Environmental Impact Assessment Report

Application to An Bord Pleanála for permission for a strategic housing development at Growth Area 2, located in the townland of Stapolin, Baldoyle, Dublin 13

Volume 2 – EIA Report

Prepared by: AWN Consulting, March 2022

Prepared for: Lismore Homes Limited

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1.0 INTRODUCTION

1.1 PROPOSED DEVELOPMENT

This Environmental Impact Assessment ('EIA') Report has been prepared and coordinated by AWN Consulting ('AWN') alongside various experienced subject matter experts on behalf of Lismore Homes Limited ('the Applicant') to accompany this Strategic Housing Development ('SHD') to An Bord Pleanála ('ABP').

The development ('the proposed development') will consist of the construction of 1,007 residential apartments (consisting of 58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units), communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a site located in the townland of Stapolin, Baldoyle, Dublin 13.

Figure 1.1 *Proposed Development Lands (indicative application boundary in red) (Source: Google Earth)*

The development lands is a c. 6.1 hectares plot of partially greenfield, partially brownfield land located in the townland of Baldoyle-Stapolin, Dublin 13 ('the Site'). The lands are bound by existing and proposed residential areas to the west and south, and the future Racecourse Park to the north and northeast. The Site is also referred to as the Growth Area 2 ('GA2') Lands in *the Baldoyle-Stapolin Local Area Plan 2013 (as extended)* and which forms part of the wider landholding of lands formerly known as

the Coast residential community that has been planned on c. 41 hectares of residential zoned land around Clongriffin DART station. The Site and surrounding site context is shown on Figure 2.1 above.

1.2 RELEVANT LEGISLATIVE REQUIREMENT FOR ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment is an essential tool in the implementation of EU environmental legislation. According to the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018) the objective of the Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), prior to development consent being given, of public and private developments that are likely to have significant effects on the environment.

The requirement for EIA Report is set out in the EIA Directive (Directive 2011/92/EU as amended by 2014/52/EU); the EIA Directives have been transposed into existing Irish planning consent procedures i.e. the *Planning and Development Act 2000 as amended* (the Act) and *Planning and Development Regulations, 2001 as amended* (the Regulations).

The EIA Directive lists projects for which an EIA is mandatory (Annex I) and those projects for which an EIA may be required (Annex II) of the EIA Directive (2011/92/EU and 2014/52/EU), these Annex are transposed into Schedule 5 of the *Planning and Development Regulations 2001 as amended*. The EU Member States can choose to apply thresholds for Annex II projects or use a case-by-case examination, or a combination of both, to assess where EIA is required. In Ireland, a combination of both has been applied.

Ireland's type of projects for which an EIA is mandatory is set out in the Schedule 5 Part 1 and Part 2 of the Regulations. The EPA Guidance (2017) requires an assessment beyond the general description of the project and to consider the component parts of the project and/or any processes arising from it. In considering the wider context and the component parts of the proposed development AWN have identified the thresholds of relevance to the proposal from Part 2 of Schedule 5; which are set out below:

10. Infrastructure projects –

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

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

(In this paragraph, 'business district' means a district within a city or town in which the predominant land use is retail or commercial use).

For the project types Class 10 (a) to (m) an EIA is mandatory only if the project equals or exceeds, as the case may be, a limit, quantity or threshold set out.

Under Class 10(b)(i) the threshold is '*more than 500 dwelling units'. Under* Class 10 (b)(iv) the appropriate threshold is considered to be '*10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere'.* The site location is on the edge of

the transition between residential and greenfield; the pragmatic approach is to consider the area to be 'part of a built-up area'.

The total site area for the proposed works is c. 6.1 hectares (ha), and the proposed development comprises 1007 no. dwelling units. The site location is not within a business district but is within a built-up area. The proposed development exceeds the limit, quantity or threshold set out in Class 10(b)(i); therefore, an EIA is mandatory.

1.3 FORMAT OF THIS ENVIRONMENTAL IMPACT ASSESSMENT REPORT

This EIA Report has been prepared in accordance with the most relevant guidance and legalisation, including the following:

- EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU)
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018)
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017)
- Guidance on the preparation of the Environmental Impact Assessment Report (European Union, 2017)
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015)

This report has been laid out using the grouped format structure, the EIA Report examines each environmental factor in a separate chapter (the chapters are listed in Table 1.1). The EIA chapters have been prepared by a suitably qualified expert(s) and have considered the construction and operational phases of the proposed development under the following headings:

- Assessment Methodology;
- Receiving Environment;
- Characteristics of the Proposed Development;
- Potential Impacts of the Proposed Development;
- Mitigation Measures;
- Residual Impacts of the Proposed Development
- Monitoring or Reinstatement; and
- Cumulative Impacts of the Proposed Development

While the EIA has the focus on the proposed development, each specialist chapters also considers the potential cumulative impact (as far as practically possible) of the proposed development with the any future development and the cumulative impacts with developments in the locality (including planned and permitted developments). Furthermore, Chapter 18 of this report shows where Interactions between environmental factors have been identified and how they have been addressed.

1.3.1 Consultation and Scoping

The Applicant and the project team have liaised with the relevant departments of Fingal County Council (FCC) and An Bord Pleanála (ABP) in advance of lodgement of this application.

In accordance with Section 5(2) of the Planning and Development (Housing) and Residential Tenancies Act, 2016 and pursuant to Section 247 of the Planning and Development Act, 2000 as amended, the Prospective Applicant's design team attended by Microsoft Teams pre-planning meetings with Fingal County Council, on 2nd September 2020, and 16th December 2020. The relevant planning and technical issues relating to the development proposals were identified and discussed between the design team and their respective opposite number in FCC.

In accordance with Section 5 of the Planning and Development (Housing) and Residential Tenancies Act 2016 and the Planning and Development (Strategic Housing Development) Regulations, 2017, a pre-application consultation request was submitted to An Bord Pleanála on 4th March 2021. A tri-partite Meeting was held with Fingal County Council, An Bord Pleanala, and the prospective applicant's design team on 20th May 2021. An Bord Pleanála issued its opinion on the 24th June 2021.

In addition, relevant specialists in the proposed development project team have liaised with statutory bodies (including the Water Services, Roads/Transportation, National Parks and Conservation, Irish Water and ESB, by correspondence during the course of the EIA Report preparation.

The structure, presentation and the non-technical summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. A 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. Public participation in the EIA process will be effected through the statutory planning application process. Information on the EIAR has also been issued for the Department of Housing, Planning and Local Government's EIA Portal.

A copy of this EIAR document and Non-Technical Summary of the EIAR document is available for inspection and/or purchase at the offices of Fingal County Council (the relevant Planning Authority) at a fee not exceeding the reasonable cost of reproducing the document.

1.3.2 Contributors to the Environmental Impact Assessment Report

The preparation and co-ordination of this EIA Report has been completed by AWN Consulting in conjunction with experienced subject matter experts. The role and responsibility of each contributor, their qualifications and relevant experience are detailed in Table 1.1 below, along with the corresponding EIA Report chapter.

Table 1.1 Design Team and Environmental Specialists (EIA Team)

Role		Consultant
Planning Consultant		Kiaran O'Malley & Co. Ltd
Architectural Design		CCH Architects
Landscape Architecture		Murray & Associates
Civil Engineering		JB Barry
Mechanical and Electrical Engineering		Ethos Engineering
Environmental Impact Assessment		AWN Consulting Limited
Chapter No.	Chapter Title	Consultant
	Non-Technical Summary	AWN – Input from each specialist
Chapter 1	Introduction	AWN – Jonathan Gauntlett

Chapter 2	Description of the Proposed Development	AWN – Jonathan Gauntlett
Chapter 3	Planning and Development Context	AWN - Conor McGrath
Chapter 4	Alternatives	AWN - Jonathan Gauntlett
Chapter 5	Population and Human Health	AWN - Conor McGrath
Chapter 6	Land, Soils, Geology and Hydrogeology	AWN – Paul Conaghan
Chapter 7	Hydrology	AWN – Paul Conaghan
Chapter 8	Biodiversity (including AA Screening Report)	Altemar Environmental Consultants - Bryan Deegan
Chapter 9	Air Quality and Climate	AWN – Niamh Nolan
Chapter 10	Microclimate Wind	BRE Group - Dr Paul Blackmore
Chapter 11	Microclimate Sunlight Daylight	BRE Group - Dr Paul Littlefair, Dr Cosmin Ticleanu, Gareth Howlett
Chapter 12	Noise and Vibration	AWN – Mike Simms
Chapter 13	Landscape and Visual	Murray & Associates -Mark Boyle
Chapter 14	Archaeological, Architectural and Cultural Heritage	CRDS Ltd. – Dr Stephen Mandal
Chapter 15	Traffic and Transportation	JB Barry – Gerard Claffey
Chapter 16	Waste Management	AWN – Chonaill Bradley
Chapter 17	Material Assets	AWN - Conor McGrath
Chapter 18	Interactions	AWN – Input from each specialist

EIA Co-ordinator/Selected Chapters, Jonathan Gauntlett Jonathan is a Principal Environmental Consultant in AWN Consulting with ongoing roles in impact assessment, licensing, environmental compliance and project management. Recent projects include; Strategic Housing Development including EIAR and EIA Screening Reports, SID and planning applications for ICT facilities; EPA Licence applications for biopharma and ICT facilities. Jonathan has over 10 years' experience in environmental compliance, planning and management of Environmental Impact Assessments, licensing, and urban planning. Jonathan has a BSocSc (Environmental Planning) and BBA (Economics) from the Waikato University in New Zealand and has experience working in the environmental consultancy, planning, and regulatory fields from Ireland, the UK and New Zealand.

Project Director, Land, Soils, Geology, Hydrogeology & Hydrology, Teri Hayes, BSc MSc PGeo. Teri is a Director with AWN Consulting with 25 years of experience in water resource management and environmental assessment and risk analysis. Teri is a member of the International Association of Hydrogeologists (Irish Group) – former president and a professional member of the Institute of Geologists of Ireland She has project managed and contributed to numerous environmental impact assessments and design of appropriate mitigation measures, acted as an expert witness at public hearings, lectured in EIA for postgraduate classes and provided expert advice on EIA sections for planning authorities and ABP.

Planning and Development Context, Population and Human Health, Material Assets, Conor McGrath is a Senior Environmental Consultant with AWN Consulting with ongoing roles in waste management, environmental licensing, site investigation and environmental impact assessment. Conor is a Chartered Environmentalist (CEnv), a Professional Member of the IGI (PGeo) and the European Federation of Professional Geologists (EurGeol). He has 10 years' consultancy experience in the Irish and UK environmental industry. Conor is a Full Member of the Institution of Environmental Sciences (MIEnvSc) and is a Full Member of the International Association of

Hydrogeologists (MIAH). Conor has completed numerous waste management strategies for residential, commercial, and industrial developments and has experience in waste licensing, environmental impact assessments and IE licence applications.

Land, Soils, Geology, Hydrogeology and Hydrology, Paul Conaghan. Paul is a Senior Environmental Consultant at AWN Consulting with over 10 years' experience working in the environmental science and environmental engineering fields. Paul holds a degree in Environmental Science from the University of Limerick and a master's in environmental engineering from Queens University Belfast. Paul has worked on a wide range of projects including Environmental Impact Assessment (EIAR), hydrogeological site investigation, groundwater source protection/ management, design of geochemical sampling programs and groundwater source (deep well) CCTV surveys. Paul is a member of the International Association of Hydrogeologists and is an IOSH certified Project Supervisor Design Process.

Biodiversity Bryan Deegan (MCIEEM) is an environmental and aquatic consultant (M.Sc. Environmental Science, BSc (Hons.) in Applied Marine Biology, National Diploma in Applied Aquatic Science, National Certificate in Science (Aquaculture)), with over 27 years' experience as an Environmental Team Leader working on Irish aquatic and terrestrial development projects. Recent projects include being lead ecologist for large developments (Lidl Regional Distribution centres in Mullingar and Newbridge, Primark distribution warehouse Newbridge, 18 airside projects for DAA and Project Pembroke (Irish Glass Bottle Site, Ringsend) in addition to housing developments, river diversions, culvert installation and sub-sea cables and port works. Bryan has extensive experience in ecological surveying and working with planners, architects and engineering consultancies carrying out Appropriate Assessment, EcIA, EIAR (biodiversity chapters), ecological constraints, project management, stakeholder consultation, GIS and habitat mapping services on large infrastructural projects.

