07:00 | 08:30 |
| | | | Last | 23:30 | 23:30 | 23:30 |
| | | Frequency | | Up to 18/day | Up to 17/day | Up to 15/day |
| 77a | Ringsend Rd. - Citywest | Ringsend Rd | First | 05:40 | 05:55 | 07:00 |
| | | | Last | 23:25 | 23:25 | 23:30 |
| | | Citywest | First | 06:00 | 06:20 | 08:00 |
| | | | Last | 23:30 | 23:20 | 23:30 |
| | | Frequency | | Up to 14/day | Up to 17/day | Up to 3/day |
| 77x | Citywest - UCD Belfield | Citywest | First | 07.20 | - | - |
| | | | Last | | | |
| | | UCD Belfield | First | - | - | - |
| | | | Last | | | |
| | | Frequency | | 1 per day | - | - |
| 69 | Hawkins St. - Rathcoole | Hawkins St. | First | 06:15 | 06:20 | 10:00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Last | 23:15 | 23:15 | 23:15 |
| | | Rathcoole | First | 06:00 | 06:15 | 11:15 |
| | | | Last | 00:05 | 00:05 | 00:10 |
| | | Frequency | | Up to 20/day | Up to 21/day | Up to 12/day |
| 175 | UCD - Kingswood Avenue | Kingswood Avenue | First | 06:00 | 07:10 | 08:10 |
| | | | Last | 23:20 | 22:15 | 22:15 |
| | | UCD | First | 06:15 | 08:15 | 09:15 |
| | | | Last | 22:15 | 23:20 | 20:05 |
| | | Frequency | | Up to 19/day | Up to 17/day | Up to 16/day |

**Table 10.1 - Local Bus Services**

Measured from the centre of the site, the nearest stop is located approximately 670m (Route A /c. 9 mins walk time) and 1.46km (Route B / c. 19 mins walk time) from the site which equates to 8 minutes walking time. This is illustrated in Figure 10.14.

Route A and Route B provide access to the services outlined in Table 11.1.

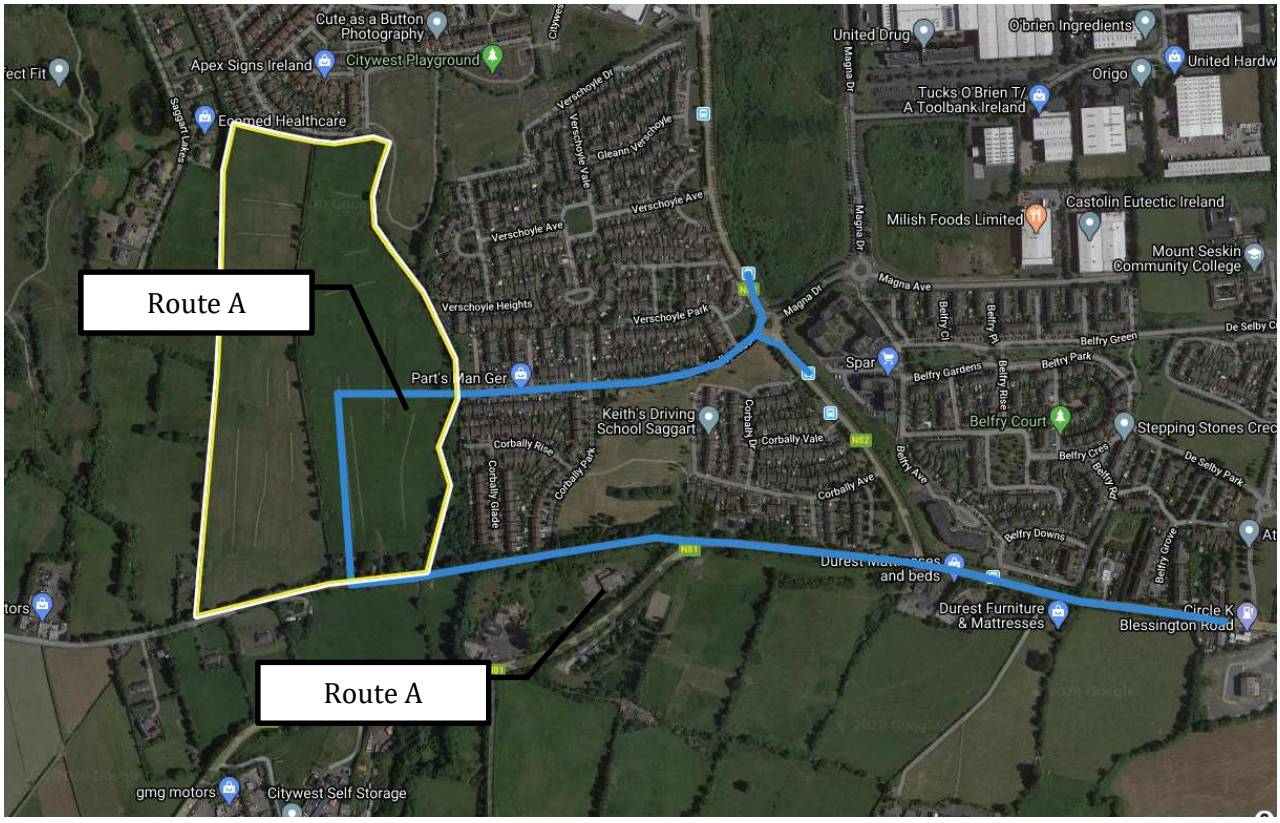



**Fig. 10.14 - Walk Routes (Source: Google Maps)**

## Luas

The Luas Red Line (Saggart/Tallaght to Conolly/The Point) calls at the Fortunestown which is located approximately 950m north of the subject site.

| **Luas Red Line** | | | | | |
|---|---|---|---|---|---|
| Monday – Friday (05:30-00:00) | | **Saturday (06:30-00:00)** | | **Sunday (07:00-23:00)** | |
| Peak | Off Peak | Peak | Off Peak | Peak | Off Peak |
| 3-6 | 6-15 | 7-8 | 10-15 | 11-12 | - |

**Table 10.2 -Luas Green Line Frequency (minutes) – (source www.luas.ie)**

The Luas has a major terminus at the Square, Tallaght which is also a major terminus for Dublin Bus. The Square is served by Dublin Bus with several local routes. Currently timetabled bus services adjacent to the site include the 27 (which has approximately 80 services per day in each direction from Clarehall to Jobstown), the 49 (which has approximately 37 services per day in each direction from Pearse Street to Tallaght), the 54a (which has approximately 30 services per day in each direction from Pearse St. towards Ellensborough / Kiltipper Way), the 65 (which has approximately 14 services per day in each direction from Hawkins Street to Blessington/Ballymore), the 75 (which has approximately 38 services per day in each direction from the Square to Dun Laoghaire), the 76 (which has approximately 40 services per day in each direction from Tallaght to Chapelizod), the 76a (which has approximately 3 services per day in each direction from Tallaght to Blanchardstown Centre) and 77a (which has approximately 56 services per day in each direction from Ringsend to Citywest).


**Fig. 10.15 - Luas Walk Times**

Measured from the centre of the site, the nearest stop is located approximately 950m (c. 10 mins walk time) from the site. This is illustrated in Figure 10.15.

**Accessibility**

Figure 10.16 outlines the distance that maybe covered on a 90minute public transport journey.

A 90-minute public transport journey allows access to areas of employment such as:

- Citywest Business Campus
- Tallaght
- Dublin City Centre
- IFCS

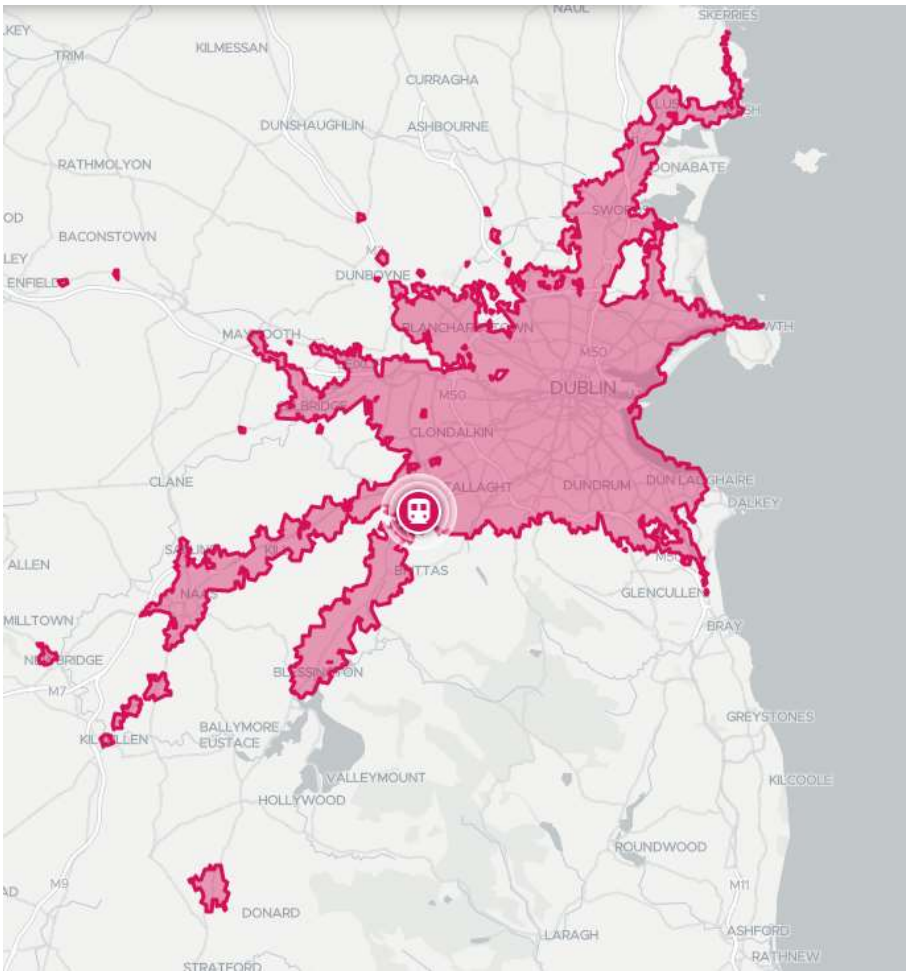



**Fig. 10.16 - Public Transport (90min Travel Time)**

A 90-minute public transport journey allows access from areas such as:

- Lusk (North County Dublin)
- Donard (North Wicklow)
- Dun Laoghaire (West Dublin)
- Maynooth (North Kildare)

This permeability opens up the site to all Third Level Institutions located within Dublin and Kildare (NUIM). It also offers permeability the major amenities located within Dublin City Centre (shopping, entertainment) and the gateway towns into Dublin where the likes of major retail parks are located.

The proposed site is located within 90-minute public transport link to all major Dublin sporting and event venues.

## 10.3 Characteristics of the Proposed Development

The proposed development will include the following primary components:

The proposed development will consist of the following:

Kelland Homes Ltd and Durkan Estates Ireland Ltd are applying to An Bord Pleanála for permission for a strategic housing development at a site at Boherboy, Saggart, County Dublin. To the immediate north of the site is the Carrigmore residential estate, to the west are agricultural lands and a single dwelling, to the east is the Corbally residential estate while to the south is the Boherboy Road. The proposed application represents the development of the entire Boherboy Neighbourhood as identified in the Fortunestown Local Area Plan (2012).

The development will consist of 655 no. dwellings, comprised of 257 no. 2, 3 & 4 bed, 2 & 3 storey detached, semi-detached & terraced houses, 152 no. 1, 2 & 3 bed duplex units in 17 no. 2-3, 3-4 & 4 storey blocks, and 246 no. 1, 2 & 3 bed apartments in 9 no. buildings ranging in height from 2 - 5 storeys, and a 2 storey crèche (693m²).

Access to the development will by via one no. vehicular access point from the Boherboy Road, along with proposed upgrade works to Boherboy Road to include the provision of a roadside footpath along the front of the site at the Boherboy Road, continuing eastwards to the junction with the N81 Blessington Road (for an overall distance of c.370m). The proposed development also provides for pedestrian and cyclist connectivity to the adjoining Carrigmore Park to the north-east, and vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north.

The proposed development provides for (i) all associated site development works above and below ground, including surface water attenuation & an underground foul sewerage pumping station at the northern end of the site, (ii) public open spaces (c. 3Ha), including alongside the Corbally Stream, which will accommodate the provision of pedestrian / cyclist links to Carrigmore Park to the north-east, (iii) communal open spaces (c. 6,392m²), (iv) hard and soft landscaping and boundary treatments, (v) undercroft, basement & surface car parking (914 no. car parking spaces, including EV parking), (vi) bicycle parking (797 no. bicycle parking spaces), (vii) bin & bicycle storage, (viii) public lighting, and (ix), plant (M&E), utility services & 5 no. ESB sub-stations, all on an overall application site area of 18.3ha. In accordance with the Fortunestown Local Area Plan (2012) an area of approx. 1.42Ha within the site is reserved as a future school site.

The red line of application represents a site has an area of 18.3Ha, with the subject two fields having an are of 17.6Ha.

It is proposed to develop this site based on the following schedule of accommodation:

| **Proposed Land Uses** | |
|---|---|
| Land Use | 17.6 Ha |
| Houses | 257 no. |
| Apartments | 152 no. |
| Duplex | 246 no. |
| **Total** | **655 no.** |

**Table 10.3 - Proposed Land Uses**

### 10.3.1 Physical infrastructure

The proposed site access points are illustrated in the figure 10.17 below:


**Fig. 10.17 - Proposed Access (Source: Davey Smith & MCORM Architects)**

Primary vehicular access to the development will be via Boherboy Road (Access No. 1), via Corbally Estate (Access No. 2) and via Carrickmore (Access No. 3).

Permeability will be provided to adjoining developments at various locations. Refer to architects' drawings for more details.

### Servicing

An AutoTrack analysis has been carried on the internal service access to demonstrate its capability to cater for residents and service vehicles such as refuse vehicles. The results of this analysis show that

the proposed development can accommodate the anticipated service vehicles that will serve the proposed development.

### Trip generation – Including Cumulative Assessment

The Trip Rate Information Computer System [TRICS] database has been interrogated to derive trip rates commensurate with developments of the character proposed in this case, notably a 544-unit residential development.

The use of the TRICS database has also enabled the profile of arrivals and departures throughout the day to be assessed and this has served to confirm the choice of the highest respective peak hours for use in the analyses.

This database is a well-established and constantly updated tool used in the determination of generated traffic for developments since it is a substantial source of validated empirical data on the arrival and departure rates for a range of differing types and sizes of developments in a variety of locations.

A full review was undertaken of the apartment trip rates. To that end, TRICS was interrogated to determine the total peak hour trip rate (the sum of the arrivals/departures for the AM peak and PM Peak) that would produce the largest trip rate to/from the development.

The sites selected for these calculations include sites in Dundalk and Drogheda. Dundalk and Drogheda have similar population levels, public transport accessibility, car ownership levels, etc making them comparable to Navan in terms of site selection.

For details on the accumulative assessment refer to Section 10.8.

The trip rates for the proposed development are outlined in Table 10.4 below.

| Peak Hour Trip Rates | | | | | |
|---|---|---|---|---|---|
| **Trip Generation from TRICS** | | **Weekday AM 08:00-09:00** | | **Weekday PM 17:00-18:00** | |
| **Usage** | **Units** | **Arrivals** | **Departures** | **Arrivals** | **Departures** |
| Houses | Per Unit | 0.204 | 0.591 | 0.476 | 0.249 |
| Apartments | Per Unit | 0.061 | 0.248 | 0.185 | 0.055 |
| Primary School | Per pupil | 0.176 | 0.094 | 0.022 | 0.019 |

**Table 10.4 – Peak Hour Trip Rates**

## 10.4 Potential Impact of the Proposal Development

### 10.4.1 Construction Phase

The likely impact of the construction works will be short-term in nature. The number of staff on site will fluctuate over the implementation of the subject scheme.

It should be noted that the majority of such vehicle movements would be undertaken outside of the traditional peak hours, and it is not considered this level of traffic would result in any operational problems

on the local road network.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, and temporary car parking is provided within the site for contractor's vehicles. It is likely that construction will have a negligible impact on pedestrian and cycle infrastructure.

The envisaged traffic generated during the construction period will depend the phasing of the construction which will be determined by the Client. It is anticipated there will not be any likely significant effects as a result of the construction of the development when compared to the operational traffic volumes.

The majority of traffic generated by delivering materials during the project are envisaged to occur during the following construction elements:

- Site clearance
- Laying of internal road
- Concrete, steel, and other material deliveries to site during the construction of structures

For the construction of the proposed development it will be necessary to transport the construction materials, equipment, and personnel to and from the work sites.

This includes (but is not limited to):

- Establishing the construction site compounds;
- The removal of surplus soil material, suitable surplus excavated material for reuse and unsuitable excavated material, which will be taken offsite to a site permitted for deposition;
- The importation of suitable soil material where required;
- The importation of relevant construction materials and equipment;
- The exportation of C&D Waste and C&D Waste Demolition;
- Transportation of workers to and from the site.

Several construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff.

It is expected that the site will generate c. 101,000 cu. m of topsoil that, subject to the suitability for it to be used elsewhere, will be used in the construction of berms on site and other landscaping features.

In addition to the removal of topsoil, a 3d terrain model has been generated to optimise the site levels. Where possible, the model seeks to balance the amount of cut and fill required on site to create a plateau. It is anticipated in the worst-case scenario that up to. 60,000 cu. m of soil will be exported off site.

This would be done over a phased basis. For the purpose of this application, it is assumed that on average, 5 soil removal related trips per day/10 two-way trips .

This spoil will be mounded to create a berm and in turn will allow for the material to be deposited onto the HGVs by excavator. The HGVs will only reverse onto site to a hard standing area, receive the load and leave site. This negates the need for vehicles to drive into site to the dig site and receive the load from the point of excavation and in turn reduce unnecessary spoil being brought onto the public road. The haulage contractor will be required to organise the HGVs in an efficient manner to prevent the build-up of vehicles waiting outside the curtilage of the site.

The road marshal appointed will be responsible to ensure that there is no disruption to traffic or pedestrians and that roadways and paths are kept clean and free of debris.

Whilst it is not possible at this stage to accurately identify the day to day traffic movements associated with the construction activities, based on experience of similar sites it is considered that the number of construction related heavy goods vehicle movements to and from the application site will be approximately 10 arrivals and departures during the first 2-3 months of works and decreasing to 3 to 5 thereafter.

It is anticipated that the development will create c. 200 cu. m of demolition and construction waste.

A large builder's skip has an estimated capacity of eight cubic yards/8tonnes. Therefore, over the lifetime of the development there will be c. 25 trips related to the removal of demolition waste.

Whilst it is not possible at this stage to accurately identify the day to day traffic movements associated with the construction waste, based on experience of similar sites it is considered that the number of construction related heavy goods vehicle movements to and from the application site will be on average 2 arrivals/departures per day over a 2 year construction period.

At the peak of construction, it is anticipated that there will be a requirement for approximately c.100-120 construction workers, which with an allowance for shared journeys could equate to a maximum of around 60-80 arrivals and departures per day. This will vary over the lifetime of the project.

The development will be served by cranage, given the construction method and site confines. Lifting capacities will be predicated on the maximum loading requirements. A material and plant loading schedule will be undertaken to evaluate these needs.

A description of the haulage routes are offered below:

**From M50 to Development ~ 7 km, 11 minutes**

Take Exit 11 of M50, Redcow -> Head southeast -> Keep right at the fork, follow signs for N81/Tallaght/Blessington -> At the roundabout, take the 3rd exit onto Tallaght Rd/N81 ->Slight right -> Turn right onto Blessington Rd/N81Continue to follow N81 -> Turn right and enter site.

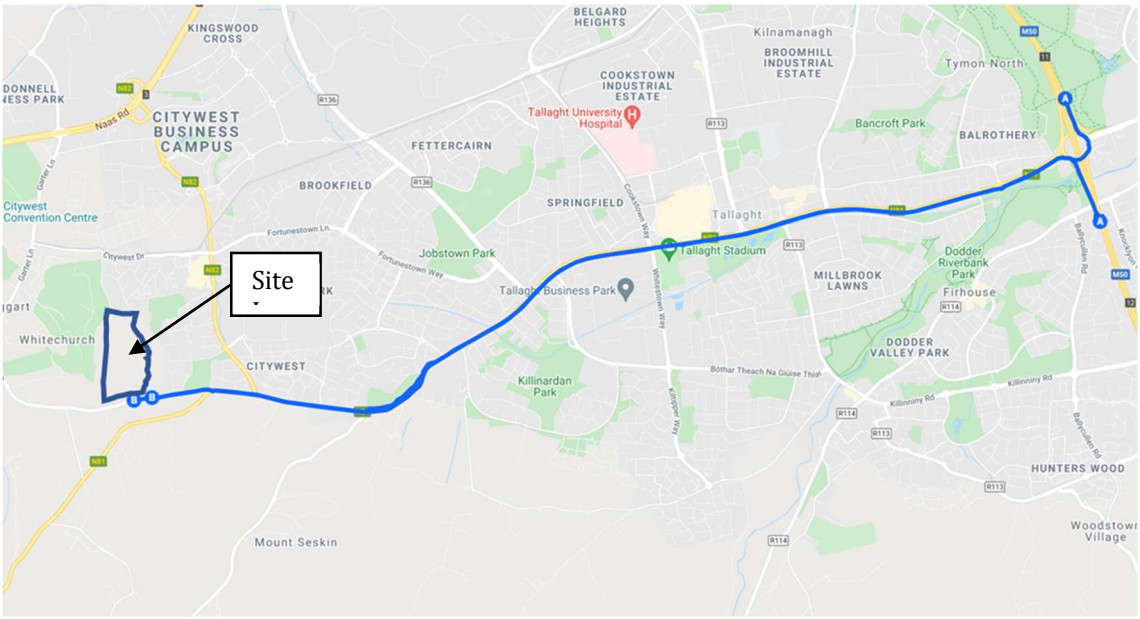



**Fig. 10.18 - Haul Route to Site**

### From Development to M50 ~ 8 km, 11 minutes

Starting on Boherboy Road -> Slight left onto N81 -> Keep right to continue on Tallaght Rd/N81 -> At the roundabout, take the 3rd exit onto the M50 ramp to Southbound -> Merge onto M50

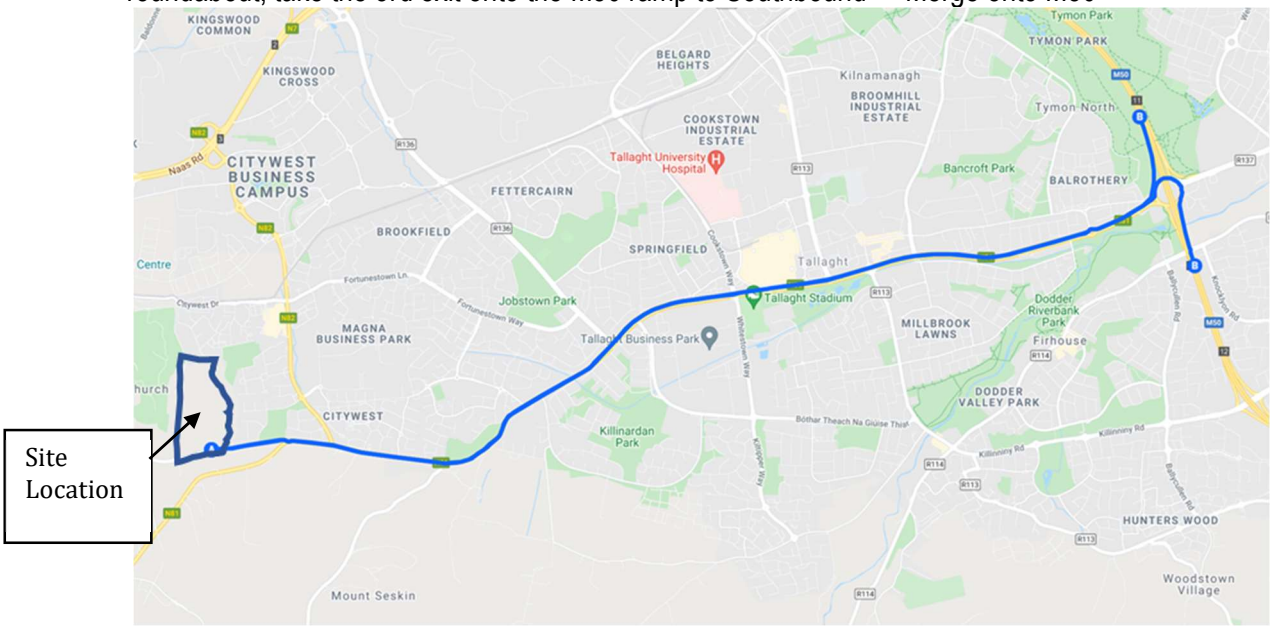



**Fig. 10.19 - Haul Route from Site**

Arrivals and departures to the site compound are to be carried out in as few vehicle movements as possible in order to minimise potential impacts on the road network.

## 10.4.2 Operational Phase

This section considers the possible types of effects a development proposal of this kind is likely to produce. The potential traffic and transport impacts of the development are considered below.

### Trip generation

The proposed development will generate a number of trips by various modes of travel including vehicular, pedestrian, cycle and public transport. These trips may have an impact on the surrounding road network. Specific impacts are identified below.

### School Site

Part of the wider Boherboy lands include a future school site.

Typically, the Department of Education has a requirement for schools with between 6 to 24 classrooms. It is understood, through the negotiations pertaining to the design of the site, that the site has been earmarked for a 16-classroom primary school.

According to the Department of Education, the Average Class Size in Primary Schools (2014/15 - 2018/19) ranges from 24.9 to 24.3 with an overall downward trend. Based on an average of 24 pupils per classroom there is a potential pupil population of 384.

According to the Census 2016 Summary Results - Part 1 published by the CSO, the average household

size is 2.75. Census 2016 shows the population of the primary school age group (5-12) stood at 548,693. Census 2016 results show that Ireland's population stood at 4,761,865. Therefore, the primary school age group (5-12) equates to 11.5% of the overall population.

Based on 655 total units, it is estimated that up to 198 children from within the development will be of primary school going age.

| Anticipated Number of Local Students | | | |
|---|---|---|---|
| **Number of Units** | **Persons per dwelling** | **Total Population** | **Primary School Children Age** |
| 628 | 2.75 | 1,727 | 194 |

**Table 10.5 - Student Population**

Based on a 16 classroom primary school, up to 384 students could be accommodated. There is the potential for up to 194 local students to cycle/walk to the school site from within the proposed development. Therefore, the total external school population would be up to 194 pupils.

It is reasonable to assume that not all local children from the proposed development will attend the local school. These trips will be included in the overall trip rate generated by the development and will be classed as link trip. These trips will have no additional impact on the external network.

The remainder of the students will have their origin outside the development. Accordingly, school site will be tested for an external pupil population of 190.

These assumptions will attract higher trips to the proposed development as the external population is bigger and therefore offers a robust assessment of the potential trip rates to/from the school site via the external road network.

Using the TRICS database, the rip rates for a primary school was calculated. These trip rates are illustrated in the table below.

| Peak Hour Trip Rates | | | | | |
|---|---|---|---|---|---|
| **Trip Generation from TRICS** | | **Weekday AM 08:00-09:00** | | **Weekday PM 17:00-18:00** | |
| **Usage** | **Units** | **Arrivals** | **Departures** | **Arrivals** | **Departures** |
| Primary School | Per Pupil | 0.176 | 0.094 | 0.022 | 0.019 |

**Table 10.6 - School Trip Rates**

## Traffic impact

The traffic impact of the development is dependent upon the background traffic on the local road network, the capacity of the existing road network, and the amount of additional traffic generated as a result of the proposed development.

### Traffic Generation - Including Cumulative Assessment

The trip rates outlined above in conjunction with the proposed schedule of accommodation to determine the resultant total trips generated by the proposed development.

For the proposed development, these figures can be seen in Table 10.7 over.

| Peak Hour Trips | | | | | |
|---|---|---|---|---|---|
| **Trip Generation from TRICS** | | **Weekday AM 08:00-09:00** | | **Weekday PM 17:00-18:00** | |
| **Usage** | **Units** | **Arrivals** | **Departures** | **Arrivals** | **Departures** |
| House[1] | 257 | 52 | 152 | 122 | 64 |
| Apartments/Duplex[1] | 398 | 24 | 66 | 44 | 22 |
| **Peak Total** | | 77 | 251 | 196 | 86 |
| **Two Way Total** | | 327 | | 282 | |
| School[2] | 190 | 34 | 18 | 4 | 4 |

**Table 10.7 – Peak Hour Trips**

[1] To be used in development flows.

[2] To be used in baseline flows only.

It can be seen from the above that the total vehicle movements generated by the proposed development will be 77 arrivals and 251 departures in the AM peak (two-way total of 327). The total number of vehicle movements in the PM peak hour will be 196arrivals and 86 departures (two-way total of 282).

### Traffic distribution

It is expected that the origins and destinations of traffic to/from the proposed development will be similar to the distribution of the current traffic patterns on the local roads.

### Car parking

One of the key principles of a residential development such as this, is the sufficient provision of car parking spaces within the development so as to avoid the need for excessive on-street parking in the vicinity of the site. A balanced approach is required which provides a compromise between a sufficient number of spaces and the need to promote greater usage of public transport and to encourage walking and cycling trips. This is covered in more detail later in the chapter.

The above trip rates assume no restriction in car parking numbers and will produce a higher number of trips compared when parking is restricted. Restricting parking numbers is a well-known demand management tool.

The above trip rates were used in the junction modelling so as to offer a robust assessment of the development impact

## Walking and cycling infrastructure

It is also necessary to ensure that the proposal incorporates appropriate access facilities for pedestrians, cyclists and public transport users in order to facilitate trips by these modes.

It is a necessary part of the design framework for a residential development such as this to ensure that there is good permeability for those residents and visitors to the development who choose not to travel by car. The development has been designed to ensure that there is good permeability for pedestrians and cyclists. Connections between the internal layout and the external pedestrian and cycle networks form part of the overall access strategy for the site. With this development pedestrian movement is suitably catered for by footpath connections within and adjacent to the development up to the relevant boundaries i.e. through Carrigmore Estate, Carrigmore District Park and Corbally Estate. These provide good linkage to the surrounding urban areas.

The internal layout demands that all visitors to the site are catered for and so pedestrian routes between dwelling areas and key nodes within the layout are well designed and clearly delineated. This applicant is very experienced in creating safe environments that satisfy resident's requirements and convenience. Accordingly, every effort has been made to ensure that vehicular access will be restricted in areas where there are likely to be the highest concentrations of pedestrian/cycle movements.

The internal site layout will include several crossing facilities that are located along key desire lines and which coordinate well with the proposed car parking layouts to enhance the safety, visibility and convenience of those people on foot. These facilities will include features such as tactile paving and surface treatments that will benefit all users and assist those with impaired mobility.

Pedestrian linkage will be provided to the boundary of the local estates such as Corbally and Carrickmore residential developments and other future developments as part of the development. Pedestrian linkage to the lands that form part of the South Dublin County Council's Development Plan 2016-2022 (and subsequent Local Area Plans) will be provided as part of subsequent stages of development.

Given the desire in current planning guidance to improve accessibility for non-car modes of travel, access by cycle is increasingly important. Since the weather and topography inevitably have an influence on cycle use, the key to cycle accessibility is the existence of convenient and safe links associated with secure and carefully sited cycle parking.

## Baseline

These baseline conditions need to be established accurately to understand fully the context of this development proposal and other developments that are built but not yet occupied or those likely to be built during the lifetime of this development.

To determine the baseline transport data reference has been made to the following:

- The quantification of the vehicular trips generated from adjoining developments and their modal distribution, or, where the site is vacant or partially vacant, the vehicular trips which might realistically be generated by any extant planning permission or permitted uses;
- Current traffic flows on links and at junctions within the study area; and
- Zoned lands such as the school site

To that end, the baseline data for the development is based on the combined flows identified in the traffic surveys, the flows predicted in Table 10.7 and the flows estimated for the lands reserved for the school site.

### 10.4.3 "*Do-nothing*" scenario

Should the proposed development not take place, the access roads and infrastructure will remain in their current state and there will be no change. Background traffic would be expected to grow over time. Given the location and zoning of the subject site, it is reasonable to assume that a similar development, with a potentially more intensive requirement for vehicular trips would be established on this site at some stage in the future.

## 10.5 Remedial or reductive measures

### 10.5.1 Construction phase

The Outline Construction Management Plan incorporates a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed developments on-site construction activities.

To minimise disruption to the surrounding environment, the following mitigation measures will be implemented:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- A dedicated 'construction' site access / egress junction will be provided during all construction phases.
- Provision of sufficient on-site parking and compounding to ensure no potential overflow of construction generated traffic onto the local network.
- Site offices and compound will be located within the site boundary. The site will be able to accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas.
- A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.
- A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- Dedicated construction haul routes will be identified and agreed with the local authority prior to the commencement of constructions activities on-site.
- Truck wheel washes will be installed at construction entrances if deemed necessary and any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.
- On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area reinstated in full on completion of the works.

All construction related parking will be provided on site. Construction traffic 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 and dumper trucks 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.

It is anticipated that the generation of HGV's during the construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods.

### 10.5.2 Operational Phase

- The local area provides suitable infrastructure and transport services for travel by sustainable modes. A key barrier to modal shift towards sustainable modes of travel is often a lack of information about potential alternatives to the car. As such, it is proposed that residents and visitors of the proposed development are made aware of potential alternatives including information on walking, cycle routes and public transport.
- A number of walking and cycling connection points are proposed within the development. These connection points will provide access for pedestrians and cyclists on to the Boherboy Road and towards the Corbally and Carrigmore Residential Development.
- These facilities will provide attractive, convenient and safe routes for residents. Therefore, there are good links proposed for residents to travel by more sustainable modes i.e. towards Luas services north of the development and bus services to the east of the site.
- As part of the remedial or reductive measures for the site, it is proposed to upgrade the Boherboy Road from the development and east towards its junction with the N81 to include a footpath. Providing a footpath in this direction provide the maximum degree of safety and convenience pedestrians and further progresses the desired modal shift. No footpath provision will be provided from the development west towards Saggart but additional public lighting will be retro fitted. Alternative routes towards Saggart via Citywest will be communicated to the residents.
- A Travel Plan has been prepared for both residents and visitors to the site in order to guide the delivery and management of coordinated initiatives post construction. The Travel Plan ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development.
- It is proposed to provide car parking in accordance with the recommendations of the 'Sustainable Urban Housing – Design Standards for New Apartments' published by the Department of Housing, Planning and Local Government (2018). Therefore, the recommended car parking will be less than that required under the South Dublin Development Plan. Car sharing and car clubs will be provided under the details of the Travel Plan to offset the impact of reduced car parking numbers.
- The number of trips to/from a development is linked to the number of car parking spaces. The restriction of car parking spaces acts as a demand management tool and will reduce the impact on the surrounding road network. It will also encourage a shift away from non-sustainable car ownership models where people who only occasionally use one no longer keep one.
- For occasional car use, it is proposed to advertise the location of local car clubs via the Travel Plan. Car Clubs gives you a 'car on call', whenever you need it. Car clubs have developed as a

modern service in many European cities and are a good alternative to high levels of private car use and 'driver only' occupancy rates. The principal of a car club is to ensure that the optimal use of a small number of vehicles to meet the needs of a wide group of people.

- The introduction of new pedestrian routes i.e. north via Carrigmore towards Citywest/Luas services and east via Corbally towards bus services, reduced car parking numbers and Car Clubs will further reinforce the efforts been made towards a modal shift away from car-based trips
- Residents will be encouraged to avail of these facilities for travel to and from work. Provision of this information would be made upon opening of the proposed development , as this represents the best opportunity to secure travel behaviour change. It is anticipated that this measure may help to reduce the level of traffic at the proposed development, thus providing mitigation against the already minimal traffic and transport effects of the development.

### 10.5.3 Predicted impact of the proposal

When considering a development of this nature, the potential traffic impact on the surrounding area must be considered for each of two stages; the construction phase and operational phase. These two distinct stages are considered separately within this section.

### 10.5.4 Construction phase

At this initial stage, it is expected that the proposed residential dwellings will be constructed at a rate of 125 units per year (subject to market forces). It is envisaged that the full scheme is not likely to be fully completed until before 2027.

All construction activities will be governed by the Construction Traffic Management Plan (CTMP),and outline CTMP is included with this application and the details of which will be agreed with the local authority prior to commencement of construction on site.

An outline CTMP has been prepared as part of this application. This document addresses a number of potential issues including the working hours of site staff, the traffic management for the site, the waste management, noise and vibration impacts as well as other issues to be addressed.

The outline CTMP provides the content of the final Construction Traffic Management Plan (CTMP) which shall be prepared by the appointed main contactor prior to construction of the proposed development. It shall be a requirement of the contract that, prior to construction, the appointed contractor shall liaise with the relevant authorities including the Transport Infrastructure Ireland (TII), Local Authorities and Emergency Services for the purpose of finalising the CTMP, which will encompass all aspects of this outline Construction Traffic Management Plan.

The CTMP shall be termed a 'Live Document', such that any changes to construction programme or operations can be incorporated into the CTMP.

The contractor will be contractually required to ensure that the elements of this outline CTMP shall be incorporated into the final CTMP. The contractor shall also agree and implement monitoring measures to confirm the effectiveness of the mitigation measures outlined in the CTMP. On finalisation of the CTMP, the contractor shall adopt the plan and associated monitoring measures. The final CTMP shall address the following issues (including all aspects identified in this outline CTMP):

- Site Access & Egress;
- Traffic Management Signage;

- Routing of Construction Traffic / Road Closures;
- Timings of Material Deliveries to Site;
- Traffic Management Speed Limits;
- Road Cleaning;
- Road Condition;
- Road Closures;
- Enforcement of Construction Traffic Management Plan
- Details of Working Hours and Days;
- Details of Emergency plan;
- Communication;
- Construction Methodologies; and
- Particular Construction Impacts

A number of the construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff.

Whilst it is not possible at this stage to accurately identify the day to day traffic movements associated with the construction activities, based on experience of similar sites it is considered that the number of construction related heavy goods vehicle movements to and from the application site will be approximately 15 arrivals and departures during the first 2-3 months of works and decreasing to 3 to 5 thereafter.

Similarly, the general workforce is unlikely to exceed c.50 in number, which with an allowance for shared journeys could equate to a maximum of around 30-40 arrivals and departures per day. A construction car park for workers immediately adjacent to the new access from Boherboy Road will be created on the start of works by the laying of a temporary surface for vehicles. This number of construction vehicle movements is considered to be relatively low compared to the wider road network. It should be noted that the majority of such vehicle movements would be undertaken outside of the traditional peak hours, and it is not considered this level of traffic would result in any operational problems.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, and temporary car parking is provided within the site for contractor's vehicles. It is likely that construction will have a negligible impact on pedestrian and cycle infrastructure.

### 10.5.5 Operational phase

To assess the resultant impact on the surrounding road network, the anticipated traffic generation and distribution through the network has been applied to the traffic model in order to assess comparative flow levels at the surveyed locations and to analyse resultant junction performance.

In addition to traffic generated due to the proposed development, there is also an expected increase in traffic flows due to general development and an increase in car ownership that needs to be considered. Using Table 5.5.1 of the Project Appraisal Guidelines – Unit 5.5 Link-Based Traffic Growth Forecasting published by the NRA, reference has been made to the percentage increase expected on all roads surrounding the site.

## Growth Factors

The estimated opening year for the proposed development is 2025. This has therefore been the focus of the road network assessment. These flows are shown in Diagrams D.1 to D.16 and for the weekday AM and PM peaks respectively.

The factor used are outlined in Table 10.8.

| Traffic Growth Rates, NRA Project Appraisal Guidelines | | |
|---|---|---|
| Year | To Year | Extract from Table 5.5.1 of Project Appraisal Guidelines |
| 2020 | 2025 | 1.025 |
| 2020 | 2030 | 1.041 |
| 2020 | 2040 | 1.081 |

**Table 10.8 - Growth Factors**

## Junction Capacity Analyses

Junction capacity analyses have been undertaken at the site access junction and at the key junctions at which existing flow data had been obtained. These tests have been carried out using industry standard and approved software for the existing junctions with no development and the assumed year of opening of the development, namely 2027, and for a 5-year design horizon, namely 2032 and for a 15-year design horizon, namely 2042 with development flows added. It may be the case at some nodes within the network that following the distribution and assignment of the traffic generated by the development, the actual proportional impact or change in traffic demand would not necessarily warrant further assessment. For the purpose of a robust assessment, all junctions have been put forward for assessment.