Air Quality and Climate, Niamh Nolan is an Environmental Consultant in the Air Quality section of AWN. She has one year experience in the environmental consulting sector and has experience preparing EIARs for a number of residential developments. She holds a BSocSci (Hons) in Social Policy and Geography from University College Dublin. She is an Associate Member of both the Institute of Air Quality Management and the Institution of Environmental Science. She has experience in mapping software primarily in QGIS and she specialises in the area of air quality, climate and sustainability.

Daylight and sunlight, Dr Paul Littlefair (MA PhD CEng MCIBSE MSLL MILP) leads BRE's lighting team and has 42 years' experience of working on daylight, sunlight and related issues. In 1984 he was awarded a PhD for a thesis entitled 'Daylighting design and energy conservation'. Paul has published over 100 papers on daylight and related issues and wrote part of the British Standard Code of Practice on daylight and the CIBSE Lighting Guide 'Daylighting and window design'. He also wrote 'Site layout planning for daylight and sunlight: a guide to good practice', the guidance generally used by local authorities in determining planning applications involving daylight and sunlight. He has carried out over 400 consultancy studies of daylight and sunlight.

Daylight and sunlight, Dr Cosmin Ticleanu (BSc PhD MBA MSLL) leads BRE's work on electric lighting, including light pollution, and also has significant expertise in daylight and sunlight. He has 15 years of research and design experience in lighting and has authored or co-authored more than 50 published papers and books on various aspects of lighting. Since joining BRE in 2011, he has been undertaking consultancy and research for government and private sector customers into all aspects of electric lighting and daylighting. Cosmin is an experienced user of the software packages

Ecotect and Dialux. He is also an expert at complex modelling of daylighting using Radiance, Rhino/Diva and Dialux.

Daylight and sunlight, Gareth Howlett (BSc) is BRE's specialist in daylight and sunlight modelling. He joined BRE in 2007. He has carried over 200 assessments of daylight and sunlight impact of developments, including projects involving major city centre mixed use developments. He has experience of development sites of all scales and complexities, covering loss of daylight and sunlight to neighbouring windows and rooms, daylight and sunlight provision to proposed rooms, sun on ground calculations, shadow plotting and assessment of impacts due to trees. He regularly produces detailed technical reports including material for Environmental Impact Assessments.

Wind Microclimate, Dr Paul Blackmore is an Associate Director at the Building Research Establishment with responsibility for wind microclimate and wind loading on and around buildings. He holds a BSc and a PhD and is a Chartered Engineer and a Member of the Institution of Structural Engineers (MIStructE) and a Member of the Institution of Civil Engineers (MICE). He has forty years' experience carrying out wind tunnel and desk based assessments of wind effects on and around building structures to support planning applications. He is a member of several European and UK standards committees as a wind engineering expert and writes expert witness reports and gives expert evidence in the fields of wind effects on people and wind damage to structures.

Noise and Vibration, Mike Simms, is a Senior Acoustic Consultant with AWN and holds a BE and MEngSc in Mechanical Engineering, and is a member of the Institute of Acoustics (MIOA) and of the Institution of Engineering and Technology (MIEI). Mike has worked in the field of acoustics for over 20 years. He has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, wind energy, industrial, commercial, and residential.

Landscape and Visual Impact, Mark Boyle Mark is a qualified Landscape Architect and Director with Murray & Associates, Landscape Architecture. He has worked with Murray & Associates since 1998 and became a director of the practice in 2008. He has considerable experience in landscape and visual assessment studies, having worked consistently in this area since the start of his career. He has completed more than 80 such studies for developments of varying scales, contexts and sectors including infrastructure, residential, commercial and industrial. Mark qualified with a Bachelor of Agricultural Science (Landscape Horticulture) from UCD in1998 and followed that up in 2002 with a Master of Landscape Architecture, also in UCD, after working with Murray & Associates for 3 years. Mark qualified as a Corporate (Full) Member of the Irish Landscape Institute in 2005. Since then, Mark achieved a Graduate Diploma in Project Management at University of Dublin (Trinity College) in 2010.

Archaeological, Architectural and Cultural Heritage, Dr Stephen Mandal holds an honours degree in Science (Geology) from Trinity College Dublin (1991) and a PhD in Geoarchaeology, also from Trinity College Dublin (1995). Following two years as a post-doctoral researcher in University College Dublin, he founded CRDS Ltd (established in 1997; incorporated in 1999), archaeological, cultural and architectural heritage consultants. As one of Ireland's leading heritage consultancies for almost 25 years, CRDS has employed over 600 archaeologists, undertaken some of the largest and most significant archaeological excavations throughout Ireland, and has won numerous national and international awards. He has overseen the writing of the Archaeology, Architectural and Cultural Heritage Chapters of in excess of 100 EIARs dating from 1997 to present. This experience covers the island a wide range of

development types including small scale developments close to culturally sensitive sites, large scale developments and liner developments including roads, ESBI power lines, railways and cycle paths.

Traffic and Transportation, Gerard Claffey is a Traffic and Transport Engineer with J. B. Barry and Partners Limited. He graduated from Trinity College Dublin with a B.A. B.A.I. M.A.I. in Civil, Structural and Environmental Engineering. Gerard is a Chartered Engineer with seven years' experience, engaged as team leader and team member on a variety of Transportation and Traffic projects. His experience includes the development of junction designs, cycle schemes, bus corridors, preparation of mobility management plans and traffic impact assessments. Gerard is a TII approved Road Safety Auditor, and has been a team member on over 40 road safety audits.

Waste Management, Chonaill Bradley (BSc ENV AssocCIWM) is a Principal Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia. He is an Associate Member of the Institute of Waste Management (CIWM). Chonaill has over seven years' experience in the environmental consultancy sector and specialises in waste management.

1.4 DESCRIPTION OF EFFECTS

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the *Guidelines on Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) this criteria is duplicated in Table 1.2.

Table 1.2 Schedule of Impacts following EPA Guidelines

Characteristic	Term	Description
Quality of Effects	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Describing the Significance of Effects	Imperceptible	An impact 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	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics
Describing the Extent and Context of Effects	Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Characteristic	Term	Description
Describing the Probability of Effects	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.
	Unlikely Effects	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	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
	Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Type of Effects	Indirect Effects	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing'	The environment as it would be in the future should no development of any kind be carried out
	`Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant impact is of greater significance than the sum of its constituents

1.5 ADDITIONAL ASSESSMENTS REQUIRED

The additional reports and/or assessments required under Legalisation or EU Directives other than the Environmental Impact Assessment Directive in respect of the proposed development are described below.

1.5.1 The Floods Directive (Directive 2007/60/EC)

The Floods Directive (Directive 2007/60/EC) establishes a framework for the assessment and management of flood risks, with the aim to reduce the adverse consequences on human health, the environment and material assets.

The Floods Directive requires Member States to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. The Floods Directive also reinforces the rights of the public to access this information and to have a say in the planning process.

The Floods Directive must be implemented in tandem with the WFD. In Ireland, the OPW is the national authority assigned with the implementation of the Floods Directive, which was transposed into Irish law by the EU (Assessment and Management of Flood Risks) Regulations SI 122 of 2010.

A Site-Specific Flood Risk Assessment (FRA) has been prepared by JBA Consulting in accordance with the Planning System and Flood Risk Management Guidelines for Local Government (2009). This Site-Specific FRA is included with the planning application and is included as Appendix 7.2 to Chapter 7 (Hydrology), in addition to the FRA a 'Statement of Consistency with Ministerial Guidance The Planning and Flood Risk Management Guidelines for Local Authorities (2009)' (JB Barry) is included with the application documents.

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

The main EU legislation for conserving biodiversity is the Directive 2009/147//EC of the European Parliament and of the Council of November 2009 on the conservation of wild birds (Birds Directive); and the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).

The Habitats Directive is the cornerstone of habitats and species protection in Ireland. The Habitats Directive (92/43/EEC) and the associated Birds Directive (2009/147/EC) are transposed into Irish legislation by Part XAB of the 2000 Act and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) as amended.

The main aim of the Habitats Directive is the conservation of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status. These annexes list habitats (Annex I) and species (Annexes II, IV and V) which are considered threatened in the EU territory. The listed habitats and species represent a considerable proportion of biodiversity in Ireland and the Directive itself is one of the most important pieces of legislation governing the conservation of biodiversity in Europe.

Articles 10 of the Habitats Directive and the Habitats Regulations 2011 place a high degree of importance on non-Natura 2000 areas as features that connect the Natura 2000 network. Articles 12 and 16 of the Habitats Directive establish a system of strict protection for the animal species listed in Annex IV(a), but also allow for derogation from these provisions under defined conditions.

The environmental sensitivity of the proposed development site in respect of Natura 2000 sites designated pursuant to the Habitats Directive and the Birds Directive been considered with reference to the application Appropriate Assessment Screening, and Natura Impact Statement (NIS) which comprises an initial impact assessment of a project; examining the direct and indirect impacts that it might have on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of the sites' conservation objectives. The *'Appropriate Assessment Screening & Natura*

Impact Statement - Information for a Stage 1 (AA Screening) and Stage 2 (Natura Impact Statement) AA for a proposed development at Baldoyle-Stapolin Growth Area 2 (GA2), Baldoyle, Dublin 13.' that has been prepared for the proposed development by Altemar Environmental Consultants is included with the planning application.

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 INTRODUCTION

This chapter presents the description of the project comprising information on the Site, design, size and other relevant features of the project. The scope of this chapter aligns with the legalisation and guidance material as set out in the EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU), as well as the relevant EPA guidance documents *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) and *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015).

This chapter summarises the existing site, the proposed development, and the existence of the project as set out within the *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017). This guidance advises that description of the existence of the project should define all aspects of the proposed lifecycle of the facility, including:

- Description of Construction;
- Description of Commissioning;
- Operation of the Project;
- Changes to the Project; and
- Description of Other Related Projects.

This chapter draws on and has been informed by the Project Design and summarises the key relevant details of the proposed development and its lifecycle as it relates to EIA Report. This description is not exhaustive, and as such the EIA Report should be read in conjunction with full application package that includes complete elevations and floor plans site, layout plans including utilities and building drawings. The specialist assessments reported in this EIA Report have been conducted using this description, and the full application package as a guide to the details of the development under consideration.

2.2 DESCRIPTION OF THE EXISTING DEVELOPMENT SITE

The Site of the proposed development is c. 6.1 hectares located at Baldoyle-Stapolin, Dublin 13. The Site forms part of a substantial area of undeveloped residential zoned land within Baldoyle-Stapolin.

It is approximately 10.5 km from O'Connell Street bridge in the centre of Dublin City, approximately 9 km from Main Street, Swords and 4 km from Howth. The Site forms part of the overall Coast residential community that has been planned on c. 41 hectares of residential zoned land around Clongriffin DART station.

The wider area is characterised by a predominantly residential uses as the Site surrounded by the residential centres of Donaghmede, Bayside and Clongriffin. The coastal towns of Portmarnock and Malahide are located further to the north. The Mayne Marsh Conservation Area and Baldoyle Estuary Nature Reserve is located beyond the future Racecourse Regional Park; these areas (including the bay itself), from part of the Baldoyle Bay Special Protection Area (SPA), Special Area of Conservation (SAC), proposed Natural Heritage Area (pNHA), and Ramsar Convention Wetland.

There are no notable mapped surface water courses on or bordering the Site, the lands are drained to ground or through the existing surface water sewers that present in the roads on Site. The Maynetown Stream and Snugborough Stream are situated to the west and flowing in a northerly direction towards the Mayne River which is located to the north of the Site.

The application Site is owned by Penshanko Limited. Penshanko Limited purchased, inter alia, c. 4.394 hectares of land at Stapolin-Baldoyle from Helsingor Limited by Memorandum of Agreement made on 24th July 2003 - Folio DN 162698F Co. Dublin refers. The Memorandum of Agreement dated 24th July 2003 between Penshanko Limited and Helsingor Limited includes legally binding provisions for both parties that run with the land including that each shall have the right to apply for Planning Permission on their respective lands. These legally binding provisions, that run with the land, also include inter alia Class 1 and Class 2 Open Space for the application Site. The proposed development Site and surrounding site context is shown on Figure 2.1 below including the indicative redline for this application.

Figure 2.1 *Site Location and Context; indicative site boundary in red (Source: Google Maps)*

The Site is located on the southern boundary of the Fingal County Council (FCC) administrative area and is subject to the *Fingal County Council Development Plan (CDP) 2017-2023* and *Baldoyle-Stapolin Local Area Plan (LAP) 2013 (as extended)*. The Dublin City Council administrative boundary is located just beyond the Dublin-Belfast / DART railway line and Clongriffin rail station. To the west of the railway lies the developing mixed use area of Clongriffin within Dublin City Council's wider North Fringe Area encompassing Northern Cross/Clare Hall/Belmayne to Clongriffin.

Under the Baldoyle-Stapolin Local Area Plan the Site is identified as "Growth Area 2" ('GA2') and occupying the northeast sector of the undeveloped lands plus a c. 170 metres length of Red Arches Park that facilitates a proposed watermain connection as requested by Irish Water. Under the FCC CDP and the Baldoyle-Stapolin LAP the subject lands are zoned *'RA – Residential Area / Residential Development'. RA – Residential Area'* (discussed further in Chapter 3 Planning and Development Context).

The Site is located to the south of the proposed Racecourse Park (c. 80 hectares), east of the Dublin-Belfast / DART railway line and Clongriffin rail station, north of Growth Area 1 ('GA1') and east of Growth Area 3 ('GA3'), as designated in the LAP (see figure 2.2 below). The proposed development site is effectively Growth Area 2 ('GA2') *Baldoyle-Stapolin Local Area Plan (LAP) 2013 (as extended)*.

Figure 2.2 *Planned Growth Areas (Source: Baldoyle Stapolin Local Area Plan)*

2.2.1 Existing Site Utilities, Infrastructure and Access

The lands themselves consists of three largely rectangular fields of largely undeveloped lands, surrounded by fencing on the north, east and south. The Site includes the roadways between and adjoining the proposed development blocks. The existing site access is via a locked construction entrance at the junction of Red Arches Park and Red Arches Drive. There is a secondary construction entranceway in the north-west that connects to an existing c. 700 m haul road via Moyne Road further to the north of the Site.

The roadways are existing roads that including underground utilities (surface water, foul water and potable water) that were originally developed in the mid 2000's. The underground utilities these have had little use since they were installed and as there is a doubt about their integrity. In addition, the surface water sewers were laid at a depth that will not allow discharge by gravity above the existing North Fringe Sewer to the wetland within the open space to the north of the Site (see Figure 2.1 above) as required by the LAP.

There is a fall across the Site from south to north. The Site is presently rough ground with some development work having been carried out e.g. access roads, drainage, etc. and some areas are covered with hard core. Due to the recent development and construction activity on the Site and in the vicinity of it, there are few landscape features on the Site. There is a short stand of trees between sectors 8A and 8B. It is proposed to retain some of these trees as part of the proposed development.

Directly to the south within Stapolin Haggard is a privately owned foul pumping station connected to the North Fringe Sewer.

There were two previous planning applications for residential development on the subject site, an extension of duration application and an application for infrastructural development to facilitate residential development. The planning history of the site and surrounds is discussed further in Chapter 3 (Planning and Development Context) and the Planning Report (Kiaran O'Malley and Company Limited, 2022).

2.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of 1,007 apartments (consisting of 58 no. studio units (38.1 – 52.3 sq.m.), 247 no. 1 bedroom units (48.9 – 79.7 sq.m.), 94 no. 2 bedroom 3 person units (67.3 – 80.42 sq.m.), 563 no. 2 bedroom 4 person units (77.7 – 106.1 sq.m.), and 45 no. 3 bedroom units (93.5 – 130.66 sq.m.), 6 no. communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a c. 6.1 hectare site as follows:

1. *The proposed residential development will consist of 1,007 no. residential apartments (58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units as follows:*
    - Block 1, sector 6A/6B, 5 storey building with 59 no. apartments with balconies and solar panels at roof level
    - Block 2, sector 6A/6B, 5 storey building with 39 no. apartments with balconies and solar panels at roof level

- Block 3, sector 6A/6B, 5 & 6 storey building with 63 no. apartments with balconies and solar panels at roof level
- Block 4, sector 6A/6B, 6 storey building with 47 no. apartments with balconies and solar panels at roof level
- Block 5, sector 6A/6B, 5 storey building with 39 no. apartments with balconies and solar panels at roof level
- Block 6, sector 6A/6B, 5 storey building with 39 no. apartments with balconies and solar panels at roof level
- Block 7, sector 6A/6B, 5 & 6 storey building with 49 no. apartments with balconies and solar panels at roof level
- Block 1, sector 7, part 5, 6, 7 & 11 storey building with 98 no. apartments with balconies and solar panels at roof level
- Block 2, sector 7, part 5, 7, 9 & 12 storey building with 125 no. apartments with balconies and solar panels at roof level
- Block 3, sector 7, part 5, 6, 7, 8 & 10 storey building with 110 no. apartments with balconies and solar panels at roof level
- Block 1, sector 8A, part 5, 6, 7 & 11 storey building with 131 no. apartments with balconies and solar panels at roof level
- Block 2, sector 8A, 5 storey building with 13 no. apartments with balconies and solar panels at roof level
- Block 1, sector 8B, part 5, 6 & 11 storey building with 96 no. apartments with balconies and solar panels at roof level
- Block 2, sector 8B, 6 & 7 storey building with 29 no. apartments with balconies and solar panels at roof level
- Block 1, sector 8C, part 4, 5 & 8 storey building with 48 no. apartments with balconies and solar panels at roof level
- Block 2, sector 8C, 4 & 5 storey building with 22 no. apartments with balconies and solar panels at roof level
- 6 no. Communal Residential Community Rooms/Facilities of c. 547 sq.m. located at ground floor level in Block 7 (sector 6A/6B), Block 2 (sector 7), Block 2 (sector 8A), and Block 1 (sector 8B), and external communal amenity space of c. 1.62 ha. provided at ground level throughout the scheme

2. *A ground floor crèche (gross floor area of 800 sq.m.) with dedicated outdoor play area of c. 208 sq.m. is proposed at Block 1, Sector 8A with 14 no. dedicated crèche car parking spaces.*
3. *A total 743 no. car parking spaces are proposed at basement level (605 no. spaces) and at surface level (138 no. spaces including 14 no. crèche car parking spaces) and 1,754 no. bicycle parking spaces for residents and 500 no. bicycle spaces for visitors are proposed in covered and secure parking facilities at ground level throughout the scheme.*
4. *Upgrade the public watermain for c. 170 metres along Red Arches Park to connect to the existing watermain at Red Arches Road as required by Irish Water.*
5. *Pedestrian, cyclist, and vehicular access will be provided at Red Arches Park, Stapolin Avenue, Ireland's Eye Avenue, and Stapolin Way.*
6. *The development will also provide for all associated ancillary site development infrastructure including: ESB sub-stations, bin stores, plant rooms, public lighting, new watermain connection to the south at Red Arches Road, foul drainage to the pumping station at Stapolin Haggarad, and surface water drainage to the west at GA3; roads and footpaths; landscaping; and all associated site development works necessary to facilitate the proposed development.*

The proposed development will integrate with the permitted Strategic Housing Developments at the GA1 lands to the south (ABP ref. TA06F.310418) and GA3 lands

to the west (ABP ref. TA06F.311016) for which an overall total of 2,202 residential units were approved by An Bord Pleanála.

Figure 2.3 *Proposed Site Layout Plan (Source CCH, Sheet Number BALN5-CCH-00-ZZ-DR-A-005)*

2.3.1 Proposed Residential Units

The overall scheme comprises a mix of 1,007 no. apartments including 58 no. studios, 247 no. one bedroom units, 657 no. two bedroom units, and 45 no. three bedroom units. The following table provides a breakdown of the number of units and building heights per development sector:

Table 2.1 *Schedule of units and building heights per development sector*

Sector	Building Heights	No. of Units
6A & 6B	5 - 6	335
7	5 - 12	333
8A	5 - 7, & 11	144
8B	5 - 7, & 11	125
8C	4, 5, & 8	70
Totals	4 - 12	1,007

A detailed breakdown of the proposed accommodation for each sector is provided in the Housing Quality Statements prepared by CCH Architects. The following table details the apartment types per sector within the proposed development:

Table 2.2 *Schedule of apartment types per sector*

Sector	Studio	1-Bed Apt.	2-Bed Apt.	3-Bed Apt.	Totals
6A & 6B	9	106	203	17	335
7	28	60	236	9	333
8A	10	44	83	7	144
8B	11	24	83	7	125
8C	-	13	52	5	70
Totals	58	247	657	45	1,007

With the exception of sector 8C, there is a full mix of studio, 1 bed, 2 bed and 3 bed units in each sector - there are no studio units proposed in sector 8C. There is a further mix of unit types within the 2 bed units through the provision of 94 no. 2 bed 3 person units spread through each sector of the proposal with the exception of sector 8C. The following table outlines the percentage mix of units and the floor area range of the different apartment types:

Table 2.3 *Mix of Units and Floor Area Ranges per Unit Type*

Unit Type	Mix of Units	Floor Area Range
Studio	5.8% (58)	38.1 - 52.3 sq.m.
1 Bed Units	24.5% (247)	48.9 - 79.7 sq.m.
2 Bed 3 Person Units	9.3% (94)	67.3 - 80.42 sq.m.
2 Bed 4 Person Units	55.9% (563)	77.7 - 106.1 sq.m.
3 Bed Units	4.5% (45)	93.5 - 130.66 sq.m.

According to the Planners Report the proposed residential development will provide an appropriate mix of unit types and sizes throughout the Site with a variety of apartment buildings and heights that will create a sense of place between the different residential sectors in GA2.

2.3.2 Proposed Childcare Provision / Creche

The development proposes a purpose built crèche (gross floor area of 800 sq.m.) with dedicated outdoor play area of c. 208 sq.m. is proposed at ground floor level of Block 1, Sector 8A. It is shown with dedicated rooms for babies, 1-2 year olds, 2-3 year olds,

and 3-6 year olds, various nap areas, kitchen prep area, WCs, male and female lockers, ancillary admin./office area, reception, and entrance lobby. There will be 14 no. dedicated crèche car parking spaces adjacent to the proposed creche.

Based on the minimum space requirements for Full Day Care Service or Part-Time Day Care Service in Child Care Act 1991 (Early Years Services) Regulations 2016, the proposed creche could provide up to 161 no. child spaces as follows:

- Babies: (120.12 sq.m allocated @ 3.5 sq.m per child) = 34 child spaces
- 1-2 yr olds: (85.86 sq.m allocated @ 2.8 sq.m per child) = 31 child spaces
- 2-3 yr olds: (92.76 sq.m allocated @ 2.35 sq.m per child) = 39 child spaces
- 3-6 yr olds: (135.30 sq.m allocated @ 2.35 sq.m per child) = 57 child spaces

If the proposed creche is used for sessional pre-school service or a pre-school service in a drop-in centre, there would be capacity for up to 238 child spaces based on the lower minimum of 1.818 square metres of clear floor space is available for each child attending the service.

It is anticipated that a combination of Full Day Care, Part Time Day Care, and Sessional services would be provided as part of a suite of creche accommodation.

2.3.3 Proposed Communal Residential Community Rooms

The development proposes 6 no. Communal Residential Community Rooms/Facilities of c. 515 sq.m. located at ground floor level in Block 7 (sector 6A/6B), Block 2 (sector 7), Block 2 (sector 8A), and Block 1 (sector 8B), and external communal amenity space of c. 1.62 ha. provided at ground level throughout the scheme.

The communal residential community rooms are provided in each of the three development sectors and for convenience they are located at ground floor level. These multi-purpose rooms will be available for use by the residents only through an on-line or similar booking system operated by the management company. The anticipated uses include for private social events such as birthday parties, watching sport or movies, display of local community information, informal indoor exercise areas, and possible hot-desk type work space for persons working from home. The hours of use of the community rooms will be limited to between 8 am to 10 pm Sunday to Thursdays, and 8 am to 11 pm on Fridays and Saturdays.

2.3.4 Proposed Open Space

The applicant has identified c. 6.14 hectares of land for the provision of Class 1 and 2 public open space for the proposed development.

This comprises c. 5.1 hectares for Class 1 public open space at Mayne Road. The land identified for Class 1 public open space is within Fingal County Council's current application for approval to An Bord Pleanála under Section 177AE of the Planning and Development Act 2000 (as amended) to carry out a park development project at the Racecourse Park located between Baldoyle and Portmarnock, Co. Dublin. The minimum requirement for Class 1 public open space in relation to the scale of the proposed development is 3 hectares, therefore the proposed development is indicating 2.1 hectares in excess of the minimum requirement.