The use of the TRL capacity model programme PICADY [Priority Intersection Capacity and Delay] is well established and accepted by the South Dublin Council for the prediction of capacity and incurred delay at priority junctions, whilst ARCADY [Assessment of Roundabout Capacity and Delay] is similarly accepted and used to provide comparable measures of the operational efficiency of roundabout junctions. OSCADY (Optimised Signal Capacity and Delay: Phase-based Rapid Optimisation) is a computer program for optimising phase-based signal timings and calculating capacities, queue lengths and delays (both queuing and geometric) for traffic signal-controlled junctions. Similarly, LinSig is a computer program for optimising phase-based signal timings and calculating capacities, queue lengths and delays (both queuing and geometric) for traffic signal-controlled junctions.

With these well-established methods the results are expressed in terms of a ratio of flow to capacity (RFC) on each approach and the maximum queue length on that approach during the period tested. If the RFC value approaches 1.0 then queuing and delay can be expected to increase. It is normal practice to ensure that the RFC is below 0.85 to achieve a theoretical reserve capacity of greater than 15%, although a value of 0.85 can be marginally exceeded in a future design year situation without any detrimental effect on the satisfactory and safe operation of the junction.

LinSig and OSCADY results are expressed in terms of queues generated and the 'Degree of Saturation' (DoS). A Dos value of 85% or below indicates that the junction is operating within capacity. A DoS value of between 85% and 100% indicates that the junction remains within capacity but is beginning to show

signs of queuing and delay. A DoS value of less than 100% is desirable in urban areas during peak period traffic. However, values of greater than 100% are typical at many junctions. For the purpose of these calculations the results are reported in terms of maximising the capacity of the junction analysed.

The results of the various capacity assessments are summarised in a series of tables. For each flow condition and for each junction the PICADY or ARCADY output has been assessed and the maximum Ratio of flow to Capacity [RFC] tabulated together with the maximum (end) queue value for the relevant time segment. For signalised junctions the OSCADY/ LinSig output will be in terms of maximum (end) queue value and DoS.

Refer to the submitted Traffic and Transport Assessment for the corresponding flow diagrams and the detailed junction analysis.

**Geometric Parameters**

The geometric parameters used for the junctions have been ascertained from the topographical survey details of the junction and other relevant sources. In this way a very good approximation of the relevant geometric inputs has been used. For the proposed junction, the geometry has been obtained by reference to the initial design drawing. This has also enabled an iterative process to be adopted if necessary, to ensure that the junction is designed in accordance with relevant design standards and to achieve sufficient levels of capacity.

In this case, the surveyed junctions will each be analysed to determine the extent of resultant highway impact and the need, if any, for mitigating measures. It is anticipated that the capacity analyses will show how the proposal will be accommodated with a reasonable degree of reserve capacity.

**Trip Distribution**

The trips generated by the proposed development have been distributed on the surrounding road network using the directional flows on the surrounding road network. Refer to the Traffic and Transport Assessment for the corresponding flow diagrams.

**Junction Capacity Analysis**

For the full junction capacity analysis refer to the submitted Traffic and Transport Assessment. A summary of the analysis is provided below.

<u>Scenario 1 – 2 No. Access Open</u>

In the 2032 opening year +5 years without development, all the roads operate within the 85% design threshold ratio of flow capacity (RFC) in both the morning and evening peak hours. The maximum RFC recorded was 0.351 with a corresponding queue of 0.53 in the 2032 AM Peak.

The new junction operates with a max delay of 0.23 mins.

<u>Scenario 2 – 3 No. Access Open</u>

In the 2042 opening year +15 years without development, all the roads operate within the 85% design threshold ratio of flow capacity (RFC) in both the morning and evening peak hours. The maximum RFC recorded was 0.283 with a corresponding queue of 0.39 in the 2042 AM Peak.

The new junction operates with a max delay of 0.21 mins.

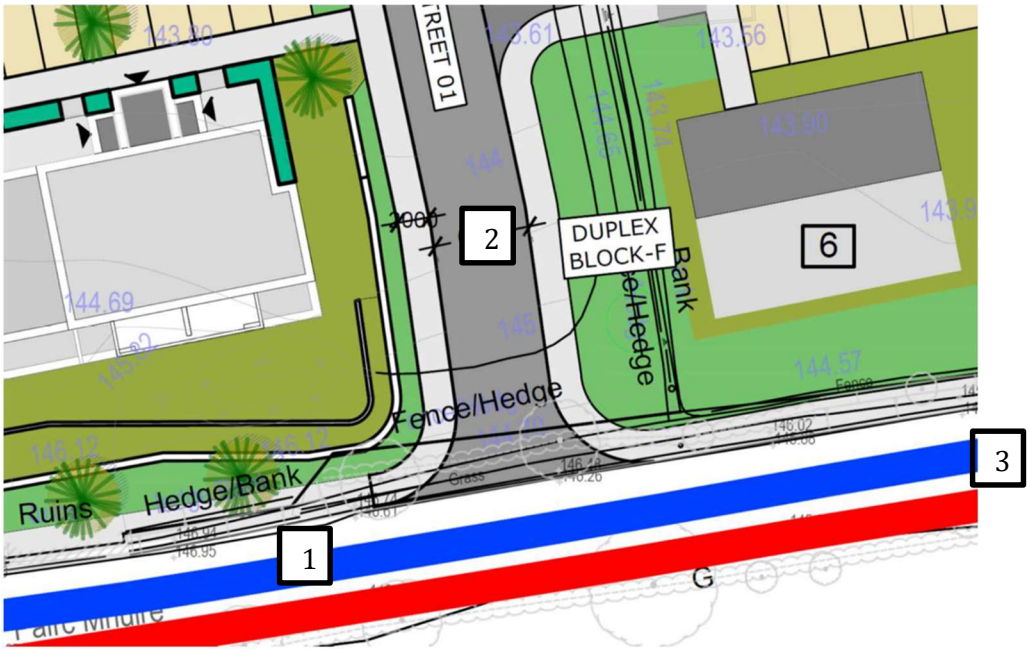



**Fig. 10.20 - Site 1 – Site Access Junction Layout**

The following arm destinations are used:

- Arm1 – Boherboy Road - West
- Arm 2 – Site Access
- Arm 3 – Boherboy Road – East

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (PCU) | Delay (min) | RFC | Queue (PCU) | Delay (min) | RFC |
| | 2027 Base + Development | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 0.52 | 0.23 | 0.346 | 0.15 | 0.19 | 0.133 |
| Arm 3 | 0.14 | 0.09 | 0.079 | 0.51 | 0.09 | 0.204 |
| | 2032 Base + Development | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 0.53 | 0.23 | 0.351 | 0.15 | 0.19 | 0.135 |
| Arm 3 | 0.15 | 0.09 | 0.080 | 0.53 | 0.09 | 0.208 |
| | 2042 Base + Development | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 0.39 | 0.21 | 0.283 | 0.09 | 0.19 | 0.105 |
| Arm 3 | 0.11 | 0.09 | 0.066 | 0.44 | 0.09 | 0.168 |

| | 2032 Base + Development | | | | | |
|---|---|---|---|---|---|---|
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 0.49 | 0.22 | 0.333 | 0.15 | 0.19 | 0.131 |
| **Arm 3** | 0.13 | 0.09 | 0.074 | 0.47 | 0.09 | 0.196 |
| | **2042 Base + Development** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 0.37 | 0.20 | 0.272 | 0.11 | 0.18 | 0.101 |
| **Arm 3** | 0.09 | 0.09 | 0.059 | 0.38 | 0.09 | 0.154 |

**Table 10.9 - Site 1 – Site Access Modelling Results Peak Hour Trip Rates**

Site 2 – Boherboy Road/N81

The operation of the priority-controlled junction was modelled using PICADY software, and tested with the 2020 Survey Year, 2027 Opening Year, 2032 Opening Year + 5 Years and 2042 Opening Year + 15 Years. Each year was modelled with and without development.

The results of the modelling are summarised in in Table 23.

The maximum RFC recorded was 0.995 with a corresponding queue of 15.87 in the 2042 AM Peak. As the RFC value approaches 1.0 then queuing and delay can be expected to increase. It is normal practice to ensure that the RFC is below 0.85 to achieve a theoretical reserve capacity of greater than 15%, although a value of 0.85 can be exceeded in a future design year situation without any detrimental effect on the satisfactory and safe operation of the junction.

The junction operates with a max delay of 1.78 mins.


**Fig. 10.21 - Site 2 – Boherboy Road/N81**

The following arm destinations are used:

- Arm1 – N81 - West
- Arm 2 – Boherboy Road
- Arm 3 – N81 – East

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | **Queue (PCU)** | **Delay (min)** | **RFC** | **Queue (PCU)** | **Delay (min)** | **RFC** |
| | **Survey - 2020** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 1.13 | 0.26 | 0.539 | 0.60 | 0.16 | 0.379 |
| **Arm 3** | 1.58 | 0.34 | 0.626 | 2.71 | 0.39 | 0.748 |
| | **2027 Base** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 1.55 | 0.32 | 0.621 | 0.71 | 0.28 | 0.420 |
| **Arm 3** | 2.40 | 0.46 | 0.726 | 4.04 | 0.53 | 0.828 |
| | **2027 Base + Development** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 2.82 | 0.50 | 0.750 | 0.80 | 0.32 | 0.449 |
| **Arm 3** | 3.11 | 0.57 | 0.770 | 8.32 | 0.91 | 0.947 |
| | **2032 Base** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 1.87 | 0.38 | 0.659 | 0.78 | 0.31 | 0.441 |
| **Arm 3** | 3.12 | 0.58 | 0.774 | 5.59 | 0.75 | 0.868 |
| | **2032 Base + Development** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 3.23 | 0.54 | 0.790 | 0.88 | 0.37 | 0.470 |
| **Arm 3** | 3.66 | 0.62 | 0.817 | 14.80 | 1.67 | 0.987 |
| | **2042 Base** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 2.12 | 0.42 | 0.688 | 0.84 | 0.33 | 0.458 |
| **Arm 3** | 3.66 | 0.67 | 0.802 | 6.99 | 0.91 | 0.899 |
| | **2042 Base + Development** | | | | | |
| **Arm 1** | - | - | - | - | - | - |
| **Arm 2** | 3.31 | 0.55 | 0.795 | 0.92 | 0.39 | 0.482 |
| **Arm 3** | 4.12 | 0.69 | 0.840 | 15.87 | 1.78 | 0.995 |

**Table 10.10 - Site 2 – Boherboy Road/N81 Modelling Results**

Site 3 – N81/N82 Signal Controlled Junction

The operation of the signalised junction was modelled using LinSig software, and tested with the 2020 Survey Year, 2027 Opening Year, 2032 Opening Year + 5 Years and 2042 Opening Year + 15 Years. Each year was modelled with and without development.

The results of the modelling are summarised in in Table 24 & 25.

The modelling illustrates that the N82/ Fortunestown Lane Signal Controlled Junction operates close to or at capacity in the AM peak in all scenarios. The maximum recorded DoS is 112.3% in 2042 with development added. For the same scenario, the maximum DoS in the PM peak period recorded is 97.0%.

A Dos value of 85% or below indicates that the junction is operating within capacity. A DoS value of between 85% and 100% indicates that the junction remains within capacity but is beginning to show signs of queuing and delay. A DoS value of less than 100% is desirable in urban areas during peak period traffic. However, values of greater than 100% are typical at many junctions.

From site observations, traffic at the junction is relatively light during non-peak periods. Commuter traffic/school traffic resulted in increased observed flows during the relevant peak periods.

These surges in traffic flows are temporary and of short duration but does lead to queuing and delays at the junction. This, combined with the narrow nature of geometry of the junction, results in queuing and delay during AM peak only with the proposed development having a minimal impact on the operation of the junction.

The following arm destinations are used:

- Arm1 – N81 - West
- Arm 2 – N82
- Arm 3 – N81- East

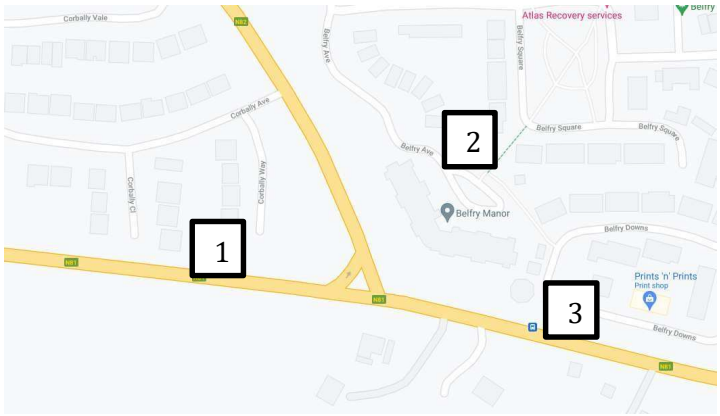



**Fig. 10.22 - N81/N82 Signal Controlled Junction Layout**

| Survey - AM | | | |
|---|---|---|---|
| **Item** | **DoS** | **Av. Delay (s/pcu)** | **Queue (pcu)** |
| 1/2+1/1 | 67.4% | 37.4 | 43.0 |
| 2/1 | 66.9% | 115.3 | 25.9 |
| 3/1+3/2 | 67.0% | 42.5 | 9.0 |
| PRC for Signaled Lanes (%): 33.6 | | | |
| **2027 Base AM** | | | |
| **Item** | **DoS** | **Av. Delay (s/pcu)** | **Queue (pcu)** |
| 1/2+1/1 | 103.6% | 193.8 | 136.1 |
| 2/1 | 103.5% | 235.1 | 75.7 |
| 3/1+3/2 | 104.1% | 173.9 | 52.9 |
| PRC for Signalled Lanes (%): -15.7 | | | |
| **2027 Base + Development AM** | | | |
| **Item** | **DoS** | **Av. Delay (s/pcu)** | **Queue (pcu)** |
| 1/2+1/1 | 108.1% | 271.0 | 162.6 |
| 2/1 | 107.0% | 300.5 | 88.0 |
| 3/1+3/2 | 107.6% | 239.9 | 67.1 |
| PRC for Signalled Lanes (%): -20.1 | | | |
| **2032 Base AM** | | | |
| **Item** | **DoS** | **Av. Delay (s/pcu)** | **Queue (pcu)** |
| 1/2+1/1 | 107.2% | 256.0 | 156.9 |
| 2/1 | 107.3% | 304.1 | 89.9 |
| 3/1+3/2 | 106.4% | 214.3 | 62.8 |
| PRC for Signalled Lanes (%): -19.2 | | | |
| **2032 Base + Development AM** | | | |
| **Item** | **DoS** | **Av. Delay (s/pcu)** | **Queue (pcu)** |
| 1/2+1/1 | 111.8% | 334.3 | 185.3 |
| 2/1 | 111.0% | 372.9 | 103.1 |
| 3/1+3/2 | 111.8% | 318.1 | 104.1 |
| PRC for Signalled Lanes (%): -24.3 | | | |
| **2042 Base AM** | | | |
| **Item** | **DoS** | **Av. Delay (s/pcu)** | **Queue (pcu)** |
| 1/2+1/1 | 110.7% | 317.4 | 177.0 |
| 2/1 | 110.5% | 363.7 | 102.3 |
| 3/1+3/2 | 110.9% | 299.1 | 81.7 |
| PRC for Signalled Lanes (%): -23.2 | | | |
| **2042 Base + Development AM** | | | |
| **Item** | **Deg Sat (%)** | **Av. Delay Per PCU (s/pcu)** | **Mean Max Queue (pcu)** |
| 1/2+1/1 | 112.3% | 342.9 | 191.2 |
| 2/1 | 111.5% | 381.6 | 106.6 |
| 3/1+3/2 | 112.2% | 323.9 | 107.2 |
| PRC for Signalled Lanes (%): -24.8 | | | |

**Table 10.11 - Site 3 - N81/N82 Signal Controlled Junction Modelling Output**

Site 4 – N82/Corbally Heath Roundabout

The operation of the roundabout was modelled using ARCADY software, and tested with the 2020 Survey Year, 2027 Opening Year, 2032 Opening Year + 5 Years and 2042 Opening Year + 15 Years. Each year was modelled with and without development.

The results of the modelling are summarised in in Table 26.

With all 3 access points open, the 2042 opening year +15 years with development, all the roads operate within the 85% design threshold ratio of flow capacity (RFC) in both the morning and evening peak hours. The maximum RFC recorded was 0.65 with a corresponding queue of 1.87 PCUs in the 2042 PM Peak.

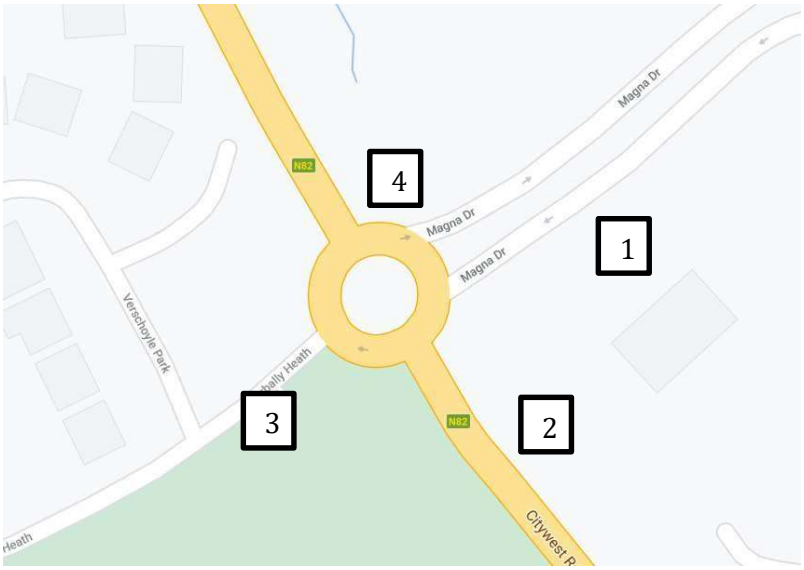



**Fig. 10.23 - N82/Corbally Heath Roundabout Junction Layout**

The following arm destinations are used:

- Arm 1 – Magna Drive
- Arm 2 – N82 South
- Arm 3 – Corbally Heath
- Arm 4 – N82 North

| | AM | | | | PM | | | |
|---|---|---|---|---|---|---|---|---|
| | **Queue (PCU)** | **Delay (min)** | **RFC** | **LOS** | **Queue (PCU)** | **Delay (min)** | **RFC** | **LOS** |
| | **Survey - 2020** | | | | | | | |
| **Arm 1** | 0.34 | 0.06 | 0.25 | A | 0.56 | 0.09 | 0.36 | A |
| **Arm 2** | 0.59 | 0.07 | 0.37 | A | 1.29 | 0.12 | 0.56 | A |
| **Arm 3** | 0.18 | 0.06 | 0.15 | A | 0.75 | 0.11 | 0.43 | A |
| **Arm 4** | 0.67 | 0.07 | 0.40 | A | 1.46 | 0.12 | 0.60 | A |
| | **2027 Base** | | | | | | | |
| **Arm 1** | 0.40 | 0.07 | 0.28 | A | 0.61 | 0.08 | 0.38 | A |
| **Arm 2** | 0.73 | 0.08 | 0.42 | A | 1.59 | 0.13 | 0.62 | A |
| **Arm 3** | 0.21 | 0.07 | 0.17 | A | 0.09 | 0.07 | 0.09 | A |
| **Arm 4** | 0.90 | 0.08 | 0.48 | A | 1.35 | 0.11 | 0.58 | A |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **2027 Base + Development** | | | | | | | |
| **Arm 1** | 0.39 | 0.06 | 0.28 | A | 0.85 | 0.12 | 0.46 | A |
| **Arm 2** | 0.73 | 0.08 | 0.42 | A | 1.59 | 0.13 | 0.62 | A |
| **Arm 3** | 0.17 | 0.07 | 0.14 | A | 0.10 | 0.07 | 0.09 | A |
| **Arm 4** | 0.88 | 0.08 | 0.47 | A | 2.17 | 0.18 | 0.69 | B |
| | **2032 Base** | | | | | | | |
| **Arm 1** | 0.42 | 0.07 | 0.30 | A | 0.67 | 0.09 | 0.40 | A |
| **Arm 2** | 0.79 | 0.08 | 0.44 | A | 1.81 | 0.14 | 0.65 | A |
| **Arm 3** | 0.23 | 0.07 | 0.19 | A | 0.10 | 0.07 | 0.09 | A |
| **Arm 4** | 0.98 | 0.09 | 0.50 | A | 1.52 | 0.12 | 0.61 | A |
| | **2032 Base + Development** | | | | | | | |
| **Arm 1** | 0.42 | 0.07 | 0.30 | A | 0.67 | 0.09 | 0.40 | A |
| **Arm 2** | 0.79 | 0.08 | 0.44 | A | 1.81 | 0.14 | 0.65 | A |
| **Arm 3** | 0.23 | 0.07 | 0.19 | A | 0.10 | 0.07 | 0.09 | A |
| **Arm 4** | 0.98 | 0.09 | 0.50 | A | 1.52 | 0.12 | 0.61 | A |
| | **2042 Base** | | | | | | | |
| **Arm 1** | 0.45 | 0.07 | 0.31 | A | 0.72 | 0.09 | 0.42 | A |
| **Arm 2** | 0.85 | 0.09 | 0.46 | A | 2.02 | 0.15 | 0.67 | A |
| **Arm 3** | 0.25 | 0.07 | 0.20 | A | 0.11 | 0.07 | 0.10 | A |
| **Arm 4** | 1.06 | 0.09 | 0.52 | A | 1.68 | 0.13 | 0.63 | A |
| | **2042 Base + Development** | | | | | | | |
| **Arm 1** | 0.50 | 0.08 | 0.33 | A | 0.74 | 0.10 | 0.43 | A |
| **Arm 2** | 0.96 | 0.10 | 0.49 | A | 2.22 | 0.17 | 0.69 | A |
| **Arm 3** | 0.36 | 0.08 | 0.27 | A | 0.13 | 0.08 | 0.12 | A |
| **Arm 4** | 1.55 | 0.11 | 0.61 | A | 1.87 | 0.14 | 0.65 | A |

**Table 10.12 - Site 4 - N82/Corbally Heath Roundabout Results**

The junction operates with a max delay of 0.12min.

Note that no development flows reach this site until 2042.

Site 5 – N82/ Fortunestown Lane Signal Controlled Junction

The operation of the signalised junction was modelled using OSCADY software, and tested with the 2020 Survey Year, 2027 Opening Year, 2032 Opening Year + 5 Years and 2042 Opening Year + 15 Years. Each year was modelled with and without development.

The results of the modelling are summarised in in Table 27.

The modelling illustrates that the N82/ Fortunestown Lane Signal Controlled Junction approaches capacity in the 2042 design scenario in the AM peak period. The maximum recorded DoS is 86.72%

in 2042 with development added. For the same scenario, the maximum DoS in the PM peak period recorded is 70.72%.
A Dos value of 85% or below indicates that the junction is operating within capacity. A DoS value of between 85% and 100% indicates that the junction remains within capacity but is beginning to show signs of queuing and delay.

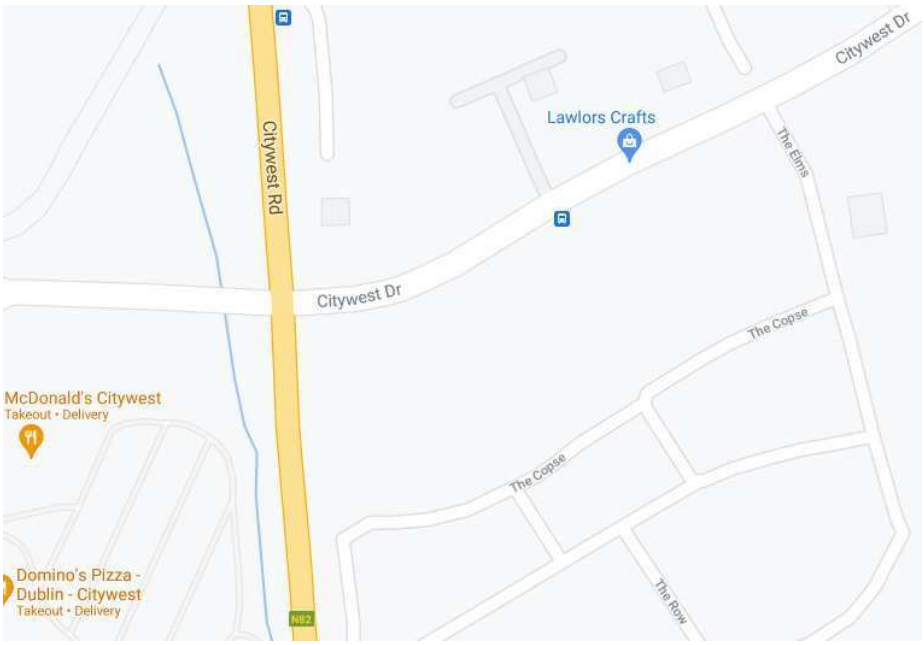



**Fig. 10.24 - N82/ Fortunestown Lane Signal Controlled Junction Layout**

The following arm destinations are used:

- Arm1 – Citywest Drive
- Arm 2 – N82 Citywest Road South
- Arm 3 – Fortunestown Lane
- Arm 4 – N82 Citywest Road North

| | AM | | PM | |
|---|---|---|---|---|
| | DoS (%) | Delay (s) | DoS (%) | Delay (s) |
| | Survey - 2020 | | | |
| **Arm 1** | 49.21 | 142.50 | 49.47 | 145.39 |
| **Arm 2** | 50.07 | 58.50 | 48.65 | 123.74 |
| **Arm 3** | 48.80 | 150.90 | 49.04 | 114.65 |
| **Arm 4** | 48.30 | 123.50 | 4945 | 80.23 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 44.1 pcu | | 51.00 pcu | |
| **PRC%** | 79.73 | | 81.93 | |
| | 2027 Base | | | |
| **Arm 1** | 80.06 | 100.98 | 63.65 | 148.54 |

| | | | | |
|---|---|---|---|---|
| **Arm 2** | 80.077 | 126.11 | 64.30 | 141.99 |
| **Arm 3** | 80.34 | 144.04 | 64.51 | 12.58 |
| **Arm 4** | 81.23 | 175.53 | 63.95 | 89.19 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 82.69 pcu | | 39.52 pcu | |
| **PRC%** | 10.79 | | 33.20 | |
| | **2027 Base + Development** | | | |
| **Arm 1** | 79.81 | 154.19 | 66.77 | 146.07 |
| **Arm 2** | 79.93 | 124.00 | 65.57 | 143.20 |
| **Arm 3** | 80.93 | 145.13 | 66.93 | 123.30 |
| **Arm 4** | 79.35 | 169.14 | 66.70 | 94.71 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 85.95 | | 72.93 pcu | |
| **PRC%** | 11.2 | | 34.47 | |
| | **2032 Base** | | | |
| **Arm 1** | 82.40 | 147.21 | 66.80 | 150.09 |
| **Arm 2** | 82.94 | 129.81 | 67.23 | 143.73 |
| **Arm 3** | 84.57 | 155.44 | 66.91 | 122.44 |
| **Arm 4** | 82.20 | 176.40 | 66.98 | 91.17 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 89.98 pcu | | 49.33 pcu | |
| **PRC%** | 6.42 | | 33.86 | |
| | **2032 Base + Development** | | | |
| **Arm 1** | 84.28 | 106.79 | 68.97 | 147.45 |
| **Arm 2** | 83.38 | 130.62 | 68.13 | 145.83 |
| **Arm 3** | 83.00 | 149.36 | 69.10 | 125.16 |
| **Arm 4** | 85.15 | 187.79 | 69.10 | 95.39 |
| **Cycle Time** | 180s | | 300s | |
| **Total Delay** | 73.46 | | 75.70 pcu | |
| **PRC%** | -1.96 | | 30.25 | |
| | **2042 Base** | | | |
| **Arm 1** | 84.84 | 148.18 | 68.97 | 151.75 |
| **Arm 2** | 84.28 | 133.31 | 69.31 | 145.99 |
| **Arm 3** | 84.57 | 155.44 | 68.77 | 124.025 |
| **Arm 4** | 84.04 | 174.60 | 68.85 | 92.48 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 93.62pcu | | 76.92 pcu | |
| **PRC%** | 6.09 | | 29.85 | |
| | **2042 Base + Development** | | | |
| **Arm 1** | 84.98 | 154.85 | 69.54 | 151.18 |
| **Arm 2** | 86.26 | 137.85 | 69.83 | 147.78 |

| | | | | |
|---|---|---|---|---|
| **Arm 3** | 86.72 | 161.63 | 70.72 | 126.67 |
| **Arm 4** | 84.85 | 183.78 | 70.18 | 95.52 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 96.25 pcu | | 77.84 pcu | |
| **PRC%** | 3.79 | | 27.26 | |

**Table 10.13 - Site 5 -N82/Fortunestown Lane Signal Controlled Junction Modelling Results**

Site 6 – Carrigmore Estate/Fortunestown Lane Priority Controlled Junction.

The operation of the priority-controlled junction was modelled using PICADY software, and tested with the 2020 Survey Year, 2027 Opening Year, 2032 Opening Year + 5 Years and 2042 Opening Year + 15 Years. Each year was modelled with and without development.

The results of the modelling are summarised in in Table 28.

The maximum RFC recorded was 1.049 with a corresponding queue of 16.54 in the 2042 AM Peak. As the RFC value approaches 1.0 then queuing and delay can be expected to increase. It is normal practice to ensure that the RFC is below 0.85 to achieve a theoretical reserve capacity of greater than 15%, although a value of 0.85 can be exceeded in a future design year situation without any detrimental effect on the satisfactory and safe operation of the junction.

The junction operates with a max delay of 3.16 mins.

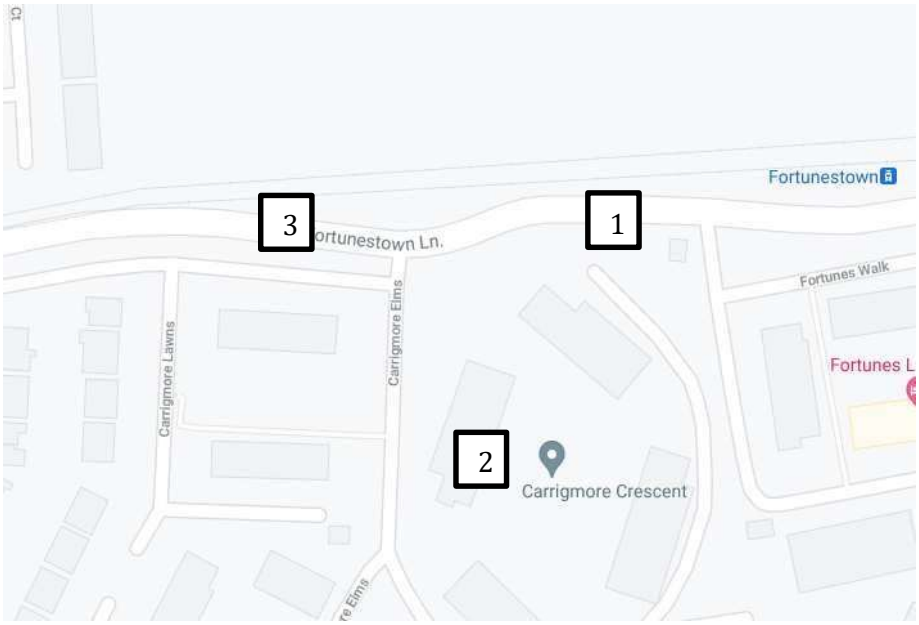



**Fig. 10.25 - Carrigmore Estate/Fortunestown Lane Priority Controlled Junction Layout**

The following arm destinations are used:

- Arm1 – Fortunestown Lane - East
- Arm 2 – Carrigmore
- Arm 3 – Fortunestown Lane – West

| | AM | | | PM | | |
|---|---|---|---|---|---|---|
| | Queue (PCU) | Delay (min) | RFC | Queue (PCU) | Delay (min) | RFC |
| | Survey | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 0.56 | 0.22 | 0.365 | 0.21 | 0.18 | 0.178 |
| Arm 3 | 0.05 | 0.13 | 0.047 | 0.08 | 0.15 | 0.077 |
| | 2027 Base | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 1.33 | 0.46 | 0.587 | 0.31 | 0.24 | 0.237 |
| Arm 3 | 0.09 | 0.15 | 0.085 | 0.10 | 0.16 | 0.093 |
| | 2027 Base + Development | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 10.92 | 1.80 | 1.044 | 0.60 | 0.29 | 0.380 |
| Arm 3 | 0.18 | 0.17 | 0.148 | 0.26 | 0.19 | 0.200 |
| | 2032 Base | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 1.55 | 0.51 | 0.627 | 0.34 | 0.25 | 0.256 |
| Arm 3 | 0.10 | 0.15 | 0.088 | 0.11 | 0.17 | 0.100 |
| | 2032 Base + Development | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 13.57 | 2.13 | 1.093 | 0.65 | 0.30 | 0.398 |
| Arm 3 | 0.18 | 0.17 | 0.152 | 0.27 | 0.20 | 0.209 |
| | 2042 Base | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 1.89 | 0.60 | 0.662 | 0.36 | 0.26 | 0.269 |
| Arm 3 | 0.09 | 0.16 | 0.086 | 0.12 | 0.17 | 0.104 |
| | 2042 Base + Development | | | | | |
| Arm 1 | - | - | - | - | - | - |
| Arm 2 | 16.54 | 3.16 | 1.049 | 0.62 | 0.19 | 0.212 |
| Arm 3 | 0.16 | 0.17 | 0.137 | 0.24 | 0.16 | 0.112 |

**Table 10.14 - Site 6 - Carrigmore Estate/Fortunestown Lane Priority Controlled Junction Layout Modelling Output**

Site 7 – Church Road/Fortunestown Lane Signal Controlled Junction

2020 Survey Year, 2027 Opening Year, 2032 Opening Year + 5 Years and 2042 Opening Year + 15 Years. Each year was modelled with and without development.

The results of the modelling are summarised in in Table 29.

The modelling illustrates that the N82/ Fortunestown Lane Signal Controlled Junction approaches capacity in the 2042 design scenario in the AM peak period. The maximum recorded DoS is 109.46% in 2042 with development added. For the same scenario, the maximum DoS in the PM peak period recorded is 89.13%.

A Dos value of 85% or below indicates that the junction is operating within capacity. A DoS value of between 85% and 100% indicates that the junction remains within capacity but is beginning to show signs of queuing and delay. A DoS value of less than 100% is desirable in urban areas during peak period traffic. However, values of greater than 100% are typical at many junctions.

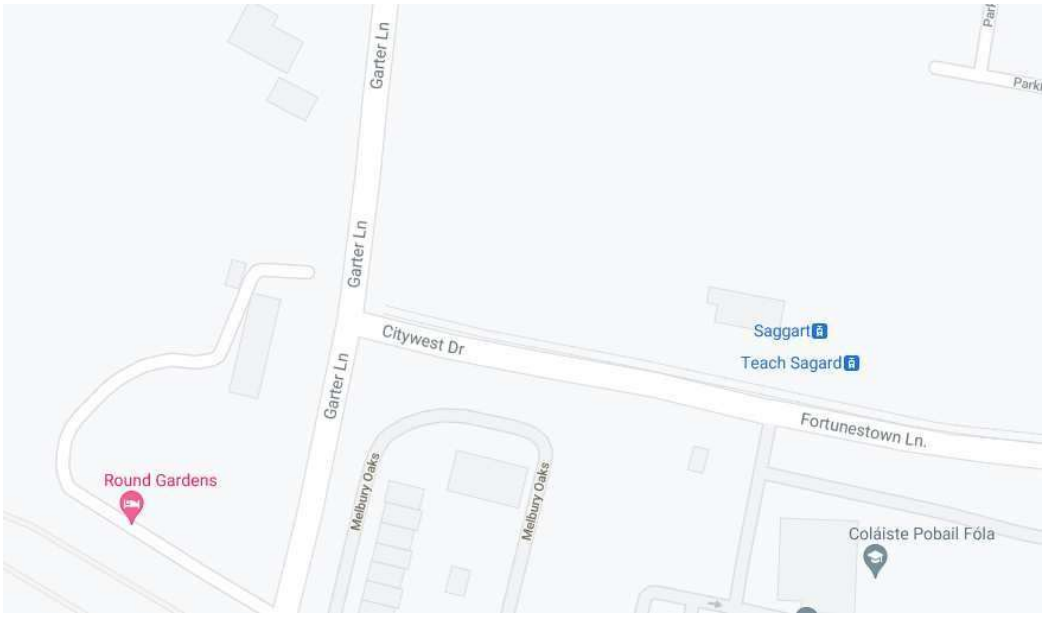



**Fig. 10.26 - Church Road/Fortunestown Lane Signal Controlled Junction Layout**

The following arm destinations are used:

- Arm1 – Garters Lane – North
- Arm 2 – Citywest Drive/Fortunestown Lane
- Arm 3 – Garters Lane – South

| | AM | | PM | |
|---|---|---|---|---|
| | DoS (%) | Delay (s) | DoS (%) | Delay (s) |
| | Survey - 2020 | | | |
| **Arm 1** | 60.31 | 117.69 | 58.61 | 92.18 |
| **Arm 2** | 59.99 | 107.67 | 58.32 | 82.17 |
| **Arm 3** | 60.19 | 63.49 | 58.28 | 108.13 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 26.65 pcu | | 27.43 pcu | |
| **PCR (%)** | 47.98 | | 55.36 | |
| | 2027 Base | | | |
| **Arm 1** | 100.99 | 248.52 | 82.28 | 123.78 |
| **Arm 2** | 101.47 | 216.84 | 83.34 | 100.93 |
| **Arm 3** | 100.88 | 189.59 | 82.57 | 121.97 |
| **Cycle Time** | 300s | | 300s | |

| | | | | |
|---|---|---|---|---|
| **Total Delay** | 56.78 pcu | | 47.55 pcu | |
| **PCR (%)** | 1.13 | | 7.99 | |
| | **2027 Base + Development** | | | |
| **Arm 1** | 105.52 | 54.50 | 86.53 | 133.69 |
| **Arm 2** | 105.21 | 105.50 | 85.40 | 102.92 |
| **Arm 3** | 104.56 | 116.50 | 86.48 | 142.00 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 144.61 pcu | | 44.96 pcu | |
| **PCR (%)** | -14.71 | | -7.15 | |
| | **2032 Base** | | | |
| **Arm 1** | 103.64 | 295.78 | 86.63 | 129.93 |
| **Arm 2** | 103.51 | 248.40 | 85.03 | 103.03 |
| **Arm 3** | 104.19 | 242.40 | 86.03 | 129.44 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 133.02 pcu | | 51.21 pcu | |
| **PCR (%)** | - 13.62 | | 4.61 | |
| | **2032 Base + Development** | | | |
| **Arm 1** | 106.86 | 349.38 | 89.90 | 139.40 |
| **Arm 2** | 106.99 | 308.58 | 88.889 | 111.10 |
| **Arm 3** | 107.13 | 297.77 | 88.91 | 82.50 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 167.33 pcu | | 56.78 pcu | |
| **PCR (%)** | -15.99 | | -1.13 | |
| | **2042 Base** | | | |
| **Arm 1** | 105.50 | 325.31 | 88.24 | 136.27 |
| **Arm 2** | 104.70 | 270.32 | 87.38 | 107.55 |
| **Arm 3** | 104.71 | 250.27 | 87.92 | 134.10 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 143.45 pcu | | 54.81 pcu | |
| **PCR (%)** | -14.69 | | 2.00 | |
| | **2042 Base + Development** | | | |
| **Arm 1** | 108.76 | 381.98 | 88.78 | 136.92 |
| **Arm 2** | 109.46 | 354.91 | 89.05 | 113.79 |
| **Arm 3** | 109.06 | 334.84 | 89.13 | 135.83 |
| **Cycle Time** | 300s | | 300s | |
| **Total Delay** | 192.16 pcu | | 57.09 pcu | |
| **PCR (%)** | -17.78 | | 0.98 | |

**Table 10.15 - Site 7- Church Road/Fortunestown Lane Signal Controlled Junction Modelling Output**

Site 8 – Boherboy Road/Saggart Signal Controlled Junction.

The operation of the signalised junction was modelled using OSCADY software, and tested with the 2020 Survey Year, 2027 Opening Year, 2032 Opening Year + 5 Years and 2042 Opening Year + 15 Years. Each year was modelled with and without development.

The results of the modelling are summarised in in Table 29.

The modelling illustrates that the Boherboy Road/Saggart Signal Controlled Junction is within capacity for both the AM and PM peak periods with a DoS of less than 100%. The maximum recorded DoS is 91.27% in 2042 with development added. For the same scenario, the maximum DoS in the PM peak period recorded is 90.22%.