The 1.037 hectares for Class 2 public open space is shown within the Haggard (see Figure 2.2), between sectors 8A and 8B, and south of sector 8C. The area identified within the Haggard has not been assigned to any extant permissions at Stapolin-

Baldoyle. The minimum requirement for Class 2 public open space in relation to the scale of the proposed development is 1 hectares, therefore the proposed development will provide in excess of the minimum requirement.

The proposed scheme also includes c. 1.385 hectares of communal open space within the residential courtyards throughout the scheme. The minimum requirement for communal open space in relation to the scale of the proposed development is 0.64 hectares, therefore the proposed development is providing 0.745 hectares in excess of the minimum requirement.

The Planning Report (Kiaran O'Malley and Company Limited, 2022) with this application addresses the provision of public and communal open space, and the location of these areas in greater detail.

2.3.5 Proposed Access, Roads and Parking

Access Arrangements

The proposed development will be accessed via the existing and emerging pedestrian, cyclist and road network within the Coast development including at Red Arches Park, Stapolin Avenue, Ireland's Eye Avenue, and Stapolin Way. The proposed scheme layout has regard to the approved layout plans for GA1 (ABP ref. TA06F.310418) and GA3 (ABP ref. TA06F.311016) and accordingly ties into those layouts.

It is proposed to utilise the two existing access points to the development from Red Arches Road onto Coast Road and from Longfield Road onto Grange Road. Pedestrian and cyclists' movements are fully catered for within the proposed development. Internal footpaths and walkways will be provided which link the proposed development to Red Arches Road and Longfield Road.

Within the development site, the road layout design and traffic management measures ensure low vehicle speeds are maintained on development roads providing a safe environment for cyclists to travel. High quality pedestrian footpaths of minimum width 1.8 metres are provided on both sides of all development roads which provide good pedestrian linkage with all parts of the development and to existing external footpaths on the surrounding road network.

Currently all construction traffic access/egress the Site via the construction route coming from Moyne Road. The route is for construction traffic only and does not interfere with the general public within the greater Baldoyle development.

For further details on access arrangements see Chapter 15 (Traffic and Transportation) of this EIA Report and the application drawings provided.

Car and Cycle Parking

Car parking is provided for residential uses, 605 no. basement spaces, and 124 no. Surface/Visitor Car Parking Spaces; as well as 14 no. Surface /Long-term/Short-term/Drop-off Car Parking Spaces dedicated to the Creche facility. In addition to the car parking, cycle parking is proposed for 1,754 no. Surface Residential Cycle Parking Spaces; and 500 no. Surface Visitor Cycle Parking Spaces.

The proposed car parking strategy at 0.6 basement car parking spaces per apartment will discourage reliance on the private car, resulting in a less negative effect on traffic in the surrounding area and is in line with a number of recent An Bord Pleanala

decisions for similar developments. This strategy agrees with the projection that car ownership levels will not increase in the Baldoyle Area (and throughout the city) due to the increased investment in public transport infrastructure such as Bus Connects, DART and MetroLink.

For further details on car and cycle parking rational see Chapter 15 (Traffic and Transportation) of this EIA Report and the application drawings provided.

Public Transport Accessibility

The proposed development is well located adjacent to existing high quality public transport services. Clongriffin DART station is just over 230 metres from the Site. It caters for all DART services between Malahide and Greystones and a limited number of northern commuter services to and from Drogheda and Dundalk.

There are also a number of existing Dublin Bus services nearby that inter alia provide access to Malahide, UCD, city centre, and Dublin Airport. The latest Bus Connects proposal identifies proposed new routes in the vicinity of the Site including the proposed Clongriffin to City Centre Core Bus Corridor that would originate at Clongriffin DART station.

For further details on public transport accessibility see Chapter 15 (Traffic and Transportation) of this EIA Report .

2.3.6 Architectural Design and Landscape Design

The proposed development has been designed having regard to national, regional and local and regional planning documents. The Design Statement has been prepared by CCH Architects is included with the application documentation. Murray and Associates Landscape Architecture have prepared the Landscape Design Statement and Green Infrastructure Report for the proposed development with the application documentation. This EIA Report should be read in conjunction with all the planning package and reports.

2.4 DESCRIPTION OF CONSTRUCTION AND COMMISSIONING

The works during the construction and commissioning phase are summarised in Table 2.4 below.

Table 2.4 *Summary of key construction works*

Activity	Description of Activity
Site Preparation Works and Establishment of Construction Services	The primary activities that will be required during the Site preparation phase for the development will be the establishment of construction fencing and hoarding and site compound. The Site compound will provide office, portable sanitary facilities, equipment storage, parking etc for contractors for the duration of the works. The Site compound will be fenced off for health and safety reasons so that access is restricted to authorised personnel only. All areas under construction will be fenced for security and safety purposes and temporary lighting supplied, as necessary. Tree protection areas will be established at an early stage in line with the project arborists recommendations. All required enabling works and site investigations, surveying and setting out for structures, archaeological impersonation (if required) etc. are carried out.
Site clearance and earthworks	This phase will include site clearance, vegetation removal, excavations and levelling of the Site to the necessary base level for construction. Surveying and setting out for structures. Rerouting of services/connections to services. Install granular fill for roads and footpaths. The Site preparation works will include the

	demolition and removal of the existing roads, watermains foul and surface water and utility pipework.
Structures	The superstructure will consist of a reinforced concrete frame of columns, walls, beams and slabs. Where the layout allows, precast concrete slabs supported by loading blockwork with suitable horizontal and vertical ties will be utilised. The roofs will be reinforced concrete to support the green roof finish. The basements will be excavated prior to commencement of construction on that phase. Foundations will generally be reinforced concrete pad footings incorporated into the concrete basement slabs. For a number of the higher buildings, it is likely that piles will be necessary to support the greater loading and the associated reinforced concrete pile caps will also be incorporated into the basement slabs. The basement slabs and perimeter walls will be tanked to ensure that ingress of ground water is negligible. All openings to the basement for access or ventilation will be above the calculated 1% AEP flood level with an adequate allowance for climate change and freeboard. Reinforced concrete transfer slabs will be employed at ground floor level to support the superstructures.
Installation of Services	New electricity and telecommunications services infrastructure will be put in place to serve the various buildings. This will be carried out in accordance with the requirements of the various service providers / authorities.
Commissioning & Fit Out	The fit out and commissioning of the units will be completed within the construction duration.
Landscaping	After the main construction works are completed on each phase the hard and soft landscaping and reinstatement works for that phase will be carried out in accordance with the proposed landscaping design.

2.4.1 Site Access, Car Parking, and Traffic Management During Construction

It is proposed that the accesses and haul roads for vehicles will utilising the existing north-south haul road from Mayne Road via a road bridge over the River Mayne (see Figure 2.1 above). The primary construction entrance will be to the north-east of the Site. All construction traffic will use the haulage route to the north. Construction traffic will not be permitted to use Red Arches Road, Red Arches Park or Grange Road/Longfield Road unless permission is obtained from Fingal County Council.

All plant, machinery and equipment will be stored on site within the works area or within the temporary construction compound which will be defined during detailed design/tendering of the project.

The access arrangements and potential traffic safety impacts are considered in Chapter 15 (Traffic and Transportation).

2.4.2 Site levelling and basement excavation

Excavations and levelling of the Site to the necessary base level for construction and the excavation of the basement will require the excavation of an estimated 135,000 m^3 of top soil, subsoils and stones. It is predicted that c. 129,000 m^3 subsoil and stones will be removed from the Site and transported off site and disposed of at a fully authorised soil recovery site.

Soil requiring removal offsite will be removed from site regularly to ensure there is minimal need for stockpiling.

The majority (but not all) of the topsoil c. 6,000 m^3 stripped from the Site will be re-used on site for backfill (levels in some areas need to be raised) and landscaping with some export required. Any surplus topsoil material will be transported off site and disposed of at a fully authorised soil recovery site.

Any excavated material temporarily stockpiled onsite for re-use during reinstatement will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc.

Contractors will be required to submit and adhere to a method statement (including the necessary risk assessments) and indicating the extent of the areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.

2.4.3 Construction Equipment, Techniques and Materials

The typical construction plant equipment expected to be used during the construction phase is:

- Tracked excavator;
- Tracked dumper or tractor and trailer;
- Articulated and rigid trucks ;
- Bulldozers, excavators, backhoes and ancillary equipment;
- Concrete delivery trucks and pumps;
- Scissor, boom and fork lifts Crane, Teleporter; and
- Chains / small tools, concrete vibrator.

There will be a requirement for deliveries of imported engineering fill (sands and gravels), and other construction materials include, steel structure, concrete, cladding, ducting and piping. Construction materials will be brought to site by road.

A 'Just in Time' delivery system will operate to minimise storage of materials. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway. Where possible it is proposed to source general construction materials from the local area to minimise transportation distances.

Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in a secure compound area within the contractors' compound on site. Liquid materials, such as fuels for construction vehicles, will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications) to prevent spillage.

2.4.4 Site Utilities and Infrastructure During Construction

During construction, contractors will require temporary power for onsite accommodation, and construction equipment /plant. The power requirements will be relatively minor. It is anticipated that generators will be provided on site to provide temporary power.

Water will be required for welfare facilities, dust suppression and general construction activities. There will also be foul waste water requirements associated portable sanitary facilities within the construction compound.

The welfare facilities (canteens, toilets etc.) will be available within the construction compound on site. The Site office and welfare facilities will be situated on site at an agreed location within the Site boundary.

The Main Contractor will require a water source for the duration of the construction works. A temporary connection for water supply from Irish Water will not be requested. Instead a combination of tankered water and bottled water will be used. Water will be required for Contractor welfare facilities and construction activities. A combination of tankered water and bottled water will be used in the early phase of construction. Temporary connections to the existing estate services in the existing estate road will be utilised by the Main Contractor to provide service and utilities subject to relevant applications and approvals.

While there is existing surface and foul water infrastructure within the Site this is to be grubbed up and removed during site preparation works. Wastewater generated at the welfare facilities in the construction compound will be managed in the early phase by means of a temporary sealed storage tank, with all wastewater being tankered off-site to an appropriately licensed facility for disposal. Temporary connections to the existing wastewater services in the existing estate road will be utilised to provide service and utilities subject to relevant applications and approvals.

Telecommunications including fibre required during the construction phase will be provided via a mobile connection.

2.4.5 Surface Water Management for the Construction Phase

There shall not be any discharge of ***untreated***, silty, or contaminated water from the works to any watercourse or stormwater network. Should any discharge of ***untreated*** construction water be required during the construction phase, the discharge will be to foul sewer following agreement with Fingal County Council / Irish Water.

There is no significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

The discharge of ***treated*** construction water from rainfall into excavated areas, or from any localised dewatering may be required during construction. This ***treated*** construction water will be discharged to the existing 1500 diameter concrete stormwater main, that traverses underneath the north fringe sewer and discharges to the Mayne River.

2.4.6 Construction Duration and Phasing

It is proposed to carry out the development on a phased basis. Details of the proposed phasing are shown on CCH Architects Drg. No. BALN5-CCH-00-ZZ-DR-A-009. It is envisaged that there will be 5 residential phases of development commencing at sector 8C, 8B, 8A, 6A and B, and 7 i.e. working westwards around Stapolin Haggard.

It is noted that section 6.4.2 of the LAP envisages phasing in accordance with the sector numbering i.e. 6A-6B, 7 and then 8. However, as the haul route into the Site is due northwest of the Site, following the LAP's phasing would result in construction traffic being routed through completed phases in order to access later phases. For example, construction traffic for sectors 8A, 8B and 8C would need to go through Longfield Road between sectors 6 and 7.

It is submitted that the proposed phasing is preferrable to that envisaged in the LAP because it would enable residential blocks to be completed within the development with the minimum construction related impact on the future residents. Further, this

phasing order would extend the development edge to the proposed Racecourse Park and enclose Stapolin Haggard that would benefit the wider residential community within the Coast development. Finally, the applicant is only seeking a standard 5 year planning permission, which should ensure that no time for a 'gap' or interim sites to be created between the northern edge of the LAP lands and Ireland's Eye Avenue.

Estimates for the duration of the construction works are included in the table below. The overall start-to-finish duration is estimated to be 48 months with some development and fit out aspects overlapping..

Table 2.5 *Estimated Construction Duration*

Development Element	Sector	Estimated Construction Duration
Phase 1	8B	12
Phase 2	8C	12
Phase 3	8A	12
Phase 4	6A, 6B	12
Phase 5	7	12

Each of the EIAR chapters will, as appropriate, include an assessment of the potential impact of construction works on their individual environmental aspect and set out the relevant mitigation measures relating to that aspects.