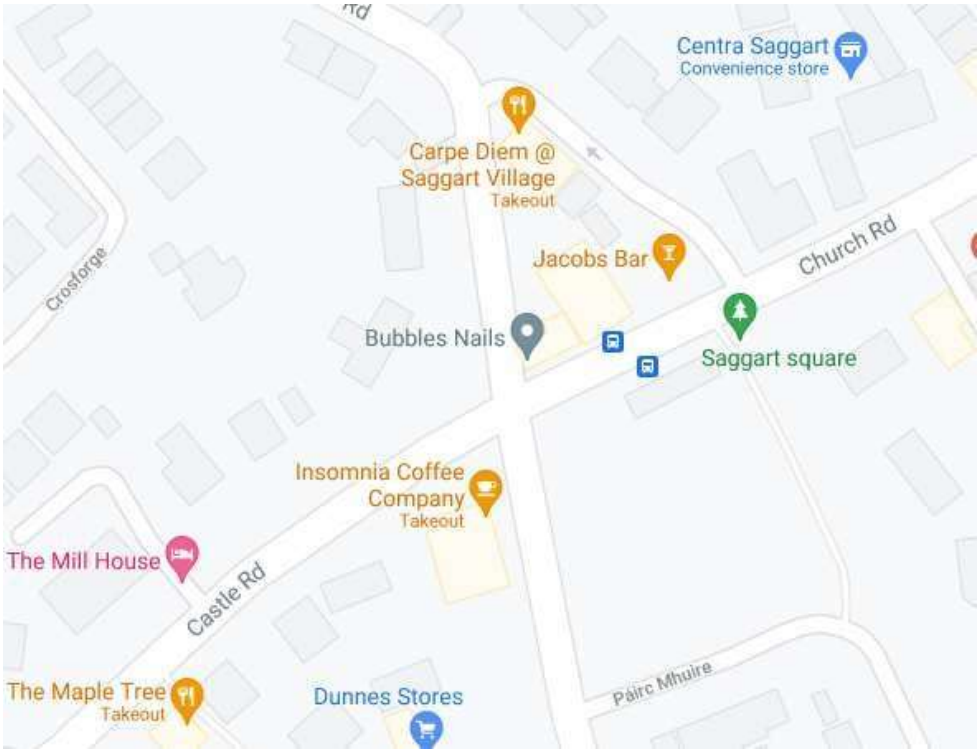



**Fig. 10.27 - Boherboy Road/Saggart Signal Controlled Junction Layout**

The following arm destinations are used:

- Arm1 – Boherboy Road
- Arm 2 – Castle Road
- Arm 3 – Mill Road
- Arm 4 - Church Road

| | AM | | PM | |
|---|---|---|---|---|
| | DoS (%) | Delay (s) | DoS (%) | Delay (s) |
| | Survey - 2020 | | | |
| Arm 1 | 68.89 | 53.69 | 73.31 | 51.77 |
| Arm 2 | 72.14 | 57.14 | 71.58 | 87.31 |
| Arm 3 | 70.69 | 47.46 | 72.41 | 49.51 |
| Arm 4 | 71.11 | 79.72 | 73.30 | 59.38 |
| Cycle Time | 120s | | 120s | |
| Total Delay | 18.26 pcu | | 19.00 pcu | |
| PCR (%) | 24.76 | | 22.79 | |
| | 2027 Base | | | |
| Arm 1 | 80.06 | 63.91 | 80.42 | 58.05 |
| Arm 2 | 79.26 | 64.15 | 86.43 | 134.351 |
| Arm 3 | 79.93 | 56.34 | 79.65 | 55.99 |
| Arm 4 | 78.75 | 86.77 | 81.76 | 68.18 |
| Cycle Time | 120s | | 120s | |
| Total Delay | 23.41 pcu | | 25.19 pcu | |
| PCR (%) | 12.41 | | 4.13 | |
| | 2027 Base + Development | | | |
| Arm 1 | 82.75 | 63.76 | 84.85 | 64.20 |
| Arm 2 | 86.23 | 79.59 | 80.60 | 106.54 |
| Arm 3 | 820.3 | 59.01 | 85.49 | 655.89 |
| Arm 4 | 86.07 | 110.35 | 84.66 | 73.52 |
| Cycle Time | 120s | | 120s | |
| Total Delay | 28.01 pcu | | 24.75 pcu | |
| PCR (%) | 4.37 | | 5.28 | |
| | 2032 Base | | | |
| Arm 1 | 83.72 | 69.35 | 83.97 | 62.76 |
| Arm 2 | 82.02 | 68.02 | 89.75 | 152.37 |
| Arm 3 | 83..55 | 61.28 | 82.89 | 60.23 |
| Arm 4 | 81.84 | 93.71 | 85.87 | 76.21 |
| Cycle Time | 120s | | 120s | |
| Total Delay | 26.64 pcu | | 28.88 pcu | |
| PCR (%) | 7.5 | | 0.28 | |
| | 2032 Base + Development | | | |
| Arm 1 | 85.84 | 69.08 | 88.40 | 71.57 |
| Arm 2 | 90.21 | 92.08 | 83.01 | 114.06 |
| Arm 3 | 85.46 | 64.63 | 89.02 | 74.40 |
| Arm 4 | 88.91 | 122.56 | 88.29 | 82.76 |
| Cycle Time | 120s | | 120s | |
| Total Delay | 32.38 pcu | | 32.18 pcu | |

| | | | | |
|---|---|---|---|---|
| **PCR (%)** | -0.23 | | 1.11 | |
| | **2042 Base** | | | |
| **Arm 1** | 86.09 | 74.01 | 86.63 | 67.52 |
| **Arm 2** | 84.55 | 72.49 | 93.07 | 175.85 |
| **Arm 3** | 86.22 | 66.16 | 85.75 | 65.16 |
| **Arm 4** | 83.17 | 97.24 | 88.53 | 83.52 |
| **Cycle Time** | 120s | | 120s | |
| **Total Delay** | 29.15 pcu | | 32.76 pcu | |
| **PCR (%)** | 4.38 | | -3.3 | |
| | **2042 Base + Development** | | | |
| **Arm 1** | 89.25 | 79.03 | 90.18 | 76.62 |
| **Arm 2** | 89.29 | 86.69 | 93.07 | 175.85 |
| **Arm 3** | 87.75 | 69.64 | 88.41 | 71.32 |
| **Arm 4** | 91.27 | 135.53 | 90.22 | 89.47 |
| **Cycle Time** | 120s | | 120s | |
| **Total Delay** | 35.09 pcu | | 36.24 pcu | |
| **PCR (%)** | -1.39 | | -3.30 | |

**Table 10.16 -Site 8 – Boherboy Road/Saggart Signal Controlled Junction Modelling Output**

## Car Parking Provision

## Car Parking Standards

Table 11.24 'Maximum Parking Rates (Residential Development)' of South Dublin County Council's Development Plan 2016-2022 sets out the car parking requirements for various types of development.

The proposed development has a medium level service level in terms of bus and Luas service. Therefore, it is assumed that the site is in Zone 1. South Dublin County Council Development Plan Parking standards are provided in Table 10.17 below.

| *General Parking Standards* | | | |
|---|---|---|---|
| **Land Use** | | **Standards** | |
| | | *Z1* | *Z2* |
| *Apartment/Duplex* | *1 bed* | *1 space* | *0.75 spaces* |
| | *2 bed* | *1.25 spaces* | *1 space* |
| | *3 bed+* | *1.5 spaces* | *1.25 spaces* |
| *House* | *1 bed* | *1 space* | *1 space* |
| | *2 bed* | *1.5 spaces* | *1.25 spaces* |
| | *3+ bed* | *2 spaces* | *1.5 spaces* |

| | | | |
|---|---|---|---|
| *Creche* | | *1 per classroom* | *0.5 per classroom* |

**Table 10.17 - Parking Standards**

### Car Parking Provision – Creche

At a rate of 1 space per classroom, a total of 8 spaces will be provided for the crèche.

### Car Parking Provision - Houses

Parking provision for the houses will be in accordance with table 11.24 'Maximum Parking Rates (Residential Development)' of South Dublin County Council's Development Plan 2016-2022.

| Schedule of Accommodation – Houses | |
|---|---|
| Land Use | Standards |
| *House 3 Bed +* | *249* |
| *Houses 2 Bed* | *8* |
| ***Total*** | ***257*** |

**Table 10.18 -Schedule of Accommodation – Houses**

Based on the schedule above, the applicable rates of car parking have been applied to each housing type as illustrated in Table 10.19.

| Parking Provision | | | |
|---|---|---|---|
| Land Use | No. | Standards | Provided |
| *House 3 Bed +* | *249* | 498 | 518 |
| *Houses 2 Bed* | *8* | 12 | 12 |
| Total | | ***510*** | ***510*** |

**Table 10.19 - Parking Provision - Houses**

A total of 510 spaces for the houses will be provided in this development.

### Car Parking Standards – Duplex

The 'Sustainable Urban Housing – Design Standards for New Apartments' published by the Department of Housing, Planning and Local Government sets out alternative designer standards for apartments.

The new design standard sets out alternative criteria for the provision of car parking spaces based on the link between the proposed development, access to local amenities and access to public transport.

Given the location of the apartment blocks relative to the Luas stop at Fortunestown, it is assumed that the apartment blocks are located in Zone 2. A comparison between development plan standards and the new apartment guidelines is illustrated in the tables below.

| Car Parking Standards – Duplex | | | |
|---|---|---|---|
| **Land Use** | | **Standards** | |
| | | Development Plan Standards (Zone 2) | 'Sustainable Urban Housing – Design Standards for New Apartments' DoECLG (2018) |
| Duplex | 1 Bed | *0.75 space* | Depends on Design & Location |
| | 2 Bed | *1 space* | |
| | 3 Bed | *1.25 spaces* | |
| Visitors | | - | 1 space per 4 units |

**Table 10.20 – Parking Standards**

| Car Parking Provision - Duplex | | | |
|---|---|---|---|
| **No. of Units** | | **Standards** | |
| | | Required | 'Sustainable Urban Housing – Design Standards for New Apartments' DoECLG (2018) |
| I Bed | 4 | 2 | 152 |
| 2 Bed | 72 | 90 | |
| 3 Bed | 76 | 114 | |
| Visitor | | - | 38 |
| **Total** | | 208 | **190** |

**Table 10.21 - Car Parking Provision - Duplex**

A total of 190 spaces for the duplexes will be provided in this development. This equates to c. 1 spaces per unit and 38 visitor spaces.

### Car Parking Standards – Apartments

The 'Sustainable Urban Housing – Design Standards for New Apartments' published by the Department of Housing, Planning and Local Government sets out alternative designer standards for apartments.

The new design standard sets out alternative criteria for the provision of car parking spaces based on the link between the proposed development, access to local amenities and access to public transport.

Given the location of the apartment blocks relative to the Luas stop at Fortunestown, it is assumed that the apartment blocks are located in Zone 2. A comparison between development plan standards and the new apartment guidelines is illustrated in the tables below.

| Car Parking Standards – Apartment | | | |
|---|---|---|---|
| **Land Use** | | **Standards** | |
| | | Development Plan Standards (Zone 2) | 'Sustainable Urban Housing – Design Standards for New Apartments' DoECLG (2018) |
| Apartments | 1 Bed | *0.75 space* | Depends on Design & Location |
| | 2 Bed | *1 space* | |
| | 3 Bed | *1.25 spaces* | |
| Visitors | | - | 1 space per 4 units |

**Table 10.22 - Car Parking Standards – Apartment**

| Car Parking Provision - Apartment | | | | |
|---|---|---|---|---|
| **Type** | **No.** | **Standards** | | |
| | | Zone | | DoECLG (2018) |
| | | Z1 | Z2 | |
| I Bed | 62 | 18 | 33 | 184 |
| 2 Bed | 177 | 33 | 151 | |
| 3 Bed | 7 | 2 | 8 | |
| Visitor | | - | | 24 |

| Car Parking Provision - Apartment | | | |
|---|---|---|---|
| Sub Total | 52 | 192 | 208 |
| **Total** | **244** | | **208** |

**Table 10.23 - Car Parking Provision - Apartments**

It is proposed to provide 192 spaces for the apartment element of the proposed development. This equates to c. 0.85 spaces per unit.

**Car Parking – Summary**

A total of 908 parking spaces will be provided for the development.

Parking will be provided within the curtilage of each house. On street surface car parking will be provided for the apartments, duplexes, creches and visitor car parking spaces.

The development plan standard suggests a total of 398 spaces for the Apartment/Duplex element of the proposed development.

Without car parking dominating the proposal and taking into account the guidance set out in publications like DMURS and 'Sustainable Urban Housing – Design Standards for New Apartments' it was proposed to provide 398 spaces for the apartment blocks and duplexes.

This level of parking will both meet the demand for spaces but will also act as demand management tool for trips to/from the proposed development.

Therefore, a balance has been struck for the car parking provision taking into account the Development Plan standard and the anticipated demand.

| **Overall Parking Provision** | |
|---|---|
| **Land Use** | **Standards Provided** |
| Houses | 510 |
| Apartments | 208 |
| Duplex | 190 |
| Creche | 8 |
| ***Total*** | ***908*** |

**Table 10.24 – Overall Parking Provision**

The reduction in car parking spaces for the duplex unit/apartment units will have many benefits including the following:

- Less congestion and therefore improved safety on local roads by promoting alternatives to the car;
- Reduced highway capacity problems by promoting sustainable travel choices;
- Local environmental improvements from reduced congestion, carbon emissions, pollution and noise;
- Making the site more attractive to potential occupiers/users;
- Increased opportunities for active healthy travel, such as walking and cycling
- Reduced demand for parking spaces enabling land to be put to more cost effective or commercially beneficial use and freeing space for active travel initiatives; and
- Improved travel choice, quality and affordable access to services for all users.

**Cycle Parking Standards**

Table 11.22 'Minimum Bicycle Parking Rates' of South Dublin County Council's Development Plan 2016-2022 sets out the car parking requirements for various types of development.

Cycle parking standards are described in terms of long term and short-term use.

| Cycle Parking Standards | | |
|---|---|---|
| Land Use | Standards | |
| | Long Term | Short Stay |
| Residential Apartment | 1 per 5 apartments | 1 per 10 apartments |
| Creche | 1 space per 5 Staff | 1 space per 10 children |

**Table 10.25 - Cycle Parking Standards**

The quantum of cycle in accordance with the Development Plan standard is illustrated in Table 10.26.

| Cycle Parking Provision | | | |
|---|---|---|---|
| Land Use | | Standards | |
| | | Long Stay | Short Stay |
| Apartment | 246 | 49 | 24 |
| Duplex | 152 | 24 | 12 |
| Crèche | | 5 | 15 |
| Sub Total | | 78 | 51 |
| Total | | 129 | |

**Table 10.26 – Cycle Parking Provision**

Under Table 11.22 'Minimum Bicycle Parking Rates' of South Dublin County Council's Development Plan 2016-2022 a total of 129 cycle spaces are required.

Given that the 'Sustainable Urban Housing – Design Standards for New Apartments' DoECLG (2020) has been applied to the car parking provision for the apartments and duplex, the quantum of cycle parking required to meet the standards has been calculated. Refer to Table 10.27 over.

| Cycle Parking Provision | | | | |
|---|---|---|---|---|
| Land Use | | | Standards | |
| | Unit Type | N0. | | |
| Apartment | One Bed | 62 | 62 | |
| | Two Bed | 177 | 354 | |
| | Three Bed | 7 | 21 | |
| Duplex | One Bed | 4 | 4 | |
| | Two Bed | 72 | 144 | |
| | Three Bed | 76 | 228 | |
| Crèche | | | Long Stay | Short Stay |
| | | | 5 | 15 |
| Total | | | 833 | |

**Table 10.27 - Cycle Parking Provision - Apartment Guidelines**

South Dublin County Council's Development Plan 2016-2022 a total of 129 cycle spaces are required. The Sustainable Urban Housing – Design Standards for New Apartments' DoECLG (2020) suggests 833 spaces should be provided.

Given that car parking is provided at c. 0.8 spaces per unit, it's the provision of cycle spaces should be greater than the South Dublin County Council's Development Plan 2016-2022 requirement but less than the 'Sustainable Urban Housing – Design Standards for New Apartments' DoECLG (2020) requirement. Therefore, 604 cycle spaces will be provided.

### 10.5.6 Construction phase

It is considered that a Construction Traffic Management Plan (CTMP) would be prepared by the appointed contractor in order to minimise the potential impact of the construction phase of the proposed development on the safety and amenity of other users of the public road.

### 10.5.7 Operational phase

Not applicable in respect of traffic and transport.

## 10.6 Monitoring

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,
- Timings of construction activities.

During the operational phase, a MMP will be prepared for both residents within the apartment units and staff within the creche in order to guide the delivery and management of coordinated initiatives post construction. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development. In order to minimise the impacts of the development and to encourage sustainable modes of transport the MMP will address the following items in order to achieve this:

- Introduction of appropriate parking management;
- Optimise links with public transport;
- Provide and enhance cyclist and pedestrian facilities;
- Encourage modes of transport other than single than car trips.

Post occupancy surveys are to be carried out in order to determine the success of the measures and initiatives as set out in the proposed MMP document. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.

## 10.7 Reinstatement

Not applicable in respect of traffic and transport.

## 10.8 Potential Cumulative Impacts

Potential cumulative impacts have been assessed in relation to the existing and permitted transportation schemes and are taken into account in the baseline modelling. The traffic modelling undertaken includes growth in background traffic flows which accounts for other developments in the area. A desktop study was conducted of planning applications in the vicinity of the subject development on the SDCC planning database to assess any cumulative impacts from granted or committed applications close to the subject scheme.

These developments will be included the modelling of the impacted junctions. Where a Traffic & Transport Statement is available the figures will be taken directly. If no Traffic & Transport Statement is available TRICS will be used to estimate flows from the development and traffic surveys used for distribution.

### 10.8.1 School Site

Part of the Boherboy lands include a site that is zoned for a school. A site is reserved as part of the proposed development for future use as a school site until such time as the Department of Education and Skills confirms their need / intentions for same.

Typically, the Department of Education has a requirement for schools with between 6 to 24 classrooms. It is understood, through the negotiations pertaining to the design of the site, that the site has been earmarked for a 16-classroom primary school.

According to the Department of Education, the Average Class Size in Primary Schools (2014/15 - 2018/19) ranges from 24.9 to 24.3 with an overall downward trend. Based on an average of 24 pupils per classroom there is a potential pupil population of 384.

According to the Census 2016 Summary Results - Part 1 published by the CSO, the average household size is 2.75. Census 2016 shows the population of the primary school age group (5-12) stood at 548,693. Census 2016 results show that Ireland's population stood at 4,761,865. Therefore, the primary school age group (5-12) equates to 11.5% of the overall population.

Based on 655 total units, it is estimated that up to 194 children from within the development will be of primary school going age.

There is the potential for up to 194 local students to cycle/walk to the school site from within the proposed development. Therefore, the total external school population would be up to 548 pupils.

It is reasonable to assume that not all local children from the proposed development will attend the local school. Accordingly, school site will be tested for an external pupil population of 190.

These assumptions will attract higher trips to the proposed development as the external population is bigger and therefore offers a robust assessment of the potential trip rates to/from the school site via the external road network.

### 10.8.2 Committed Development

A planning search was undertaken to identify any developments that have planning permission but are not yet implemented or any schemes that are implemented but are as of yet un-let or empty. The following developments were included in the accumulative impact:

- Register Reference: SHD3ABP-305556-19
- Register Reference: SHD3AP-306602-20
- Register Reference: SHD3ABP- 305563-1
- Register Reference: SHD3ABP-308088-20

An allowance has been made for the school site, with appropriate linked trip reduction has also been allowed for.

These developments will be included the modelling of the impacted junctions. Where a Traffic & Transport Statement is available the figures will be taken directly. If no Traffic & Transport Statement is available TRICS will be used to estimate flows from the development and traffic surveys used for distribution.

These trips were assigned to the local road network and combined with the traffic counts referenced earlier in this report.

## 10.9 Interactions

The projected increase in vehicle traffic during the operational stage may lead to a slight increase in noise levels during peak trip generation periods, however, implementation of the mitigation measures described in the Noise and Air Quality Section of this Environmental Impact Assessment Report will prevent and minimize the potential impacts of this interaction.

### 10.9.1 Air Quality

The Air Quality and Climate Chapter of this EIAR states that the impact of the proposed development on air quality and climate is considered Long-term and imperceptible for the Operational Stage of the proposed development.

The design team has been in regular contact with each other throughout the design process to minimise environmental impacts and to ensure a sustainable and integrated approach to the design of the proposed development.

There is the interaction between Land and Soils Chapter where the import and export of construction materials is considered. It is noted that the designs have been developed to achieve a near balance of the cut and fill materials on site, which minimise construction related traffic. The associated construction traffic has been considered in the construction stage impacts and Construction Management Plan included with the application.

Temporary negative impacts to human health may be likely during the construction phase due to noise, dust, air quality and visual impacts which are discussed in other chapters within this EIAR. The traffic impacts, which would also be temporary in duration are not considered to be significant due to the implementation of the mitigation measures identified.

## 10.10 Risks to Human Health

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. Measures will be put in place to reduce the risk of road traffic accidents during the construction phase. Furthermore, it 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 and no unusual substance or underground tunnelling works required or predicted.

### 10.10.1 Construction Stage

A number of temporary risks to human health may occur during construction phase related to noise, dust, air quality and visual impacts which are addressed in other sections of this EIAR. Traffic impacts are considered to be negligible due to the implementation of mitigation measures identified.

### 10.10.2 Operational Stage

There will be a slight increase in traffic on the local road network.

**NOTE: Refer to Volume III of the EIAR for appendices associated with this chapter – i.e. Appendix 11**

# 11.0. Material Assets: Resource and Waste Management

## 11.1. Introduction

This Chapter of the EIAR comprises an assessment of the likely impact of the proposed development on the waste generated from the development as well as identifying proposed mitigation measures to minimise any associated impacts.

This Chapter was prepared by Chonaill Bradley of AWN Consulting. Chonaill Bradley is a Senior Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia. He is an Associate Member of the Institute of Waste Management (CIWM). Chonaill has over seven years' experience in the environmental consultancy sector.

A site-specific Construction and Demolition Resource Waste Management Plan (C&D RWMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the demolition, excavation and construction phases of the proposed Development and has been included as Appendix 11.1. The C&D RWMP was prepared in accordance with the 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government (DoEHLG) in July 2006 and the Environmental Protection Agency's (EPA) document 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021).

A separate Operational Waste Management Plan (OWMP) has also been prepared for the operational phase of the proposed Development and is included as Appendix 11.2 of (Volume III of the EIAR).

The Chapter has been prepared in accordance with EPA Guidelines on the Information to be contained in EIAR (2017, Draft). These documents will ensure the sustainable management of wastes arising at the Development Site in accordance with legislative requirements and best practice standards.

## 11.2 Methodology

The assessment of the impacts of the proposed Development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management, including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports. A summary of the documents reviewed, and the relevant legislation is provided in the C&D WMP and in the OWMP provided in Appendices 11.1 and 11.2.

This Chapter is based on the proposed Development, as described in Chapter 3 (Description of Project and Alternatives) and considers the following aspects:

- Legislative context;
- Construction phase (including demolition, site preparation and excavation); and
- Operational phase.

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed Development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the *National Waste Reports and National Waste Statistics*, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed Development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 11.5.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 5 of this EIAR (Land, Soil and Geology). Chapter 5 also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed Development.

### 11.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 11.1).


**Fig. 11.1: Waste Hierarchy (Source: European Commission)**

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland*, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity,* in 2012. The need to embed climate action in all strands of public policy aligns with the goals of the European Green Deal.

The strategy for the management of waste from the construction phase is in line with the requirements of the DoEHLG's Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (2021) and the EPA's Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2006). The guidance document, Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers (FÁS & Construction Industry Federation, 2002), was also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance in this respect is taken from industry guidelines, plans and reports including the Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, the Fingal County Council (FCC) Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws 2020, and the EPA national waste statistics 1998 – 2019.

### 11.2.1 Terminology

Note that the terminology used herein is generally consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

***Waste*** - Any substance or object which the holder discards or intends or is required to discard.

***Prevention*** - Measures taken before a substance, material or product has become waste, that reduce:

a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
b) the adverse impacts of the generated waste on the environment and human health; or
c) the content of harmful substances in materials and products.

***Reuse*** - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

***Preparing for Reuse*** - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

***Treatment*** - Recovery or disposal operations, including preparation prior to recovery or disposal.

***Recovery*** - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

***Recycling*** - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

***Disposal*** - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations.

### 11.3. Existing Receiving Environment (Baseline Scenario)

The development will principally consist of the demolition of the existing agricultural buildings onsite and the construction of a residential development consisting of houses, duplex units and apartments to accommodate residential dwellings and including a crèche, and residential tenant amenities.

In terms of waste management, the receiving environment is largely defined by SDCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *EMR Waste Management Plan 2015 – 2021*, which sets out the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of "70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. Ireland achieved 84 per cent material recovery of such waste in 2019, and therefore surpassed the 2020 target and is currently surpassing the 2025 target. The National Waste Statistics update published by the EPA in November 2021 identifies that Ireland's current against "Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)" was met for 2020 at 51% however they are currently not in line with the 2025 target..

The South Dublin County Development Plan 2016 – 2022 and the Draft South Dublin County Development Plan 2022 – 2028 also set policies and objectives for the SDCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, SDCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

### 11.3.1 Characteristics of the Proposed Development

A full description of the proposed Development can be found in Chapter 2 (Description of Project and Alternatives). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

**Note:** Appendix 11.1 Construction & Demolition resource Waste Management Plan (C&D RWMP) and Appendix 11.2 Operational Waste Management Plan (OWMP) are enclosed in Volume III of this EIAR under Appendix 11.

#### 11.3.1.1 Demolition Phase

There will be a quantity of waste materials generated from the demolition of the existing farm buildings and hardstanding areas on site, as well as from the excavation of the building foundations.

Further detail on the waste materials likely to be generated during the demolition works are presented in the project-specific C&D RWMP in Appendix 11.1. The C&D RWMP provides an estimate of the main waste types likely to be generated during the C&D phase of the proposed Development. The reuse, recycling / recovery and disposal rates have been estimated using the EPA National Waste Reports and these are summarised in Table 11.1:

| Waste Type | Tonnes | Reuse | | Recycle / Recovery | | Disposal | |
|---|---|---|---|---|---|---|---|
| | | % | Tonnes | % | Tonnes | % | Tonnes |
| **Concrete, Bricks, Tiles, Ceramics** | 84.2 | 30 | 25.2 | 65 | 54.7 | 5 | 4.2 |
| **Plasterboard** | 1.7 | 0 | 0.0 | 25 | 0.4 | 75 | 1.2 |
| **Metals** | 24.8 | 5 | 1.2 | 80 | 19.8 | 15 | 3.7 |
| **Timber** | 19.8 | 10 | 2.0 | 60 | 11.9 | 30 | 5.9 |
| **Total** | **130.4** | | **28.5** | | **86.8** | | **15.1** |

**Table 11.1: Estimated off-site Reuse, Recycle and Disposal Rates for Demolition Waste**

#### 11.3.1.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

In addition, topsoil, subsoil, clay and made ground will require excavation to facilitate site levelling, construction of foundations, along with the installation of underground services. The Project Quantity Surveyors have estimated that c. 101,000m$^3$ of material will require excavation. It is envisaged that the majority of this material will be removed off-site with only c. 41,000 m$^3$ of material expected to be kept for on-site reuse. These estimates will be refined prior to commencement of construction.

If the material that requires removal from Site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011). For more information in relation to the envisaged management of by-products, refer to the C&D RWMP (Appendix 11.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2019). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

| Waste Type | Tonnes | Reuse | | Recycle / Recovery | | Disposal | |
|---|---|---|---|---|---|---|---|
| | | % | Tonnes | % | Tonnes | % | Tonnes |
| **Mixed C&D** | 1300.9 | 10 | 130.1 | 80 | 1040.7 | 10 | 130.1 |
| **Timber** | 1103.8 | 40 | 441.5 | 55 | 607.1 | 5 | 55.2 |
| **Plasterboard** | 394.2 | 30 | 118.3 | 60 | 236.5 | 10 | 39.4 |
| **Metals** | 315.4 | 5 | 15.8 | 90 | 283.8 | 5 | 15.8 |
| **Concrete** | 236.5 | 30 | 71.0 | 65 | 153.7 | 5 | 11.8 |
| **Other** | 591.3 | 20 | 118.3 | 60 | 354.8 | 20 | 118.3 |
| Hazardous | 0.1 | 0 | 0.0 | 0 | 0.0 | 100 | 0.1 |
| **Total** | 0.1 | 0 | 0.0 | 0 | 0.0 | 100 | 0.1 |

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP (Appendix 11.1). The C&D WMP provides an estimate of the main waste types likely to be generated during the Construction phase of the proposed Development. These are summarised in Table 11.2 below.

**Table 11.2: Estimated off-site Reuse, Recycle and Disposal Rates for Construction Waste**

#### 11.3.1.3 Operational Phase

As noted in Section 11.1, an OWMP has been prepared for the proposed Development and is included as Appendix 11.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables (DMR), organic waste and mixed non-recyclable waste (MNR), as well as providing a strategy for management of waste glass, batteries, WEEE, printer / toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The total estimated waste generation for the proposed Development for the main waste types, based on the AWN waste generation model (WGM), is presented in Table 11.3, and is based on the uses and areas as advised by the Project Architects. Further unit breakdowns can be found in Appendix 11.2.

| Waste Type | Waste Volume ($m^3$/week) | |
|---|---|---|
| | Residential Units (Combined) | Crèche Unit (Combined) |
| **Organic Waste** | 11.86 | 0.07 |
| **DMR** | 84.08 | 2.73 |
| **Glass** | 2.30 | 0.01 |
| **MNR** | 44.21 | 1.21 |
| **Total** | **142.45** | **4.02** |

**Table 11.3: Estimated Waste Generation During Operational Phase**

The residents and crèche tenants will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the residents. As required, the residents and tenants will need to bring these segregated wastes from their units to their allocated Waste Storage Areas (WSAs). WSAs can be viewed on the plans submitted with the application under separate cover.

The OWMP seeks to ensure that the proposed Development contributes to the targets outlined in the *EMR Waste Management Plan 2015 – 2021* and the SDCC, County of South Dublin (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018.

Mitigation measures proposed to manage impacts arising from wastes generated during the operational phase of the proposed Development are summarised below.

### 11.4 Predicted Impacts of the Proposed Development

If the proposed Development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no demolition, excavation or construction or operational waste generated at this Site. There would, therefore, be a *neutral* effect on the environment in terms of waste.

This section details the potential waste effects associated with the proposed development.

### 11.4.1 Construction Phase

The proposed Development will generate a range of non-hazardous and hazardous waste materials during site demolition, excavation and construction. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the Development Site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local environment is likely to be ***short-term, significant*** and ***negative***.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be ***Long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the Development Site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed Development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 6. It is anticipated that c. 60,000m$^3$ of excavated material will need to be removed off-site, however it is envisaged that c. 41,000 m$^3$ tonnes of excavated material will be reused on-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

### 11.4.2 Operational Phase

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

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

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

Waste contractors will be required to service the proposed Development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***Long-term, significant*** and ***negative***.

## 11.5 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

### 11.5.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development:

As previously stated, a project specific C&D RWMP has been prepared in line with the requirements of the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, 2006) and The EPA, Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)* and is included as Appendix 11.1. Adherence to the high-level strategy presented in this C&D RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the C&D RWMP (Appendix 11.1) in agreement with SDCC, or submit an addendum to the C&D RWMP to SDCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.

- The Contractor will be required to fully implement the C&D RWMP throughout the duration of the proposed construction and demolition phases.

A quantity of topsoil, sub soil, clay and made ground which will need to be excavated to facilitate the proposed Development. Project Engineers have estimated that c.60,000 $m^3$ of excavated material will need to be removed off-site, however it is envisaged that c. 41,000 $m^3$ excavated material will be reused on-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
- Concrete rubble (including ceramics, tiles and bricks);
- Plasterboard;
- Metals;
- Glass;
- Timber;
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition, excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities;
- All waste leaving the site will be recorded and copies of relevant documentation maintained; and
- Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed Development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the *EMR Waste Management Plan 2015 – 2021*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

### 11.5.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 11.2 of Volume III of this EIAR.

- The Operator / Buildings Manager of the Site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the Site of the proposed development.

In addition, the following mitigation measures will be implemented:

- The Operator / Buildings Manager will ensure on-Site segregation of all waste materials into appropriate categories, including (but not limited to):
    - Organic waste;
    - Dry Mixed Recyclables;
    - Mixed Non-Recyclable Waste;
    - Glass;
    - Waste electrical and electronic equipment (WEEE);
    - Batteries (non-hazardous and hazardous);
    - Cooking oil;
    - Light bulbs;
    - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
    - Furniture (and from time to time other bulky waste); and
    - Abandoned bicycles.

- The Operator / Buildings Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Operator / Buildings Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Operator / Buildings Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, *the Litter Pollution Act 1997*, the *EMR Waste Management Plan 2015 – 2021* and the SDCC, County of South Dublin (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

## 11.6 Residual Impacts

The implementation of the mitigation measures outlined in Section 11.5 will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the proposed development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

### 11.6.1 Construction Phase

A carefully planned approach to waste management as set out in Section 11.5 and adherence to the C&D RWMP during the construction phase will ensure that the predicted effect on the environment will be ***short-term*, *imperceptible* and *neutral*.**

### 11.6.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 11.5 and adherence to the OWMP will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be ***long-term, imperceptible*** **and** ***neutral*****.**

### 11.6.3 Conclusion

Assuming the full and proper implementation of the mitigation measures set out herein and in the C&D WMP (Appendix 11.1) and the OWMP (Appendix 11.2), no likely significant negative effects are predicted to occur as a result of the construction or operational of the proposed development.

## 11.7 Monitoring

The management of waste during the construction phase will be monitored by the Contactor's appointed Waste Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation. The management of waste during the operational phase will be monitored by the Operator / Buildings Manager to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

### 11.7.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the demolition, excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting construction schedule targets. The C&D RWMP specifies the need for a Waste Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Waste Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed Development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

### 11.7.2 Operational Phase

During the operational phase, waste generation volumes will be monitored by the Operator / Buildings Manager against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

## 11.8 Interactions

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR.

### 11.8.1 Land, Soil & Geology

During the construction phase, excavated soil, stone, clay and made ground (c. 101,000 $m^3$) will be generated from the excavations required to facilitate site levelling, construction of the basements and construction of new foundations. It is estimated that c. 60,000 $m^3$ of excavated material will need to be removed off-site. However, it is envisaged that c. 41,000 $m^3$ material will be reused on-site for landscaping and fill. Where material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 5 and the requirements of the C&D RWMP (Appendix 11.1), will ensure the effect is ***long-term***, ***imperceptible*** and ***neutral.***

### 11.8.2 Material Assets: Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the Site during the construction and operational phases of the proposed Development. The increase in vehicle movements as a result of waste generated during the construction phase will be *temporary* in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 10 (Material Assets - Transportation). Provided the mitigation measures detailed in Chapter 10 and the requirements of the OWMP (included as Appendix 11.2) are adhered to, the predicted effects are ***short to long-term, imperceptible*** and ***neutral.***

### 11.8.3 Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific C&D WMP and OWMP (Appendices 11.1 and 11.2, respectively), will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be ***long-term***, ***imperceptible*** **and** ***neutral.***

## 11.9 Cumulative Impacts

At the time of writing this Chapter, relevant applications in the environs of the site and within the administrative area of South Dublin County Council were reviewed and assed. Therefore, the potential for any cumulative impacts to occur have been comprehensively considered in the preparation of this chapter

### 11.9.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. Due to the high number of waste contractors

in the Dublin region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, not significant*** and ***neutral***.

### 11.9.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

## 11.10 Difficulties Encountered in Compiling the Chapter

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

There is a number of licensed, permitted and registered waste facilities in the Dublin region and in the surrounding counties. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity, serviceability, and cost.

**NOTE: Refer to Volume III of the EIAR for appendices associated with this chapter – i.e. Appendix 11**

## 11.11 Reference List


- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation include:
  - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
  - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
  - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
  - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
  - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015).
  - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014).
  - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
  - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
  - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015).
  - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
  - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.
  - European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011).
  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended.
- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (2020).
- Department of Environment and Local Government (DELG) (1998). *Waste Management – Changing Our Ways, A Policy Statement*.
- Department of Environment, Communities and Local Government (DECLG) (2012*). A Resource Opportunity - Waste Management Policy in Ireland*.
- South Dublin County Council (SDCC), South Dublin County Council Development Plan 2016-2022
- SDCC, Draft South Dublin County Council Development Plan 2022-2028 (2021)
- SDCC, South Dublin County Council Household & Commercial Waste Bye-Laws (2018).
- Department of Environment, Heritage and Local Government (DEHLG) (2020). *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities.*
- Department of Environment, Heritage and Local Government (DEHLG) (2006). *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.*
- Eastern-Midlands Region Waste Management Plan 2015-2021 (2015).
- Environmental Protection Agency (EPA). National Waste Database Reports 1998-2012.
- EPA (2015). *Waste Classification-List of Waste & Determining if Waste is Hazardous or Non-Hazardous*.
- EPA and Galway-Mayo Institute of Technology (GMIT) (2015). *EPA Research Report 146-A Review of Design and Construction Waste Management Practices in Selected Case Studies-Lessons Learned.*
- FÁS and the Construction Industry Federation (CIF) (2002). *Construction and Demolition Waste Management-a handbook for Contractors and Site Managers.*
- Forum for the Construction Industry-Recycling of Construction and Demolition Waste.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended.
- Protection of the Environment Act 2003, (No. 27 of 2003) as amended.

# 12.0. Archaeology and Cultural Heritage

## 12.1. Introduction

This section of the Environmental Impact Assessment Report (EIAR) assesses the impact of the proposed development on the Cultural Heritage of the site and its environs. The report includes a desktop study and a site inspection. The desktop section of the report was compiled using: The Records of Monuments and Places; buildings of Ireland, Excavations Bulletin; historic maps; aerial photographs; place names and historic books and journals. Archaeological testing was undertaken in 2018 to supplement this report.

Field walking was undertaken in June 2018. John Purcell Archaeological Consultancy undertook this report. Field walking was undertaken by John Purcell BA. John Purcell graduated from UCC with and honours degree in archaeology in 1997. He has been excavation licence eligible with the Department of Housing, Local Government and Heritage since 2002 and has worked consistently since then in the area of archaeology.

## 12.2. Assessment Methodology

### 12.2.1. Guidance and Legislation

As part of the assessment the following legislation and guidelines were consulted as part of the study:

- National Monuments Acts, 1930-2014;
- The Planning and Development Act, 2000 (as amended);
- Heritage Act, 1995;
- Environment Protection Agency: Advice Notes for preparing Environmental Impact Statements, 2015;
- EPA: Draft Revised Guidelines on The Information to be Contained in Environmental Impact Assessment Reports, August 2017;
- Frameworks and Principles for the protection of Archaeological Heritage 1999;
- Architectural Heritage (National Inventory) and Historic Monuments and the Local Government (Planning and Development) Act 2000;
- South Dublin County Development Plan 2016-2022.

### 12.2.2. Study Methodology

This assessment consists of a paper survey identifying all recorded sites within the vicinity of the proposed development and a site inspection. The methodology has been conducted based on the guidelines from the Department of Culture, Heritage and the Gaeltacht (DAHG).

### 12.2.3. Desktop Survey

The desktop survey undertaken consisted of a document and cartographic search utilising a number of sources including the following:

- Record of Monuments and Places (RMP); The RMP records known upstanding archaeological monuments, the original location of destroyed monuments and the location of possible sites identified through, documentary, cartographic, photographic research and field inspections.

- The RMP consists of a list, organised by county and subdivided by 6" map sheets showing the location of each site. The RMP data is compiled from the files of the Archaeological Survey.
- National Inventory of Architectural Heritage; The inventory of architectural heritage lists all post 1700 structures and buildings in the country. This includes structures of architectural, historical, archaeological, artistic, cultural, social, scientific or technical importance.

- County Development Plans; The Development plan was consulted to ascertain if any structures listed in the Record of Protected Structures (RPS) and/or any Architectural Conservation Areas (ACAs). The Record of Protected Structures lists all protected structures and buildings in Laois. This includes structures of architectural, historical, archaeological, artistic, cultural, social, scientific or technical importance.

- Cartographic Sources; The following maps were examined: Down Survey, 1st edition Ordnance Survey Maps (1836-1846) and 2nd edition Ordnance Survey Maps (1908), Rocque Map and the Cassini Map.