2.4.7 Construction Staffing and Working Hours

Standard working hours for construction will be 8.00 am to 7.00 pm Monday to Friday and 8.00 am to 2.00 pm on Saturday (if required), with no works on Sundays or Bank Holidays except in exceptional circumstances or in the event of an emergency.

During peak construction periods this is expected by up to a maximum of 250 staff and contractors on site per day. Site staff will include; management, engineers, construction crews, supervisors, environment health and safety personal, and maintenance contractors.

All site personnel will be required to wear project notification labelling on high visibility vests and head protection so that they can be easily identified by all workers on-site.

2.4.8 Commissioning and Fit out

Once the superstructure is completed, specialist contractors will be mobilised to complete the fit out commissioning residential units. Commissioning will be carried out on a phased basis as block is completed. Commissioning will be carried out over a period of weeks and is included within the construction timelines in Table 2.3 above.

2.4.9 Landscaping/Reinstatement

Once the majority of the construction works are completed for that phase the landscaping will be completed in accordance with the specification of the project landscape architect and to the agreement with the local authority. A combination of hardscape (paths) and softscape (planting gardens and recreational areas) are proposed.

2.4.10 Construction and Environmental Management

Construction Environmental Management Plan (CEMP)

AWN Consulting and the project team have prepared *Outline Construction Environmental Management Plan (CEMP)* (2022) that is included with the application documentation as Appendix 7.3. This outline and explains the construction techniques and methodologies which will be implemented during construction of the proposed development.

Traffic management and road signage will be in accordance with the *Department of Transport: Traffic Signs Manual - Chapter 8: Temporary Traffic Measures and Signs for Road Works*. The Traffic management and road signage will be set out in the project specific Construction Traffic Management Plan (CTMP) prepared by the main contractor and agreed with the local authority.

The CEMP mitigation measures will be implemented to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The CEMP will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The construction Contractor will provide a further detailed CEMP that will include any subsequent planning conditions relevant to the proposed development and set out further detail of the overarching vision of how the construction Contractor of the proposed development manage the Site in a safe and organised manner.

Construction Surface Water Management Plan (SWMP)

During construction the contamination of surface waters, and run-off from excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.

The Construction Surface Water Management Plan prepared by AWN This SWMP is included as Appendix 7.4 to Chapter 7 (Hydrology). The SWMP aims to set out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the SWMP will be employed on site during the construction phase. All mitigation measures outlined within the SWMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

The main areas of water related concerns covered by the SWMP document are:

- Pre-Construction, Construction Phase drainage controls;
- Management of Earthworks and Materials Storage;
- Surface water runoff protection (sit fences, silt traps, diversion channels);
- Prevention of Accidental Releases (concrete, fuel, and chemical handling); and
- Surface Water Treatment and Discharge, and
- Foul Water And Onsite Sanitation.

The SWMP is live document and will be modified over time as detailed contractor methods of work are developed. If the development is permitted an updated version of

this document will be issued to all parties involved in the construction process when appropriate changes are deemed necessary.

Arboricultural Report and Tree Protection Strategy

An Arboricultural Impact Assessment and Tree Protection Strategy report has bene prepared by Murray and Associates Landscape Architecture that is included with the application. The report provides recommendations for preservation and or removal of trees and hedgerows. The report provides a tree protection plan highlighting which trees are to be removed and/or retained.

Dust Management Plan

A construction stage Dust Management Plan has been prepared by AWN Consulting and is appended to this EIAR (Appendix 9.3). It contains a suite of measures to control dust at the construction site to ensure that no significant nuisance occurs at nearby receptors, and has been informed by international best practice guidance documents. The plan will be implemented in full during the construction works. For further information, refer to Chapter 9 (Air Quality and Climate).

Construction & Demolition Waste Management Plan (C&D WMP)

The demolition waste will be segregated at source where practical and transferred off site for reuse, recycling and recovery, with landfill disposal only to be used where there are no available reuse, recycling or recovery options.

Chapter 16 contains a detailed description of waste management relating to construction of the Proposed Development. A site-specific Construction and Demolition (C&D) Waste Management Plan is included as Appendix 16.1 of this EIA Report. This C&D Waste Management Plan will be implemented to ensure best practice is followed in the management of waste from the Proposed Development.

The majority of construction waste materials generated will be soil from excavation works.

It is expected that volumes of wastes generated (other than excavated material and trees/shubbery) from other construction activities will be negligible and will generally comprise waste generated from construction workers. These wastes would generally be 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 at the Site compound during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

It should be noted that 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 construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the detailed design and construction process.

2.4.11 Potential Impacts and Mitigation Measures During Construction and Commissioning

There are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or the existing drainage ditches associated with demolition, excavations and construction.

In order to manage these short-term impacts the *Outline Construction Environmental Management Plan (CEMP)* prepared by AWN Consulting will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. The specific mitigation measures to address potential environmental impacts, are presented in each individual EIAR chapter.

The main potential impacts during demolition, excavation, construction, and commissioning which require mitigation are:

- Management of run-off water in terms of silt runoff and dewatering (if required) (see Chapter 6 (Land, Soils, Geology & Hydrogeology) and Chapter 7 (Hydrology) for further information);
- Impacts on human beings in terms of nuisances relating to the air quality of the environs due to dust and other particulate matter generated (see Chapter 9 (Air Quality and Climate) for further information);
- Impacts on human beings in terms of nuisances due to plant noise and vibration from equipment (see Chapter 12 (Noise and Vibration) for further information); and;
- Effects on the road network (due to construction workers and other staff attending site (see Chapter 15 (Traffic and Transportation) for further information).

The potential for impacts depends on the type of construction activity being carried out in conjunction with environmental factors including prevailing weather conditions i.e. levels of rainfall, wind speeds and wind direction; as well as the distance to potentially sensitive receptors.

2.5 OPERATION OF THE PROPOSED DEVELOPMENT

The most significant environmental effects are expected to arise during the construction phase; with the potential impacts with the proposed developments operational phase relatively minor.

The proposed development, when operational, will generate typical anthropogenic impacts associated with the usual operation of a large-scale, residential, and apartment complex. The main potential impacts are associated with additional traffic (associated air emissions), and surface and foul water emissions, visual impacts, biodiversity, and wastes generation due to changes from the current undeveloped site to a build environment.

During the operational phase the proposed development will have a Property Management Team. As set out in the Aramark Property Management Strategy Report that are included with the application documentation. The Property Management Team will be primarily responsible for the following:

- Management and implementation of the parking and mobility strategy.

- Management of lease agreements and operational budgeting for the effective management of the common areas.
- Management of contractors and other requirements of efficient building and estate operation.
- Co-ordination of stakeholder and community events and engagement.
- Ensuring that the appropriate standards for resident behaviour are upheld, creating a secure and friendly environment.
- Management of delivery strategies to ensure full access to facilitate deliveries for all stakeholders as required.

The relevant features of the operational phase for the purpose of EIA are described in the corresponding specialist chapters.

2.5.1 Site Utilities and Infrastructure (Resource Consumption)

2.5.1.1 Potable Water

It is proposed to connect the proposed Baldoyle GA2 development to the existing watermain network in the Baldoyle Stapolin LAP lands which is fed by the adjacent North Fringe Watermain. The proposed new watermain layout including the connection to Red Arches Road is shown on the accompanying drawing 20211-JBB-00-XX-DR-C-01002.

The Confirmation of Feasibility issued by Irish Water on the 28th January 2021 (Reference: CDS20004716) confirmed that the water connection was feasible subject to upgrade works. The upgrades outlined are for approximately 200m network extension will be required to connect the Premises to the existing 300mm MOPVC main in Red Arches Rd./Castlerosse Crescent. The connection main should be 200mm ID pipe with a bulk meter and associated telemetry system. An agreement will be reached with Irish Water to progress with the connection, and the Applicant will fund the extension works.

The projected water demand for the residential units is an estimated 407,835 litres per day, with a Average Hour Water Demand of 5.90 litres/sec, and Peak Hour Water Demand of 29.5 litres/sec.

The projected water demand for the Creche (assuming a total of 250 children and staff) is an estimated 15,000 litres per day, with an Average Hour Water Demand of 0.65 litres/sec, and a Peak Hour Water Demand of 3.25 litres/sec.

The combined Average Hour Water Demand is 6.55 litres/sec, and The combined Peak Hour Water Demand 32.75 litres/sec.

During the operational stage of the project, a Water Conservation Plan will be developed by the Management Company which will encourage the residents to adopt water conservation measures in their day to day activities.

Watermain works, Water Conservation Measures, Metering and Pressure Control will be strictly in accordance with Irish Water and Fingal County Council requirements, specifications and standard details.

2.5.1.2 Foul Water

It is proposed to connect the foul sewerage from the development to the existing foul sewer network in the Baldoyle Stapolin LAP lands. The network discharges to an

existing privately owned pumping station in Stapolin Haggard from where it is pumped to the North Fringe Sewer. The proposed new foul sewer network is shown on accompanying drawing 20211-JBB-00-XX-DR-C-01003.

The projected foul flow from the residential units is Combined 6 DWF 31.20 litres/sec. and the projected foul flow from the Creche is as follows Combined 6 DWF 34.32 litres/sec.

A Confirmation of Feasibility was issued by Irish Water on the 28th January 2021 (Reference: CDS20004716). This confirmed that the connection was feasible subject without upgrade works; provided that the connection detail to the adjacent 1600 mm sewer has to be submitted and agreed at Connection Application stage.

Foul sewer construction will comply with Fingal County Council and Irish Water's requirements, specification and standard required to withstand any surcharging effect to the internal network.

2.5.1.3 Stormwater

Planning permission F16A/0412 requires that a storm water wetland is provided in the open space amenity lands to the north of the proposed development as a regional control as recommended in the SuDS Strategy Briefing Document, Baldoyle Stapolin LAP. All storm water from the proposed development will pass through the wetland prior to discharge to Baldoyle Estuary. The wetlands comply with the Storm Water Wetland Briefing Paper, GDSDS.

It is proposed to connect surface water runoff from the proposed development to a new surface water sewer network within the Baldoyle Stapolin LAP lands. Currently, surface water sewers are present in the roads running through the proposed development, but these have had little use since they were installed in the mid 2000s. In addition, the sewers were laid at a depth that will not allow discharge by gravity above the existing North Fringe Sewer to a wetland within the open space to the north as required by the LAP. Consequently, to comply with the LAP, finished ground levels will have to be raised by up to 1.5m and a new surface water network for the proposed development will have to be installed. Details of the proposed new network are shown on accompanying drawing 20211-JBB-00-XX-DR-C-01003. This new network will discharge to a new permitted network to be installed by The Shoreline Partnership for Growth Area 3 (ABP ref. 311016-21). This discharges to a new outfall pipe which traverses over the North Fringe Sewer and discharges into a new permitted wetland in the open space area. The wetland discharges to the Mayne River and ultimately to Baldoyle Estuary through a series of flap valves.

Further details on the proposed design of the surface water drainage is within the Water Services Report (JB Barry, 2022) and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

2.5.1.4 Electricity and Telecommunications

New electrical and telecommunications infrastructure will be developed to serve the proposed development.

2.5.2 Access Arrangements and Parking

The proposed development incorporate several design elements (mitigation by design) intended to mitigate any significant impact on the surrounding road network

during its operational phase. The physical aspects of parking and access arrangement are discussed further the above Section 2.3.5 above and Chapter 15 (Traffic and Transportation).

In its operational phase, the proposed development will generate regular vehicular trips on the surrounding road network. These trips would be predominately from the residents themselves, but also from ancillary users such as crèche staff, waste collection, maintenance of private units and communal areas under contractual agreements.

The requirement for car parking and cycle parking provision has be based on a reduced car parking provision, which shall discourage higher vehicle ownership rates and excessive vehicular trips and a high provision of secure bicycle parking, which shall encourage bicycle journeys by both occupants and visitors.

During the operational phase the proposed development will have a Property Management Team. The service hours are envisaged to be from 08.00 to 20.00 Monday to Friday, Saturday - Sunday 09.00 to 14.00. The Property Management Team will including staffing for onsite management and staff teams, security, access control and CCTV, cleaning of external and internal common areas, waste management, and maintenance of outdoor amenity and landscaping.