- Literary Sources; Various published sources, including local and national journals, were consulted to establish a historical background for the proposed development site. Literary sources are a valuable means of completing the written record of an area and gaining insight into the history of the environs of the proposed development. Principal archaeological sources include: The Excavations Bulletin; Local Journals; Published archaeological and architectural inventories; Peter Harbison, (1975). Guide to the National Monuments of Ireland; and O'Donovan's Ordnance Survey Letters.

A comprehensive list of all literary sources consulted is given in the bibliography.

### 12.2.4 Site Inspection

An archaeological field inspection survey seeks to verify the location and extent of known archaeological features and to record the location and extent of any newly identified features. A field inspection should also identify any areas of archaeological potential with no above ground visibility. In certain cases archaeological test trenches can be excavated to examine the sub surface potential of a site. Many monument types do not leave surface markers. Wooden sites such as prehistoric house or burials may only be recorded through excavation works.

### 12.2.5 Assessment Criteria

The criteria used to assess the significance of the impact of a development on an archaeological landscape, site, feature, monument or complex are defined as follows:

- Profound - Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where an archaeological site is completely and irreversibly destroyed by a proposed development.

- Significant - An impact which, by its magnitude, duration or intensity, alters an important aspect of the environment. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about the archaeological feature/site.

- Moderate - A moderate direct impact arises where a change to the site is proposed which though noticeable, is not such that the archaeological integrity of the site is compromised, and which is reversible. This arises where an archaeological feature can be incorporated into a modern-day development without damage and that all procedures used to facilitate this are reversible.

- Slight - An impact which causes changes in the character of the environment which are not significant or profound and do not directly impact or affect an archaeological feature or monument.

- Imperceptible - An impact capable of measurement but without noticeable consequences.

### 12.2.6 Difficulties Encountered

No difficulties that could hinder the archaeological assessment were encountered,

### 12.2.7 Consultations

No consultations were undertaken.

## 12.3 The Receiving Environment

The proposed development is located in the townland of Boherboy to the east of the village of Saggart. The study area is currently laid out as pasture in two fields. Evidence of land improvements in the form of hedgerow removal is visible. He site contains a farmyard and a domestic dwelling in disrepair at the south. These are visible on the first edition OS map.

The site slopes to the south and has commanding views over the countryside to the north. The site is bounded by a third class road at the south. By a stream at the east. Housing developments are visible at the east and it is bounded by agricultural land at the west.

The study area does not include any record archaeological monuments.

## 12.4 General Archaeological and Historical Summary

### 12.4.1 Brief Archaeological Background

**Prehistory**

The Sites and Monuments Record (SMR) lists a number of prehistoric sites in this part of Co. Dublin. The earliest recorded archaeology in the area dates from the Neolithic (4,200-2,500BC). At this stage communities became more stable with the introduction of agricultural practices. The more permanent settlement allowed communities to construct large ceremonial sites. These megalithic sites are visible in the Dublin Mountains to the southeast of the study area.

The bronze age marks the introduction of metal working to Ireland. This allowed for more efficient farming and hunting techniques. It also allowed for small industry and trade to take place between communities. Barrows are a common form of monument across in this area from this period. These are associated with the Bronze/Iron Age burial tradition (c. 2400 BC - AD 400) and are defined by an artificial mound of earth or

earth and stone, normally constructed to contain or conceal burials. These sites vary in shape and scale and can be variously described as bowl-barrow, ditch barrow, embanked barrow, mound barrow, pond barrow, ring-barrow and stepped barrow. The incidence and frequency of these sites in the area attests to the extent of prehistoric settlement in this area from earliest times. Prehistoric settlements sites are generally not visible at ground level and can only be uncovered as a result of ground works.

**Iron Age to Early Medieval Period**

In late Bronze Age Ireland the use of the metal reached a high point with the production of high quality decorated weapons, ornament and instruments, often discovered from hoards or ritual deposits. The Iron Age however is known as a 'dark age' in Irish prehistory. Iron objects are found rarely, but there is no evidence for the warrior culture of the rest of Europe, although the distinctive La Tené style of art with animal motifs and spirals was adopted. Political life in the Iron Age seems to have been defined by continually warring petty kingdoms vying for power. These kingdoms, run on an extended clan system, had their economy based on mixed farming and, in particular cattle. Settlement was typically centred on a focal hillfort.

Another more domestic site common to the Bronze Age is the *fulachta fiadh*. These are located along the edges of streams or in damp areas. They consist of a mound of charcoal enriched soil with fragmented burnt rocks. They usually are accompanied by a wooden or stone lined trough. These were used seasonally possibly for cooking or may have been used for recreational purposes.

Settlement in the Early Medieval Period is defined by the ringfort. The country was a patchwork of competing kingdoms during this period numbering up to 150. Ringforts were a farmstead surrounded by one or more earthen banks. These are the commonest monument across the south of Co. Dublin and have been frequently recorded in the area. These are generally located in areas with commanding views over the countryside to provide security.

**Ecclesiastical Settlement**

The introduction of Christianity to Ireland in the fifth century had a profound impact on Gaelic society, not in the least in terms of land ownership and the development of churches and the development of a large number of religious houses. The earliest churches were constructed of wood and mortar and wattle walls. By the ninth and tenth centuries these were being replaced by stone structures including the construction of Round Towers. These settlements became very important around the country and became small towns. Many of these sites were surrounded large earthen enclosures.

Several early Christian Monuments are located in the vicinity of the study area.

**Historic Period**

Following the Norman Conquest of the country a series of tower houses and boroughs were built across this part of Co. Dublin. A series of medieval churches were also constructed across the area to service the growing population. A large number of tower houses and fortified houses were constructed in the area to protect and consolidate settlement in the area.

### Post Medieval Ireland

Seventeenth century Ireland saw massive upheaval a result of the Confederate wars, the Cromwellian response and the Wars of the two kings. The impact on the country was profound. The settlements at Saggart were affected by the Cromwellian Restoration and land settlements. All catholic property owners were affected, and large land and property confiscations took place. It has been estimated that up to a third of the population was wiped out because of famine, disease and war. Soldiers were given land as payment resulting in further upheaval of the local population and the establishment of large estates. These came to dominate the landscape from this period onwards. Religious intolerance in other parts of Europe resulted in the expulsion of the Huguenot from France which were welcomed by the English Crown into Ireland.

### Industrial Period

The eighteenth century saw considerable industrial growth across the country. In Saggart the Swiftbrook Paper Mills were founded in 1760. The mill was expanded and renovated in the later 18th century and the mid-19th century. These were powered using water wheels on the River Camac.

## 12.4.2 Archaeological Monuments

The proposed development will have no impact on the archaeological landscape or on any recorded monuments. No recorded monuments exist in the environs of the site and none will be affected by its development. The closest site is a holy well this is located 320m to the west. The ecclesiastical remains at Saggart are 1.2km to the west. The development will have no impact on these remains. Their details are listed below.

A holy well is located in the townland of Boherboy to the west of the site (DU021-045). The archaeological survey of Ireland describes this as a natural spring alongside a field boundary in a field of rough pasture which falls away to the N. There are traces of dry stone walling around it. The site is marked by elder bushes.

A standing stone pair is recorded in the townland of Boherboy to the southwest of the site (DU021-044). This is described in the archaeological survey of Ireland. The site is situated in a field of pasture at the base of the S slopes of Saggart Hill. The stones are aligned NW-SE and are 1.3m apart. The SE stone is a three-sided granite pyramid (H 1.4m; 1.2-1.5m), the NW stone is a rectangular, granite, pillar (H 1.6m; L 1-1.3m; Wth 0.8-0.9m). Known locally as the 'Adam and Eve' stones (McDix 1899, 125-9).

To the south if the site in the townland of Corbally lies the remains of a holy well (DU021 051) This is described in the archaeological survey of Ireland as a natural spring well which lies in a marshy hollow. It is dedicated to St. Moling (Ó Danachair 1958, 85). The OS Letters describe it as a blessed well called Tobar Moling beside a burying ground which had been in use up to the 1830's (O'Flanagan 1926, 39). No longer venerated.

As part of the Cork-Dublin gas pipeline a settlement site was uncovered in Brownsbarn to the north of the site (RMP DU021 023). This is described in the archaeological survey of Ireland. It was situated adjacent to a small stream. Although initially considered to be the remains of a possible *fulachta fiadh* (Gowan 1982, 29) on further examination it was determined as the remains of a possible settlement site. This was evident as a shallow fosse or drain (15m long, 0.3m deep and 1m wide) and a sub-rectangular pit (L 5.80m long and 0.9m wide). The fill in the fosse contained charcoal enriched soil, animal bone and oxidised clay, possibly from a hearth; a bone comb was recovered from the fill. The fill of the pit comprised a dark brown humus-enriched

soil and animal bones. The excavators suggested that the finds indicate that the drain and pit may be part of a 9th or 10th century AD settlement site. It has not been possible to identify with certainty the precise location of this site and the current ITM coordinates should only be considered as indicative.

The village of Saggart developed around an ecclesiastical settlement. This includes and number of monuments (listed below) and a number of medieval architectural fragments.

The medieval church was surrounded by an ecclesiastical enclosure (DU021-034001).
This is described in the archaeological survey of Ireland. The walled graveyard has a raised interior and is oval in plan (dims. c. 70m N-S c. 52m E-W). There are traces of an inner fosse at the base of slope running from N to SE (dims. Wth 5-7m, D 0.40m). The plan of the graveyard indicates the probable existence of an ecclesiastical enclosure associated with St. Mosacra who founded a church here in the 7th century.

The village also includes a medieval church (DU021-034002). The remains of medieval church are located in the centre of this enclosure(DU021-034001-). This survives to foundation level and comprises nave and chancel with a possible S transept ext. dims. nave L 22.25m, Wth 10.85m, wall T 1.30m; chancel 2.40m, L 4.80m, Wth 6.40m). A mortuary house was built over the E end of chancel. This church was still in good repair in 1615 but had collapsed by 1630 after which time it seems to have been abandoned (Ball 1905, 117; Bradley & King 1987, 293).

The village also includes a deserted medieval settlement (DU021 034). Saggart was a small medieval borough located on an exposed position in the late medieval period. It was captured and burnt in 1580 by Fiach Mc Hugh O' Byrne. In the mid-17th century it was described as a village containing two castles in repair and the remains of another castle as well as some thatched houses and cabins (Ball 1902-20, III, 115). In 1682 Thomas Den was given the right of holding a weekly market and three weekly fairs there (ibid, 116). The layout of the settlement was linear, consisting of a single main street, intersected by a road running NW-SE. The marketplace was probably located at the intersection in the centre of the village where the plot pattern suggests that there may have been a triangular market place.

The density of sites within the area shows high archaeological potential. Evidence of additional archaeological remains may be preserved below the ground level as has been evidenced through geo physical surveys of the area. Early house site and burials may be detected through archaeological excavation within the farm yard. Ground disturbance may uncover buried archaeological sites, features or artefacts.

### 12.4.3 Previous Archaeological Assessments

No archaeological excavation is listed in excavations.ie for the townland of Boherboy. A number of remains have been excavated in the wider landscape. This includes medieval remains within the village of Saggart 500m to the west of the site.

There may be other archaeological material in the area that has not yet been recorded. Houses constructed in the Medieval Period were generally made of stone and wood once this decayed the remains can be detected during excavation works. Similarly, burial sites may not have any surface markers and remain undetected below the surface. Ground disturbance may uncover buried archaeological sites, features or artefacts.

### 12.4.4 Architectural Record

Two structures are listed in the buildings of Ireland in the townland of Boherboy. One of these in is close proximity to the proposed development but will not be impacted on. This site is described on buildingsofireland.com as a detached multiple-bay single-storey former house. It is located across the road to the south of the development (Register number 11214010). The cottage is now derelict and in danger of collapse, it dates from c.1800. The structure is constructed of rubble stone walls with possible mud wall construction also. The house has a pitched corrugated-iron roof with roughcast rendered central chimney stack. Another smaller chimney stack to the east gable. This vernacular dwelling is in poor condition but retains its partial mud walls.

To the southwest of the development in the townland of Boherboy is a detached four-bay single storey farm house (Reg number 11219001). The structure dates to c.1860 and is now abandoned. The structure consists of stone rubble walls with brick dressing to cemented over openings. The roof is a pitched slate roof with some original slate. It contains chimney stacks to each gable end and the centre.

Another farm house is located to the east of similar construction with a brick eaves course. It is a four-bay single-storey outbuilding facing road, with roughcast rendered walls, corrugated roof, and some original timber casement windows.

A third structure is located in the townland of Corbally to the southeast of the study area (Reg 112114011). This is a detached two story, six bay former swelling house. It has smooth rendered walls. The walls at the east and west are roughly rendered. It contains timber casement windows.

### 12.4.5 Site Survey

Field walking was undertaken in March 2018. The works recorded two ruined farmhouses and farmyards at the south of the study area along the Boherboy Road. The farmyard at the southeast is on the site of a dwelling marked on Taylors Map of 1816 and on the first edition OS Map at the north of the site (Figures 1-9). This farmyard was not marked on the Rocque map of 1760. The remains consist of two 20th century corrugated iron sheds and the remains of a 20th century stone structure at the southeast (Appendix II, Plates 1-9). At the southwest one shed remains of an earlier farmyard and dwelling marked on the first edition OS map. This is in a state of disrepair and heavily overgrown. It was visible as a single storey structure of random rubble walling with a corrugated iron roof.

### 12.4.6 Archaeological Testing

Archaeological testing was undertaken in May 2018 (Appendix 13 – refer to Volume III of EIAR). The archaeological test trenches were excavated using a mechanical excavator fitted with a grading bucket. The trenches were located across the site to maximise the area tested, the trenches measured between 75 and 350m in length and 2m in width. The trenches were excavated to subsoil level. The trenches have shown that extensive land improvements have taken place across the site in the form of hedgerow removal. A series of watermains cross the site to provide Dublin City with water. These were visible in the form of differential grass growth. The field are delineated by mature hedgerows and drainage channels. The fields are currently in use as pasture. The Vershoyles Stream at the east and the drains surrounding the fields have recently been cleaned, these were assessed for archaeological remains such as fulachta fiadh. None were in evidence.

No archaeological finds, features, architectural fragments or artefacts were uncovered as a result of the testing.

### 12.4.7 Cartographic Evidence

An examination of the cartographic evidence for the area of proposed development was undertaken. This involved the 17th century Down Survey, The Rocque Map of 1760, Taylors Map of 1816, the first edition of the Ordnance Survey Map (Figure 4-6), and the Cassini map for the area. No features indicative of archaeological remains were visible on the maps or the aerial photographs for the area.

Both fields contain domestic dwellings and farmyards at the south on the Boherboy Road. These are marked on the first edition OS map, the 25" map and the current OS map on the Boherboy Road. At the southeast the remains of a farmyard and dwelling are also visible on the early 19th Century Taylors Map and the OS maps but not on the 18th century Rocque Map. The structures have been replaced with modern structures including corrugated iron sheds and the remains of a 20th century farmhouse.

At the southeast the remains of one structure visible on the first edition OS map of 1837 remain. This was heavily overgrown and only one wall was visible along the roadside. This shows a random rubble wall and a corrugated iron roof (Appendix 13.2, Plates 1-9 - refer to Volume III of EIAR). The remainder of the structure was not visible.

### 12.4.8 Place name Evidence

Townland names can give an indication of previous activities at the area that have since been forgotten and leave no trace at ground level. They can contain information on previous ownership, land use or archaeological monuments such as churches or settlement sites. Townland boundaries may reflect ancient territories, and some have been associated archaeological features. Townland names and boundaries were first recorded in the 17th century and lay down the land divisions from this period. The development in located in the townland of Boherboy in Irish this is Bothar Bui or yellow road.

## 12.5 Do Nothing Scenario

The proposed development will have a negligible effect on the known archaeological landscape. Should the development not proceed this will have not impact on or enhance the archaeological heritage of the site. Should this development not proceed given the location in a sought after location and it is likely that development will proceed in the near future.

## 12.6 Likely Significant Effects

### 12.6.1 Construction Phase

No recorded archaeological features will be impacted on by the proposed development. The proposed development is at a remove from any recorded cultural heritage monuments and construction will have no negative impact on them. No subsurface remains were identified during archaeological testing undertaken at the site. It is unlikely that construction works will uncover remains.

### 12.6.2 Operational Phase

There are no potential impacts on archaeological cultural heritage expected as a result of the operational phase of the proposed development.

### 12.6.3 Cumulative Impacts

There will be no cumulative effect on the cultural Heritage landscape as a result of the proposed development. The proposed works are at the edge of an urban environment which includes a number of large scale developments. These are at a distance from the registered archaeological monuments in the area.

### 12.6.4 Worst-case Scenario

The proposed development will have no impact on the cultural heritage landscape.

## 12.7 Mitigation Measures

### 12.7.1 Design Mitigation

There are no mitigations required as part of the design of the development.

### 12.7.2 Construction Phase Mitigation

Archaeological testing did not uncover any remain at the proposed development. It is unlikely that further remains will be uncovered during excavation works at the site. However should any remains be uncovered the National Monuments Service at the Department of Housing, Heritage and Local Government should be contacted.

### 12.7.3 Operational Phase Mitigation

A series of site visits and archaeological testing did not reveal any archaeological remains. As a result of this it is unlikely that archaeological deposits exist at the site. As a result of this there is no archaeological mitigation required at operational phase.

## 12.8 Residual Impacts

### 12.8.1 Construction Phase

No residual impacts on archaeology or cultural heritage are predicted.

### 12.8.2 Operational Phase

There is no predicted residual impact on the cultural heritage landscape during the operational phase of the development.

### 12.8.3 Cumulative Impacts

There is no predicted cumulative impact on the cultural heritage landscape as a result of the development.

## 12.9 Interactions

There are no predicted interactions between the different environmental factors.

## 12.10 References


- Archaeology.ie
- Buildingsofireland.ie
- downsurvey.tcd.ie
- Excavations.ie
- Policy and Guidelines on Archaeological Excavation (1999) Stationary Office
- National Museum of Ireland, Advice notes for excavation
- Edwards, N (1996) Archaeology of Early Medieval Ireland. RIA.
- Fitzpatrick, E (2009) Native enclosed settlement and the problem of the Irish 'Ringfort'. IAP
- Johnson, P. and J. Kiely (2015) Hidden Voices, The Archaeology of the M8. Wordwell
- Leonard, K. (2014) Ritual in Late Bronze Age Ireland - Material Culture, Practices, Landscape Setting and Social Context. IAP.
- McCormick, F; Kerr, TR; McClatchie, M; O'Sullivan, A (2014) *Early medieval agriculture, livestock and cereal production in Ireland, AD 400-1100.* Oxford: British Archaeological Reports, Archaeopress.
- Waddell, J (1998) The Prehistoric Archaeology of Ireland, GUP.
- Thomas, A (1992) Irish walled Towns, IAP


**NOTE: Refer to Volume III of the EIAR for appendices associated with this chapter – i.e. Appendix 12**

# 13.0 The Landscape

## 13.1 Introduction

This Landscape and Visual Impact Assessment (hereafter LVIA), prepared by Ronan MacDiarmada & Associates Ltd (hereafter RMDA), and was informed by a desktop study, and a survey of the site and receiving environment in June 2021. The assessment is in accordance with the methodology prescribed in the Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA) published by the UK Landscape Institute and the Institute for Environmental Management and Assessment.

This report identifies and discusses the landscape and visual constraints effects in relation to the proposed development at Boherboy, Saggart, Co. Dublin. RMDA has been commissioned by the applicants, Kelland Homes Ltd & Durkan Estates Ireland Ltd. to prepare a Landscape and Visual Impact Assessment to accompany a Strategic Housing Development (SHD) planning application on a site measuring circa 18.3Ha hectares, on lands that are subject to the Fortunestown Local Area Plan 2012 and the South Dublin County Development Plan 2016-2022. Boherboy is in the Electoral Division of Saggart, in Civil Parish of Saggart, in the Barony of Newcastle, in the County of Dublin. The Irish name for Boherboy is An Bóthar Buí. This names translates as yellow road and reflects the colour of the sub soil here which is marshy and boggy.

This assessment should be read in conjunction with Chapter 2: Description of Project & Alternatives. Photomontages have been prepared for the scheme which are included in the separate A3 document "LVIA Viewpoints" prepared by Digital Dimensions, which should also be read in conjunction with this chapter. In addition, please also refer to section 13.9 and 13.10, as well as and Figs 13.8 and 13.9 of this chapter for an assessment of the viewpoints.

The development shall consist of a 655 no. residential units and a creche, on a site located north of the Boherboy Road, south of the housing development of Carrigmore housing estate, and west of the Corbally housing development. The site is located 2.5 km from the centre of Saggart, once a small village on the outskirts of Dublin city but now an expanding satellite town and is 23.8km to O'Connell Street, the centre of Dublin city by road. The proposed residential development at Boherboy shall form an important and expanding development in this area and shall be consistent with emerging housing patterns in the area.

The proposed residential units shall be characterised by houses, including detached, semi-detached and terraced houses, as well as duplexes and apartments with open spaces, greenways, the retention of existing trees and hedgerows, associated tree planting, roads, driveways, and new boundary treatments. The proposal also includes drainage and SUDS proposals, electricity sub–stations and all associated site development works facilitating the proposed development.

## 13.1.2 Statement of Authority

RMDA provides specialist landscape and visual services for projects from inception, through site/route selection, environmental impact assessment (EIA) and the planning process, to detailed design and construction. The company specialises in landscape character assessment (LCA) and landscape and visual impact assessment (LVIA) – for a wide variety of projects.


**Fig. 13.1 – Landscape Plan**

Ronan MacDiarmada is the chapter's main author, and Martin Redmond provided oversight and review. Ronan MacDiarmada, B.Agr. Sc. (Land. Hort.) is the director of Ronan MacDiarmada & Associates Ltd, and is graduate of University College Dublin. He is a qualified Landscape Architect and a Corporate Member of the Irish Landscape Institute. He has specialised in Landscape and Visual Assessment (LVIA) and has over twenty years' experience in a range of projects, from large scale strategic design, master planning and detailed design to LVIA and landscape planning, including Strategic Housing Developments throughout Ireland.


**Fig. 13.2 - Landscaping Plan**

## 13.2 Methodology Used

Landscape and Visual Assessment Methodology:

This assessment is based on the following guidelines:

- "Advice Notes on Current Practice in the preparation of Environmental Impact Statements", Environmental Protection Agency (2015)
- "Guidelines on the Information to the Contained in Environmental Impact Statements", Environmental Protection Agency (2002).
- "*Draft 2017 EPA Guidelines on Environmental Impact Assessment",* Environmental Protection Agency.
- "Advice Notes for Preparing Environmental Impact Statements" Draft (September 2015)
- *"Guidelines for Landscape and Visual Assessment"*, 3rd Ed., Landscape Institute and Institute of Environmental Management and Assessment, 2013.
- "*Environmental Impact Assessment of Projects - Guidance on the preparation of the EIAR*" European Commission, 2011.

The following Methodology was used in this assessment:

- A desk top study of the proposed site and its environs, including reviewing aerial photography and ordinance survey documents.
- A site survey was undertaken to determine the character of the landscape and the surrounding area, including site visits during the month of June 2021.
- An assessment of the proposed development was carried out by examining the layout plans, elevations, and sections to determine the impacts of the development.
- An evaluation of these impacts was carried out in accordance with the criteria set out in the EPA guidelines.
- A review of statutory planning and other documentation in order to ascertain the local and wider significance; and visiting the site and surrounding area during May and June 2021 and preparing a photographic record of views and landscape features.
- RMDA were involved in the landscape design of the proposed development and liaised directly with the arborist, ecologist and the design team for the project. The design was heavily influenced by the retention of existing trees and the planting of native hedges, trees and pollinator planting.
- Photomontages and CGI were prepared by Digital Dimensions, the review and assessment to determine the visual impact and effect on the Landscape was carried out by RMDA.

### 13.2.1 Definition of Landscape

Ireland is a signatory to 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, as it defines that the landscape is not only a physical and visual amenity but provides for a range of functions:. As a cultural resource, the interaction of man and landscape has formed the basis of much of our cultural heritage and values. The rhythms of the land as it was settled has informed what Boherboy is today. The landscape provides opportunities for passive and active recreation. It contributes to the sense of place, as over time and place various histories and interactions have formed a sense of place for the local populations. The landscape provides a historic record, it also is a resource for food production, sources of energy and in the natural cycle, oxygen, water. as the source for materials for living. In particular the landscape has the ability to renew itself.

Boherboy and its environs is that of an rural setting and this is defined in "Guidelines for Landscape and Visual Assessment 2013 (GL VIA-2013)"in the following manner (Section 2.2): *"Landscape is about the relationship between people and place. It provides the setting for our day to day lives. The term does not mean just special or designated landscapes and it does not only apply to the countryside".*

### 13.2.2 Forces for Landscape Change

The landscape in Boherboy is not unchanging. It has changed with the settlement pattern over the last several hundred years. It has progressed from wilderness to agriculture and settlement. The patterns of settlement have been driven primarily by economic need and the requirement to provide shelter and a food resource. In this frame, it has to be accepted that change shall occur and it requires finding an appropriate balance between economic, social and environmental forces and values.

In this, the landscape proposals have focused on the existing hedgerows and the retention and augmentation of same. This is done to minimise visual impact, create and retain existing habitats. It is anticipated to retain the sense of value and place in the location in which local residents work and reside. This shall encourage the growth of community in Boherboy.


**Fig. 13.3 – Conceptual Layout**

The landscape proposals have focused on bringing nature into the urban realm so that the residents may have a sense of value and place in the location in which they reside. This shall encourage the growth of community in Boherboy, through natural interventions, retention of hedgerows and trees, woodland planting and extensive tree planting.


**Fig. 13.4 – Planting Moodboard**

Climate change was also one of the factors, that informed this proposed design consideration, i.e. the need to mitigate and offset issues associated with urban development. In this, the approach to surface water run-off is integrated with landscape solutions in the SUDS requirements. It was considered very important to be able to manage the water and more extreme weather and rainfall patterns. The use of natural falls, existing ditches, woodland planting and extensive tree planting, have been adopted as part of this new landscape and is considered to a positive visual impact upon the landscape and the environment.


**Fig. 13.5 – Sustainable Drainage Systems**

### 13.2.3 Nature of Impacts

Impact on landscape arising from development has two distinct but closely related aspects. The first is impact in the form of change to character of the landscape that arises from the excavation of the existing landform and the insertion of the proposed development into the existing context. The second aspect is the visual impact; which depends on the degree and nature of change in the visual environment. It is recognised that the combined impact on character and views will draw responses, the significance of which will be partly informed by an individual's subjective perception of how much the changes matter.

The assessment of landscape/Landscape and visual impacts include:

- Direct impacts upon specific landscape elements and buildings within and adjacent to the site.
- Effects on the overall pattern of the landscape elements that give rise to the character of the site and its surroundings;
- Impacts upon any special features or interests in or around the site;
- Direct impacts of the scheme upon views in the landscape;
- Overall impact on landscape character and visual amenity.

In determining the Visual Impacts, the following definitions were used to assess the significance of the impacts:

### 13.2.4 Impact Significance Criteria – Table 1

**No Impact:** There are no changes to views in the visual landscape.

**Imperceptible Impact:** An impact capable of measurement but without noticeable consequences.

**Slight Impact:** An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.

**Moderate Impact:** An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.

**Significant Impact:** An impact which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.

**Profound Impact:** An impact which obliterates sensitive characteristics.

Terms used to describe quality of visual impact:

- **Neutral Impact**: A change which does not affect the quality of the landscape.
- **Positive Impact**: A change which improves the quality of the environment or landscape.
- **Negative Impact**: A change which reduces the quality of the environment or landscape.

### 13.2.5 Terms used to describe the Duration of visual impact

- Momentary Effects — Seconds to Minutes
- Brief Effects — Less than a day
- Temporary Effects — Less than a year
- Short-term Effects — Lasting 1 to 7 years

- Medium-term Effects — Lasting 7 to 15 years
- Long-term Effects — Lasting 15 to 60 years
- Permanent Effects — Lasting over 60 years
- Reversible Effects — Effects that can be undone
- Frequency of Effects — Describe how often the effect will occur

## 13.3 Receiving Environment

### 13.3.1 Description of the Receiving Environment

The area of the red line of application equates to 18.3Ha which includes the proposed connections to adjoining lands to the north and east as well as proposed upgrades to the Boherboy Road. The area of the subject two fields, that will accommodate the proposed housing, creche, associated open spaces and site development works etc., is approximately 17.6Ha hectares, which are located south and west of two large housing developments, Carrigmore and Corbally respectively. The proposed site lies north of the Boherboy Road which connects to the N81, an important arterial road to Blessington in County Wicklow. To the west of the development site, lies existing field patterns that remain agricultural in appearance but are no longer functioning as such, as well as individual houses. Just beyond the fields, to the west, lies the expanding village of Saggart, a number of small developments and a golf course.


**Fig. 13.6 – Landscape Plan in Context**

Currently there a number of old farm outbuildings which have been abandoned for some time on the subject site, that are proposed to be demolished. The lands have rented to a local farmer to keep the land managed and in good order.

This is an area characterised by the expanding village of Saggart to the west, consisting primarily of suburban housing, a number of shops, public house, church and a large hotel complex i.e. Citywest hotel. There are a number of amenities in the area, St Mary´s GAA club and golf courses. The County town of Tallaght is expanding to the east, along the N81 Blessington Road.

To the north-east of the subject site is the Carrigmore (District) Park which adjoins the District Centre that accommodates the Citywest Shopping Centre, McDonalds and the Luas Red Line. Further north-east is Citywest Business Campus is a large business park, with international and national businesses residing there. It is located north-east of the Boherboy lands, and is well served by road networks and the local rail network LUAS. Overall, the lands to the north and north-east have undergone large scale development in terms of office, commercial, retails, industrial and residential uses.

The subject site is situated on the foothills of the Dublin Mountains, and as such the land falls away quickly from the Boherboy Road. With a contour of 155m OD at its south-west corner, falling quickly to a contour of 146m OD, a fall of 9m. From here, the fall becomes more gradual towards the middle of the site and falling to the 117m OD contour on the site's northern boundary adjoining Carrigmore. There is a considerable fall in lands, which is visually screened by existing hedgerows and trees.

The proposed development site has an open character combined with large field patterns with tree belts and hedges. It is long in length with three lengths of native hedgerow and trees, with a remnant of a fourth, all running north-south along the site boundaries.

To the north-east of the site, a newly constructed park that serves the local area has been constructed and finished, it is the district park for the local area and is known as Carrigmore Park, serving the amenity needs of the local population. Further north-east, is the district centre for the local area, including the Citywest shopping centre that be accessed by pedestrians from Carrigmore Park.

Carrigmore Park is an important amenity, providing recreational value, playgrounds, paths and green space for the local population. It is accessible from the Carrigmore housing development and Fortunestown Lane which has connections to Saggart and to the Naas Road, M7. It is a park managed by the local authority, South Dublin County Council for the amenity of the population of the area.

A stream flows along the eastern boundary of the subject site, with that of Corbally housing estate, it remains rural in nature, with an existing hedgerow and habitat. It shall be retained in the long term for the amenity of residents and the public. The creation of a walkway alongside the stream shall provide a linear park along the Eastern boundary and this shall connect with Carrigmore Park. The stream turns westwards along the northern boundary of the site where it is ultimately culverted.


**Fig 13.7 - Location of Stream and Existing Hedgerows in Boherboy.**

South Dublin County contains three main geological areas. The oldest of these are volcanic and sedimentary rocks formed on the ancient sea floors of the lapetus Ocean around 470 to 440 million years ago (Ordovician volcanic rocks and Silurian sedimentary rocks). These rocks are found in the foothills of the south western part of the county including Athgoe and Saggart Hills.

### 13.3.2 Landscape Type - Characteristics of the Proposed Development

The proposed scheme involves the development of a wide variety of dwelling types for the expanding Fortunestown area, the village of Saggart, the increasing population of Dublin City and its immediate environs.

The access to the site shall be directly from the Boherboy road, with proposed vehicular connections to both Carrigmore to the north and Corbally to the east. Pedestrian and cyclist connections are also proposed from the subject site into Carrigmore and Corbally, as well as pedestrian and cyclist connections into Carrigmore Park to the north-east.

Notably on the site are two large watermains which cross over the site. They have been considered in the design of the development, as the wayleaves preclude buildings and tree planting of any consequence. As a result, landscape planting is limited in these two areas, restricting to large shrubby type plants rather than trees. Paths, seating and sensory planting, in the form of wildflower meadow mixes have been proposed to provide amenity in these areas.


**Fig 13.8 – Pedestrian & Cycle Links**

It is intended that the site shall retain much of the existing native trees and hedgerows. On completion of the residential development, it shall be landscaped to a very high standard, with tree planting, pollinator shrubs, paths, play spaces, wild flower meadows, bulb planting and paving in the external open spaces.

A link along the stream on the eastern boundary shall be provided for in the form of a public path and cycleway from the Boherboy Road to Carrigmore Park. The path and stream shall run the length of the development, north to south and shall retain its existing character, i.e. that of hedgerow and trees, with associated habitat. This habitat shall be augmented by further development of wildflower meadows and tree planting to provide foraging routes for wildlife such as badgers and birds.

Although works shall occur in the construction of the dwellings, much of the character of the site at present shall be retained. The open space to the north of the development, as well as open spaces within the development, shall help define the character of the proposal and shall be made available to the public from the Boherboy Road, from Carrigmore Park and the adjoining housing developments to the north and east, i.e. Carrigmore and Corbally respectively. The open spaces shall contain many of the existing hedges and trees, thus retaining the existing field structure as part of the development of the site.

The soft landscape proposals shall compliment the development aesthetically and functionally and shall tie in with the existing and surrounding landscape. The proposed and existing trees, hedges and shrubs shall position the development into the landscape and provide a large element of screening. It is intended to tie in with and blend the development into the local landscape befitting of its semi-rural context merging into an established urban background.

***In landscape terms the proposed development will have the following objectives:***

1. To renew and augment existing vegetation with planting suitable to the local and new proposed environment;
2. To create new landscape features that will complement and enhance the landscape;

**3.** To provide a new landscape feature in the form of a housing development that will significantly enhance and retain the character of the area.

### 13.3.3 Policy Context of Receiving Environment

The following section includes policies and objectives from the 2016-2022 South Dublin County Development Plan (hereafter referred as the Plan) and the 2012 Fortunestown Local Area Plan (hereafter referred as the LAP) which relate to the site, including policies relating to the core strategy, landscape, views and prospects, and green infrastructure. The Plan includes policies relating to landscape character, protected views and general landscape policies, whereas the LAP includes more specific policies for the vicinity of the proposed development site.

#### 13.3.3.1 South Dublin County Development Plan 2016-2022

Zoning

The site is zoned RES-N: *"To provide for new residential communities in accordance with approved area plans".*

Urban Design

Section 2.2.1 of the SDCDP sets out the policy on urban design in residential developments, which should inform the consideration of potential townscape impacts. The policies include:

**H7 Objective 1:** *"To ensure that residential development contributes to the creation of sustainable communities in accordance with the requirements of the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, DEHLG (2009) (or any superseding document) including the urban design criteria as illustrated under the companion Urban Design Manual – A Best Practice Guide, DEHLG (2009)."*

**H7 Objective 2**: *"To ensure that residential development provides an integrated and balanced approach to movement, place-making and streetscape design in accordance with the requirements of the Design Manual for Urban Roads and Streets, DTTAS and DEHLG (2013)."*

Residential Density and Building Height

Section 2.2.2 of the Plan sets out the policy on residential density, which affects building height and thus is relevant to the consideration townscape and visual impacts. It states: "It is the policy of the Council to promote higher residential densities at appropriate locations and to ensure that the density of new residential development is appropriate to its location and surrounding context".

In a landscape context the height and density contribute to the visual mass that shall be part of the new landscape. In visual terms the impact of the new development in the landscape shall be mitigated by the retention of existing hedgerows and the replanting of new native hedgerows and trees. The inclusion of the local authority policy in respect of the density and building height was important to understand the parameters of the building form, so the landscape design and visual assessment could take account of this and provide for a suitable landscape response.

The policy objectives include:

**H8 Objective 1:** *"To ensure that the density of residential development makes efficient use of zoned lands and maximises the value of existing and planned infrastructure and services, including public transport, physical and social infrastructure, in accordance with the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, DEHLG (2009)."*

**H8 Objective 2:** *"To consider higher residential densities at appropriate locations that are close to Town, District and Local Centres and high capacity public transport corridors in accordance with the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, DEHLG (2009)".*
In Section 2.2.3 the Plan sets out the policy on residential building height. It states: *"Varied building heights are supported across residential and mixed use areas in South Dublin County to promote compact urban form, a sense of place, urban legibility and visual diversity".*

**H9 Objective 1:** *"To encourage varied building heights in new residential developments to support compact urban form, sense of place, urban legibility and visual diversity."*

**H9 Objective 2:** *"To ensure that higher buildings in established areas respect the surrounding context."*

**H9 Objective 3:** *"To ensure that new residential developments immediately adjoining existing one and two storey housing incorporate a gradual change in building heights with no significant marked increase in building height in close proximity to existing housing."*

**H9 Objective 4**: *"To direct tall buildings that exceed five storeys in height to strategic and landmark locations in Town Centres, Mixed Use zones and Strategic Development Zones and subject to an approved Local Area Plan or Planning Scheme."*

The above policies on density and height have been superseded/supplemented by the publication of *Urban Development and Building Heights – Guidelines for Planning Authorities*. This national policy seeks to ensure substantially higher development density (than heretofore) in urban areas where the supporting infrastructure, public transport and services can sustain it - through increased building height.

Figure 9.1: Landscape Character Areas of South Dublin County


**Fig. 13.9 - Landscape Character Assessment Map (Source SDCC CDP Fig. 9.1)**

## Landscape Character

The Character Area of Athgoe & Saggart Hills (Athgoe and Saggart Hills LCA): The foothills and hills that form the backdrop and southern setting to the greater Dublin area; these hills provide a variety of uses including agriculture, forestry, recreation as well as important ecological services associated with their habitats. The LCA is diverse and offers the access into the more strongly rural areas of the county and beyond. Long views over the lowlands and south to the Wicklow Mountains are an important characteristic. The integrity of the landscape character is derived from agriculture combined with other rural land uses including coniferous plantations. The integrity of its character, and of its value as a landscape setting have been compromised by housing developments in the area and measures are recommended to enhance this rural diverse agricultural landscape and protect the long views that are a defining feature of this LCA. In this the proposed development seeks to retain and augment key existing landscape elements, such as streams, grassland, trees and hedgerows, which shall reduce the landscape impact and retain the integrity of the landscape.

## High Amenity Areas

The Plan designates areas of High Amenity in the County. The site is not within a High Amenity Area. The nearest High Amenity Area is located approximately 1,200 metres to the south of the site.

## Protected Views

The Verschoyle's Hill and Lugmore/ Tallaght Views are included in the LVIA as they are considered protected views and prospects in the Development plan. The proposed site is proximate to the Dublin Mountains backdrop, and is located close to a very sensitive landscape character area as identified in the South Dublin County Council Landscape Character Assessment 2015:

- 10 - N81 @ junction with Meagan's Lane
- 11 - On Meagan's Lanen (L7355) looking north
- 12 - On woodland walk in Verschoyle's Hill forest

## Lugmore/Tallaght Hill Views

- 13. On Mt. Seskin Rd (L7377) @ junction with Lugmore Ln

They are located to the south of the proposed site area, approximately 1,200m to the south.

## Built Heritage

## Record of Protected Structures

There are a number of protected structures in the locality but there are no protected structures, monuments or sites recorded on the Sites and Monuments Record (SMR) adjacent to or within the subject site.

**1.** DU021-045 Boherboy Holy Well;

| DU021-045 | **Boherboy Holy Well** |
|---|---|
| | St. Patrick's well is in the townland of Boherboy in Cullens field. It is a spring well, where no water appears to flow in or out of it. |

**2.** 349 349 Boherboy, Saggart Standing Stones (Pair of) (RM);

| **349** | **Boherboy, Saggart Standing Stones** |
|---|---|
| |  |
| | Known locally as 'Adam and Eve', the stones most probably date to the Bronze Age; their exact date and original function, however, remains unknown. They could be burial markers, memorials to the dead or the remains of another type of prehistoric burial monument such as a portal tomb. |
| | The stones are located to the south west of the site |

**3.** 424 424 St Mary's National School, Boherboy, Saggart. Detached, four-bay single-storey former National School, c.1940.