Residential Travel Plan prepared by JB Barry and Partners Consulting Engineers that identifies a package of measures to encourage an organisation's residents and visitors to use sustainable forms of transport such as walking, cycling and public transport and to reduce dependency on private car single-occupancy use. The objective of the Residential Travel Plan is to provide a more sustainable approach to the Site's transportation requirements and to improve accessibility. In line with the Baldoyle-Stapolin LAP Objective TM 2, the development seeks to put a strong emphasis on sustainable forms of transport.

2.5.3 Sustainability Energy Efficiency And Resource Use

Included with the application documentation is the *Sustainability & Residential Energy Statement* and *Sustainability & Commercial Energy Statement* prepared by Ethos Engineers. These reports aim to satisfy the legislative planning requirements by addressing how the overall energy strategy of the proposed development has been approached in a holistic manner, striving to meet the highest standards of sustainable building design such as passive solar design, high efficiency systems and use of renewable energy technologies. These reports also address how the proposed development will comply with NZEB (Part L 2021 Dwellings). The principles underpinning Part L compliance are energy demand reduction through passive measures and increased supply from renewable and efficient sources. The proposed design will follow this principle.

The *Sustainability & Commercial Energy Statement* summarises sustainability measures for the proposed development, and states that it will meet the highest standards of sustainable design and construction in line with all applicable regulations and planning requirements. Where feasible the development will aspire to exceed these requirements. In line with the Fingal County Development Plan 2017-2023 the following sustainability considerations will be inherently addressed during design and construction to ensure the overall development;

- Makes most efficient use of land and existing buildings
- Reduces carbon dioxide and other emissions that contribute to climate change

- Is designed for flexible use throughout its lifetime
- Minimises energy use, including by passive solar design, natural ventilation, and vegetation (green roofs etc.) on buildings
- Minimises energy use, including passive solar design and natural ventilation
- Supplies energy efficiently and incorporates decentralised energy systems such as VRF and uses renewable energy where feasible
- Manages flood risk, including application of sustainable drainage systems (SuDS) and flood resilient design for infrastructure and property
- Reduces air and water pollution
- Is comfortable and secure for its users
- Conserves and enhances the natural environment, particularly in relation to biodiversity, and enables ready access to open spaces
- Avoids the creation of adverse local climatic conditions
- Promotes sustainable waste behaviour
- Reduces adverse noise impacts internally and externally

2.5.4 Potential Impacts During Operation and Mitigation Measures

The proposed development shall incorporate several design elements (mitigation by design) intended to mitigate the impact of the proposed development during the operational phase on the surrounding environment.

Each chapter of this EIA Report assesses the potential impact of the operation of the proposed development on the receiving environment. Please refer to each specialist chapter respectively.

2.6 CHANGES TO THE PROJECT

The lifespan of the proposed development is not defined but it is anticipated that it will will be maintained, and periodic upgrading and re-fit undertaken over the long-term (i.e. 15-60 years). In order to demonstrate how the development will be maintained, Aramark have prepared a Building Lifecycle Report and Property Management Strategy Report that are included with the application documentation.

The purpose of the Building Lifecycle Report is to provide an initial assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application, as well as demonstrating what measures have been specifically considered to effectively manage and reduce costs for the benefit of the residents.

The intention of the Property Management Strategy Report is to set out the management strategy for the scheme post construction in order to demonstrate how once operational, the mechanics of the property management and public realm maintenance will work in practice and be maintained to the highest standards.

If the proposed development is no longer required, then full decommissioning and demolition in accordance with prevailing best practice will be undertaken.

2.7 DESCRIPTION OF OTHER RELATED PROJECTS

2.7.1 Irish Water Network Upgrades

As discussed in Section 2.5.1.1 above the Confirmation of Feasibility issued by Irish Water on the 28th January 2021 (Reference: CDS20004716) confirmed that the water connection was feasible subject to upgrade works. The upgrades outlined are for approximately 200m network extension will be required to connect the Premises to the existing 300mm MOPVC main in Red Arches Rd./Castlerosse Crescent. The connection main should be 200mm ID pipe with a bulk meter and associated telemetry system. An agreement will be reached with Irish Water to progress with the connection, and the Applicant will fund the extension works.

These works have been included within the application site boundary, agreement will be reached with Irish Water regarding the undertaker of the works at connection application stage.

2.7.2 Stapolin-Haggard Foul Pumping Station Upgrade

As discussed in Section 2.5.1.2 above the proposed foul network discharges to an existing pumping station in Stapolin-Haggard from where it is pumped to the North Fringe Sewer. The pumping station has not been taken in charge. The pump station currently serves the existing Myrtle and Red Arches developments. The foul pumping station discharges via a 300 mm rising main to the North Fringe Foul Sewer.

This pumping station will be upgraded as required by Irish Water in conjunction with the developer of Growth Areas 1 and 3 in accordance with the conditions of the Memorandum of Agreement dated 24th July 2003 between Helsingor Limited (the registered owner per Folio 3241 and Folio 132779F County Dublin in the Land Registry) and Penshanko Limited that applies to the application site.

2.7.3 Stormwater and Wetland

As discussed in Section 2.5.1.3 above it is proposed to connect surface water runoff from the proposed development to a new surface water sewer network within the Baldoyle Stapolin LAP lands.

Planning permission F16A/0412 requires that a storm water wetland is provided in the open space amenity lands to the north of the proposed development as a regional control as recommended in the SuDS Strategy Briefing Document, Baldoyle Stapolin LAP. The wetland proposed under F16A/0412 was sized based on a treatment volume of 15mm rainfall over 100% of the impermeable site areas (in accordance with the LAP and SuDS Manual C753). The treatment volume has been calculated for the development areas GA1, GA2 and GA3. This wetland has been constructed, and can be seen on Figure 2.1 directly to the north of the proposed development site.

This new network will discharge to a new permitted network to be installed by The Shoreline Partnership for Growth Area 3 (ABP ref. TA06F.311016). This discharges to a new outfall pipe which traverses over the North Fringe Sewer and discharges into a new permitted wetland in the open space area. The wetland discharges to the Mayne River and ultimately to Baldoyle Estuary through a series of flap valves. All storm water from the proposed development will pass through the wetland for treatment prior to discharge to Baldoyle Estuary.

Further details on the proposed design of the surface water drainage is within the Water Services Report (JB Barry, 2022) and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

2.7.4 Potential Impacts from Other Related Projects and Mitigation Measures

As part of the assessment of the impact of the proposed development, account has also been taken of developments that are currently planned, permitted or under construction within the neighbouring residential developments and surrounding areas. The potential for Cumulative Impacts has been addressed in each chapter of this EIA Report.

3.0 PLANNING AND DEVELOPMENT CONTEXT

3.1 INTRODUCTION

This chapter describes the proposed development within the context of the relevant planning policy as it relates to the environment. The proposed development is in the Local Authority area of Fingal County Council (FCC). The proposed development is described in further detail in Chapter 2 (Description of the Proposed Development).

The National and Regional Planning Context has been described in the Planning Report produced by Kiaran O'Malley and Company Limited (KOM, 2022) and included with the application documentation.

This chapter will broadly set out the Local Planning and Development Context and the interaction with the specialist chapters of this EIA report.

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

National Policy Context

- Sustainable Urban Housing – Design Standards for New Apartments (2020)
- Project Ireland 2040 – National Planning Framework (2018 – 2040)
- Urban Development and Building Heights – Guidelines for Planning Authorities (2018)
- Rebuilding Ireland – Action Plan for Housing and Homelessness (2016)
- Design Manual for Urban Roads and Streets (2013)
- Smarter Travel – A Sustainable Transport Future (2009 – 2020)
- Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009)
- Urban Design Manual – A Best Practice Guide (2009)
- The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009)
- Delivering Homes, Sustaining Communities (2007)
- Childcare Facilities – Guidelines for Planning Authorities (2001)

Regional Policy Context

- Eastern and Midland Regional Assembly – Regional Spatial and Economic Strategy (2019 – 2031)
- Transport Strategy for the Greater Dublin Area (2016 – 2035) Local Policy Context

The following sections describe how the proposed development complies with the stated and statutory requirements of FCC with respect to planning and sustainable development. The relevant local planning policy with which the proposed development complies is defined by the:

- Fingal Development Plan (2017 – 2023)
- Baldoyle-Stapolin Local Area Plan (LAP) (2013) (as extended)

3.2 DEVELOPMENT CONTEXT

The proposed development will consist of the construction of 1,007 apartments (consisting of 58 no. studio units (38.1 – 52.3 sq.m.), 247 no. 1 bedroom units (48.9 – 79.7 sq.m.), 94 no. 2 bedroom 3 person units (67.3 – 80.42 sq.m.), 563 no. 2 bedroom 4 person units (77.7 – 106.1 sq.m.), and 45 no. 3 bedroom units (93.5 – 130.66 sq.m.), 6 no. communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a c. 6.1 hectare site located in the townland of Stapolin, Coast Road, Baldoyle, Dublin 13 c. 10 km north-east of Dublin City Centre.

The site forms part of the overall Coast residential community that has been planned on c. 41 hectares of residential zoned land around Clongriffin DART station with the proposed Racecourse Park ABP Reg. Reg.: ABP-311315-21 located to the east, northeast, and north of the overall Coast development.

The site consists of three primary blocks of land for residential development and the associated roadways between and adjoining those development blocks. To facilitate proper phasing of the development of the subject lands, the LAP identifies three Growth Areas: GA1, GA2 and GA3. The subject site is identified as Growth Area 2 (GA2) occupying the northeast sector of the undeveloped lands and consists of an undeveloped greenfield site that is currently vacant, bounded by hoarding. GA1 is due southwest and GA3 is immediately west. The subject site is 6.1 hectares in extent. Figure 3.1 presents the red line boundary for the lands subject to this planning application.

The Shoreline Partnership have received permission to develop the GA1, and GA3 areas as shown on the Figure 3.1 below. GA1 (ABP Reg Ref: ABP-310418-21) the development will consist of the alteration of permitted development, as permitted under FCC Reg. Ref. F16A/0412, ABP Reg. Ref. ABP-248970, as amended, with development now proposed for 882 no. residential dwellings (747 apartments, 135 houses). GA3 (ABP Reg Ref: ABP-311016-21) the development will consist of the development of 1,221 no. residential apartment/duplex dwellings in 11 no. blocks ranging in height from 2 to 15 storeys and including for residential tenant amenity, restaurant/cafe, crèche on a site of 6.89 ha.

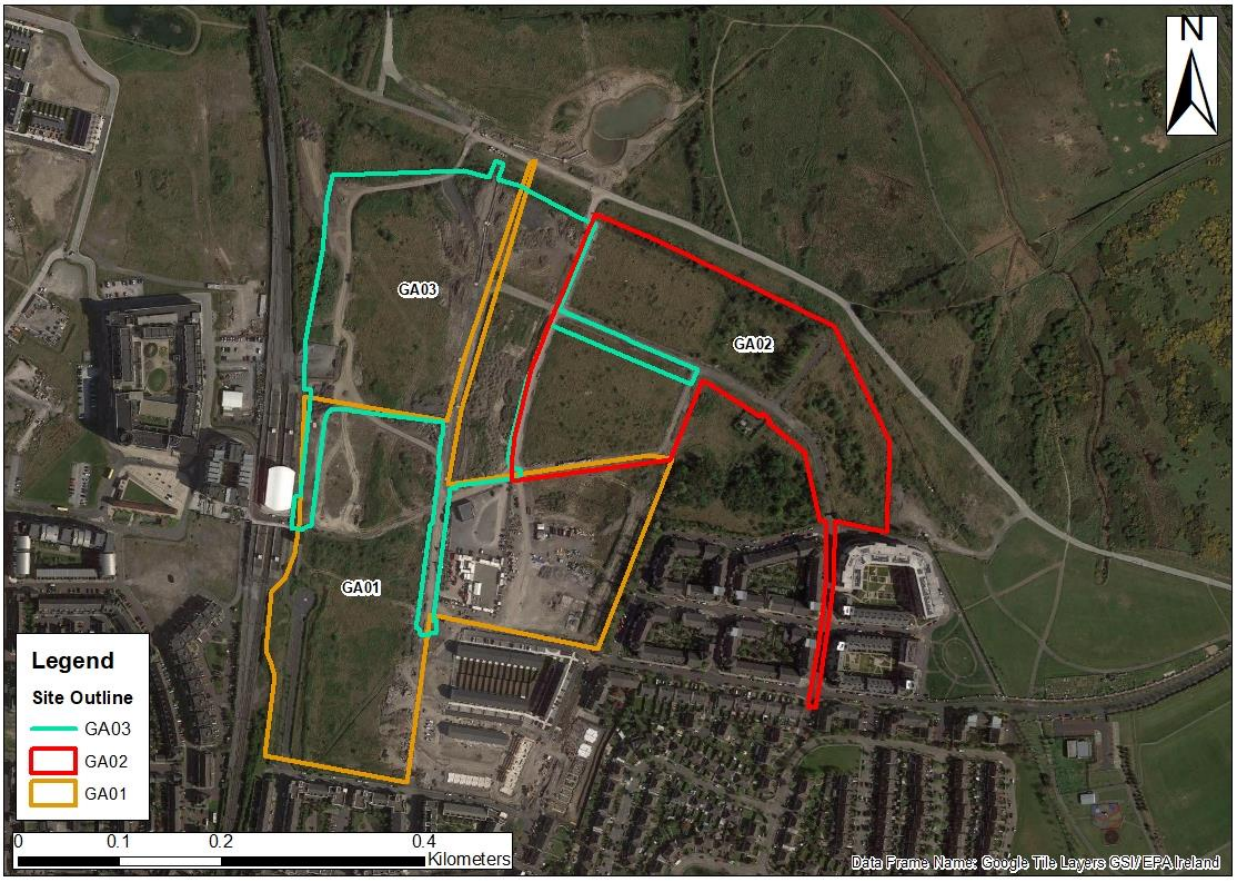

Figure 3.1 *Proposed Development Lands (indicative red boundary)*

The proposed development within GA2 (indicative red boundary in Figure 3.1 above) will occurs along the north eastern boundary of the plan lands, linking to the existing development at the east of the lands, through the open space at The Haggard and Stapolin Avenue, to the village centre along Ireland's Eye Avenue. The north eastern boundary is to the Racecourse Park and the proposed Stapolin Haggard public open space is situated between the site and Red Arches Drive to the south.