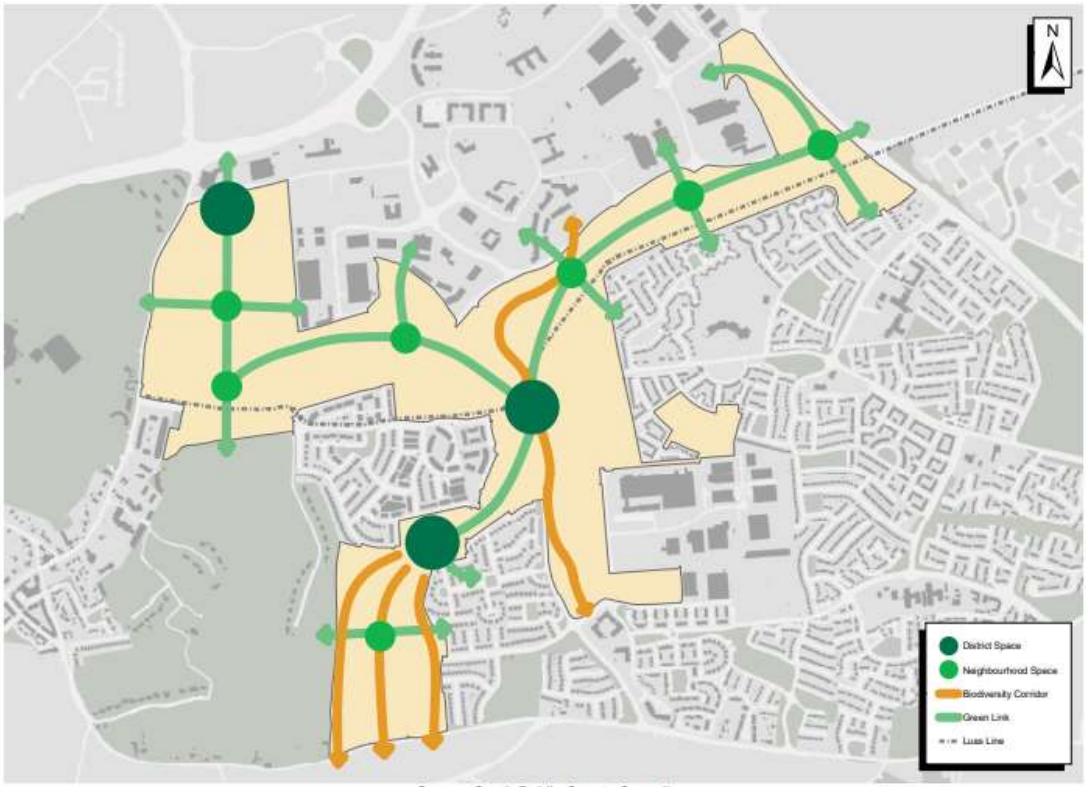
| **424** | **St Mary's National School, Boherboy, Saggart.** |
|---|---|
| |  |
| | Detached, four-bay single-storey former National School, c.1940. |

### 13.3.3.2 Fortunestown Local Area Plan 2012

The following extracts of the LAP are most relevant to this assessment. They provide clear indication of South Dublin County Council's vision and objectives for the landscape/townscape and amenities of the Boherboy Neighbourhood.

The Plan includes a number of policies and objectives relating to landscape and natural heritage:

Green Infrastructure - The construction of a green network to ensure the conservation and enhancement of biodiversity; the provision of accessible parks, open spaces and recreational facilities; the sustainable management of water; the maintenance of landscape character; and the protection and enhancement of the architectural and archaeological heritage. A green infrastructure strategy and framework are provided which illustrate the district open spaces/parks, neighbourhood open spaces/parks, squares, green links and biodiversity corridors. A SUDS strategy and network is set out for Corbally, Fettercairn and Kingswood Streams.




Source: South Dublin County Council

**Fig. 13.10 - Green Infrastructure Strategy of Fortunestown LAP**

### Framework

The LAP (Section 6.4 Framework 4) states: *"The Boherboy Neighbourhood will function as the green lung of the Plan Lands and will act as an important link between the Fortunestown Centre and the amenities of the Dublin Mountains. In order to incorporate the valuable heritage features that occupy Boherboy and respond to the rural character of the surrounding area, development of the Boherboy Neighbourhood will largely take the form of low-density housing set amongst green corridors and parkland".*

## Green Infrastructure

The construction of a green network to ensure the conservation and enhancement of biodiversity; the provision of accessible parks, open spaces and recreational facilities; the sustainable management of water; the maintenance of landscape character; and the protection and enhancement of the architectural and archaeological heritage. A green infrastructure strategy and framework are provided which illustrate the district open spaces/parks, neighbourhood open spaces/parks, squares, green links and biodiversity corridors. A SUDS strategy and network is set out for Corbally, Fettercairn and Kingswood Streams.

Section 6.4.4 of the LAP states that development of the Boherboy Neighbourhood will include for the protection and incorporation of the elements of the Corbally Stream and the hedgerows that run through Boherboy especially the stream and hedgerow along the eastern side of the neighbourhood, which represent the old townland boundary between Boherboy and Gibbons and also represents an historic parish and barony boundary.

**Fig. 13.11 – Proposed Linear Park ("Riverside Park"): Wetland Habitat, Native Tree Planting, Wildflower Meadow & Walking Route**

The historic boundary and stream will be set within a linear park lined by footpaths and cycle routes, which in turn will be overlooked by dwellings. A central neighbourhood park will also be provided and will create a link with the Plan Land's Green Network between the District Park and the Dublin Mountains via a central street verge. The street verge will follow the route and preserve the majority of the north-south field boundary hedgerow that currently centres on and divides the Boherboy lands. The layout of streets shall attempt to exploit views of the Dublin Mountains and the church tower in Saggart Village. It is an objective of the Local Area Plan that:

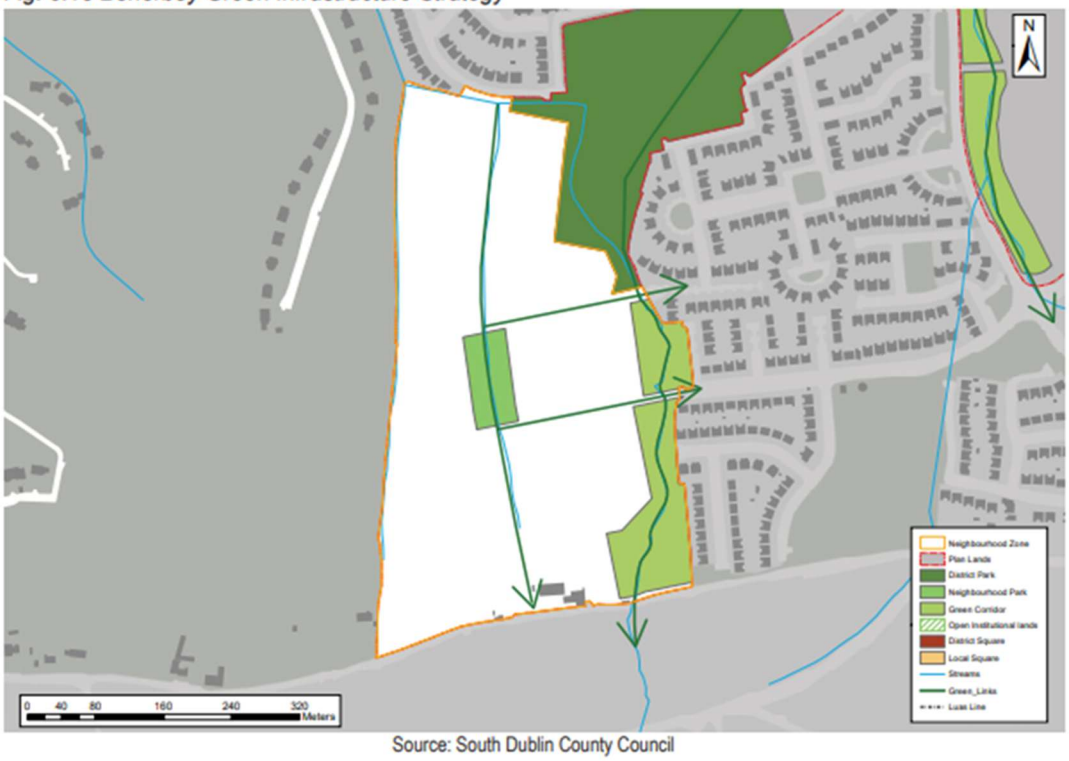
- *A 10 metre (min) biodiversity strip (measured from the top of the bank) shall be reserved along both sides of the designated sections of the Corbally Stream for flood management, landscape and biodiversity reasons. This biodiversity strip shall cater for a pedestrian/cycle path from the Boherboy Road to the public open space to the north-east (District Park) as part of Phase 1 of development of the Boherboy lands.* ***(Objective BN5a)***

- *Development across the Boherboy Neighbourhood shall protect and incorporate its existing rolling topography and its existing hedgerows and streams especially the watercourse and hedgerow that demarcates the old townland boundary between Boherboy and Gibbons.* ***(Objective BN6)***

- *The slope of the neighbourhood's topography shall be utilised as part of any development and the level of cut and fi ll shall be kept to an absolute minimum. This shall be demonstrated under all planning applications with extensive north-south and east-west sections. The excessive use of retaining walls shall be avoided.* ***(Objective BN7)***

- *Development proposals on the south-west corner of the Boherboy lands shall either avoid the lands above the 150 metre contour through the provision of an appropriately landscaped buffer (see Section 7.2.15) or demonstrate design integration with the landscape through measures that may include a combination of low density housing (i.e. bungalows or similar) and properly landscaped public open space that would be of benefit to the development of the site and lands as a whole.* ***(Objective BN7a)***

*Fig. 6.18 Boherboy Green Infrastructure Strategy*




Source: South Dublin County Council

**Fig. 13.12 – Extract from Fortunestown LAP – (Fig. 6.18) Boherboy Green Infrastructure Strategy**

## 13.4 Summary of Landscape Characteristics and Values

### 13.4.1 Landscape Values

The GLVIA Guidelines sets out the methodology for assigning landscape sensitivity. This is based on combining judgements on landscape value, and landscape susceptibility.

Landscape values are derived from both indications of value as seen in national and local policy, as well as other indications that a landscape or landscape element, is valued. The CDP and LAP have both designated the site for residential development along with open spaces. There is also an objective to set back development form the top of the bank of the Corbally Stream and to provide for paths and connectivity in a north-south direction along the eastern boundary of the site. The site is not covered by any landscape designations.

In addition to formal designations at international, national and local level, the GLVIA refers to criteria which can help to describe landscape values in landscapes that are not covered by designations. These include the following:

**Landscape Quality/Condition:**

The quality of the landscape and the condition of individual elements is considered to be good. The tree survey indicates the majority of the hedgerows on site are of moderate quality, typical native hedgerows. Currently the land has been rented out to a local farmer and the grass is being grazed by cattle, therefore the grassland remains open. There is a stream flowing through the site that is open and shall remain open. A wetland to the North shall be retained and utilised as part of the Suds strategy and may also be used for amenity for future residents, with wetland planting and stone paths as part of the development of the space.

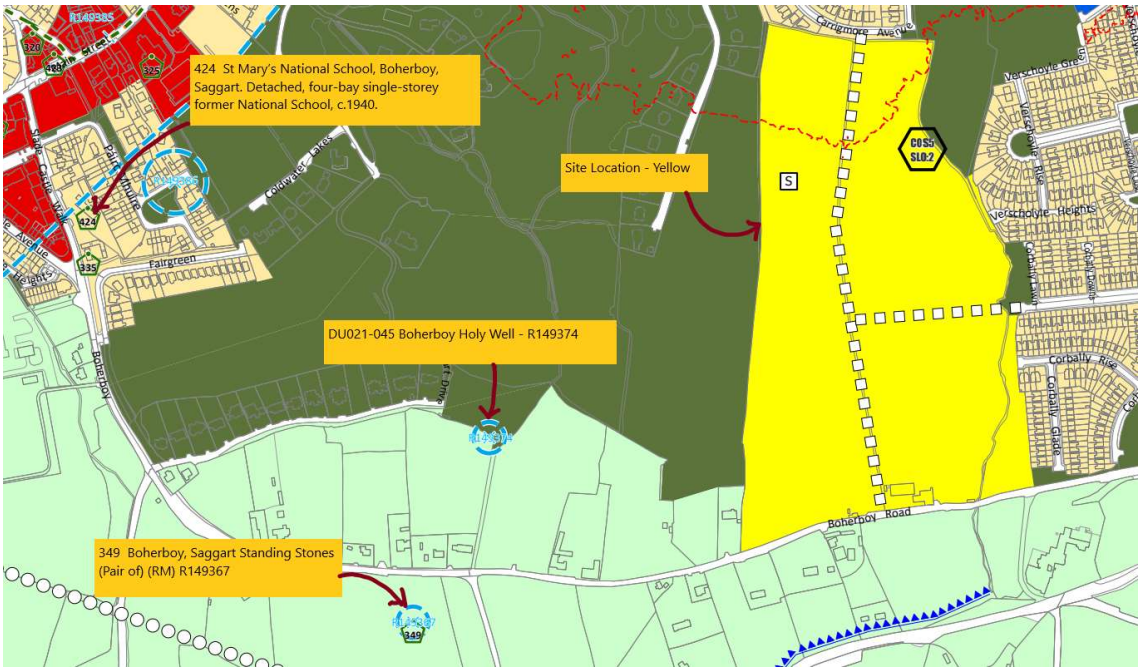



**Fig. 13.13 – Extract from Development Plan Map 8 – Location of recorded monuments and structures**

**Cultural Heritage/Conservation value:**

There are no sites recorded on the Sites and Monuments Record (SMR) within the plan area, see Fig.13.13. Recorded Monuments outside of the site include:

1. DU021-045 Boherboy Holy Well
2. 349 Boherboy, Saggart Standing Stones (Pair of) (RM)
3. 424 St Mary's National School, Boherboy, Saggart. Detached, four-bay single-storey former National School, c.1940.

**Aesthetic/Scenic Quality**:

The site has mature hedgerows, tree lines and semi natural grassland which give a pleasant open visual quality to the site. The existing stream, with tree cover is very pleasant and remains untouched and open. The backdrop to the Dublin Mountains is an important aspect of the site and various receptor views were taken in these locations so show that there was no visual impact to them.

**Perceptual aspects**:

A landscape may be valued for its perceptual qualities, such as wildness or tranquillity. The site is an area of pastureland adjacent to a built up area. It has maintained the existing stream, mature hedgerows and trees. The location at the foothills of the Dublin mountains provides an open ambience on the southern portion of the land

**Public Accessibility and Recreation Value**:

The site is in private ownership and not publicly accessible. These values can further be categorised in two ways – values which should be conserved, and those that provide opportunity for enhancement. It is proposed to reinforce and manage the existing inventory of natural habitats, i.e. hedgerows.

### 13.4.2 Conservation Values / Cultural Heritage

The conservation values indicate those aspects of the receiving environment which are sensitive and could be negatively impacted on by the proposed development. These values form the potential landscape and visual constraints to the proposed development. These include:

- Relatively open, sloping character;
- Trees and hedgerows contribute to the character of the site and shall be retained in the main where possible.

The Greenway routes throughout the site, as set out in the Fortunestown LAP shall be maintained and paths provided for access by residents and users. The existing vegetation of hedgerow and trees shall be retained and managed.

The existing stream shall be retained and maintained as an open watercourse. The wetland area to the very north shall also be retained and combined with SUDS features so it may be sustained as a wetland area. The open spaces shall preserve existing grass cover and shall be augmented by bulbs and wild meadow grasses and flowers.

The eastern boundary of the site, along the Corbally Stream, represents an historic townland, barony and parish boundary that divided the old townlands of Boherboy, Corbally and Fortunestown. The creation of the proposed "Riverside Park" as part of the proposed development retains this cultural heritage feature.

### 13.4.3 Enhancement Values

The enhancement values reflect change that is occurring in the landscape and its inherent robustness. These values would include existing hedgerows, stream, and landform. The enhancement would take account of these landscape features and utilise them, wherever possible in the proposed landscape design. The enhancement would take the form of providing active and passive recreational amenity for the future residents. These features would be further expanded upon by the use of additional tree and hedge planting to augment or add to the existing hedgerows. Paths, seating, callisthenic, play areas and wildflower/meadow mix shall be added to enhance the amenity and landscape of the proposed development.

These include:

- The green routes, along existing hedgerows shall be utilised as connection routes to internal and external open spaces.
- 
- The existing hedgerows shall be retained and managed, augmented with native species, including but not limited to Hawthorn, Blackthorn, Gorse, Dog-Rose;

- The street hierarchy shall be of a high quality leading to greater sense of place and to a greater sense of well-being. The retention of existing hedgerows combined with new planting shall preserve the old and provide a new urban landscape that shall be ordered and provide a sense of place.

- Opportunity to increase permeability with adjacent built up areas. The proposed circulation has been devised to provide access throughout the development and into adjoining access points, greenways and public paths and roads. The paths are located within open space areas leading to greater recreational use and permeability.

- Opportunity to provide ecological enhancement. This shall include the planting of a large number of trees, far in excess of the existing number on site. The retention and augmentation of existing hedgerows, and the hedgerows shall be managed to ensure that they shall survive into the future.

- The open spaces shall be developed with habitat renewal to the fore, it is proposed to retain the grassland native to the location. This shall be augmented by wild meadow grasses and wild flower mixes. Bulb planting to aid pollination is also proposed.

- The existing stream shall be retained in a linear park that shall have a path and cycle way to provide a connection form Boherboy road to the south connecting to an existing amenity park to the north. The linear park shall provide amenity for residents in the form of walking and biodiversity.

- The linear park shall have wild flower mixes and additional tree planting.

- To further enhance the linear park, callisthenic gym equipment and seating shall be placed along the route.

- Several pocket parks and open spaces are proposed and shall retain an open ambience. They shall be planted with pollinator trees and wild flower and bulb mixes.

- On the large central open space – the existing hedgerow shall be retained and shall bolstered with wild flower to the base of it to provide a biodiversity corridor for foraging wildlife.

## 13.5 Characteristics of the Proposed Development

The development proposal consists of the construction of a residential development of 655 no. dwellings and a creche, as well as open spaces, and all associated site development works.

Access to the subject site will be from the Boherboy Road, with connections internally from the site to Corbally to the east and Carrigmore to the north, as well as pedestrian and cyclist connections directly into the adjoining Carrigmore Park.

It is intended that the site shall retain many of the existing native trees and hedgerows. Upon completion of the development, there shall be a very high standard of landscaping, with tree planting and paving that shall characterise the external open spaces and shall feature a high standard of landscape development. The open spaces shall contain, green areas, paths, public plazas, and extensive tree, shrub, wildflower and bulb planting.

Many of the proposed species will be pollinator friendly in order to create biodiversity within the scheme. The range of plants have been taken from the All Ireland Pollinator Plan 2015 – 2020 & 2021 - 2025. The provision of shrub planting includes Bergenia cordifolia, Hypericum hidcote, Lavandula angustifolia, Libertia grandifloria, Persicaria affine, Rosemarinus 'Prostratus'.

Although the existing green fields and some internal vegetation shall be removed in the construction of the development, much of the character of the site at present shall be retained with the retention of the key elements – the hedgerows, that shall be protected and kept in order to add to the appearance of the development, the stream shall form part of a riverside park and the grassland in the open spaces.

The soft landscape proposals shall compliment the development aesthetically and functionally and shall tie in with the existing and surrounding landscape. The proposed and existing trees, hedges and shrubs shall sit the development into the landscape and provide a large element of screening. It is intended to tie in with and assimilate the development into the local landscape befitting of its suburban background, as follows:

1. To retain existing vegetation, hedgerows and trees, and to augment with native planting where appropriate.

2. To create new landscape features that are biodiversity friendly that will complement and enhance the landscape;

3. To provide a new landscape feature in the form of a development that will significantly enhance and retain the character of the area.

**Fig. 13.14 – CGI of proposed central open space with natural play ground and kickabout area**

## 13.6 Assessment of Potential Impacts of the Proposed Development

This section of the report describes the potential effects of the proposed development, on the visual and landscape qualities of the subject site and wider context; at construction and operational stages. Effects may vary between positive or negative, short or long term; temporary or permanent.

### Construction Phase

Potential visual impacts during the construction phase are related to temporary works, site activity, and vehicular movement within and around the subject site. Vehicular movement may increase in the immediate area, and temporary vertical elements such as cranes, scaffolding, site fencing/hoarding, gates, plant and machinery etc., will be required and put in place. All construction impacts will be temporary, and may include the following:

- Site preparation works and operations;
- Site excavations and earthworks;
- Site infrastructure and vehicular access;
- Construction traffic, dust and other emissions;
- Temporary fencing/hoardings;
- Temporary site lighting;
- Temporary site buildings (including office accommodation);
- Cranes, crash deck and scaffolding;
- Piling rigs.

## Operational Phase

The importance of design quality in the process of urban renewal and inserting new buildings into the city fabric should not be underestimated. Good design in such circumstances is a rigorous process involving: a deep understanding of the site, its context and existing sensitivities; testing of the range of appropriate design options; a broad knowledge of suitable design approaches and; the ability to convert these through careful detailing, materials selection and effective control throughout the construction process. These aspects of design are central to successful and appropriate integration of new development within its context. Any development has the potential to impact negatively if poorly designed. Conversely it has the potential to impact positively, indeed to inspire, if well designed.

Many aspects of the proposed scheme design at this preliminary stage are included specifically to respond to such issues and any associated concerns. The design approach and specific mitigation measures employed to address the sensitive contextual issues and to respect and enhance the local environs are outlined in the following sections.

### 13.6.1 Do Nothing Impact

Should the development not proceed it is likely that the site would remain in its present state and perhaps deteriorate.

If the site remains undeveloped, the area becomes unmanaged and in particular, the existing hedgerows will fall further into disrepair as they are not maintained or used. Pioneer trees and scrub would begin to establish. Therefore, as development continues on all sides of the site, the agricultural function having ceased, being cut off from its' hinterland, the area returns to wilderness and in accessible area that may be used as a dumping area and a location for anti-social activity.

The open space and undeveloped lands shall cease to function as grassland and as such shall fall into disrepair and into waste ground. Visually and functionally the lands become unkempt and are limited in the range of amenity and use.

The function of agriculture is limited due to the proximity of the encroaching town of Tallaght and the surrounding developments in Fortunestown to the North and the increasing developments of Saggart to the West.

Therefore, were the site to remain vacant, it would probably attract anti-social behaviour resulting in generally negative environmental impact.

### 13.6.2 Potential Visual Impact of the Proposed Development

The visual impacts of the proposed development on the landscape are considered in the context of the construction and operational stages. Generally, the development shall reduce the amount of green space, replacing it with the proposed units, and associated walls, roads and driveways. The space that is being removed is a number, or part of fields with hedgerows and trees as boundaries.

The main visual changes shall be the height and the extent of the proposed residential development and associated building works to the landscape. The development shall be located on rising contours which shall increase its visual impact, notably from the visual receptors directly north and south of the site.

**Fig. 13.15 – Visual Impact of building minimised by level change and mature planting.**

The design and organisation of the open space shall ameliorate the impact of this development and of the decrease in spatial area. This shall be aided through provision of extensive semi - mature tree planting, native hedge planting and mounding. The hedge and tree planting shall position the housing into the landscape as per the proposed landscape design.

The lines and the height of the buildings shall be visually reduced through the retention of existing trees and hedgerows, the proposed use of more soft landscape materials shall further reduce the impact of the development. Semi - mature trees and shrub planting shall give an immediate effect tying in with the surrounding landscape. The visual impact of the landscape intervention on the existing development shall be positive and long term, the impact on the agricultural nature of the surrounding landscape shall be moderate in the long term.

#### 13.6.2.1 Assessment of Construction Impacts

During the construction of the development, the area shall be changed from agricultural fields to a residential development. The introduction of the built structures, driveways boundaries and landscape will be developed while maintaining the existing hedge and trees along the centre and the perimeter of the site.

Tree protection shall be provided to retain the character of the existing trees and hedge.

The development shall be carried out in an organised basis, thus reducing the visual impact upon the environment: however, the impact on the initial area of construction shall be moderate to significant.


**Fig. 13.16 –Tree & Hedgerow Retention**

The retention of the hedgerows, surrounding the site, combined with the maintaining of much of the hedgerow in the centre of the site shall reduce the visual impact of the proposal during construction. The requirement to remove the front boundary hedge shall be significant visually in the short to medium term. This is a requirement from SDCC with respect to sight lines and road widening on the Boherboy Road.

As the development increases and phasing continues, the improvement, growth and maturity, in terms of the landscape elements, trees, hedges and shrubs, shall reduce the visual impact. In the long term, it will be moderate to neutral, as other existing housing developments and Saggart village and Fortunestown grow to meet this area.

The greatest impact shall be the views through the site as they will become determined by the proposed units, walls, and landscape elements of trees and hedges.

Due to the removal of the site vegetation


**Fig. 13.17 – Tree & Hedgerow Removal**

During the construction stages traffic movement, excavation operations and construction works shall have a significant visual impact on the site. There may be some moderate - significant visual impacts during the construction stage.

Grass forms the groundcover over a portion of the site with native hedges and trees providing screening and boundary treatment.

The removal of the grass will be necessary for the development to commence.

The existing native hedge and tree line to the Boherboy Road shall be removed due to the requirement from South Dublin County Council to upgrade this road through the provision of a path along the road. The visual impact upon the area shall be moderate – significant to the short to medium term.

The majority of the hedgerows shall be retained:
Total outer hedgerow 1776 lin/m
Retain 1481 lin/m (83.4%)
Lose 295 lin/m (16.6%)

Total centre Hedgerow 601 lin/m
Retain 364 lin/m (60.5%)
Lose 237 lin/m (39.5%)

Total Hedgerow for whole site = 2467 lin/m
Retain 1892 lin/m (76.6%)
Lose 575 lin/m (23.4%)

Although the portion of 'Green' land will be reduced, no loss of botanical significance shall be incurred, however, some of the native hedge line and some mature trees shall be removed, as may be seen, above. The majority of the hedgerows, 77.7% overall shall be retained.

As existing hedges and trees are being retained and augmented by the introduction of new trees and planting, the predicted impact during construction shall be moderate in the short-term depending on the length of time on site.

#### 13.6.2.2 Assessment of Operational Impacts

Initially, on completion of the development, the introduced shrubs will be at early stages of establishment and the trees shall be semi-mature at planting. As time progresses, the plants and trees will grow and stabilise in their new environment creating better defined avenues and spaces.

The number and quality of landscape elements shall be an addition to the built environment of Boherboy / Fortunestown providing quality amenity for the residents. The extensive development of the external spaces shall provide an improvement on the existing landscape. The ordered design shall be visually positive and long term. The visual impact on the surrounding landscape shall be moderate – significant in the short term and with maturity of the trees, hedges and plants it shall be neutral to positive in the long term.

**Fig. 13.18 – Riparian Zone – Wildflower meadows & shared greenway set along the existing stream**

The proposed development respects the natural attributes of the site, retaining the existing hedgerows, notably the hedgerows to the eastern boundary leading from the road to the open space, to Carrigmore Park to the north of the proposed development area. The central hedgerow, although limited in quality in places, shall be respected and retained in the most part and shall be augmented with native hedging and trees. It shall form an important walking route linking open spaces throughout the development. The hedgerows shall form an important link that shall be open to the public, to access the Boherboy Road from the south, with the LUAS rail line, Carrigmore and the Citywest shopping centre and park, to the north.

Internally, the boundaries the existing trees and hedgerows shall be retained as much as possible, they shall be augmented with new hedges and trees.

There shall be new homes with a landscape scheme, both hard and soft, accompanying them to provide a highly developed and coherent design. The proposed house, driveway, parking and planting shall be clearly identified and developed in an organised manner.

**Fig. 13.19 – Proposed "Local" Streetscape**

### Due to introduction of new structures & buildings

The introduction of the proposed buildings shall form the vertical elements of the proposal. However, existing trees and hedgerows shall reduce the visual impact as it has established vertical elements, i.e. trees. The main visual impact shall be the mass of the proposed structures.

The new structures and associated works will reduce the amount of current open space and remove several trees and hedgerows internally.

**Fig. 13.20 – Proposed Retention of Hedgerow**

The proposed development will require regrading of the site, which will generate impacts to the existing topography. In the short term and long term, the visual impact of the development will be moderate to significant, due to the level topography of the site. The proposed extensive landscape development, utilising existing vegetation and proposed new trees and planting shall ameliorate this impact and over the medium to long term it shall form part of a new landscape.

**Fig. 13.21 –Development proposed across existing topography with retained hedgerow planting**

The potential visual impact shall be negative in the short term and shall change to neutral /positive development in the long term, as new housing is developed. The southern receptor view locations are the most negative as the existing hedgerow and trees are to be removed. The road is to be widened along the Boherboy road with footpath and boundary proposed. The visual impact shall change over time as the new native hedge and trees shall grow and mature, reconnecting with existing hedgerows along the boundaries.

The development shall therefore be a maturing site, becoming increasingly knitted to the fabric of the landscape in this area, which in isolation has a suburban and isolated rural feel but increasingly urban to the north, east and further west.


**Fig. 13.22 – Road Network**

The entrance and access road shall be from existing roads and shall follow the contours of the land. The access road from the Boherboy Road shall be guided by the significant fall in height from the Boherboy Road. The southeaster corner is notable in its fall of 9m in a short distance. The cut and fill required shall have a significant visual impact, however, the planting and landform grading shall ameliorate this impact to a moderate visual impact.

The positive outcome of rising contours is the need to organise the roads into shorter lengths contributing to the reduction of long visual lines to the houses internally. Internally there shall be a hierarchy of roads with associated details. The roads shall be heavily planted with semi mature trees and hedges, reducing the impact of the road on the environment.

**Fig. 13.23 – Public facing streetscape proposed with high quality boundary finishes & buffer planting**

### Due to Landscape Proposals

The landscape proposals shall consist of retention of much of the existing hedgerow & trees, new planting of a variety of tree species, including native trees, being introduced along with shrubs in specified areas. These proposals shall enhance the landscape character of the development. The site will change from an agricultural use to a completed residential development with an associated landscape scheme.

The landscape scheme shall impact on the development in a positive way, working with the landscape through the use of and retention of trees and hedging to create an environment maintaining desirable aspects of the existing landscape and accentuating them through the introduction of new elements.

The current street frontage of the existing hedgerow shall be replaced by a native hedge and stone wall. & railing. The development of a new native hedgerow set back from the road as per direction from South Dublin County Council shall provide an ordered and a boundary that is in keeping with the landscape.

There shall be an increase in the species and varieties of plants, wildflower grass meadows, bulbs and notably trees on the existing landscape which was primarily a monoculture of grass.

The landscape proposals shall include for a range of pollinator plants, trees, hedges, flowering bulbs and wildflowers and shrub planting. The flowering of these plants shall enable bees to flourish but also increase the texture and colour in the landscape. This shall be a positive and long-term visual impact.

### Parking

The entrance roadway has been designed not to have a visual link from the road to the proposed houses, in part due to the topography. The parking areas shall be screened by new hedges and existing trees. The visual effect shall be moderate to significant in the short to medium term. As the planting matures, the organised

layout with the associated tree planting will create their own character, creating an organised new landscape. Visually therefore the proposal shall become a new urban landscape, part of the current and emerging trend in the locality. In the short term the impact shall be significant to moderate and shall be positive, moderate to slight impact over the medium to long term.

**Waste handling areas**

The bin storage of an individual house shall be to the rear as this shall be typical of a housing development. The apartments/duplex units shall have their waste handled by a management company and shall be centralised in designed bin stores and shall screened from view.

**Due to Telecommunications/Power Lines**

On this site, the development shall be served from existing services, telecommunications, and power lines. The proposed services, telecommunications and power lines on site shall be all underground. The opportunity to organise and reduce the telecommunication and services to current standards shall be utilised to reduce the visual impact on the development. Therefore the only items that may be seen shall be lamp standards, ESB mini box, and substation. The lamp standards shall be designed to fit into the streetscape in an organised manner, (as per below). The telecommunications shall be all underground and shall serve the houses individually and shall not impact visually upon the new landscape.

**Due to Lighting**

The lighting of the new development shall be limited and shall be typical of a similar scheme with roads, footpaths, carparking and the main open spaces lit up by the overspill of street lighting.

Internally the roads and streets shall be lit by individual columns, which shall visually change the character of the landscape. Therefore the impact of lighting on the existing landscape shall be moderate in the medium term, negative for the short term and shall become neutral in the medium term to long term.
The lighting of the new houses shall be limited and shall be typical of a housing development. The proposed lighting shall form an extension of the existing roads and developments which are established. In the short term it will be a moderate to significant impact, however as the development establishes, it shall form part of the extended housing neighbourhood in the area and shall be neutral in the long term.

### 13.6.3 Do Nothing Impact

Should the development not proceed it is likely that the site would remain in its present state and perhaps deteriorate.

If the site remains partially developed, the area becomes unmanaged and in particular, the existing hedgerows will fall further into disrepair as they are not maintained or used. Pioneer trees and scrub would begin to establish. Therefore, as development continues on all sides of the site, the agricultural function having ceased, being cut off from its' hinterland.

The open space, undeveloped lands are ceasing to function as grassland and as such shall fall into disrepair and into waste ground. Visually and functionally the lands become unkempt and are limited in the range of amenity and use.

The function of agriculture is limited due to the proximity of the encroaching town of Tallaght and the surrounding developments in Fortunestown to the North and the increasing developments of Saggart to the West.

Therefore, were the site to remain vacant, it could attract anti-social behaviour resulting in generally negative environmental impact.

### 13.6.4 Mitigation Measures

**Monitoring**

A Landscape Architect shall be appointed to oversee and monitor the project at construction and operational stage. They shall liaise with other project members in relation to any existing and proposed trees.

The landscape architect shall overview all hard and soft landscape works and liaise with resident engineer, project team and contractor. The landscape architect shall also inspect the trees; however, most of the monitoring works shall be during and post-civil construction stage. The landscape architect shall review and instruct on details of soft planting, trees, shrubs and of paving materials, walls and railings.

During the operational stage, the Landscape Architect and Arborist shall review the state of all planting and trees. The landscape architect shall review for period of 18 months, from practical completion of each stage the standard and quality of the materials and workmanship. A final certificate of completion shall be issued by the landscape architect in respect of this.

#### 13.6.4.1 Mitigation Measures - Construction Phase

During the construction of the development, the area shall be changed from agricultural use lands to a residential development with a crèche. The introduction of the built structures, roads, carparking and landscaped open spaces will be carried out while maintaining most of the existing hedges and trees of the site. During construction, there will be a change to the landscape and there will be negative visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity.


**Fig. 13.24 – Tree Protection Plan**

Tree protection shall be provided to retain the character of the existing trees and hedgerows.

Although the existing hedgerow along the Boherboy road shall be removed due to a request from South Dublin County Council, in order to provide a public path and associated upgrades to the Boherboy Road, it is proposed to retain the existing mature trees and shrubs along the perimeter of the site and the main internal hedge.

The development shall be carried out in an organised basis, thus reducing the visual impact upon the environment; however, the impact on the initial area of construction shall be moderate to significant. The remedial measures proposed include the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that 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 to short term nature only and therefore it is expected that this will require no remedial action other than as already stated.

The retention of the hedgerows on and surrounding the site combined shall reduce the visual impact of the proposal during construction. This shall include the use of Tree protection fences to BS standard BS5837.

The stream shall be protected by the tree protection measures employed for the existing hedgerow and shall be aided by the use of bales of straw to capture, in the unlikely event, any possible debris from the site.

All building material shall be stored within the site compound, the compound shall be enclosed by a stout fence, and shall be accessed only by a gate manned by a security guard.

The stripped soil shall be stored in berms, until required for use in gardens and open spaces. The balance of the material, that is not required, sod shall be removed to an approved tipping waste management facility.

As the development increases and phasing continues, the improvement in terms of landscape elements, trees etc., growth of the new vegetation and management of the existing hedgerows shall reduce the visual impact and in the long term be positive.

The greatest impact shall be the views through the site as they will become determined by the existing buildings, walls and boundaries, landscape elements of trees and hedges shall also affect these views. However the views are currently screened by existing hedgerows, these are being retained and augmented by the introduction of new trees and planting, the predicted impact during construction shall be moderate in the short-term depending on the length of time on site, as views are restricted by the existing vegetated boundaries.

### 13.6.4.2 Mitigation Measures – Operational Phase

In landscape terms the design proposal seeks to complement the existing landscape, implementing new landscape features that integrate with and enhance the character of the area and wider environment. The design rationale seeks to mitigate negative effects on the visual amenity and landscape of the area with the following objectives:

- The retention of the existing landscape structure of field boundaries, where possible, as well as boundary trees and an area of wet woodland to the north-west corner. A large, cohesive area of open space has been provided consistent with that set out in the Fortunestown LAP;
- Once the development has been lived in for a significant period, the upgrade and improvement of the external spaces shall have a positive impact on the landscape and reduce the visual impact upon nature of the location;
- Follow a multidisciplinary approach to align landscape planting with service elements, maximising the opportunity for public realm trees and buffer planting;
- Use of appropriate materials and boundary treatments to provide high quality public facing finishes that are harmonious with the buildings' facades and provide a legible, safe, and comfortable physical environment;
- The extensive planting of additional trees and shrubs throughout the site and on the site boundaries in keeping with the wider landscape character, will over time, provide visual relief, add to the amenity of the current landscape, reduce the visual mass of the buildings, soften the development over time from various viewpoints and assist in integrating the development into the landscape.

**Fig. 13.25 – CGI – Provision of public open space planted with natural grassland and native tree species**

- Native and pollinator species (as per The All-Ireland Pollinator Plan 2015 – 2020, 2021 - 2025) planting for biodiversity has been incorporated into the scheme and this includes a native tree belt / woodland wetland area, wildflower meadows and semi natural grassland.
- Several connected public open spaces have been designed as part of an overall design strategy that focuses on creating a distinctive 'sense of place' and individual character for the development area. The design of public open space that forms part of a network of spaces that includes areas for passive and active recreation, social / community interaction and play facilities catering for all ages. This area of open space corresponds to that as indicated in the Fortunestown LAP.
- A number of pocket parks shall be developed throughout the development to add to the amenity for the residents and provide additional opportunities for biodiversity. The pocket parks shall be natural and organic in form, using plants from the All-Ireland Pollinator plan for the new and emerging communities. The provision of significant parkland areas/open spaces will facilitate permeability and access to nature.
- Retention of the existing watercourse and the integration into a linear park.
- Enhancement of the wetland area through provision for Sustainable Drainage Systems (GNU-2)
- The hedgerows that are to be removed shall and reinstated with additional native tree planting and a replacement stone wall re-using existing stone will be provided, to the front of the site.
- Connections to the Greenway to the south of the proposed development forms an integral part of the landscape proposals, with formal links and piers to announce the access points. (GNU-6)
- The proposed Planting Plan shall use trees and wildflower meadow mixes, taken from the All-Ireland pollinator Plan 2015 – 2020, 2021 – 2025 & the RHS Plants for pollinators. Therefore there shall be an increase in the range and area of pollinator planting.
- Shrubs and hedges to be used in the private spaces shall be taken from the All-Ireland pollinator Plan 2015 – 2020, 2021 – 2025 & the RHS Plants for pollinators. This shall help encourage insects and bees and provide interconnected routes for birds and biodiversity.
- Greenway routes as per the Fortunestown LAP have been respected and shall be integrated into the overall design.
- Augmentation of the hedgerows and trees to provide continuous sustainable biodiversity green links for flora and fauna.

- Application of best practice horticultural methods to ensure that mitigation measures establish and grow appropriately.

**Fig. 13.26 – Proposed Tree Planting**

Landscape works are proposed to reduce and offset any adverse impacts generated due to the proposed development, where possible. The planting of substantial numbers of new trees and other planting in the open spaces, at the site boundaries and internal roads, both native and ornamental varieties. This will enhance the overall appearance of the new development and compensate for any removal of hedgerows and trees, where needed, for the construction works, and increase the overall landscape capacity of the site to accommodate development. Thus offsetting the effect upon the landscape in visual and physical terms, to short to medium term.

### 13.6.5 Residual Impacts

Initially, on completion of the development, the introduced shrubs will be at early stages of establishment, the trees shall be semi mature at planting. As time progresses, the plants and trees will grow and stabilise in their new environment creating better defined avenues and spaces.

The number and quality of landscape elements shall be an addition to the built environment of Boherboy providing quality amenity for the residents.

The extensive development of the external spaces shall provide an improvement on the existing landscape. The ordered design shall be visually positive and long term. The visual impact on the surrounding landscape shall be negative and moderate in the short term and with maturity of the trees, hedges and plants it shall be moderate to neutral in the long term.

### 13.6.6 Cumulative Impacts

Cumulative Impacts are impacts that result from incremental changes caused by other past, present or reasonably foreseeable developments together with the proposed development
(a) Likely;
(b) Significant; and

(c) Relating to an event which has either occurred or is reasonably foreseeable together with the impacts from this development.

In assessing Cumulative Impacts the following the principal sources consulted:

- South Dublin County Council Development Plan;
- South Dublin County Council Planning File;
- An Bord Pleanála Planning Files;
- South Dublin County Council.

In accordance with Schedule 6, Part 2(c) of the Planning and Development Regulations 2001, this Section has considered the cumulative impact of the proposed development. This relates to the cumulative impact on the subject site itself and on surrounding sites. The European Commission's report of May 1999 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' defines cumulative impact as follows:

*"Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project".*

Regarding the cumulative impact of proposed development on landscape and visual amenity, the future development will take place on open fields and will form part of the comprehensive redevelopment and rejuvenation of the Fortunestown area, in line with the current Fortunestown LAP.

In this regard, the cumulative impact of the overall development is expected to be moderately positive, over the medium to long term. It is considered that there will be short to medium term moderate negative impacts associated with the construction phase of the project over all phases of development. Subsequent construction phases are likely to occur sequentially after the completion of the first Phase.

It is considered that there will be a long term positive visual impact as a result of the proposed development, due to the modern residential facilities being provided, the improved visual amenity and outlook from the surrounding area, creation of an integrated streetscape and attractive, useable public realm, and the provision of organised pocket parks, calisthenic items, playgrounds and seating to serve the needs of the local community.

The most significant impact on the local area in recent periods was the development of the Fortunestown area, directly adjacent to the North of the site. This has included housing, shopping centre and apartment building. The landscape around Fortunestown has changed steadily over the past 30 years from a back rural road to an urban centre. Fortunestown is directly adjacent to the north of the proposed development site at Boherboy

As Boherboy is surrounded by development, to the North and East, West, and to the south, the visual impact will be limited due to existing developments. The proposed development shall visually assimilate into the new urban – suburban landscape.

The proposed housing development shall provide a visual interaction with existing residential developments of Corbally and Carrigmore. The proposed new development at Boherboy shall tie in with these existing developments and shall provide a positive impact to the development in the immediate area.

A new hotel and apart hotel to the south of the site that has been granted permission, SD20A/0232, forms part of the emerging trend of development in the immediate area. It means that development shall surround the proposed lands at Boherboy. The landscape is changing from rural, suburban to a built urban environment.

Carrigmore Park has been established and this shall have positive interactions and impacts upon Boherboy and provide a valuable visual and recreational amenity for the area. The proposed interaction between the proposals in the form of paths and connections is a positive impact and shall provide a resource for the expanding population.

Citywest Business Campus, Greenogue Business Park and Grange Castle Business Park have been developed in the locality to provide employment for the local population. They are well serviced and are landscaped to a high degree providing an ordered and organised public realm. The future impact of these business parks shall be dependent on economic conditions. The proposed Boherboy development shall provide a positive interaction with the business parks and the ordered development of the housing shall have a positive long term visual impact and effect.

Cumulative effects are considered as those effects which result from additional changes caused by the proposed development in conjunction with other similar developments. The list of projects considered in the cumulative assessment is included in Chapter 3 of this EIAR.

Inter-relationships are the interaction / interrelations between the impacts and proposed mitigation for one discipline with another associated discipline.

### 13.6.7. Cumulative Impacts – Construction Visual Impact

During the construction stages, traffic movement, excavation operations and construction works will have a moderate – significant visual impacts on the site, under the following headings.

### Material Assets & Land – Property

Landscape and visual effects may impact on residential properties located near the proposed development. Likely landscape and visual effects will be most pronounced during the construction and initial operation stages, causing initial visual impacts, after which landscape mitigation measures will be increasingly effective in integrating the proposed development within the landscape and in reducing landscape and visual impacts on properties.

Existing agricultural grasslands form the groundcover over the site with native hedges and trees providing screening and boundary treatment. These lands at present have a limited function, providing grazing for a local farmer. Therefore limited as functioning agricultural use, the future development of the site for residential land use will have a moderate - significant visual impact.

The removal of the existing agricultural lands will be necessary for the development to commence. Large lengths of the native hedge and tree lines within the development are to be retained with some removed to accommodate both roads and residential units.

Although the portion of 'Green' land will be reduced, no loss of botanical significance shall be incurred, however, the native hedge line and some mature trees shall be removed as per the arborist and ecological reports. The visual impact upon the area shall be moderate to significant in the short to medium term.

### Soils & Geology

The construction of the proposed development will involve excavation of existing soils, primarily soft in nature, with spoil material being placed in material deposition areas within the land take. The development of the

proposal, both horizontal and vertical, takes account of landscape and visual impacts on residential properties. The stripping of the soil shall be a moderate to significant visual impact, removing the sod cover. The topsoil to be retained on site shall be stored on site in berms that shall be used at a later date for gardens and open space.

**Hydrogeology**

As a result of the redistribution of traffic, there is a risk to water quality through pollution and spillage accident risk. The construction phase of the project has the potential to impact on groundwater and habitats. Mitigation measures have been put in place to avoid and/or minimise these effects. During the operational stage, sealed drainage systems will be used, and stormwater drainage will be suitably treated prior to discharge. The SUDS (Sustainable Urban Drainage System) proposed will be a significant improvement over the traditional drainage regimes and with the distribution of the traffic onto the new roads is likely to result in an improvement during the operation stage for hydrogeology. The SUDS proposed aim to utilise a two-step intervention of surface water, cleaning and temporary storage, prior to release to the system. This shall not be visible except for the interventions above ground. The large detention basin to the north of the site, the swales, rain garden and a number of tree pits.

### 13.6.8 Cumulative Impacts – Operational Visual Impact

Based on the Viewpoints 1, 3, 7, 8, 9, 10, 11, 12 and 13 (described in section 14.9), it is not likely that any development would be visible in the aforementioned viewpoints.

A number of developments are already in existence, notably to the East and to the North. The cumulative visual effects are therefore not likely in the immediate vicinity of the site, therefore, cumulative visual effects arising from the proposed development are considered to be moderate, over the medium to long term.

The lands to the west are currently open fields, with no zoning for building, however the village of Saggart is expanding and it would be reasonable to expect development from the west along Boherboy road. The visual effect from the western lands at this present time would be significant. However the retention of the existing hedgerow along this boundary shall reduce the visual impact of the development.

The extensive planting, retention of trees and hedgerows, particularly at the north, east and west of the development shall reduce the visual impact of the proposal, the operational visual effect shall be moderate – significant in the short term and neutral to positive in the long term.

**Traffic**

Traffic in the proposed development will have landscape and visual effects on properties in proximity to the proposed development.

These effects were considered during the design process of the proposed development. Mitigation measures have been proposed, in the form of landscape planting, street trees, width of new streets and roads. The organised planting of street trees along roads and parking spaces, all provide a new environment and sense of place. The new traffic from the existing Boherboy Road to the south connecting to Carrigmore to the north and Corbally to the east, through the development site, provides the opportunity to propose an organised and varied design that shall provide a positive landscape and visual impact along the proposed roads and streets. The retention of existing hedgerows and the provision of a number of open spaces, ranging in size from pocket

parks, communal spaces to large central park, riverside park and other large spaces shall reduce the impact of the built environment and shall help reduce the visual impact of Traffic.

### 13.6.9 Cumulative Impacts – Operational Landscape Impact

The cumulative landscape effects of the development may result in Moderate, adverse effects on the wider landscape at Boherboy, in the short term, as the land will change from open fields to built-up areas, with potential loss of landscape elements such as vegetation and hedgerows which define the field patterns. However this loss shall be minimal, with the majority of the hedgerows and existing trees being retained.

The subject lands have been zoned for residential land use since 1998 and 2004 County Development Plans respectively, with the Fortunestown LAP, adopted in 2012. This identified the application site being developed for housing as part of the "Boherboy Neighbourhood". Therefore, both the CDP and LAP clearly envisage residential development of considerable size on the subject lands. The development of the site is consistent with both the CDP and LAP zoning.

The retention of the mature hedgerows shall be significant in the operational impact, by providing screening and backdrop to the proposed development. The mature hedgerows shall aid in tying the development into the wider landscape and reduce the operational landscape impact.

The cumulative effects of the development of the entire LAP lands depended on the nature, scale and design of those developments to the north and north-east. These lands have been well developed, with associated roads, paths, buildings and open spaces. The potential cumulative landscape effects of the proposed development, in conjunction with the development of lands within the LAP area, may have a moderate effect on the landscape in the environs of the site, as it forms part of the existing development.

### Biodiversity

The scheme has been developed to minimise the removal of existing hedgerows and trees on the Boherboy site. Open spaces have been selected to retain the trees and hedgerows. However, some parts of hedgerows and scrub vegetation will be removed in the construction – generally for access roads. The main impact shall be the removal of existing cover of grass. This may have a negative effect on landscape quality visual amenity in the short term, however the monoculture of grass shall be replaced by pollinator rich wild flower and bulbs, aiding the biodiversity in the long term. In conjunction to this, there shall be more trees planted 693 no. than removed, 77no., enhancing the range and number of tree species in the locality.

Landscape mitigation proposals have been developed to be complementary with the ecological requirements. These include planting of native, naturalised and indigenous species to augment existing hedgerows. The hierarchy of street tree planting shall help in reconnecting ecological networks resulting in a positive effect on biodiversity and a positive long-term impact for the subject site at Boherboy.

Further enhancements in the form of wildflower meadow, bulbs, native hedgerow and trees shall aid the reduction in landscape impacts.

**Fig. 13.27 – Proposed planting scheme to create greater levels of biodiversity across the site**

## Population & Human Health

Negative temporary visual impacts will arise for residents located close to or adjoining the construction boundary. A Construction Management Plan (CMP) shall be drawn prior to construction and implemented. Specific mitigation measures include the provision of hoarding around construction compounds during the construction phase for properties particularly impacted by the works.

During the operational phase, landscape and visual impacts will arise from the built physical presence of the roads and streets. Mitigation measures will include general measures such as retention of existing hedgerows and trees, the augmentation of existing hedgerows established throughout the development, and the planting of a range of trees and species. Landscape and visual mitigation measures have been utilised in the design of the proposed development to reduce impacts on property.

The impacts of the new development shall be offset by the further potential to enhance sustainable green links through the site and to surrounding employment and housing areas. The engagement with the natural landscape environment and renewed habitat areas are beneficial to the health and wellbeing of the local population. The facilitating of sustainable alternative transportation is positive for human health and aids in the forming of a sense of place at Boherboy. The negative impacts shall be temporary to short term, while the organised and enhanced landscape shall provide an interesting and varied living spaces which add to the quality of life for residents and users.

## 13.7 Landscape Impact Assessment Criteria

The following criteria are considered, when assessing the potential impacts on the landscape resulting from a proposed development:

- Landscape/Landscape character, value and sensitivity;
- Magnitude of likely impacts;
- Significance of landscape effects.

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape/Landscape Value and Sensitivity is classified using the following criteria set out in Table 13.1

| Sensitivity | Description |
|---|---|
| Very High | Areas where the Landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value townscapes, protected at an international or national level (e.g. World Heritage Site), where the principal management objectives are likely to be protection of the existing character. |
| High | Areas where the Landscape character exhibits a low capacity for change in the form of development. Examples of which are high value townscapes, protected at a national or regional level, where the principal management objectives are likely to be considered conservation of the existing character. |
| Medium | Areas where the Landscape character exhibits some capacity and scope for development. Examples of which are townscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use. |
| Low | Areas where the Landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated townscapes that may also have some elements or features of recognisable quality, where management objectives include, enhancement, repair and restoration. |
| Negligible | Areas of Landscape character that include derelict sites and degradation where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of Landscape improvements and/or restoration. |

**Table 13.1 - Landscape/Landscape Value and Sensitivity – Magnitude of Change**

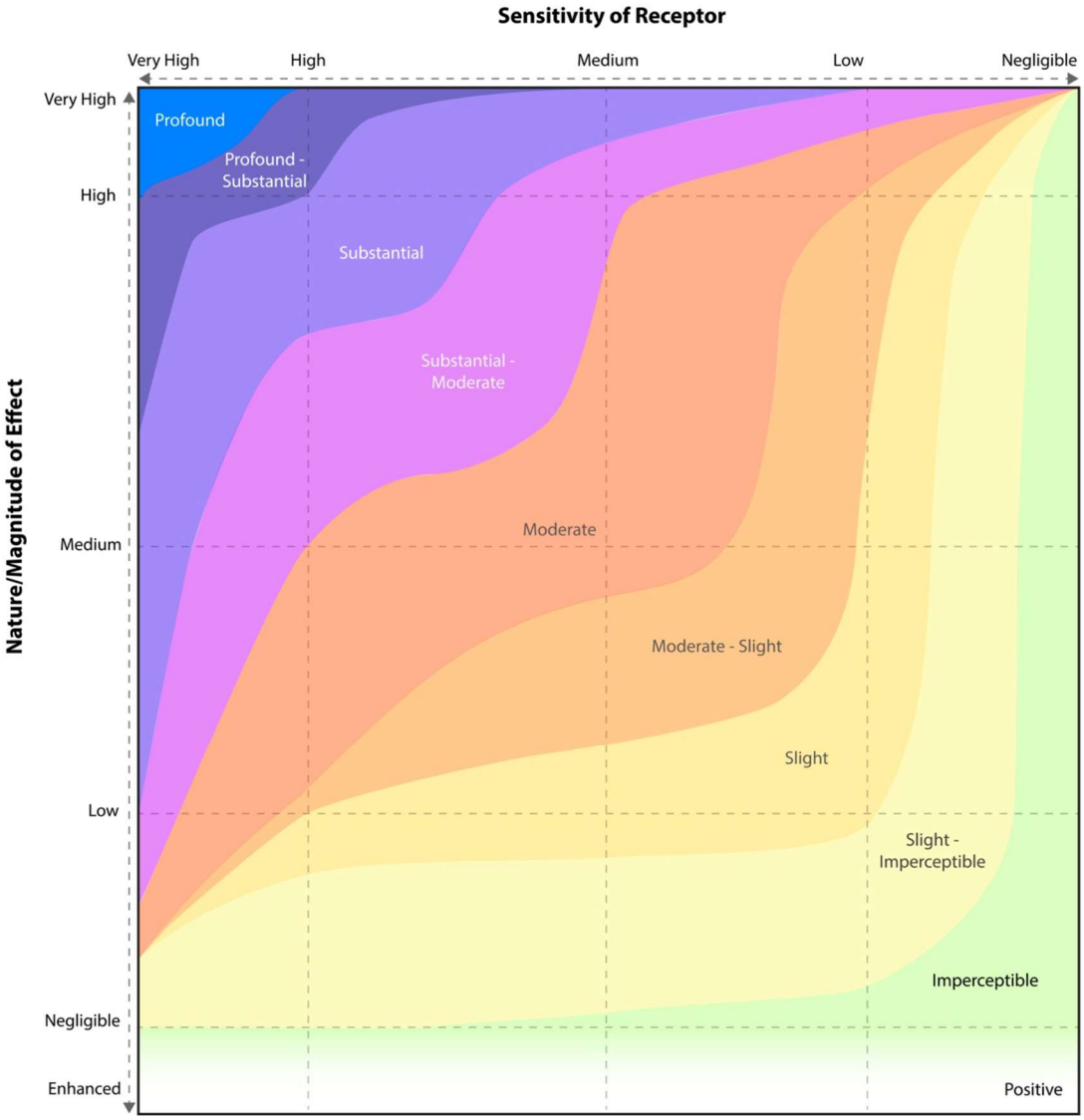



**Fig. 13.28 - Impact Significance Matrix**

| Magnitude | Typical Criteria for Landscape Receptors |
|---|---|
| **High** | Major removal or addition of landscape features or removal of localised but unusual or distinctive landscape features and/or addition of new conspicuous features and elements which may alter the character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are not replaceable or are replaceable only in the long term. |
| **Medium** | Moderate removal or addition of landscape features and/or addition of new noticeable features and elements which would be clearly visible but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are replaceable in the medium term. |
| **Low** | Minor removal or addition of landscape features and/or addition of new discrete features and elements which would be perceptible within but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are readily replaceable in the short term. |
| **Negligible** | Barely perceptible removal or addition of landscape features would occur and the development would be barely perceptible in visual/ character terms. |

**Table 13.2 - Assessment of Magnitude of Change for Landscape Receptors**

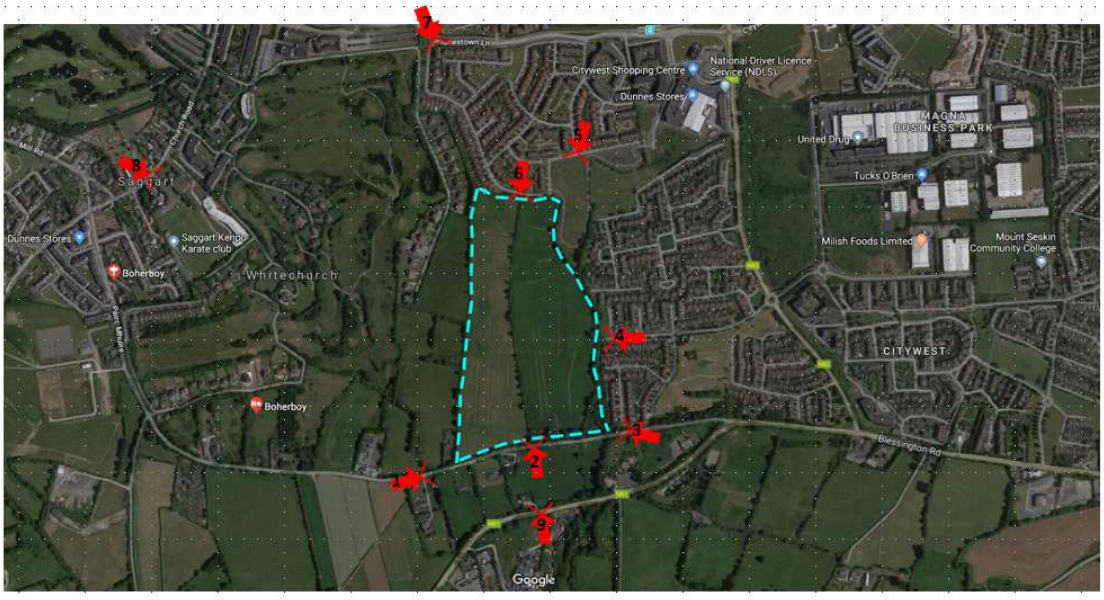
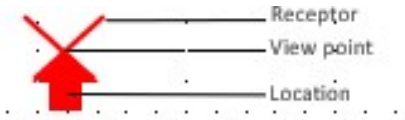



**Fig 13.29 - Visual Receptors – Locations 1 – 9**



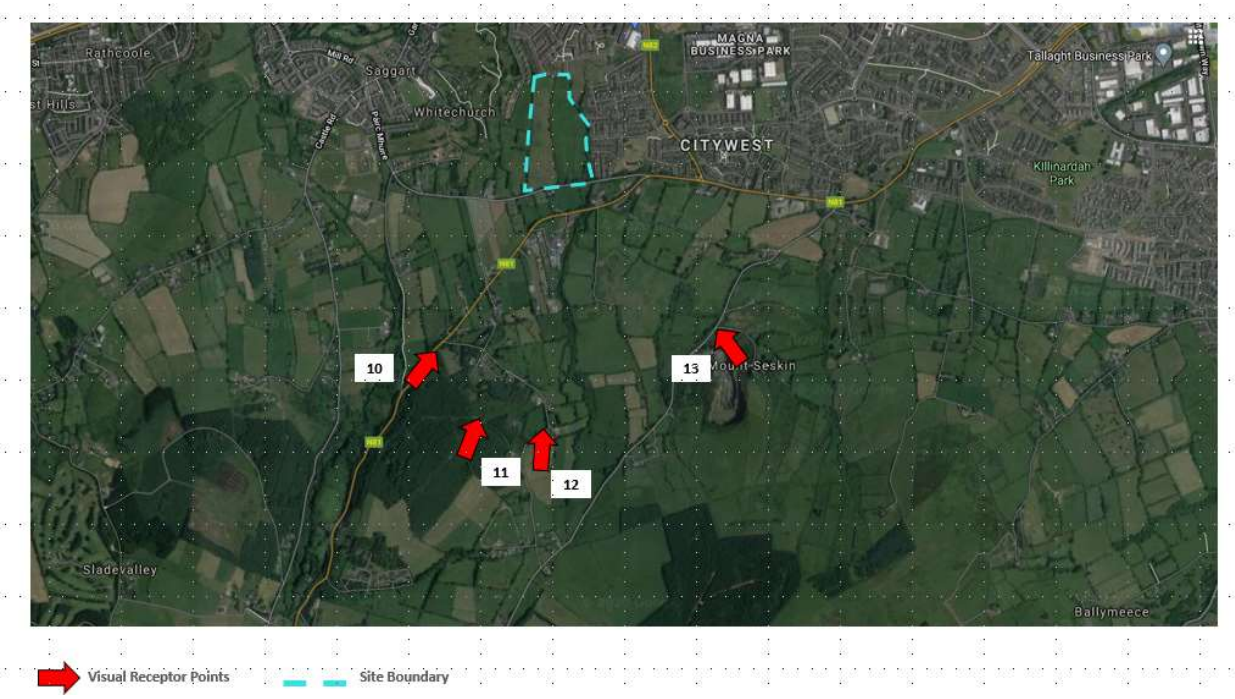



**Fig. 13.30 – Visual Receptors – Locations 10 - 13**

The extensive development of the external spaces shall provide an improvement on the existing landscape. The ordered design shall be visually positive and long term. The visual impact on the surrounding landscape shall be negative and moderate in the short term and with maturity of the trees, hedges and plants it shall be moderate to neutral in the long term.

The Verschoyle's Hill and Lugmore/ Tallaght Views are included in the LVIA as they are considered protected views and prospects in the Development Plan. The proposed site is proximate to the Dublin Mountains backdrop, and is located close toa very sensitive landscape character area as identified in the South Dublin County Council Landscape Character Assessment 2015

- 10 - N81 @ junction with Meagan's Lane
- 11 - On Meagan's Lane (L7355) looking north
- 12. - On woodland walk in Verschoyle's Hill forest

<u>Lugmore/Tallaght Hill Views</u>

- 13 - On Mt. Seskin Rd (L7377) @ junction with Lugmore Lane

## 13.8 Visual Selector Interaction

The 13 no. visual receptors have been assessed and presented to the design team. Through a process of dialogue in conjunction with the project architects, planners and Digital Dimensions, they represent the most significant and sensitive location points, and were based upon the sensitivity of the locations and typical criteria is listed on Table 13.3 over.

### 13.8.1 Sensitivity – susceptibility of receptors.

A visual receptor is a human user of the landscape. The practice has adopted the principle that the sensitivity for each type of visual receptor is inherent to the nature of the activity they are undertaking rather than the view itself.

In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are:

- *"Residents at home;*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area;*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".*

Visual receptors that are less susceptible to changes in views and visual amenity include:

- *"People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".*

### 13.8.2 Images & Photomontages

A collection of 13 no. photomontages have been prepared surrounding the site to fully illustrate the physical and visual nature of the proposed development. Please note the proposed photomontage photo location points were prepared by Digital Dimensions from publicly accessible viewpoints around the location of the subject lands.

| Sensitivity | Typical Criteria for Visual Receptors |
|---|---|
| High | Users of residential properties, public rights of way, named viewpoints and scenic roads or railways.<br>Users of cultural heritage features including World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments, Listed Buildings and Conservation Areas where they are known to be tourist destinations or places used by local communities. |
| Medium | Users of public rights of way (urban or industrial areas) play areas, sporting and outdoor active recreational facilities and rural roads. |
| Low | Users of office and employment areas, industrial areas and the main road and rail network. |

**Table 13.3 - Visual Receptor Sensitivity**

## 13.9 Visual Impact Assessment Viewpoints

### 13.9.1 Visual Impacts: Images

We have noted images from various receptor points as per the aerial plan (Fig.s 13.8 & 13.9), enclosed in the accompanying landscape receptor views. They have been prepared to illustrate the impacts, if any, with respect to the proposed development along associated access roads, the Boherboy Road, N81, Fortunestown Lane, Local Housing Estates, and the Church of the nativity of the Blessed Virgin, Church road located in the centre of Saggart.

| View | Description |
|---|---|
| 1 | Looking north-east, east of a single house and scrapyard on the Boherboy Road |
| 2 | Looking north, directly south of the site on the Boherboy Road |
| 3 | Looking west, on the Boherboy Road close to Corbally Glade |
| 4 | Looking west from Corbally Heath from the estate road and the boundary to the development. |
| 5 | Looking south, from a road adjacent to Carrigmore Park, at the junction of Carrigmore Elms and Carrigmore Green |
| 6 | Looking south, site boundary, from Carrigmore Avenue |
| 7 | Looking south-east, on Fortunestown Lane, outside the entrance road of Carrigmore Glen. |
| 8 | Looking west, from the Church Road, Saggart village. Outside entrance to the Church Car park (Church of the Nativity of the Blessed Virgin Mary) |
| 9 | Looking north, due south of the subject lands on the Blessington Road, N81. |
| 10 | N81 @ junction with Meagan's Lane |
| 11 | On Meagan's Lane (L7355) looking north |
| 12 | On woodland walk in Verschoyle's Hill forest |
| 13 | On Mt. Seskin Rd (L7377) @ junction with Lugmore Lane |

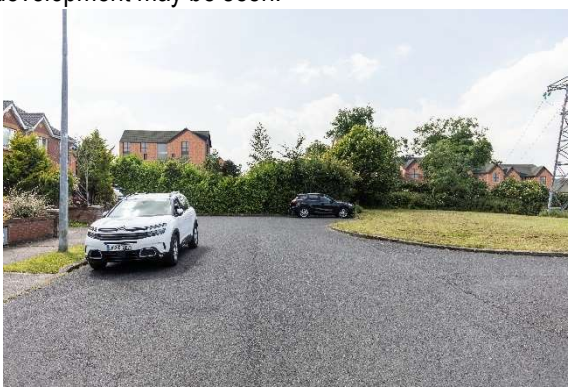
**Table 13.4 – Receptor Views**

The 13 no. visual receptors that are presented, are the closest to the proposed development site and have been selected to best represent the most significant and sensitive location points.

| View 1 | |
|---|---|
| Existing View | Looking north-east, outside of single house on the Boherboy Road |
| Proposed View | The proposed development site is shown with red outline and cannot be seen from the road due to the existing mature planting & hedgerow  |
| Impact – Construction Stage | No Impact – Neutral in the short term. Cannot be seen due to hedgerow and trees along the road |
| Impact – Operational Stage | No Impact – Neutral in the short term. Cannot be seen due to hedgerow and trees along the road |
| Visual Receptor Sensitivity | Medium |
| Magnitude of Change for Landscape Receptors | Medium |
| Quality of Change | Neutral in the long term. Cannot be seen due to hedgerow and trees along the road. Further reduced over time by maturing plant material – trees, hedges and shrubs. |

| View 2 | |
|---|---|
| Existing View | Looking north, directly south of the site on the Boherboy Road |
| Proposed View | The proposed development shall be seen from the road due to the removal of the existing mature planting.  |
| Impact – Construction Stage | Negative Impact |
| Impact – Operational Stage | Negative in the short term - Moderate in the long term |
| Visual Receptor Sensitivity | Medium |
| Magnitude of Change for Landscape Receptors | Medium |
| Quality of Change | Moderate to Neutral in the long term |

| View 3 | |
|---|---|
| Existing View | Looking south-west, on the Boherboy Road close to Corbally Glade |
| Proposed View | The red lines denotes the outline of the proposed development. The main part of the proposed development cannot be seen from the road due to the existing mature hedgerow.  |
| Impact – Construction Stage | Moderate to negative Impact – removal of hedgerow along the road frontage. |
| Impact – Operational Stage | Moderate Impact |
| Visual Receptor Sensitivity | Medium |
| Magnitude of Change for Landscape Receptors | Medium |
| Quality of Change | In the short term – Moderate – emerging trends, i.e. more housing shall render the visual impact Neutral in the long term |

| View 4 | |
|---|---|
| Existing View | Looking west from Corbally Heath from the estate road and the boundary to the development. |
| Proposed View | The proposed development, in part can be seen from the Road. The existing mature planting frames the development, therefore a portion of the development may be seen.  |
| Impact – Construction Stage | Moderate to Negative Impact |
| Impact – Operational Stage | Moderate Impact – consistent with emerging trends. |
| Visual Receptor Sensitivity | Low |
| Magnitude of Change for Landscape Receptors | Low |
| Quality of Change | Moderate to Neutral in the long term |

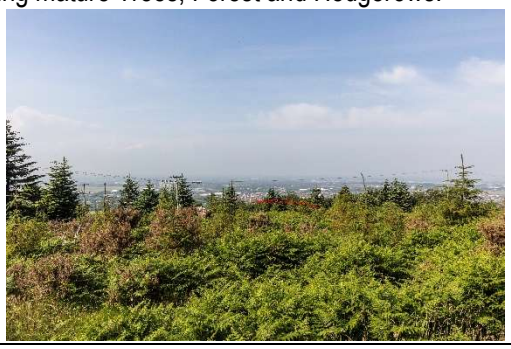
| View 5 | |
|---|---|
| Existing View | Looking south-west, from a road adjacent to Carrigmore Park, at the junction of Carrigmore Elms and Carrigmore Green |
| Proposed View | The proposed development may be seen from the road due to the level rise and ground conditions. However, the existing mature hedges and trees reduce the visual impact  |
| Impact – Construction Stage | Moderate to Negative |
| Impact – Operational Stage | Moderate to the medium term, Neutral to the long term. |
| Visual Receptor Sensitivity | Medium |
| Magnitude of Change for Landscape Receptors | Low |
| Quality of Change | Moderate to the medium term. Neutral in the long term |

| View 6 | |
|---|---|
| Existing View | Looking south, from the site boundary, at Carrigmore Avenue |
| Proposed View | The proposed development may be seen from the road, however it shall be screened by the existing hedge to a large degree.  |
| Impact – Construction Stage | Moderate to Significant Impact |
| Impact – Operational Stage | Moderate Impact |
| Visual Receptor Sensitivity | Low |
| Magnitude of Change for Landscape Receptors | Low - Medium |
| Quality of Change | Negative short term, Moderate to the medium term Neutral in the long term |

| | |
|---|---|
| **View 7** | |
| Existing View | Looking south-east, on Fortunestown Lane, outside the entrance road of Carrigmore Glen. |
| Proposed View | The proposed development cannot be seen from the Road due to the existing housing mature planting, native hedgerows to the distance  |
| Impact – Construction Stage | No Impact – Neutral |
| Impact – Operational Stage | No Impact – Neutral |
| Visual Receptor Sensitivity | Low |
| Magnitude of Change for Landscape Receptors | Negligible |
| Quality of Change | Neutral in the long term |
| **View 8** | |
| Existing View | Looking west, Church Road, Saggart village. Outside entrance to the Church Car park (Church of the Nativity of the Blessed Virgin Mary) |
| Proposed View | The proposed development cannot be seen from the road due to the existing mature planting and distance.  |
| Impact – Construction Stage | No Impact - Neutral |
| Impact – Operational Stage | No Impact - Neutral |
| Visual Receptor Sensitivity | Medium |
| Magnitude of Change for Landscape Receptors | Medium |
| Quality of Change | Neutral in the long term |

| View 9 | |
|---|---|
| Existing View | Looking north, due south of the subject lands on the Blessington Road, N81. |
| Proposed View | The proposed development cannot be seen from the road due to the existing mature Hedgerow.<br>  |
| Impact – Construction Stage | No Impact - Neutral |
| Impact – Operational Stage | No Impact - Neutral |
| Visual Receptor Sensitivity | Medium |
| Magnitude of Change for Landscape Receptors | Medium |
| Quality of Change | Neutral in the long term |

| View 10 | |
|---|---|
| Existing View | N81 @ junction with Meagan's Lane |
| Proposed View | The proposed development cannot be seen from the road due to the existing mature Hedgerow.<br>  |
| Impact – Construction Stage | No Impact - Neutral |
| Impact – Operational Stage | No Impact - Neutral |
| Visual Receptor Sensitivity | Medium |
| Magnitude of Change for Landscape Receptors | Medium |
| Quality of Change | Neutral in the long term |

| View 11 | |
|---|---|
| Existing View | On Meagan's Lane (L7355) looking north |
| Proposed View | The proposed development cannot be seen from the road due to the existing mature Trees, Forest and Hedgerows.  |
| Impact – Construction Stage | No Impact - Neutral |
| Impact – Operational Stage | No Impact - Neutral |
| Visual Receptor Sensitivity | Very High |
| Magnitude of Change for Landscape Receptors | High |
| Quality of Change | Neutral in the long term |

| View 12 | |
|---|---|
| Existing View | On woodland walk in Verschoyle's Hill forest |
| Proposed View | The proposed development cannot be seen from the road due to the existing mature Trees and vegetation.  |
| Impact – Construction Stage | No Impact - Neutral |
| Impact – Operational Stage | No Impact - Neutral |
| Visual Receptor Sensitivity | Very High |
| Magnitude of Change for Landscape Receptors | High |
| Quality of Change | Neutral in the long term |

| View 13 | |
|---|---|
| Existing View | On Mt. Seskin Rd (L7377) @ junction with Lugmore Lane |
| Proposed View | The proposed development cannot be seen from the road due to the existing mature Trees and vegetation.  |
| Impact – Construction Stage | No Impact - Neutral |
| Impact – Operational Stage | No Impact - Neutral |
| Visual Receptor Sensitivity | High |
| Magnitude of Change for Landscape Receptors | Medium |
| Quality of Change | Neutral in the long term |

### 13.10 Difficulties Encountered in Compiling

Boherboy is an open site with easy access to the site . There were no difficulties encountered on visiting the development area.

### 13.11 Conclusion

The visual impact of the housing development shall be negative at first, due to the reduction in open space and the removal of the roadside hedgerow. However, as the subject site provides more accommodation for future residents, the well-designed layout that retains and is sympathetic to the characteristics of the surrounding landscape, it shall have a moderate visual impact that is consistent with emerging trends

The increase and coherent design of external spaces, shall replace the open space of the field. A direct connection to the open space to the north-east, from the Boherboy Road, utilising the existing hedge line, shall provide a positive visual amenity.

The retention of the existing native hedgerows along the east, west and internally, along with the proposed planting shall tie the proposed dwellings with the natural landscape.

Although the character of the environment shall change, it is in line with emerging patterns of development in the locality, notably Saggart and the Fortunestown area. The proposal is, however, sympathetic to the surrounding landscape and shall present a moderate visual impact in the long term.

The increased tree cover shall also enhance and increase the biodiversity of the existing landscape and tie it in with the existing hedgerows and trees.

The duration of this visual impact shall be negative in the short term but as development increases in Fortunestown / LAP environs, the emerging trends shall view this development as moderate neutral to positive in the long term, as the proposal is well designed and sympathetic to the natural landscape.

It may be viewed, that as this new development retains elements of the existing rural character, it enshrines the retention of the main internal hedgerow, provides valuable amenity space and creates an important pedestrian/cycle link to the amenity, habitat areas of the local park - Carrigmore Park.

The proposed development shall influence the surrounding land use, in particular the field to the west. This development shall be an addition to the existing urban fabric of the Fortunestown LAP area, and in the long term, it shall have a moderate impact upon the landscape and its usage, due to its strong greenway connections and organisation of open spaces.

As the proposed houses are surrounded by existing hedgerows and housing developments, the visual impact upon the landscape, may not be seen from many of the surrounding visual receptors, notably the N81 Road, Fortunestown Lane, the visual impact shall be neutral in the long term.

The visual impact shall be moderate to significant due to the rising landform. Therefore, from the visual receptors on Boherboy Road and from Carrigmore Park and Avenue, it shall be a significant visual impact in the short term, to a moderate impact in the medium and long term.

The proposed development shall provide a coherent ordering of buildings and external spaces and present a positive visual impact upon the existing development and shall not detract from the local landscape. Therefore the visual impact upon the nature of the landscape shall be moderate to significant in the short term, moderate in the medium term resulting as neutral visual impact in the long term. This shall be due to the emerging patterns of development – maturing landscape and the retention of existing habitat and hedgerows.

## 13.12 References:


- British Standard BS5837:2012 Trees in Relation to Design, Demolition and Construction. Recommendations.
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (1995)
- Guidelines on the Information to the Contained in Environmental Impact Statements (2002).
- Revised Guidelines on the information to be contained in Environmental Impact Statements Draft (September 2015)
- Advice Notes for Preparing Environmental Impact Statements Draft (September 2015)
- Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports Draft (August 2017)
- South Dublin County Council Development Plan 2016 - 2022
- Fortunestown Local Area Plan 2012
- Landscape Institute and Institute of Environmental Management & Assessment (2013). Guidelines for Landscape and Visual Impact Assessment.
- Planning and Development, Act 2000, as amended.
- Landscape Character Assessment of South Dublin County Draft Report May 2015
- South Dublin County Council Development Plan 2022 – 2028 - Appendix 4 Green Infrastructure: Local Objectives and Case Studies

# 14.0. Identification of Significant Impacts / Interactions

## 14.1 Identification of Significant Effects

The purpose of this section of the EIAR is to draw attention to significant interaction and interdependencies in the existing 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 5, 6 and 7 of the Planning and Development Regulations 2001, as amended. The detail in relation to interactions between environmental factors is covered in each chapter of the EIAR.

This chapter collates the significant interactions between the different disciplines outlined throughout this EIAR. Table 14.1 (included at the end of this chapter) provides a matrix which summarises the significant interactions associated with the proposed development. the description of effects is in accordance with Table 3.3 of the *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports 2017*. These Guidelines note that *"The relevant terms listed in the table below can be used to consistently describe specific effects. All categories of terms do not need to be used for every effect".*

| | |
|---|---|
| **Quality of Effects**<br><br>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral | **Positive Effects** - A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities). |
| | **Neutral Effects** - No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error. |
| | **Negative/adverse Effects** - A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance). |

| | |
|---|---|
| **Describing the Significance of Effects**<br><br>''Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance below). | **Imperceptible** - An effect capable of measurement but without significant consequences.<br><br>**Not significant** - An effect which causes noticeable changes in the character of the environment but without significant consequences.<br><br>**Slight Effects** - An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.<br><br>**Moderate Effects** - An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.<br><br>**Significant Effects** - An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment<br><br>**Very Significant** - An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.<br><br>**Profound Effects** - An effect which obliterates sensitive characteristics. |

| | |
|---|---|
| **Describing the Extent and Context of Effects**<br><br>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced. | **Extent:**<br><br>Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.<br><br>**Context:**<br><br>Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?). |

| | |
|---|---|
| **Describing the Probability of Effects**<br><br>Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision. | **Likely Effects:**<br><br>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.<br><br>**Unlikely Effects:**<br><br>The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented. |

| | |
|---|---|
| **Describing the Duration and Frequency of Effects**<br><br>'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful. | **Momentary Effects -** Effects lasting from seconds to minutes.<br><br>**Brief Effects -** Effects lasting less than a day.<br><br>**Temporary Effects -** Effects lasting less than a year.<br><br>**Short-term Effects -** Effects lasting one to seven years.<br><br>**Medium-term Effects** - Effects lasting seven to fifteen years.<br><br>**Long-term Effects -** Effects lasting fifteen to sixty years.<br><br>**Permanent Effects -** Effects lasting over sixty years<br><br>**Reversible Effects -** Effects that can be undone, for example through remediation or restoration<br><br>**Frequency of Effects -** Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually). |

All environmental factors are interlinked to a degree such that interrelationships exist on numerous levels. Interactions within the study area can be one-way interactions, two-way interactions and multiple-phase interactions which can be influenced by the proposed development. 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 of the EIAR was prepared by Tracy Armstrong, BA, MRUP, MIPI, MRTPI, Planning Consultant of Armstrong Fenton Associates, who is a Corporate member of the Irish Planning Institute and has 17 no. years post-qualification experience. Tracy has experience in preparing and coordinating EIARs for a variety of projects and has also been involved in the coordination of a wide range of developments including residential and commercial developments.

All of the potential significant effects of the proposed development and the measures proposed to mitigate them have been outlined in the preceding chapters of this EIAR. However, for any development with the potential for significant environmental effects, there is also the potential for interaction amongst these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or ameliorate them, or have a neutral effect.

The purpose of this requirement of an EIAR is to draw attention to significant interaction and interrelationships in the existing environment. Armstrong Fenton Associates Planning Consultants, in preparing and co-ordinating this EIAR ensured that each of the specialist consultants liaised with each other and dealt with the likely interactions between effects predicted as a result of the proposed development during the preparation of the proposals for the subject and ensuring that appropriate mitigation measures are incorporated into the design process.