The site forms part of a substantial area of undeveloped residential zoned land within Baldoyle-Stapolin. The site is presently rough ground with some development work having been carried out (e.g. access roads, drainage, etc) and some areas covered with hard core. Due to the recent development and construction activity on the site and in the vicinity of the site, there are few landscape features.

The proposed development site is zoned as '*RA – Residential Area'* in the Development Plan, for which the zoning objective is to "*Provide for new residential communities subject to the provision of the necessary social and physical infrastructure*" in the Baldoyle-Stapolin LAP (2013 – 2019).

3.3 NATIONAL POLICY CONTEXT

3.3.1 Sustainable Urban Housing – Design Standards for New Apartments (2020)

Sustainable Urban Housing – Design Standards for New Apartments was published in 2018 by the Department of Housing, Local Government and Heritage. It was subsequently updated in 2020, principally to introduce a presumption against co-living development. It provides standards for apartment developments in a manner consistent with the national level policy, particularly the Housing Agency's National Statement on Housing Demand and Supply, and the Government's National Planning Framework (NPF) and *Rebuilding Ireland – Action Plan for Housing and Homelessness*.

The principal objectives of these policies in relation to housing are to significantly increase supply and ensure that supply is delivered at locations and scales that are appropriate and sustainable. In relation to the location of apartment developments, the Guidelines states that "*Existing public transport nodes or locations where high frequency public transport can be provided, that are close to locations of employment and a range of urban amenities including parks/waterfronts, shopping and other services, are also particularly suited to apartments*".

The site is located is within close proximity to Clongriffin DART station that will become a transport hub with the full implementation of the BUS Connects proposal. Further, the proposal would overlook the Racecourse Park to the east, northeast and north. Consistent with the GA1 and GA3 lands, the subject site is especially suitable for higher density and higher residential development in compliance with the objectives of the apartment guidelines.

The proposed development will provide for a car parking and bicycle parking spaces. The subject site is in very close proximity to existing and planned high quality, and high frequency public transport thus supporting the proposal for reduced car parking as set out in the Apartment Guidelines. Private amenity space is provided for each apartment in the form of balconies and terraces. The proposed development will provide for courtyard communal spaces within each block of the development.

3.3.2 Project Ireland 2040 – National Planning Framework (2018 – 2040)

Project Ireland 2040 is the Government's overarching planning and development policy for the country to 2040. It constitutes a "*strategy to make Ireland a better country for all of its people*" by setting public investment policy at a high level.

The NPF presents ten National Strategic Outcomes (NSOs), *"a shared set of goals for every community across the country".* A corresponding suite of National Policy Objectives (NPOs) are set out with a view to achieving these NSOs.

The following NPOs are of relevance to the proposed development:

- NPO 4 is to "*Ensure the creation of attractive, liveable, well designed, high quality urban places that are home to diverse and integrated communities that enjoy a high quality of life and well-being*."
- NPO 11 states that "*In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and*

generate more jobs and activity within existing cities, towns and villages, subject to development meeting appropriate planning standards and achieving targeted growth."

- NPO 13 further states that "*In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high quality outcomes in order to achieve targeted growth"*.

The proposed development site is well aligned with the NPFs policies, in that it will provide a large number of additional well-designed, high quality and liveable residential units within the DMA and at a Site well served by existing and future proposed public transport services.

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

The Urban Development and Building Heights Guidelines for Planning Authorities (UD & BHGs) were published in December 2018 by the Minister for Housing, Planning & Local Government. They have been published to support the objectives of the NPF, by securing a more compact and sustainable manner of development in urban areas.

The proposed development features new residential buildings ranging in height from four to nine storeys. The proposed range of building heights contravenes the limits set out in the BaldoyleStapolin LAP (2013) as extended, which stipulates an upper limit of 4 – 4.5 storeys with the possibility of increased height for residential development in this area. The LAP also stipulates a general density of 42 – 80+ units / ha across the Site, which the proposed density of 200 units / ha exceeds. The height and density of the proposed development is further addressed in the material contravention statement included with this application.

The Urban Development and Building Height Guidelines were prepared in response to the National Planning Framework and as means of supporting increased density, scale and height of development in the town and city cores. The Guidelines note that "increased building height is a significant component in making optimal use of the capacity of sites in urban locations where transport, employment, services or retail development can achieve a requisite level of intensity for sustainability." The proposed development is consistent with the overriding principle of these Guidelines.

The proposed development has regard to the policy framework set out in the Building Height Guidelines. The proposed development complies with the applicable objectives and therefore it is considered to be in accordance with the provisions of national policy guidelines. The subject site is located in close proximity to existing and planned public transport including Clongriffin DART station, Dublin Bus routes, and BUS Connects. It therefore represents a suitable location for increased building heights and densities

3.3.4 Rebuilding Ireland – Action Plan for Housing and Homelessness (2016)

Rebuilding Ireland is the Government's Action Plan for Housing and Homelessness, launched in 2016. The Plan's aim is to accelerate housing supply by addressing the needs of homeless people and families in emergency accommodation, accelerate the

provision of social housing, deliver more housing, utilise vacant homes and improve the rental sector.

Rebuilding Ireland is set around 5 no. pillars of proposed actions summarised as follows:

> ***Pillar 1*** *– Address Homelessness: Provide early solutions to address the unacceptable level of families in emergency accommodation; deliver inter-agency supports for people who are currently homeless, with a particular emphasis on minimising the incidence of rough sleeping, and enhance State supports to keep people in their own homes.*
>
> ***Pillar 2*** *– Accelerate Social Housing: Increase the level and speed of delivery of social housing and other State – supported housing*
>
> ***Pillar 3*** *– Build More Homes: Increase the output of private housing to meet demand at affordable prices.*
>
> ***Pillar 4*** *– Improve the Rental Sector: Address the obstacles to greater private rented sector delivery, to improve the supply of units at affordable rents.*
>
> ***Pillar 5*** *– Utilise Existing Housing: Ensure that existing housing stock is used to the maximum degree possible – focusing on measures to use vacant stock to renew urban and rural areas.*

The proposed development is consistent with Pillar 3 to build more homes. The proposed development will construct 1,007 new residential units on a strategically located site providing a variety of unit types to suit differently sized households. The provision of these units will substantially add to the residential accommodation availability of the area and cater to the increasing housing demand.

3.3.5 Design Manual for Urban Roads and Streets

The Design Manual for Urban Roads and Streets (DMURS) was adopted by the Department of Transport and the Department of Environment (now Housing) in 2013. The proposed development site is the outcome of integrated urban design and landscaping to create lower traffic speeds through the Site and, thereby, facilitate a safer environment for pedestrians and cyclists.

Statement of Consistency with DMURS prepared by J.B. Barry & Partners is included with the application. .

3.3.6 Smarter Travel – A Sustainable Transport Future (2009 – 2020

Smarter Travel – A Sustainable Transport Future (2009 – 2020) outlines the Government's goals to achieve transport sustainability. The proposed development site will promote sustainable personal mobility decisions by virtue of its proximity to existing and future proposed public transport services (including its location immediately adjacent to the Clongriffin rail station), and the proposal to minimise car parking provision while maximising bicycle parking (one space per bedroom, not including additional visitor spaces) and providing other cyclist facilities. The proposed development site will also provide electric vehicle (EV) charging points.

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

The Department of Environment, Heritage and Local Government's Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009) sets out the key planning principles guiding the delivery of residential development in urban areas in Ireland. The proposed development site is situated immediately adjacent to the existing rail station at Clongriffin and in area served by existing and future proposed public bus services, is consistent with this policy.

3.3.8 Urban Design Manual – A Best Practice Guide

The Urban Design Manual provides best practice guidance on the practical implementation of the policies contained in the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009). The criteria of the Urban Design Manual have been given due consideration in the design of the proposed development site.

3.3.9 The Planning System and Flood Risk Management – Guidelines for Planning Authorities

The Planning System and Flood Risk Management – Guidelines for Planning Authorities was published by the Office of Public Works (OPW) and Department of Environment, Heritage and Local Government in 2009. The guidelines introduce comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process.

The proposed residential properties are situated in Flood Zone C and protected from inundation up to the 0.1% predicted annual exceedance probability (AEP) tidal event.

3.3.10 Delivering Homes, Sustaining Communities – Statement on Housing Policy (2007)

The Department of Environment, Heritage and Local Government's 2007 policy statement, Delivering Homes, Sustaining Communities – Statement on Housing Policy, provides an overarching policy framework for an integrated approach to housing and planning.

It is considered that the proposed development site is consistent with the vision for housing set out in the Statement, in that it will provide high quality residential units that is strategically located in terms of proximity to existing community amenities, public transport services and employment hubs. Refer to the Schools & Childcare Assessment and the Community & Social Infrastructure Audit.

3.3.11 Childcare Facilities – Guidelines for Planning Authorities (2001)

Childcare Facilities – Guidelines for Planning Authorities (2001) provide a framework to guide Local Authorities in preparing development plans and assessing applications for planning permission, and developers and childcare providers in formulating development proposals. It is proposed to provide a creche facility to cater for the projected demand from the future residents of the proposed development. The proposed crèche, in

combination with existing and permitted crèches in the wider area, will meet residents' demand for childcare facilities.

3.4 LOCAL PLANNING CONTEXT

3.4.1 Eastern and Midland Regional Assembly – Regional Spatial and Economic Strategy (2019 – 2031)

On 28th June 2019, the Regional Spatial and Economic Plan for the Eastern Midlands Region 2019-2031 (RSES) was made by Eastern Midlands Regionals Assembly (EMRA). This strategic plan and investment framework will shape the future of the Region to 2031 and beyond as per the Vision Statement. "To create a sustainable and competitive Region that supports the health and wellbeing of our people and places, urban and rural, with access to quality housing, travel and employment opportunities for all."

Consistent with the provisions of the NPF, the RSES supports continued population and economic growth in Dublin City and suburbs, with high quality new housing promoted and a focus on the role of good urban design, brownfield redevelopment and urban renewal and regeneration. The RSES notes that the NPF sets out ambitious targets to achieve compact growth with 50% of housing to be provided within or contiguous to the built-up area of Dublin City and suburbs, which includes the subject site. As a result, regional planning objective (RPO) 4.3 that is set out below applies:

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

Chapter 5 of the RSES focuses on the Dublin Metropolitan Area Strategic Plan (MASP) that also applies to the site at Stapolin, Baldoyle. To achieve the vision for the MASP, there are a number of guiding principles for the sustainable development of the Dublin Metropolitan Area that inter alia include the following:

- Compact sustainable growth and accelerated housing delivery – To promote sustainable consolidated growth of the Metropolitan Area, including brownfield and infill development, to achieve a target of 50% of all new homes within or contiguous to the built-up area of Dublin City and suburbs, and at least 30% in other settlements. To support a steady supply of sites and to accelerate housing supply, in order to achieve higher densities in urban built up areas, supported by improved services and public transport.
- Integrated Transport and Land use – To focus growth along existing and proposed high quality public transport corridors and nodes on the expanding public transport network and to support the delivery and integration of 'Bus Connects', DART expansion and LUAS extension programmes, and Metro Link, while maintaining the capacity and safety of strategic transport networks.