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. In addition, likely interactions between one topic and another have been discussed, where relevant, by the relevant specialist consultant(s).

The primary interactions can be summarised as follows:

- Noise, air, waste, water and traffic with population and human health;
- Land and soils with traffic, water, resource management, noise, air and biodiversity;
- Water with biodiversity;
- Waste with biodiversity;
- Cultural heritage and the landscape and
- Air quality and climate and traffic.

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.

However, the reader is directed to the relevant environmental topic chapter of this EIAR document for a more detailed assessment.

During the Operational Phase, it is anticipated that water and traffic will be the key environmental factors impacting upon population and human health as a new residential landscape will be created. The increase in population will result in increased traffic and increased demands on water supply and increased requirements for wastewater treatment. These are addressed in the appropriate sections of this EIAR.

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.

Where appropriate, the relevant impact areas are considered in grouped form, as set out below.

## 14.2 Description of Significant Interactions

### 14.2.1 Interactions between Population/Human Health and Air Quality/Climate

Interactions between population/human health and air quality/climate are discussed in Chapters 3 and 7. The main interactions are predicted to arise during construction stage as there will be dust emissions associated with the construction of the proposed development. Mitigation measures such as the implementation of a Dust Management Plan (outlined in Appendix 11.2) will minimise dust emissions during construction stage and ensure that no adverse impacts will occur on population and human health. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term, imperceptible and neutral with respect to population and human health during construction and long-term, imperceptible and neutral during operation phase.

### 14.2.2 Interactions between Population/Human Health and Transportation

The scheme will be developed in line with the Transportation Chapter (Chapter 10 of this EIAR) and the separately enclosed Outline Construction Management Plan (OCMP) and Construction Traffic Management Plan to ensure any impacts on local traffic is minimised during the construction stage. Chapter 10 notes that a large proportion of the construction employees are anticipated to arrive in shared transport therefore reducing the potential for associated temporary negative impacts on the surrounding

road network. Appropriate on-site parking and compounding will be provided on this large site to prevent overflow onto the local network. Deliveries will be actively controlled and subsequently arrive at a dispersed rate during the course of the working day. Provided that mitigation measures and management procedures detailed in Chapter 10 are implemented, the residual impact on the local receiving environment during the construction stage will be short-term, imperceptible and neutral.

As the development proposes some 655 no. residential units and associated car parking, there will be additional traffic movements at the site and in the vicinity. The implementation of mitigation measures such as the implementation of the Mobility Management Plan will ensure that the residual effect on the local receiving environment is both managed and minimised. The promotion of sustainable modes of transport from the site, the large quantum of bicycle parking provided and the incorporation of permeable links through the site will contribute towards modal shift in travel patterns and increased physical activity, which will have a positive, significant and long-term effect on the area.

If the development does not proceed at the subject lands, there would be a potential negative impact for pedestrians and cyclists in the local area as the significantly enhanced pedestrian and cyclist permeability through the site would not be provided to shorten journeys to public transport, services and facilities.

### 14.2.3 Interactions between Air Quality and Climate, Transportation and Population/Human Health

Chapters 7 and 10 outline interactions between air quality and traffic/transportation respectively. Interactions between air quality and traffic can be significant. Chapter 7 states that interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

The traffic impacts, which would also be temporary in duration are not considered to be significant due to the implementation of the mitigation measures identified. 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. It 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 and no unusual substance or underground tunnelling works required or predicted.

As set out above in Sections 14.2.1 and 14.2.2, the interaction between air quality/climate and transportation with population and human health is not expected to generate any significant impacts.

### 14.2.4 Interactions between Population/Human Health and Noise/Vibration

Interactions between population/human health and noise/vibration are discussed in Chapters 3 and 8. The potential impacts on human beings in relation to the generation of noise and vibration during the construction phases are that high levels of noise and vibration could cause nuisance to people in nearby sensitive locations. Best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid significant impacts at the nearest sensitive buildings. Implementation of the mitigation measures set out and adherence to good practice noise reducing

measures will ensure that the short-term, slight to significant, negative impacts on human health will be lessened.

Similarly, during the operational phase, plant selections designed to achieve the relevant noise criteria will result in a residual impact that is long-term, imperceptible and neutral to people in nearby noise sensitive locations. External noise sources have been assessed and mitigation to ensure internal noise levels achieve the relevant noise criteria have been provided.

### 14.2.5 Interactions between Population/Human Health and Waste Management

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific C&D WMP and OWMP (Appendices 11.1 and 11.2, respectively), will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be ***long-term***, ***imperceptible*** **and** ***neutral***.

### 14.2.7 Interactions between Population/Human Health and Biodiversity

The open space within the site will provide amenity areas, including play areas, planting and benches. There will be a loss of dry meadows and grassy verges habitat, scattered trees and parkland, and treelines and hedgerows within the proposed development, as these habitats will be directly impacted by construction activities. The areas that will be lost are relatively small in the context of the site and the wider environs, with 23 'Category U' trees (Those trees in such a condition that any existing value would be lost within 10 years), 40+ 'Category C' trees (trees of low quality and value), and seven 'Category B' trees (trees of moderate quality and value) being removed[28]. Although 575m of hedgerow habitat will be removed, this encompasses c. 23.3% of the total hedgerow habitat within the site. The hedgerows on the peripheries of the site are largely being retained, whilst along the central hedgerow there will be some removal, this vegetation will be augmented and bulked up with new shrub and hedge planting which will compensate for the loss in this area. Mitigation measures involve planting of native shrubs in the understory which will enhance the woodland structure and planting of 692 no. new trees/large shrubs across the site. These measures will provide habitat for wildlife to safely commute and nesting opportunity for birds.

Interaction with population and human health involves the provision of lighting to provide a safe outdoor realm for residents which, without mitigation, could impact on nocturnal species, such as bats. Any light spill affecting bat use of habitats outside of the proposed development boundary will be avoided, particularly along the boundaries of the site, and along the central boundary. Light levels during construction and operation in these areas will be maintained at baseline levels where possible. This will be achieved through sensitive siting and design of the lighting elements. This will include careful consideration of light placement on buildings, column heights and luminaire design. Luminaires have been selected which do not emit UV light.

With the implementation of the outlined mitigation measures, the interaction between population/human health and biodiversity will be long-term, not significant and neutral.

[28] *An Arboricultural Assessment on Lands at 'Boherboy', Saggart, Co. Dublin.* Arborists Associates Ltd.

### 14.2.8 Interactions between Population/Human Health and Water

Potential impacts on human health have been considered in the Water chapter (Chapter 6). The chapter sets out that the implementation of the measures outlined within the chapter will ensure that the potential impacts do not occur on water and hydrology and ultimately there is anticipated to be no impact on population and human health in this regard.

As set out in Chapter 6, surface water drainage has been carried out in accordance with Greater Dublin Strategic Drainage Study (GDSDS) and SuDS methodologies will be implemented, therefore no predicted impacts on water and hydrology will arise during the operational stage. Therefore, the interaction between population/human health and water-hydrology are considered to be long-term, imperceptible and neutral.

### 14.2.9 Interactions between Biodiversity and Landscape

The scheme has been developed to minimise the removal of existing hedgerows and trees on the Boherboy site. Open spaces have been selected to retain the trees and hedgerows. However, some parts of hedgerows and scrub vegetation will be removed in the construction – generally for access roads. This shall have a negative effect on landscape quality visual amenity and biodiversity.

Landscape mitigation proposals have been developed to be complementary with the ecological requirements. These include planting of native, naturalised and indigenous species to augment existing hedgerows. The hierarchy of street tree planting shall help in reconnecting ecological networks resulting in a positive effect on biodiversity and a positive long-term impact for the subject site at Boherboy.

It is also proposed as part of the development to plant c.692 no. new trees and large shrubs. Given that these specimens would all be in better condition than the majority of the 150 no. trees to be removed, there would be a similar quantity and a net improvement in the quality of shrub and tree cover on the site as a result of the proposed development, which will ensure the site's function to provide habitat for a range of species and providing a wildlife corridor at the site. Therefore, the interactions between biodiversity and landscape is considered to be long-term, slight and neutral.

### 14.2.10 Interactions between Land, Soils and Geology, Biodiversity and Air Quality

The Air Quality and Climate Chapter (Chapter 7) notes that construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. As set out in Chapter 5 (Land, Soils and Geology), dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed for example.

The works involve stripping of topsoil and excavations, which will remove some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity.

The impact of the interactions between land, soils and geology, biodiversity and air quality are considered to be short-term, imperceptible and neutral.

### 14.2.14 Interactions between Land, Soils and Geology, Transportation and Noise/Vibration

Delivery of materials to site (e.g. aggregates for road construction, concrete for foundations, delivery of construction plant to site) will lead to potential impact on the surrounding road network. There will be a level of construction related noise and vibration during the construction of the development on the lands. However, mitigation works outlined in Chapter 5 (Land, Soils and Geology) such as the provision of vehicle wheel wash facilities will be installed in the vicinity of site entrances and road sweeping will be implemented as necessary in order to maintain the road network in the vicinity of the site.

Mitigation measures proposed will ensure that the potential impacts of the proposed development on land, soils and the geological environment do not occur during the construction phase and that any residual impacts will be short term, imperceptible and neutral. On completion of the construction phase no further mitigation measures are proposed as there will be no further impact on soils and the geological environment.

In relation to the interaction between transportation and noise/vibration, with the implementation of mitigation measures the interaction between construction noise and vibration and transportation will be short-term, slight to significant and neutral. In the operation stage, the interaction will be permanent, imperceptible and neutral.

### 14.2.15 Interactions between Land, Soils and Geology and Water

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden surface water runoff. Chapter 10 (Land, Soils and Geology) sets out that the stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. 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.

Mitigation measures proposed such as the above will ensure that the potential impacts of the proposed development on soils and the geological environment do not occur during the construction phase and that any residual impacts will be short term, imperceptible and neutral.

### 14.2.16 Interactions between Land, Soils and Geology and Waste Management

During the construction phase, excavated soil, stone, clay and made ground (c. 101,000 $m^3$) will be generated from the excavations required to facilitate site levelling, construction of the basements and construction of new foundations. It is estimated that c. 60,000 $m^3$ of excavated material will need to be removed off-site. However, it is envisaged that c. 41,000 $m^3$ material will be reused on-site for landscaping and fill. These estimates will be refined prior to commencement of construction. Where material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 5 and the requirements of the C&D RWMP (Appendix

11.1), will ensure the effect is ***long-term***, ***imperceptible*** and ***neutral.***

Where material has to be taken off site it will be taken for reuse or recovery, where practical, with disposal as last resort. Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licenced facility.

The management of waste during the construction phase in accordance with the submitted Construction and Demolition Waste Management Plan will meet the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy. Adherence to the mitigation measures in Chapter 11 (Material Assets: Waste Management) such as on-site segregation of waste and contacting nearby sites to investigate reuse opportunities for clean and inert materials, and the requirements of the submitted Construction and Demolition Waste Management Plan will ensure the effect is long-term, imperceptible and neutral.

### 14.2.17 Interactions between Water and Transportation

Construction and operation stage traffic have the potential to impact 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 11 (Water), and the impact of the interaction is considered to be short-term, imperceptible and neutral.

### 14.2.19 Interactions between Transportation and Material Assets – Waste Management

Construction and operational stage traffic have the potential to be impacted by waste generation and resource management on site. Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 10 (Material Assets: Transportation).

Provided the mitigation measures detailed in Chapter 11 (Material Assets: Transportation) and the requirements of the submitted Operational Waste Management Plan are adhered to, the interaction should be short to long-term, imperceptible and neutral.

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the Site during the construction and operational phases of the proposed Development. The increase in vehicle movements as a result of waste generated during the construction phase will be *temporary* in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 10 (Material Assets - Transportation). Provided the mitigation measures detailed in Chapter 10 and the requirements of the OWMP (included as Appendix 11.2) are adhered to, the predicted effects are ***short to long-term, imperceptible*** and ***neutral.***

### 14.2.1 Summary of Interaction of Impacts

Schedule 6 Item 2 (b) of the Planning and Development Regulations, 2001 (as amended) requires that proposed developments are examined with regard to the inter-relationship of aspects referred to in Item 2 (b) of Schedule 6. The matrix incorporated in Table 14.1 over inter-relates the various Chapters of this EIAR to the various impact headings referred to in Schedule 6 Item 2 (b) of the Planning and Development Regulations, 2001 (as amended). The matrix also indicates where these statutory information requirements have been incorporated in this EIAR. It should be emphasised that this matrix does not represent a form of relative assessment of impacts, but merely identifies and amalgamates areas of principal interaction and significance.

**Table 14.1 – Interactions Matrix**

| Chapter No. | Chapter Headings in EIAR | Interaction of Impacts / Identification of Significant Effects | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Population & Human Health | Biodiversity | Land & Soils | Water | Air Quality & Climate | Noise & Vibration | Material Assets | Waste Management | Cultural Heritage | Landscape |
| 4 | Population & Human Health | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5 | Biodiversity | ✓ | | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| 6 | Land, Soils & Geology | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 7 | Water | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | |
| 8 | Air Quality & Climate | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | |
| 9 | Noise | ✓ | | | | | | ✓ | | | |
| 10 | Material Assets: Built Services | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| 11 | Material Assets: Transportation | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | |
| 12 | Material Assets: Resource & Waste Management | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| 13 | Archaeology & Cultural Heritage | ✓ | | | | | | | | | |
| 14 | The Landscape | ✓ | ✓ | | | | | | ✓ | | |

✓ Area of Principal Interaction

## 14.3 Other Impacts

### 14.3.1 Direct and Indirect Effects Resulting from the Use of Natural Resources

Schedule 6 Item 2 (c) of the Planning and Development Regulations, 2001 (as amended) requires that an EIAR contains a description of the likely significant effects (including direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative) of the proposed development on the environment resulting from the use of natural resources. No likely significant effects (including direct, indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative) of the proposed development on the environment are expected to arise from the use of natural resources.

### 14.3.2 Direct and Indirect Effects Resulting from Emission of Pollutants, Creation of Nuisances and Elimination of Waste

Schedule 6 Item 2 (c) of the Planning and Development Regulations, 2001 (as amended) requires that an EIAR contains a description of the likely significant effects (including direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative) of the proposed development on the environment resulting from the emission of pollutants, the creation of nuisances and the elimination of waste. No likely significant effects on the environment are expected to arise from the emission of pollutants, the creation of nuisances or the elimination of waste.

## 14.4 Residual Impacts and Cumulative Impacts

Residual impacts can be defined as the final impacts that occur after proposed mitigation measures have taken effect. Many of the findings of the EIA have been incorporated into the design of the development and have contributed to the reduction or amelioration of potential impacts. Where residual impacts arise, they are detailed in the relevant chapters and further mitigation measures detailed where necessary.

Cumulative impacts are defined as: *"The addition of many small impacts to create one larger, more significant, impact"* (EPA 2002). Cumulatively, these impacts may be significant if they occur close together in terms of location and time.

Any potential cumulative impacts have been considered in the preparation of this EIAR and are detailed where relevant in the various EIAR Chapters e.g. construction stage impacts, surface water drainage infrastructure, foul drainage, water supply, landscape and visual impact and traffic etc. We confirm that this EIAR has assessed environmental impacts from existing developments as part of the baseline assessments.

At the time of writing this Environmental Impact Assessment Report, we note the following relevant applications, which have been reviewed and considered by the authors of each EIAR Chapter and included in the cumulative assessment where deemed appropriate.

**Permitted Developments:**

| Location | Reg. Ref.s | Total Residential Units |
|---|---|---|
| Fortunestown Centre | SD16A/0210 | 111 |
| | SD16A/0078 | 128 |
| | SD18A/0014 | 78 |
| | SD18A/0015 | 52 |
| | ABP-306602-20 | 463 |
| | ABP-305556-19 | 290 |
| Fortunestown Centre/Cheeverstown | SD15A/0127 | 384 |
| Cheeverstown | SD168/0002 | 85 |
| Cheeverstown | SD20A/0219 | 98 |
| Citywest Road | SD17A/0458 & SD17A/0030 | 12 |
| Saggart Cooldown Commons | SD14A/0121 & SD15A/0095 | 224 |
| | SD16A/0297 | 12 |
| | ABP-300555-18 | 524 |
| | ABP-302398-18 | 459 |
| | ABP-305563-19 | 488 |
| | ABP-308088-20 | 224 |
| | ABP-310570-21* | 260 |
| **Total** | | **3,892** |

**Table 14.2 – Permitted developments to date under the 2012 Fortunestown LAP**

In relation to Ref. ABP-310570-21* above, permission was granted on 6th October 2021 for a development that sought to replace the 32 no. duplex units previously permitted under Ref. ABP-302398-19, and replacing the entirety of the permitted 129 no. dwellings under Ref. SD16A/0078 and replacing both with 421 no. new residential units, which equates to an overall net increase of 260 no. units for the two aforementioned combined sites, north of the Fortunestown Luas stop and the Citywest Shopping Centre (to the north-west of the subject site), located within the Saggart–Cooldown Commons and Fortunestown Neighbourhoods of the LAP. Taking the quantum of permitted development into consideration (i.e. 3,892 no. dwellings), and should permission be granted for the current proposal of 655 no. dwellings, the LAP lands would be catering for 4,547 no. dwellings.

**Pending / Proposed:**

**Ref. ABP-312501-22** - Demolition of an existing dwelling, construction of 274 no. residential units (51 no. houses, 223 no. apartments), creche and associated site works, at Mill Road, Saggart, Co. Dublin

Therefore, it is clear that the potential for any cumulative impacts to occur have been comprehensively considered in the preparation of this EIAR, as detailed where relevant throughout the various chapters.

To determine traffic impacts in Chapter 11, the traffic generated by the proposed development is combined with the baseline traffic generated by the traffic on the road network in the area. The potential traffic impacts from other developments were also considered in the assessment (e.g. residential developments - adjacent to the site to the south and east).

Each of the relevant specialists has considered the potential for cumulative impact in preparing their assessments. 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.

## 14.5 Environmental Commitments and Mitigation Measures

Mitigation measures to be adopted during the construction and operational phases of the proposed development are detailed within each chapter.

Mitigation measures will be managed by the contractor(s) as part of the Construction Management Plan and by the developer/ landowners thereafter.

## 14.6 Conclusion

This EIAR has regard to and builds on the Strategic Environmental Assessment prepared with the South Dublin County Development Plan 2016-2022 and the Fortunestown Local Area Plan, 2012. The EIAR has considered the likely, significant, adverse effects of the proposed project on the receiving environment.

Mitigation measures are included, to avoid and / or reduce impacts on the environment where considered necessary. This includes mitigation measures incorporated into the design of the proposed development.

It is considered that there are no material or significant environmental issues arising which were not anticipated by either the South Dublin County Development Plan 2016-2022 and the Fortunestown Local Area Plan, 2012, and considered in their Strategic Environmental Assessments.

In summary, it is concluded that the proposed development will not result in any significant synergistic interactions or cumulative adverse impacts on the environment. The assessment of cumulative impact assessment considers the impacts associated with the proposed development in combination with those of other plans and projects within the study area of the proposed development.

The most notable interaction occurs between Human Health and Population, and Noise and Vibration, which arises from construction noise experienced by residents when construction activities occur within close proximity of shared site boundaries. This predicted negative impact occurs in the worst case scenario, when

the assessed construction machinery is operating simultaneously. The implementation of mitigation measures will ensure that this interaction is not significant.

Accordingly, and as the comprehensive assessments undertaken as part of this EIAR has revealed, with proposed mitigation measures in place the proposed development will not result in any significant singular adverse effects on the environment. It is therefore considered that the environmental impact of the proposed development is acceptable.

# 15.0 Summary of EIA Mitigation and Monitoring Measures

## 15.1 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 Armstrong Fenton Associates and sets out 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 Tracy Armstrong, BA, MRUP, MIPI, MRTPI, Planning Consultant of Armstrong Fenton Associates, who is a Corporate member of the Irish Planning Institute and has 17 no. years post-qualification experience. Tracy has experience in preparing and coordinating EIARs for a variety of projects and has also been involved in the coordination of a wide range of developments including residential and commercial developments.

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. 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.

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.

## 15.2 Mitigation Strategies

### 15.2.1 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).

### 15.2.2 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 3.

### 15.2.3 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.

### 15.2.4 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.

### 15.2.5 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).

### 15.2.6 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.

## 15.3 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.

### 15.3.1 Project Description and Alternatives Examined

**Construction Phase**

It is envisaged that the development of the lands, the subject of the proposed development, will occur over a five year period. Given the nature of the project and the need for flexibility to respond to market demand, the development phases are indicative. An Outline/Preliminary Construction Management Plan has been prepared and reviewed by the relevant EIAR consultants and is included in the SHD application. A Construction and Environmental Management Plan will be prepared prior to construction commencing on site that will address noise and vibration, traffic management, working hours, pollution control, dust control, road cleaning, compound/public health facilities and staff parking associated with the construction works, and will be submitted as compliance with the conditions, attached to an order to grant permission, to the Planning Authority.

**Operational Phase**

Not applicable.

**Monitoring**

Not applicable.

### 15.3.2 Population and Human Health

**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 EIA.

During the Construction Phase a number of mitigating measures will be considered, including *inter alia:*

- Maintain a OMC (CEMP) in effect for duration of works;
- Restrict working hours from 07:00 to 19:00; Monday to Friday and from 09:00 to 13:00 on Saturdays. No general works are envisaged to be carried out on Sundays. Should there be a need to work Sundays/Bank Holidays, a written request will be made to DCC for permission to do so. Any conditions from DCC relating to out of hours working will be followed including any required notifications to relevant parties;
- Maintain a Traffic Management Plan (TMP) in effect for duration of works;
- The CEMP will be agreed with the Planning Authority upon receipt of planning permission. The construction of the proposed development shall adhere to the relevant provisions of this Plan; and;
- As part of the CEMP, maintain a Dust and Noise abatement plan in operation.

**Operational Phase**

Where relevant, mitigation measures to address the potential impacts of noise, air traffic etc. on people are included in the appropriate "Noise" chapter of this EIAR. No likely significant impacts have been identified for population, or land use, accordingly no mitigation measures are required for the Operational Phase.

The proposed development has been designed to avoid significant impacts in relation to local amenities and recreational facilities by:

- Incorporating the provision of a new childcare facility within the design proposal;
- Reserving a site to accommodate a potential new primary school, dependent on confirmation from the Department of Education and Skills for the need for same;
- The provision of c.30,450sq.m of public open space representing c. 17% of the site area;
- Providing new pedestrian and cyclist links to local amenities and facilities.

**Monitoring**

In relation to the impact of the development on population and human health, the monitoring measures outlined in regards to the other environmental topics such as water, air quality and climate and noise etc. sufficiently address monitoring requirements. In respect of these impacts, the contractor will monitor development during the construction phase to ensure compliance with the parameters of the Construction Management Plan. Remedial action will be taken, if required, to ensure construction activities conform to its requirements.

### 15.3.3 Biodiversity

**Mitigation Measures for Habitats during Construction Stage**

Retention and Protection of Vegetation during Construction

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

- All trees along the proposed development boundary that are to be retained, both within and adjacent to the proposed development boundary (where the root protection area of the tree extends into the proposed development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist;
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it;
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines;
- A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the proposed development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist;
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged.

Protection of Vegetation from Dust during Construction

To control dust emissions during construction works standard mitigation measures shall include: spraying of exposed earthwork activities and site haul roads during dry and/or windy conditions; provision of wheel washes at exit points; control of vehicle speeds and speed restrictions (20 km/h on any un-surfaced site road); covering of haulage vehicles; and, sweeping of hard surface roads. These procedures will be strictly monitored and assessed on a daily basis.

Dust screens will be implemented at locations where there is the potential for air quality impacts on sensitive ecological receptors (i.e. within 100m of the works) during the construction phase.

Protection of water quality

Mitigation measures to protect surface water in the receiving environment during construction will include the following:

- Entry to the stream channel by vehicles and/or personnel will not be permitted under normal circumstances. Works will be carried out from the bank side. In-stream works are proposed however,

they will be restricted to the period 1st July through 30th September, inclusive to minimise the risks to any salmonids downstream;

- There will be no direct discharges to surface waters;
- Prior to any machinery working on site for any purpose, the working area will be marked out with wooden stakes and where deemed necessary, hazard tape will be erected to identify the working limits;
- Working limits to be checked at the end of every day by the Site Manager;
- Provision of measures to prevent the release of sediment during the construction work will be installed prior to any site clearance. In respect to works adjacent to the drainage ditches with flowing water, these measures may include but not be limited to the use of silt fences, sedimentation mats etc.;
- Provision of exclusion zones and barriers (sediment fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the receiving water environment;
- Temporary construction surface drainage and sediment control measures will be in place before earthworks commence;
- If pouring of cementitious materials is required for the works adjacent to a pond, surface water drainage features, or drainage features connected to same, this will be carried out in the dry;
- Discharge water generated during placement of concrete will be removed off site for treatment and disposal;
- Where stockpiling is required, temporary stockpiles will be located >50 metres from any water features. Three sides will be surrounded with silt fences with access from the fourth (uphill) side. Sides will be smoothened and collection of run-off considered i.e. discharging to a settlement pond etc.;
- The contractor will avoid work involving moving of soil during heavy rainfall to minimise potential for entrainment of silt. Where forecasts indicate heavy rainfall events, works should be rescheduled accordingly;
- Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to surface water. Concrete washout areas will be located remote from any surface water drainage features to avoid accidental discharge to watercourses;
- No storage of hydrocarbons or any polluting chemicals will occur within 50m of the surface water network. Fuel storage tanks will be bunded to a capacity at least 110% of the volume of the storage tank (plus an allowance of 30mm for rainwater ingress). Re-fuelling of plant will not occur within 50m of the surface water network and only in bunded refuelling areas;
- Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures;
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste;
- If any heavily contaminated land is encountered during construction, it will be removed off-site and be disposed of at a licenced waste facility;
- Contaminated groundwater, if encountered on site, could result in contaminated waters being discharged from the construction site. Any such contaminated waters will be treated using best practice, appropriate measures/controls dependent on the nature of the contamination prior to discharge to the surface water network;
- There will be no direct pumping of contaminated water from the works to the surface water drainage/stream network at any time;

- Foul drainage from site offices and compounds, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations, to prevent the pollution of watercourses;
- An Emergency Response Plan detailing the procedures to be undertaken in the event of flooding, a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident will be prepared;
- Ensure site staff are trained in the implementation of the Emergency Response Plan and the use of any spill control equipment as necessary;
- The contractor will employ an environmental specialist who will monitor water quality upstream and downstream of the area of works. Data on pH, conductivity, and suspended solids will be collected as follows:
    - Twice weekly visits during general site works
    - Daily site visits during key construction activities (to be agreed between the environmental specialist and Dun Laoghaire-Rathdown County Council), e.g. during installation of the proposed outfall, during and immediately after clearance of on-site vegetation.
    - Event inspection e.g. following heavy rainfall events or during concreting works
- Monitoring will be undertaken for a period of at least two months prior to works commencing and one-month post construction. Trigger concentrations should be agreed at commencement and based on the baseline established in the two months prior to works commencing. Note: Additional measures will be implemented in the event that threshold concentrations are surpassed;
- All monitoring data should be collated to show trends for indicator parameters pH, conductivity, suspended solids and hydrocarbons, and will be shared at regular intervals with South Dublin County Council.

Mitigation measures to protect surface water in the receiving local environment in the Corbally Stream during operation are detailed in Chapter 6: Water, and in the Outline Construction and Environmental Management Plan (oCEMP), and include:

- Continued management, monitoring and maintenance of the waste water treatment systems in accordance with the EPA licence requirements;
- Filter drains to the rear of housing;
- Permeable paving to all private parking areas;
- Rainwater butts (200l) to the rear downpipes of the houses;
- Filter swales adjacent to roadways where feasible;
- Grassed/landscaped detention basin;
- Silt-trap/catchpit manholes;
- Hydrobrake limiting flow to Qbar Greenfield rates; and
- Petrol interceptor upstream of all outfall points.

These mitigation measures are for the protection of the water quality within the Corbally Stream watercourse only, and not for the protection of European Sites downstream as there are no significant effects likely to arise on European sites as a result of water quality impacts associated with the proposed development, as discussed above in Section 6.1.

**Mitigation Measures for Badgers during Construction Stage**

The mitigation measures described below follow the recommendations set out in the Guidelines for the Treatment of badgers during the Construction of National Road Schemes (National Roads Authority, 2006). These guidelines set out the best practice approach in considering and mitigating impacts on badgers during construction works.

As badger could potentially establish new setts in the future within the ZoI of the proposed development, a pre-construction check of all suitable habitat within the proposed development boundary will be required within 12 months of any constructions works commencing. Any new badger setts present will be afforded protection in line with the requirements set out in the TII/NRA guidance document as follows:

- Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage;
- No heavy machinery shall be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance shall not take place within 10m of sett entrances;
- During the breeding season (December to June inclusive), none of the above works shall be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts;
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of a badger ecologist;
- During construction, the use of egress ramps in any pits or holes that have been dug on site is required. This will allow for any mammal species that have fallen in, to allow to escape and be unharmed by construction activities.

As the proposed development will not result in the permanent loss of any badger setts, there is no requirement to construct any artificial setts as part of the mitigation strategy.

**Mitigation Measures for Otter During Construction Stage**

The mitigation measures as described above in Section 4.9.1.1 to protect water quality within the local receiving environment, will also mitigate for habitat degradation impacts on otter species.

Where feasible, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required.

**Mitigation for Amphibians during Construction Stage**

<u>Disturbance and Mortality Risk</u>

If works to clear any of the habitat features suitable to support amphibian species are to begin during the season where frogspawn or tadpoles may be present (February – mid-summer), or where breeding adult newts, their eggs or larvae may be present (mid-March – September), a pre-construction survey will be undertaken to determine whether breeding amphibians are present.

In the case of common frog, any frog spawn, tadpoles, juvenile or adult frogs present will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat beyond the ZoI of the proposed development.

In the case of smooth newt, individuals will be captured and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of available suitable habitat, beyond the ZoI of the proposed development. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating smooth nest.

If the size or depth of the habitat feature is such that it cannot be determined whether all amphibians have been captured, it will be drained under the supervision of a suitably experienced ecologist to confirm that no amphibian species remain before it is destroyed or infilled. Any mechanical pumps used to drain the habitat feature will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism.

Any capture and translocation works shall be undertaken immediately in advance of site clearance/construction works commencing.

Protection of Water Quality

The mitigation measures as described above in Section 4.9.1.1 to protect water quality within the local receiving environment, will also mitigate for habitat degradation impacts on amphibians.

**Mitigation Measures for White-clawed crayfish during construction stage**

The mitigation measures as described above in Section 4.9.1.1 to protect water quality within the local receiving environment, will also mitigate for habitat degradation impacts on white-clawed crayfish.

**Mitigation Measures for bats during Construction Stage**

Measures to Protect Bats during the Removal of Roosts

The following mitigation measures are proposed in relation to structures and trees considered to have the potential to support roosting bats:

- Prior to demolition, for structures which have not been confirmed as bat roosts but regarded to have potential for bats, a bat detector assessment of the property to be demolished will be carried out. If demolitions are proposed during the period May – August, this will be an all-night examination to determine if bats enter the building during the night or early morning. This will provide adequate information to proceed with demolition, unless weather conditions were unsuitable for feeding bats, and prevented a pre-demolition survey from taking place. If bats are present, then they will require exclusion from the property over several nights or if possible physical removal by hand by a licenced bat specialist to be placed in a bat box or similar for release in the evening after capture. If any roosts are identified within the buildings due for removal, a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes.

- Once structures containing roosts are deemed to be clear of bats, the bat specialist will be on site to supervise the demolition procedure until the structure is no longer deemed able to support a bat roost. Bats may re-enter a partially demolished structure overnight so the bat specialist may be required to be present during demolition works until they are completed.
- Where possible, buildings or trees confirmed as bat roosts will not be demolished during the breeding period or hibernation period (April to mid-August and November-March) as the risk of accidental death or injury is higher at this time. Bats may use roosts in smaller numbers in winter but may nevertheless be present. Outside of these periods, the approach to demolition of bat roosts will be determined on a case-by-case basis and subject to relevant licence conditions.
- Buildings confirmed as bat roosts proposed for demolition will be marked on the ground with agreed paint marking to permit identification by Contractors.

Measures to Protect Bats during Vegetation Clearance

The following mitigation measures are proposed in relation to those trees identified as having potential to support roosting bats (Figure 4.5). Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore there is an inherent risk that bats could be affected by the proposed felling works. The following mitigation procedures will be followed:

- Felling of confirmed and potential tree roosts will be undertaken during the periods April – May or September – October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation;
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present;
- Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist;
- Trees should only be felled “in section” where the sections can be rigged to avoid sudden movements or jarring of the sections;
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture;
- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes. The specifications, type, location and number of bat boxes (at least one box per roost lost) will be advised by the site ecologist, which will be determined by the species of bat that is identified roosting within the tree deemed for removal.

Measures to Control and Reduce Light Spill During Construction

Lighting of the site during construction is designed in accordance with the following guidance:

- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2020)
- Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010)
- Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2008).

During construction, any external lighting to be installed, including facilitating night-time working or security lighting, on the site shall be sensitive to the presence of bats in the area, downlighting, and time limited. Lighting of sensitive wildlife areas and primary ecological corridors (e.g. along the central hedgerow/drainage ditch, boundaries of the site) and light pollution in general will be avoided. Light levels during construction in these areas will be maintained at baseline levels where possible.

Monitoring of light levels along the treelines and hedgerows will be undertaken pre-construction, during construction and post-construction to identify any areas where light spill is affecting background levels during construction. Where monitoring detects light spill is affecting these habitat areas, remedial measures, such as censored lighting or low column height lights, and will be implemented to ensure that background light levels are maintained.

**Operational Stage**

**Mitigation Measures for Bats during Operation Stage**

Any light spill affecting bat use of habitats outside of the proposed development boundary will be avoided, particularly along the boundaries of the site, and along the central boundary. Light levels during construction and operation in these areas will be maintained at baseline levels where possible.

This will be achieved through sensitive siting and design of the lighting elements. This will include careful consideration of light placement on buildings, column heights and luminaire design. Luminaires have been selected which do not emit UV light (e.g. metal halide and fluorescent light sources should be avoided), and luminaries are designed using full cut off to ensure there is no direct upward light. The threshold increment is included in the lighting calculations to that luminaries are not a glare source, with the lighting designed to dim by 25% from 00:00 to 06:00.

Monitoring of light levels along the treelines and hedgerows will be undertaken pre-construction, during-construction and post-construction to identify any areas where light spill is affecting background levels during construction or operation. Where monitoring detects light spill is affecting these habitat areas, remedial measures will be implemented to ensure that background light levels are maintained.

Reporting on the monitoring will be forwarded to the local authority for their review and any remediation required agreed between them and the applicant.

**Monitoring**

Monitoring will be undertaken for a period of at least two months prior to works commencing and one-month post construction. Trigger concentrations should be agreed at commencement and based on the baseline established in the two months prior to works commencing. Note: Additional measures will be implemented in the event that threshold concentrations are surpassed.

All monitoring data should be collated to show trends for indicator parameters pH, conductivity, suspended solids and hydrocarbons, and will be shared at regular intervals with South Dublin County Council.

Mitigation measures to protect surface water in the receiving local environment in the Corbally Stream during operation are detailed in Chapter 6: Water and include:

- Continued management, monitoring and maintenance of the waste water treatment systems in accordance with the EPA licence requirements.

### 15.3.4 Land, Soil and Geology

**Construction Phase**

As part of the SHD process, an Outline Construction Management Plan (OCMP) is submitted as part of the subject application, and sets out a range of mitigating measures. In addition, the following mitigation measures are also proposed:

- All fuel stored is to be bunded within a secure hardstanding area with strict management control and access to same. Bunding is to be 100% + 10% of the volume stored.
- The removal of the topsoil layer is to be carried out in a carefully managed process and in coordination with the construction phasing management of the development.
- Topsoil stockpiles are to be located in such a manner as to minimise the risk of washing away into local drainage or watercourses.
- Topsoil is to be reused in gardens and landscape areas as well as the attenuation detention basin areas.
- The design of the road and block levels on the site has been carried out in such a way as to best balance the cut/fill aspects and to follow the natural site topography where possible.
- The contractor is to have a full time site foreman responsible for the site management and is to be made fully aware of the relevance of the works in relation to the Corbally Stream. A site noticeboard is to be positioned in a suitably located prominent location on the site with the contact details of the person responsible for ensuring the pollution prevention methodology.
- The construction management of this project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and ground contamination.
- Exposed subsoil in excavations is to be backfilled as soon as possible to minimise effects of weathering.
- Surface water flows from the site will be directed to temporary siltation beds and screening before discharge to the receiving watercourse during the construction phase.
- Wherever possible, excavated material will be re-used on the project in the construction of attenuation, bunding and landscape features.
- The design of the layout has minimised the impact on the hedgerows and therefore there is little mitigation works to be implemented regarding hedgerows. The remaining central spine hedgerow is to be kept free of site storage or access and is to be appropriately cordoned off to discourage access during the construction phase. The site foreman/management will manage the protection of the remaining hedgerows and trees on the site.
- Wheel wash facilities are to be provided and implemented by the site management to minimise the uncontrolled removal of sub-soil on wheels and deposited on the local road network.
- Earthworks machinery and deliveries are to be managed in a controlled fashion and cordoned onto specific haul roads.

## Operational Phase

It is not anticipated that there will be any long-term impacts on the soil during the operational phase of the development.

Any residual risk will emanate from contamination of surface water infiltrating to the subsoil via the SuDS features incorporated within the scheme.

Regular maintenance of the SuDS features is required to maintain the quality of the run off and prevention of blockages.

The surface water collected from the project has been designed in accordance with the CIRIA SuDS Manual and the Greater Dublin Strategic Drainage Study and the appropriate treatment train process has been applied in the design.

Maintenance of all SuDS features by the development management team is required until such a stage that the Local Authority take in charge the project.

Household waste generated in the operation of the development when completed is to be securely stored within designated collection areas by licenced waste management contractors. All communal designated waste storage areas are to have gullies connected to the foul drainage network to facilitate wash down as required.

## Monitoring

Implementation of the Construction Management Plan is necessary to protect the land, soils and geology throughout the developments construction stage. Maintenance of the mitigation measures and monitoring of the management processes is required to ensure best practice.

The following specific monitoring measures are to be implemented:

- Monitoring of the management and storage of dangerous chemicals and fuel is imperative.
- Monitoring of the quality and quantity of soil being removed from site is necessary to ensure that the most there is efficient reusing of suitable excavated soils on the site.
- Adhering to the “Construction and Demolition Waste Management Plan”.
- Implementation of Inspection Management Plan to ensure the suitable level of excavation is reached in the formation of foundations of structures and sub-base level of roads.
- Monitoring and maintenance of the wheel wash facilities.
- Monitoring of the stored stock piles of top-soil and sub soil on site.
- Regular maintenance and monitoring of the sediment control measures upstream of the surface water outfall.
- Monitoring of the necessary protection measures to the existing hedgerows and mature trees on the site.

Upon completion of the construction phase, only the monitoring of the maintenance of the SuDS features on the development will be required during the operational phase of the development.

Reinstatement of any disturbance to the open space areas will be required.

### 15.3.5 Water

**Construction Phase**

An Outline Construction & Environmental Management Plan has been prepared to include the following construction stage mitigation measures. These will be implemented in full.

The implementation of the following measures will minimise the impact on the Hydrology and Water Services in the area of the proposed development during the construction phase:

- Surface water runoff from topsoil stripped areas is to be directed towards on-site settlement ponds. Upstream of the piped surface water outfalls, temporary settlement ponds/filter trench are to be constructed consisting of a geotextile lined stone filled trench with a further inclusion of baled straw filter at the inlet – all to catch any site washed silt during the construction process and before the development is completed. This filter trench is to be inspected and maintained regularly by the contractor throughout the construction stage. Such measures are to be taken to capture, remove and treat sediment prior to discharge of the filtered runoff to the receiving watercourses.

- To minimise the adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the stripping back of the topsoil. For example, by avoiding excavation and movement of topsoil ahead of any known upcoming heavy rainfall event.

- The removal of the topsoil layer will be carried out in a carefully managed process and in coordination with the construction phasing management of the development.

- A flood storage compensatory area is to be constructed along the northern boundary of the site to provide an area for the Corbally Stream to overspill into during the 1%AEP rainfall event. This area is specified in detail the SSFRA and summarised in Section 7.4.2 of this chapter. In providing the flood storage compensatory area there will be a **2.48m** freeboard provided to the lowest finished floor level on the site which is significantly greater than the Guidelines recommended 0.5m. Fig.7.7 indicates the proposed flood storage compensatory area and illustrates the top water level of the 1%AEP event to be **118.02mOD.**
- The existing ground level along the western edge of the Corbally Stream in the north-eastern portion of the site will be raised to provide a minimum freeboard of 750mm above the calculated 1%AEP event. This will eliminate the risk of overland flow and keep the flow within the channel through this area. Fig.7.8 indicates the extent of the localised raising of the stream embankment.

- The SSFRA has calculated the top water level at all crossings of the Corbally Stream for the 1%AEP event and determined that the soffit levels of the proposed crossings are a more that 500mm above the 1%AEP top water level and therefore comfortably comply with the recommendations given in the Guidelines.

- Sand, gravel or other loose materials brought to the site shall be stored in locations a minimum of 10m from the Corbally Stream and are not to be positioned where rainfall run-off could wash silt towards the watercourse. Any cement is to be stored in bags under cover from the elements at a location remote from the watercourse.

- The site layout shall be such that it includes a dedicated set down area for deliveries to the site and temporary storage of construction materials. The area is to be clearly demarcated and managed to avoid

haphazard placement of materials throughout the site.

- The set down location shall be managed to ensure it is well ordered and tidy in line with good site management practice.

Use construction best practices and the implementation of the Construction Management Plan is to take place to avoid the risk of contamination of the receiving watercourses or ground water. Pre-construction meetings to be held with all sub-contractors to explain works method statements and site management practices. Periodic, documented inspections of the site and subcontractor activities are to be carried out to improve overall site safety, efficiency and mitigate the risk of pollution of the stream or groundwater. Subcontractor method statements will be formally reviewed to ensure that comply with the requirements of the Construction Regulations 2006 and the Construction Management Plan. The site supervisor will conduct documented site inspections, using a Site Inspection Checklist on a weekly basis, or greater to ensure compliance. Potential spillages from storage tanks must not be allowed to seep into the ground and Spill kits are to be made available.

- An Outline Construction Management Plan (OCMP) has been prepared and will be implemented during the construction phase.

- This will include Site personnel inductions to ensure all site personnel are made aware of the procedures and best practice with regards to the management of surface water runoff and ground water protection.

- Concrete batching will take place off site and wash out of concrete trucks will take place off site (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).

- Wheel wash down facilities will be provided in specifically designated areas and managed in accordance with the OCMP. Discharge from these areas will be directed into settlement/treatment areas and this will prevent uncontrolled runoff site.

- All fuel stored will be bunded within a secure hardstanding area with strict management control and access to same. Bunding is to be 100% + 10% of the volume stored.
- Fuel spill clean-up kits will be kept in the designated re-fuelling areas.

- Topsoil stockpiles will be located in such a manner as to minimise the risk of washing away into local drainage or watercourses.

- The contractor will have a full time Site Manager responsible for the site management. The Manager will be fully aware of the relevance of the works in relation to the watercourse and will ensure all staff on site are made aware. A site noticeboard will be positioned in a suitably located prominent location on the site with the contact details of the person responsible for ensuring the pollution prevention methodology.

- The construction management of this project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and ground contamination.

- Dewatering of trenches should be used where deemed necessary and cannot be avoided and all run off from dewatering areas is to be directed to the designated settlement/treatment areas.

## Operational Phase

The implementation of the following measures will minimise the impact on the Hydrology and Water Services in the area of the proposed development during the operational phase of thedevelopment;

- The surface water collected from the project has been designed in accordance with the CIRIA SuDS Manual and the Greater Dublin Strategic Drainage Study and the appropriate treatment train process has been applied in the design.

- Regular maintenance of all SuDS features by the development management team will be carried out until such a stage that the Local Authority take in charge the project.

- The road/house/apartment floor levels have been designed to provide a greater than minimum 500mm freeboard above the highest estimated flood levels. The top of water level for the Q100+10% event has been estimated in the SSFRA to be **118.02mOD** and the lowest floor slab level on the site is 120.50mOD which is **2.48m** above the highest flood event for that 1%AEP event.

- In accordance with best practice, appropriate SuDS features included in this development include filter drains, roadside filter swales, permeable paving in parking bays, green roofs, tree pits, bio-retention area, buildings, silt-trap/catchpit manholes, permeable geocellular attenuation storage, vortex flow control limiting devices and petrol interceptors.

- The surface water drainage infrastructure has been designed to allow for a 10% increase in rainfall due to climate change in accordance with the GDSDS.

- The surface water runoff from the site will be limited to the greenfield runoff rate (59.7l/s) and the attenuated flows are to be stored in below ground geocellular systems in accordance with the GDSDS. Further detailed information relating to the site development drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled “Drainage and Water Infrastructure Engineering Report”.

- All communal designated waste storage areas will have gullies connected to the foul drainage network to facilitate wash down as required.

- Operational waste will be removed from the completed development using only licenced contractors to appropriately licensed facilities.

- The wastewater drainage infrastructure has been designed in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2020 and has been approved by Irish Water (refer to IW Statement of Design Acceptance letter Ref.CDS20004359 in Appendix 6A of Volume III of this EIAR).

- The pumping station at the north of the site has been designed in accordance with the IW COP and includes real time remote monitoring, alarms and telemetry connected to the SDCC pumping station control centre using a “SCADA” system. The pumping station has also been designed to incorporate a duty and stand-by duty pump in case if failure of any single pump. Furthermore, the pumping station can accommodate 24hrs overflow storage below ground in the chamber designed. Refer to Dwg.No.1324B/321 for further detail. Watermain supply to the site is to be monitored by Irish Water using the required and designed flow meters as have been approved under the IW SDC design review. Refer to Dwg.’s 1324B/310-312 for location of same.

- Watermain supply to the site is to be monitored by Irish Water using the required and designed bulk flow meters as have been approved under the IW CDS design review. Refer to Dwg.'s 1324B/310-312 for location of same.

**Monitoring**

Implementation of the OCMP will be carried out to protect the hydrology and water services throughout the development's construction stage. Maintenance of the mitigation measures and monitoring of the management processes is required to ensure best practice.

The following specific monitoring measures are to be implemented:

- Monitoring of the management and storage of dangerous chemicals and fuel is imperative;
- Monitoring and maintenance of the wheel wash facilities;
- Regular maintenance and monitoring of the sediment control measures upstream of the surface water outfall;
- Monitoring of SuDS features, road gullies, attenuation storage and flow control device is imperative both during the construction and operational phases of the development.

The following reinstatement measures are to be implemented:

- Landscaping disturbance of the existing Carrigmore Park due to the laying of the wastewater pipe outfall Park will be remediated in accordance with the requirements of the SDCC Public Realm (Parks) Department.

- The watermain connection into the existing 400mm diameter main in Boherboy Road will require the road crossing to be reinstated and will be done in accordance with the requirements of the SDCC Roads Department.

All surface water outfalls to the existing Corbally Stream have been designed and agreed in principle with SDCC Water Services Department and are detailed on the submitted engineering drawing no.1324B/18. Localised reinstatement of the landscaping will be in accordance with the Ronan Mac Diarmada Landscape Architects details as agreed with the Public Realm (Parks) Department of SDCC.

### 15.3.6 Air Quality and Climate

**Construction Phase**

A detailed dust minimisation plan associated with a high level of dust control is outlined in Appendix 7.3. This plan draws on best practice mitigation measures from Ireland, the UK and the USA in order to ensure the highest level of mitigation possible.

In summary the measures which will be implemented include:

- 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.

- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads and footpaths outside the site will be regularly inspected for cleanliness and cleaned as necessary. If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used.
- 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.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Hoarding or screens shall be erected around works areas to reduce visual impact. This will also have an added benefit of preventing larger particles of dust from travelling off-site and impacting receptors.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

**Operational Phase**

No mitigation is proposed for the operation phase of the proposed development as it is predicted to have an imperceptible impact on air quality and climate.

**Monitoring**

**Construction Phase**

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/($m^2$*day) during the monitoring period between 28 - 32 days.

**Operational Phase**

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

### 15.3.7 Noise

#### Construction Phase

Mitigation measures for the construction phase are set out below in order to reduce potential impacts as far as practicable to within the adopted design goals for noise and vibration.

#### Noise and Vibration

Best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid significant impacts at the nearest sensitive NSLs. The best practice measures set out in BS *5228 (2009 +A1 2014)* Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening,
- liaison with the public, and;
- project programme.

Further comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring, where required.

#### Selection of Quiet Plant

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

#### Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

The following best practice migration measures will be considered:

- Site compounds will be located away from noise sensitive boundaries within the site constraints. The lifting of bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as cranes, dump trucks, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation. Mobile plant should be switched off when not in use and not left idling.

- For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system.
- For percussive tools such as pneumatic breakers, noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are sealed. Localised screens will be erected around breaker or drill bits when in operation in close proximity to noise sensitive boundaries.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Compressors, generators and pumps should be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- 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.

**Screening**

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Standard construction site hoarding (2.4m in height) with a mass per unit of surface area greater than 7 kg/m$^2$ can provide adequate sound insulation. This is recommended, as a minimum, around the site perimeter.

**Liaison with the Public**

A designated noise liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

**Project Programme**

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. If ground breaking works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to ensure noise limits are not exceeded due to cumulative activities. This will be reviewed in relation to other potential cumulative works occurring on adjacent construction sites in close proximity to noise sensitive properties, which have the potential to lead to significant construction noise impacts. To date no other construction sites nearby have been identified.

**Operational Phase Noise Mitigation**

**Additional Traffic on Adjacent Roads**

During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary.

**Building Services Plant**

The noise impact assessment outlined previously has demonstrated that once the mechanical plant is selected to have cumulative noise emissions lower than 45 dB $L_{Aeq,15min}$ during daytime periods and 40 dB $L_{Aeq,15min}$ at night at the facades of the nearest NSLs, specific mitigation measures are not required in order to avoid a significant noise impact at the nearest noise sensitive locations.

Notwithstanding this, the following practices are recommended for all plant items in order to minimise potential noise disturbance for neighbours:

- All mechanical plant items shall be regularly maintained to ensure that excessive noise generated by any worn or rattling components is minimised;
- Any new or replacement mechanical plant items, including plant located inside new or existing buildings, shall be designed so that all noise emissions from site do not exceed the noise limits outlined in this document; and,
- Installed plant will have no tonal or impulsive characteristics when in operation.

### Internal Roads

During the operational phase of the development, noise mitigation measures with respect to the internal roads on site are not deemed necessary.

### Creche playground noise breakout

During the operational phase of the development, noise mitigation measures with respect to the creche playground on site are not deemed necessary.

### Operational Phase Vibration Mitigation

Operational vibration impacts are expected to be within acceptable levels, therefore no mitigation measures are required.

### Monitoring

### Construction Phase

During the construction phase noise monitoring will be undertaken at the nearest sensitive locations to ensure construction noise limits outlined in Table 8.2 are not exceeded. Noise monitoring will be conducted in accordance with the International Standard ISO 1996: *Acoustics – Description, measurement and assessment of environmental noise Part 1 (2016) and Part 2 (2017).* The selection of monitoring locations will be based on the nearest sensitive buildings to the working areas.

It is recommended that noise control audits are conducted at regular intervals throughout the construction programme in conjunction with noise monitoring. The purpose of the audits will be to ensure that all appropriate steps are being taken to control construction noise emissions and to identify opportunities for improvement, where required.

### Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to noise and vibration are predicted to be imperceptible.

### 15.3.8 Material Assets: Built Services

**Construction Phase**

An Outline Construction Management Plan is submitted with this application, which includes the following construction stage mitigation measures. These mitigation measures are tried and tested and proven to be effective and will be implemented in full.

Prior to and during the construction, the contractor will liaise with the each of the relevant utilities provider. The contractor will apply for the relevant permit/licence to and comply with each utility providers requirements.

Unless this has been agreed in advance with the relevant service provider, the Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services.

All works near any existing utilities will be carried out in ongoing consultation with the relevant utility company or Local Authority and will be in compliance with any requirements or guidelines they may have.
The implementation of the following measures will minimise the impact on the Material Assets/Built Services in the area of the proposed development during the construction phase:

**Surface Water Infrastructure**

- Surface water runoff from topsoil stripped areas is to be directed towards on-site settlement ponds. Upstream of the piped surface water outfalls, temporary settlement ponds/filter trench are to be constructed consisting of a geotextile lined stone filled trench with a further inclusion of baled straw filter at the inlet – all to catch any site washed silt during the construction process and before the development is completed. This filter trench is to be inspected and maintained regularly by the contractor throughout the construction stage. Such measures are to be taken to capture, remove and treat sediment prior to discharge of the filtered runoff to the receiving watercourses.

- To minimise the adverse effects, the prevailing weather conditions and time of year is to take into account when the site development manager is planning the stripping back of the topsoil. For example, by avoiding excavation and movement of top soil ahead of any known upcoming heavy rainfall event.

- The removal of the topsoil layer will be carried out in a carefully managed process and in coordination with the construction phasing management of the development.

- Sand, gravel or other loose materials brought to the site shall be stored in locations a minimum of 10m from the Corbally Stream and are not to be positioned where rainfall run-off could wash silt towards the watercourse. Any cement is to be stored in bags under cover from the elements at a location remote from the watercourse.

- The site layout shall be such that it includes a dedicated set down area for deliveries to the site and temporary storage of construction materials. The area is to be clearly demarcated and managed to avoid haphazard placement of materials throughout the site.

- The set down location shall be managed to ensure it is well ordered and tidy in line with good site management practice.

- Use construction best practices and the implementation of the Construction Management Plan is to

take place to avoid the risk of contamination of the receiving watercourses or ground water. Pre-construction meetings to be held with all sub-contractors to explain works method statements and site management practices. Periodic, documented inspections of the site and subcontractor activities are to be carried out to improve overall site safety, efficiency and mitigate the risk of pollution of the stream or groundwater. Subcontractor method statements will be formally reviewed to ensure that comply with the requirements of the Construction Regulations 2006 and the Construction Management Plan. The site supervisor will conduct documented site inspections, using a Site Inspection Checklist on a weekly basis, or greater to ensure compliance. Potential spillages from storage tanks must not be allowed to seep into the ground and Spill kits are to be made available.

- An Outline Construction Management Plan has been developed and will be implemented during the construction phase.

- This will include Site personnel inductions to ensure all site personnel are made aware of the procedures and best practice with regards to the management of surface water runoff and ground water protection.

- Concrete batching will take place off site and wash out of concrete trucks will take place off site (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).

- Wheel wash down facilities will be provided in specifically designated areas and managed in accordance with the OCMP. Discharge from these areas will be directed into settlement/treatment areas and this will prevent uncontrolled runoff site.

- All fuel stored will be bunded within a secure hardstanding area with strict management control and access to same. Bunding is to be 100% + 10% of the volume stored.

- Fuel spill clean-up kits will be kept in the designated re-fuelling areas.

- Topsoil stockpiles will be located in such a manner as to minimise the risk of washing away into local drainage or watercourses.

- The contractor will have a full time Site Manager responsible for the site management. The Manager will be fully aware of the relevance of the works in relation to the watercourse and will ensure all staff on site are made aware. A site noticeboard will be positioned in a suitably located prominent location on the site with the contact details of the person responsible for ensuring the pollution prevention methodology.

- The construction management of this project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and ground contamination.

- Dewatering of trenches should be used where deemed necessary and cannot be avoided and all run off from dewatering areas is to be directed to the designated settlement/treatment areas.

**Foul/Wastewater Infrastructure**

- The wastewater discharge from the site during construction stage is to be managed by a licenced

waste disposal contractor in accordance with the agreement of Irish Water.

- As construction sites have managed toilet blocks, foul drainage from the construction compound will be removed off site to a licensed facility until the connection to the public foul drainage network has been established.

- The overburden thickness, low permeability nature of the till sub-soil and lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect discharges of leaking toilet blocks to ground at the site.

- There is a minimal risk of contamination by direct pathway to the Corbally Stream.

- As such the is no potential for a change in the ground water body status or significant source pathway linkage through the aquifer to any Natura 2000 site.

- Construction of the proposed new foul outfall pipe across Carrigmore Park will be fully coordinated with Irish Water to ensure there is no disruption to the users of the existing infrastructure.

- All new wastewater pipes/manholes will be laid in accordance with the Irish Water Code of Practice for Wastewater Infrastructure & Standard Details for Wastewater Infrastructure.

- All foul drainage infrastructure will be pressure tested and CCTV surveyed in order to reduce the risk of defective or leaking sewers.

- The proposed foul pumping station to serve the northern located apartment Blocks A and C or the potential future school site is to be in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2017 – Part 5 – Pumping Stations. The details of which can be viewed on drawing No.1324B/321.Please note that the foul pumping station is below ground and is proposed to have only 2No.above ground kiosks visible as per the IW standards as per the below extracts from IW STD-WW-30A and 31A.

- The pumping station has been located to provide c.40m separation distance to the nearest existing habitable building and c.22m to the nearest proposed building. The separation distances provided exceed the Irish Water recommended 15m and have been approved by Irish Water as part of the Statement of Design Acceptance dated 19/08/21 and agreed in principle with South Dublin County Councils Water Services Department as part of the pre-planning process.

- A Pre-Connection enquiry was submitted to Irish Water (IW) and the subsequent Confirmation of Feasibility (CoF) letter (25/08/20) from IW concluded that a connection to the network is "Feasible subject to upgrades" to existing pipelines and the cost of same is to be agreed at connection application stage. A copy of the CoF letter can be viewed in Appendix 6A of Volume III of this EIAR.

- Further to the CoF stage of the engagement with IW, comprehensive discussions were held between the Applicants and IW to agree the technical details of the proposed foul drainage infrastructure and connection. As a result of those engagements the relevant foul drainage drawings were submitted to Irish water for technical review and subsequently, they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The Statement of Acceptance letter can be viewed in Appendix 6A of Volume III of this EIAR.

- Layout, levels, gradients, pipe sizes and details of the proposed foul drainage infrastructure can be viewed on the planning submission drawing no.s 1324B/307-309, 321-329.

**Potable Water Infrastructure**

The proposed water supply for the development is to be made by connecting to an existing 400mm diameter main located in the Boherboy Road (L2008) to the south of the site.

The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.

A single 200mm diameter connection has been approved by Irish Water and will supply the proposed development via a 200mm diameter spine watermain with interconnecting 150mm and 100mm diameter looped branch watermains connected to it. Individual houses are to be supplied with a 25mm connection. In reference to the Irish Water Code of Practice for Water Infrastructure (July 2020) document, each individual residential dwelling within the development is to be provided with a boundary box. Each dwelling will be fitted with a cold-water storage tank to provide 24 hours of supply. Apartments will be supplied via a centralised water tanks and system per apartment block.

All watermain layout, connections, hydrants, valves and details have been designed in accordance with the Irish Water Code of Practice for Water Infrastructure 2020 and the Water Infrastructure Standard Details 2020.

Refer to the submitted engineering drawing no.s 1324B/310-312 for the watermain layout and to drawing no. 1324B/316 for sections across the existing trunk watermains which have been reviewed and approved by Irish Water.

A Pre-Connection enquiry was submitted to Irish Water (IW) and the following that a Confirmation of Feasibility (CoF) letter (25/08/20) was received from IW and concluded that a connection to the water network is "Feasible without infrastructure upgrade by Irish Water". Subsequently a full set of watermain design drawings (Dwg.'s 1324B/310-312) were submitted to Irish Water for their technical review and as a result they issued a Statement of Design Acceptance dated 19/08/21 (Ref.CDS20004359) noting that "Irish Water has no objection to your proposals". The CoF and Statement of Acceptance letters can be viewed in Appendix 6A of Volume III of this EIAR.

Exclusion zones and setback requirements to the existing trunk watermains have been established in consultation and agreement with Irish Water at pre-application design stage. Construction method statements are to be agreed with IW in advance of a connection agreement or commencement of works.

Specific and detailed cross sections of all built assets crossing the existing watermains have been agreed with Irish Water Asset Management section and are shown on the submitted RMA Dwg.No.13214B/316 included in the application.

The construction compound's potable water supply will be protected from contamination by any construction activities or materials.

## Electrical Supply

In advance of construction commencing, the Contractor will prepare Method Statement detailing proposals for works in the vicinity of existing overhead electrical cables.

The contractor is to carry out scanning/GPR surveys in advance of site excavations.

Connections to the existing electrical networks will be coordinated with the relevant utility provider and carried out by approved contractors.

Contractor to comply with HSA Code of Practice for Avoiding Danger from Underground Services.

The Contractor will coordinate with ESB Networks Ireland regarding the relocation of the existing overhead power lines to ensure minimal interruption to the existing electricity network.

All ducting, cable installation and placement of new poles will be constructed in advance of decommissioning of existing overhead electricity lines.

As the time frames for planned outages is required to be planned the ESB will be engaged at an early stage to ensure any potential issues with utility connections are reviewed and mitigated as early in the process as possible. ESB will not engage with design process until such time as planning has been approved, and an application for power has been made with the scheme name and numbering has been approve by the local County Council.

## Utilities Infrastructure

All connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

The Site Manager will be responsible for establishing a protocol of communication with nearby residents in the event of unavoidable temporary disruption to material assets and be the single contact point. Leaflet drops, publicly visible signboard and advertisements in local news bulletins will form part of the communication strategy between the development and locality.

On completion of the construction phase of the development, there are no further mitigation measures required in relation to the telecoms, gas and electrical infrastructure.

## Operational Phase

As detailed in Chapter 6 – Water, the implementation of the following measures will minimise the impact on the Hydrology and Water Services in the area of the proposed development during the operational phase of the development;

- The surface water collected from the project has been designed in accordance with the CIRIA SuDS Manual and the Greater Dublin Strategic Drainage Study and the appropriate treatment train process has been applied in the design.
- Regular maintenance of all SuDS features by the development management team will be carried out until such a stage that the Local Authority take in charge the project.

- The road and block levels design has been carried out following the existing natural site contours and replicating where possible the natural flow paths. The road and block levels along the northern boundary of the site have been raised above the Flood Zone A & B levels as per the SSFRA recommendations.

- The house/apartment floor levels have been designed to provide a greater than minimum 500mm freeboard above the highest estimated flood levels. The top of water level for the Q100+10% event has been estimated in the SSFRA to be **118.02mOD** and the lowest floor slab level on the site is 120.50mOD which is **2.48m** above the highest flood event for that 1%AEP (1 in 100 year) event.

- In accordance with best practice, appropriate SuDS features included in this development include filter drains, roadside filter swales, permeable paving in parking bays, green roofs, tree pits, bio-retention area, buildings, silt-trap/catchpit manholes, permeable geocellular attenuation storage, vortex flow control limiting devices and petrol interceptors.
- The surface water drainage infrastructure has been designed to allow for a 10% increase in rainfall due to climate change in accordance with the GDSDS.

- The surface water runoff from the site will be limited to the greenfield runoff rate (59.7l/s) and the attenuated flows are to be stored in below ground geocellular systems in accordance with the GDSDS. Further detailed information relating to the site development drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled “Drainage and Water Infrastructure Engineering Report”.

- All communal designated waste storage areas will have gullies connected to the foul drainage network to facilitate wash down as required.

- Operational waste will be removed from the completed development using only licenced contractors to appropriately licensed facilities.

- The wastewater drainage infrastructure has been designed in accordance with the Irish Water Code of Practice for Wastewater Infrastructure 2020 and has been approved by Irish Water (refer to IW Statement of Design Acceptance letter Ref.CDS20004359 in Appendix 6A of Volume III of this EIAR).

- The pumping station at the north of the site has been designed in accordance with the IW COP and includes real time remote monitoring, alarms and telemetry connected to the SDCC pumping station control centre using a “SCADA” system. The pumping station has also been designed to incorporate a duty and stand-by duty pump in case if failure of any single pump. Furthermore, the pumping station can accommodate 24hrs overflow storage below ground in the chamber designed. Refer to Dwg.No.1324B/321 for further detail. Watermain supply to the site is to be monitored by Irish Water using the required and designed flow meters as have been approved under the IW SDC design review. Refer to the submitted engineering drawing no.s 1324B/310-312 for location of same.

- Usage of low flush toilets in the residences and installation of rainwater butts as identified on the RMA drainage drawings will reduce the demand on the public water supply infrastructure and the wastewater infrastructure.

- Implementation of photovoltaic solar panels on the roofs of the buildings will reduce the potential demand on the electrical network.

On completion of the construction phase of the development, there are no further mitigation measures required in relation to the telecoms, gas and electrical infrastructure.

**Operational Phase**

As detailed in Chapter 6 – Water, the implementation of the following measures will minimise the impact on the Hydrology and Water Services in the area of the proposed development during the operational phase of the development;

- The surface water collected from the project has been designed in accordance with the CIRIA SuDS Manual and the Greater Dublin Strategic Drainage Study and the appropriate treatment train process has been applied in the design.

- Regular maintenance of all SuDS features by the development management team is required until such a stage that the Local Authority & Irish Water take in charge the project.

- In accordance with best practice, appropriate SuDS features included in this development which include filter drains, roadside filter swales, permeable paving in parking bays, green roofs to all flat roof buildings, silt-trap/catchpit manholes, permeable geocellular attenuation storage, vortex flow control limiting devices and petrol interceptors.

- The surface water runoff from the site is to be limited to the greenfield runoff rate (66.3l/s) and the attenuated flows are to be stored in below ground geocellular systems in accordance with the GDSDS. Further detailed information relating to the site development drainage and water infrastructure is outlined in a separate document prepared by Roger Mullarkey & Associates entitled “Drainage and Water Infrastructure Engineering Report”.

- All communal designated waste storage areas are to have gullies connected to the foul drainage network to facilitate wash down as required.

- Air pressure testing of all drainage pipelines and CCTV records are to be carried out.

- Operational waste is to be removed from the completed development using only licenced contractors to appropriately licenced facilities.

- Usage of low flush toilets in the residences and installation of rain water butts as identified on the RMA drainage drawings will reduce the demand on the public water supply infrastructure and the wastewater infrastructure.

- Implementation of photovoltaic solar panels on the roofs of the buildings will reduce the potential demand on the electrical network.

On completion of the construction phase of the development, there are no further mitigation measures required in relation to the telecoms, gas and electrical infrastructure.

ESB will be engaged at an early stage to ensure any potential issues with utility connections are reviewed and mitigated as early in the process as possible. ESB will not engage with design process until such time as planning has been approved and the scheme name and numbering has been approved.

### Monitoring

Proposed monitoring during the operational phase in relation to the material assets/built services are as follows:

- Monitoring of the management and storage of dangerous chemicals and fuel is imperative.
- On-going water usage within the proposed development will be monitored by bulk water meters. Water usage will be monitored by Irish Water to avoid waste and leaks etc.
- Maintenance of the surface water SuDS features are to be monitored by the Local Authority.
- Monitoring of the foul pumping station by Irish Water will be required to ensure efficient operation of same.
- Monitoring of the quality and quantity of soil being removed from site is necessary to ensure that the most there is efficient reusing of suitable excavated soils on the site.
- Adhering to the "Construction and Demolition Waste Management Plan"

The electricity network will be monitored by ESB networks. Telecoms will be monitored by EIR and Gas Networks Ireland will monitor the existing gas network.

Reinstatement of any disturbance to the open space areas will be required.

## 15.3.9 Material Assets: Transportation

### Construction Phase

The Outline Construction Management Plan incorporates a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed developments on-site construction activities.

To minimise disruption to the surrounding environment, the following mitigation measures will be implemented:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- A dedicated 'construction' site access / egress junction will be provided during all construction phases.
- Provision of sufficient on-site parking and compounding to ensure no potential overflow of construction generated traffic onto the local network.
- Site offices and compound will be located within the site boundary. The site will be able to accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas.

- A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.
- A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- Dedicated construction haul routes will be identified and agreed with the local authority prior to the commencement of constructions activities on-site.
- Truck wheel washes will be installed at construction entrances if deemed necessary and any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.
- On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area reinstated in full on completion of the works.

All construction related parking will be provided on site. Construction traffic 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 and dumper trucks 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.

It is anticipated that the generation of HGV's during the construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods.

**Operational Phase**

- The local area provides suitable infrastructure and transport services for travel by sustainable modes. A key barrier to modal shift towards sustainable modes of travel is often a lack of information about potential alternatives to the car. As such, it is proposed that residents and visitors of the proposed development are made aware of potential alternatives including information on walking, cycle routes and public transport.
- A number of walking and cycling connection points are proposed within the development. These connection points will provide access for pedestrians and cyclists on to the Boherboy Road and towards the Corbally and Carrigmore Residential Development.
- These facilities will provide attractive, convenient and safe routes for residents. Therefore, there are good links proposed for residents to travel by more sustainable modes i.e. towards Luas services north of the development and bus services to the east of the site.
- As part of the remedial or reductive measures for the site, it is proposed to upgrade the Boherboy Road from the development and east towards its junction with the N81 to include a footpath. Providing a footpath in this direction provide the maximum degree of safety and convenience pedestrians and further progresses the desired modal shift. No footpath provision will be provided from the development west towards Saggart but additional public lighting will be retro fitted. Alternative routes towards Saggart via Citywest will be communicated to the residents.
- A Travel Plan has been prepared for both residents and visitors to the site in order to guide the delivery and management of coordinated initiatives post construction. The Travel Plan ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development.

- It is proposed to provide car parking in accordance with the recommendations of the 'Sustainable Urban Housing – Design Standards for New Apartments' published by the Department of Housing, Planning and Local Government (2018). Therefore, the recommended car parking will be less than that required under the South Dublin Development Plan. Car sharing and car clubs will be provided under the details of the Travel Plan to offset the impact of reduced car parking numbers.
- The number of trips to/from a development is linked to the number of car parking spaces. The restriction of car parking spaces acts as a demand management tool and will reduce the impact on the surrounding road network. It will also encourage a shift away from non-sustainable car ownership models where people who only occasionally use one no longer keep one.
- For occasional car use, it is proposed to advertise the location of local car clubs via the Travel Plan. Car Clubs gives you a 'car on call', whenever you need it. Car clubs have developed as a modern service in many European cities and are a good alternative to high levels of private car use and 'driver only' occupancy rates. The principal of a car club is to ensure that the optimal use of a small number of vehicles to meet the needs of a wide group of people.
- The introduction of new pedestrian routes i.e. north via Carrigmore towards Citywest/Luas services and east via Corbally towards bus services, reduced car parking numbers and Car Clubs will further reinforce the efforts been made towards a modal shift away from car-based trips
- Residents will be encouraged to avail of these facilities for travel to and from work. Provision of this information would be made upon opening of the proposed development , as this represents the best opportunity to secure travel behaviour change. It is anticipated that this measure may help to reduce the level of traffic at the proposed development, thus providing mitigation against the already minimal traffic and transport effects of the development.

**Monitoring**

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,
- Timings of construction activities.

During the operational phase, a MMP will be prepared for both residents within the apartment units and staff within the creche in order to guide the delivery and management of coordinated initiatives post construction. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development. In order to minimise the impacts of the development and to encourage sustainable modes of transport the MMP will address the following items in order to achieve this:

- Introduction of appropriate parking management;
- Optimise links with public transport;
- Provide and enhance cyclist and pedestrian facilities;
- Encourage modes of transport other than single than car trips.

Post occupancy surveys are to be carried out in order to determine the success of the measures and initiatives as set out in the proposed MMP document. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.

### 15.3.10 Material Assets: Resource and Waste Management

**Construction Phase**

The following mitigation measures will be implemented during the construction phase of the proposed development:

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG, 2006), and is included as Appendix 12.1. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the C&D WMP (Appendix 12.1) in agreement with SDCC, or submit an addendum to the C&D WMP to SDCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.

- The Contractor will be required to fully implement the C&D WMP throughout the duration of the proposed construction and demolition phases.

A quantity of topsoil, sub soil, clay and made ground which will need to be excavated to facilitate the proposed Development. Project Engineers have estimated that c.60,000 $m^3$ of excavated material will need to be removed off-site, however it is envisaged that c. 41,000 $m^3$ excavated material will be reused on-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
- Concrete rubble (including ceramics, tiles and bricks);
- Plasterboard;
- Metals;
- Glass; and
- Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition, excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;

- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.
- Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed Development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the *EMR Waste Management Plan 2015 – 2021*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

**Operational Phase**

As previously stated, a project specific OWMP has been prepared and is included as Appendix 11.2.

- The Operator / Buildings Manager of the Site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the Site of the proposed development.

In addition, the following mitigation measures will be implemented:

- The Operator / Buildings Manager will ensure on-Site segregation of all waste materials into appropriate categories, including (but not limited to):
    - Organic waste;
    - Dry Mixed Recyclables;
    - Mixed Non-Recyclable Waste;
    - Glass;
    - Waste electrical and electronic equipment (WEEE);
    - Batteries (non-hazardous and hazardous);
    - Cooking oil;
    - Light bulbs;
    - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
    - Furniture (and from time to time other bulky waste); and
    - Abandoned bicycles.

- The Operator / Buildings Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Operator / Buildings Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Operator / Buildings Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, *the Litter Pollution Act 1997*, the *EMR Waste Management Plan 2015 – 2021* and the SDCC, County of South Dublin (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

**Monitoring**

The management of waste during the construction phase will be monitored by the Contactor's appointed Waste Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.
The management of waste during the operational phase will be monitored by the Operator / Buildings Manager to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

**Construction Phase**

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the demolition, excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting construction schedule targets. The C&D RWMP specifies the need for a Waste Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Waste Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed Development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

**Operational Phase**

During the operational phase, waste generation volumes will be monitored by the Operator / Buildings Manager against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

### 15.3.11 Archaeology and Cultural Heritage

**Construction Phase Mitigation**

Archaeological testing did not uncover any remain at the proposed development. It is unlikely that further remains will be uncovered during excavation works at the site. However should any remains be uncovered the National Monuments Service at the Department of Housing, Heritage and Local Government should be contacted.

### Operational Phase Mitigation

A series of site visits and archaeological testing did not reveal any archaeological remains. As a result of this it is unlikely that archaeological deposits exist at the site. As a result of this there is no archaeological mitigation required at operational phase.

### Monitoring

Archaeological testing did not uncover any remain at the proposed development. No monitoring is required.

## 15.3.12 The Landscape

### Mitigation Measures - Construction Phase

During the construction of the development, the area shall be changed from agricultural use lands to a residential development with a crèche. The introduction of the built structures, roads, carparking and landscaped open spaces will be carried out while maintaining most of the existing hedges and trees of the site. During construction, there will be a change to the landscape and there will be negative visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity.


**Fig. 15.1 – Tree Protection Plan**

Tree protection shall be provided to retain the character of the existing trees and hedgerows.

Although the existing hedgerow along the Boherboy road shall be removed due to a request from South Dublin County Council, in order to provide a public path and associated upgrades to the Boherboy Road, it is proposed to retain the existing mature trees and shrubs along the perimeter of the site and the main internal hedge.

The development shall be carried out in an organised basis, thus reducing the visual impact upon the environment; however, the impact on the initial area of construction shall be moderate to significant. The remedial measures proposed include the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that 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 to short term nature only and therefore it is expected that this will require no remedial action other than as already stated.

The retention of the hedgerows on and surrounding the site combined shall reduce the visual impact of the proposal during construction. This shall include the use of Tree protection fences to BS standard BS5837.

The stream shall be protected by the tree protection measures employed for the existing hedgerow and shall be aided by the use of bales of straw to capture, in the unlikely event, any possible debris from the site.

All building material shall be stored within the site compound, the compound shall be enclosed by a stout fence, and shall be accessed only by a gate manned by a security guard.

The stripped soil shall be stored in berms, until required for use in gardens and open spaces. The balance of the material, that is not required, sod shall be removed to an approved tipping waste management facility.

As the development increases and phasing continues, the improvement in terms of landscape elements, trees etc., growth of the new vegetation and management of the existing hedgerows shall reduce the visual impact and in the long term be positive.

The greatest impact shall be the views through the site as they will become determined by the existing buildings, walls and boundaries, landscape elements of trees and hedges shall also affect these views. However the views are currently screened by existing hedgerows, these are being retained and augmented by the introduction of new trees and planting, the predicted impact during construction shall be moderate in the short-term depending on the length of time on site, as views are restricted by the existing vegetated boundaries.

**Mitigation Measures – Operational Phase**

In landscape terms the design proposal seeks to complement the existing landscape, implementing new landscape features that integrate with and enhance the character of the area and wider environment. The design rationale seeks to mitigate negative effects on the visual amenity and landscape of the area with the following objectives:

- The retention of the existing landscape structure of field boundaries, where possible, as well as boundary trees and an area of wet woodland to the north-west corner. A large, cohesive area of open space has been provided consistent with that set out in the Fortunestown LAP;

- Once the development has been lived in for a significant period, the upgrade and improvement of the external spaces shall have a positive impact on the landscape and reduce the visual impact upon nature of the location;
- Follow a multidisciplinary approach to align landscape planting with service elements, maximising the opportunity for public realm trees and buffer planting;
- Use of appropriate materials and boundary treatments to provide high quality public facing finishes that are harmonious with the buildings' facades and provide a legible, safe, and comfortable physical environment;
- The extensive planting of additional trees and shrubs throughout the site and on the site boundaries in keeping with the wider landscape character, will over time, provide visual relief, add to the amenity of the current landscape, reduce the visual mass of the buildings, soften the development over time from various viewpoints and assist in integrating the development into the landscape.

**Fig. 15.2- CGI – Provision of public open space planted with natural grassland & native tree species**

- Native and pollinator species (as per The All-Ireland Pollinator Plan 2015 – 2020, 2021 - 2025) planting for biodiversity has been incorporated into the scheme and this includes a native tree belt / woodland wetland area, wildflower meadows and semi natural grassland.
- Several connected public open spaces have been designed as part of an overall design strategy that focuses on creating a distinctive 'sense of place' and individual character for the development area. The design of public open space that forms part of a network of spaces that includes areas for passive and active recreation, social / community interaction and play facilities catering for all ages. This area of open space corresponds to that as indicated in the Fortunestown LAP.
- A number of pocket parks shall be developed throughout the development to add to the amenity for the residents and provide additional opportunities for biodiversity. The pocket parks shall be natural and organic in form, using plants from the All-Ireland Pollinator plan for the new and emerging communities. The provision of significant parkland areas/open spaces will facilitate permeability and access to nature.
- Retention of the existing watercourse and the integration into a linear park.
- Enhancement of the wetland area through provision for Sustainable Drainage Systems (GNU-2)
- The hedgerows that are to be removed shall and reinstated with additional native tree planting and a replacement stone wall re-using existing stone will be provided, to the front of the site.

- Connections to the Greenway to the south of the proposed development forms an integral part of the landscape proposals, with formal links and piers to announce the access points. (GNU-6)
- The proposed Planting Plan shall use trees and wildflower meadow mixes, taken from the All-Ireland pollinator Plan 2015 – 2020, 2021 – 2025 & the RHS Plants for pollinators. Therefore there shall be an increase in the range and area of pollinator planting.
- Shrubs and hedges to be used in the private spaces shall be taken from the All-Ireland pollinator Plan 2015 – 2020, 2021 – 2025 & the RHS Plants for pollinators. This shall help encourage insects and bees and provide interconnected routes for birds and biodiversity.
- Greenway routes as per the Fortunestown LAP have been respected and shall be integrated into the overall design.
- Augmentation of the hedgerows and trees to provide continuous sustainable biodiversity green links for flora and fauna.
- Application of best practice horticultural methods to ensure that mitigation measures establish and grow appropriately.

**Fig. 15.3 – Proposed Tree Planting**

Landscape works are proposed to reduce and offset any adverse impacts generated due to the proposed development, where possible. The planting of substantial numbers of new trees and other planting in the open spaces, at the site boundaries and internal roads, both native and ornamental varieties. This will enhance the overall appearance of the new development and compensate for any removal of hedgerows and trees, where needed, for the construction works, and increase the overall landscape capacity of the site to accommodate development. Thus offsetting the effect upon the landscape in visual and physical terms, to short to medium term.

## Monitoring

A Landscape Architect shall be appointed to oversee and monitor the project at construction and operational stage. They shall liaise with other project members in relation to any existing and proposed trees.

The landscape architect shall overview all hard and soft landscape works and liaise with resident engineer, project team and contractor. The landscape architect shall also inspect the trees; however, most of the monitoring works shall be during and post-civil construction stage. The landscape architect shall review and instruct on details of soft planting, trees, shrubs and of paving materials, walls and railings.

During the operational stage, the Landscape Architect and Arborist shall review the state of all planting and trees. The landscape architect shall review for period of 18 months, from practical completion of each stage the standard and quality of the materials and workmanship. A final certificate of completion shall be issued by the landscape architect in respect of this.