The proposed development is supported by both of these guiding principles. The proposed development seeks to provide a high-density residential development with appropriate building heights within the overall Coast development on land that is

strategically located within the Dublin Metropolitan Area. The proposal is therefore fully compliant with the overall policies and objectives of the RSES for the Eastern and Midland Region as it relates to Baldoyle-Stapolin.

3.4.2 Fingal County Council Development Plan 2017 – 2023

The development strategy for the development seeks to utilise existing infrastructure such as roads and public transport in an area which has been designated to be consolidated within Dublin's North Fringe (new residential zone straddling Dublin City Council and FCC areas, at the northern edge of Dublin City).

In the Development Plan, Baldoyle is considered a '*Consolidation Area within the Gateway*'. The policy approach in these areas is "*to gain maximum benefit from existing transport, social, and community infrastructure through the continued consolidation of the city and its suburbs. Future development will happen in a planned and efficient manner utilising opportunities to achieve increased densities where appropriate*" (p. 45). Objective SS16 is to *"Examine the possibility of achieving higher densities in urban areas adjoining Dublin City where such an approach would be in keeping with the character and form of existing residential communities or would otherwise be appropriate in the context of the site*".

The proposed development site will provide a well-designed, high quality and a higher density mixed-use (predominantly residential) development on appropriately zoned lands, which are well served by public transport (public bus and rail), supporting the delivery of planned sustainable mixed use residential development in Baldoyle, as envisaged in the Development Plan.

3.4.3 Baldoyle-Stapolin Local Area Plan 2013 – 2019

The Baldoyle Stapolin Local Area Plan 2013 was adopted by FCC in May 2013 and was extended up to 11th May 2023 by Council decision pursuant to section 19 of the Planning and Development Act 2000 (as amended). The Local Area Plan lands comprise the site of former Baldoyle Racecourse and Stapolin House. There is c. 41 hectares of residential zoned land, c. 81 hectares of high amenity areas, and lands within the development boundary subject of various local objectives including a retirement village.

As noted in the LAP, the initial masterplan for Stapolin Village and the Baldoyle Action Area Plan envisaged approximately 2,600 homes on the c. 41 hectares of residential zoned land. In 2013, development within the LAP was largely at a standstill notwithstanding that Clongriffin DART station was constructed and operational.

The lands south, southwest, and west of the subject site are also zoned for residential development whereas the lands to the north and east are zoned HA High Amenity with an objective to protect and enhance high amenity areas.

In relation to housing mix, the LAP requires that "*a suitable variety and mix of dwelling types and sizes are provided in developments to meet different needs, having regard to demographics, social changes and the human life cycle patterns*", and aims to ensure that "*one-bedroom dwellings are kept to a minimum within the development and are provided only to facilitate choice for the homebuyer*".

The proposed development site meets the requirements for infrastructure on the LAP lands. It is considered that the proposed development is consistent with the objectives of the LAP. As part of the assessment of the impact of the proposed development, account has been taken of relevant developments that are currently permitted, or under construction and substantial projects for which planning has been submitted within the surrounding areas.

3.5 SITE PLANNING HISTORY

There have been two previous planning applications for residential development on the subject site, an extension of duration application and an application for infrastructural development to facilitate residential development.

Reg. Ref. F03A/1529 (PL 06F.205508)

This was a planning application by Ballymore Properties Ltd. for: "Infrastructural development consisting of internal roads infrastructure and associated piped services infrastructure. This application was approved by FCC but modified on appeal to An Bord Pleanála (ABP) by the applicant. The approved development provided for the construction of roads, drainage, water supply, etc. for the overall Baldoyle Stapolin development.

Reg. Ref. F07A/1561 (PL 06F.228026)

This was a planning application by Regents Park Developments Limited for 422 no. residential units, 6 no. retail units, a creche and ancillary site development works. Planning permission was refused by FCC for 7 no. reason. That decision was appealed to ABP who refused planning permission citing a single reason for refusal.

Reg. Ref. F11A/0290 (PL 06F.239732)

This was a second planning application by Regents Park Developments Limited for 400 no. dwellings units, 3 no. retail units, a crèche, etc. and ancillary site development works. Planning permission was again refused by FCC for 7 no. reasons. That decision was appealed to ABP who overturned the local authority decision and granted planning permission subject to 23 no. conditions.

Reg. Ref. F11A/0290/E1

On March 2018, an application to extend the duration of planning permission F11A/0290 was submitted to FCC. By order dated 10th May 2018, the Council issued a decision to extend the duration of the planning permission up to 23rd May 2023.

3.6 PLANNING HISTORY ON OTHER UNDEVELOPED RESIDENTIAL

The Fingal County Council, Dublin City Council and An Bord Pleanála online planning search system was consulted for the previous 5 years to generate a list of granted planning permissions from the area surrounding proposed development**.** Table 3.1 below shows the notable applications granted permission within that period.

It is important to note that each project currently permitted shown in the table is subject to an EIA and/or planning conditions which include appropriate mitigation measures to minimise environmental impacts.

Any new development proposed on the lands after the submission of the proposed development would be accompanied by and EIA, or EIA Screening as required and the take into consideration the development of this site.

Table 3.1 *Planning Applications and Permitted*

Application Reference	Description
Location: In townlands of Stapolin and Baldoyle, Co Dublin **Applicant:** Fingal County Council **Planning Reference:** ABP-311315-21 **Status:** due for decision	This is an application by Fingal County Council to An Bord Pleanála under Section 177AE of the Planning and Development Act 2000 (as amended) to carry out a park development project at the Racecourse Park located between Baldoyle and Portmarnock, Co. Dublin. The proposed development consists of the following works on a c. 84 hectare site:
Location: Lands at Baldoyle (Formerly known as the Coast, Dublin 13 **Applicant:** The Shoreline Partnership **Planning Reference:** F22A/0017 **Status:** GRANT PERMISSION 25 Feb 2022	The site is bounded to north by undeveloped lands, to the south by the residential development of Myrtle, to the east by residential development of Red Arches, and to the west by undeveloped lands and the Dublin - Belfast railway line. The development consists of minor alterations to permitted residential development, as permitted under F16A/0412, ABP Ref: PL06F.248970 as amended under F20A/0258 and F21A/0046. The proposed alterations relate to Blocks C2, and C3 only and primarily relate to the alteration of external finishes and material of permitted housing units. Proposed alterations to the permitted floor areas of each building typology with either a minor increase or decrease in floor areas from 0.5 sq.m. to 5 sq.m. varying across permitted typologies.
Location: Lands at Baldoyle/Stapolin, referred to as GA03 Lands in the Baldoyle-Stapolin **Applicant**: The Shoreline Partnership **Reference**: ABP-311016-21 **Status**: Grant Permission 23 November 2021	The proposed development will consist of the development of 1,221 no. residential apartment/duplex dwellings in 11 no. blocks ranging in height from 2 to 15 storeys and including for residential tenant amenity, restaurant/cafe, crèche on a site of 6.89ha.
Location: GA1 Lands at Baldoyle (adjacent lands formerly known as the Coast), Baldoyle, Dublin 13. **Applicant:** The Shoreline Partnership	The proposed development will consist of the alteration of permitted development, as permitted under FCC Reg. Ref F16A/0412, ABP -248970 (and as amended under F20A/0258 and F21A/0046, for the development of 544 no. residential units (385 no. apartments and 159 no. houses) retail and a creche (99 no units of which in Blocks C4 C5 and C6 (previously indicated as D1) are under construction) with development now proposed for 882 no. residential dwellings (747 apartments, 135 houses) in 15 no. blocks ranging in height from 2 to 15 storeys and including for residential tenant amenity, retail/cafe/restaurant, pharmacy, medical centre, creche, gym, car bicycle parking and public realm, over a site area of approx 9.1 ha of which the development area is 8.89ha. The proposed alterations result in an overall increase of

Planning Reference: ABP 310418-21 **Status:** GRANT PERMISSION, 22 Sep 2021	437 no. units and a total permitted development of 981 units in total under F16A/0412, ABP 248970 as amended. The propsed development relates to the alteration of development previously permitted at Blocks A1, A2, A3, B1, B2, B3, B4, C1, C2 & C3 and new proposed Blocks D1,D2, & D3 to the north of Stapolin Square as follows.
Location: Lands at Baldoyle (Formerly known as the Coast, Dublin 13 **Applicant:** The Shoreline Partnership **Planning Reference:** F21A/0046 **Status:** GRANT PERMISSION, FINAL GRANT 27 Apr 2021	The site is bounded to north by undeveloped lands, to the south by the residential development of Myrtle, to the east by residential development of Red Arches, and to the west by undeveloped lands and the Dublin - Belfast railway line. The development consists of minor alterations to permitted residential development, as permitted under F16A/0412, ABP Ref: PL06F.248970 as amended under F20A/0258. The proposed alterations relate to Blocks B3, B4,C3, C4 and C5 only and relate to either: Proposed alterations to some of the permitted Unit Types in respect of their external design which relates primarily to roof and porch design as well as external finishes, minor internal reconfiguration and removal or alteration of permitted solar panels. This proposed replacement and alteration of permitted unit types results in a reduction in permitted units by 5. Permission is also sought for the resultant increase in car-parking from 98 permitted spaces to 122 spaces relating to the subject units and for the alterations to permitted landscaping as a result of the proposed development.
Location: Lands at Baldoyle, (formerly known as The Coast), Dublin 13 **Applicant:** The Shoreline Partnership **Planning Reference:** F20A/0258 **Status:** GRANT PERMISSION; FINAL GRANT 03 Sep 2020	Minor alterations to permitted residential development, as permitted under F16A/0412, ABP Re. Ref; PL06F.248970. The prposed alterations relate to Blocks C4, C5 and D1 only and primarily relate to the alteration of external finishes and material of permitted housing units including the: Omission of permitted fireplaces and chimneys; Alterations to permitted fenestration including vertical frame sections, transoms and mullions, of windows and doors to front and rear of houses; Alteration of permitted rear flat roof to pitched roof on Building Types A & D; removal of permitted decorative balustrades; Alterations of the permitted brickwork finish to the rear and side elevations of the houses with a render finish; Alteration of permitted bin stores to include brick finishes; Removal of permitted solar panels from Building Types A,B,D,E,F G and alterations of permitted solar panels on Building Types K & N.
Location: Parkside 4, Parkside Boulevard, Dublin 13 **Applicant**: Cairn Homes Properties Limited **Reference**: ABP-305623-19 **Status**: Grant Permission 06 February 2020	The proposed development will comprise a residential scheme 282 residential units in 4 apartment blocks ranging in height from 3 to 7 storeys in height, the continuation of the Mayne River Linear Park and all associated development works.
Location: Lands at Clongriffin, Dublin 13 on plots known as 3, 13 and 15, located to the south of Park Street, east of Friars' Street and north of Main Street (plot 3) to the north of	Planning permission is sought for development at lands at Clongriffin, Dublin 13, on plots known as 3, 13 and 15, located to the south of Park Street, east of Friars' Street and north of main Street (plot 3), to the north of Market Street, south of Dargan Street, east of Lake Street and west of Clongriffin Road (plot 13), to the north of Main Street, south of Market Street, west of Station Square and east of Market Lane (plot 15); all of which are located to the north of Main Street, Clongriffin, Dublin 13. The development will consist of the construction of a mixed-use development (within 3 no blocks,

Market Street, south of Dargam Sreet, east of Lake Street and west of Clongriffin **Applicant:** Gerard Gannon Properties **Planning Reference:** 3894/19 **Status:** GRANT PERMISSION 20 Mar 2020	i.e. Blocks 3, 13 and 15) comprising of 420 no. apartment units (127 no. one beds, 273 no. two beds and 20 no. three beds) of which 233 no. units are residential and 187 no. units are 'build to rent' with ancillary residential amenity facilities; 14 no. retail units, 1 no. 8 screen cinema, 4 no. cafes/restaurants and 10 no. floors of commercial office suites.
Location: Plots 6, 8, 11, 17, 25, 26, 27, 28 & 29 to the North and South of Main Street, Clongriffin, Dublin 13 **Applicant**: Gerard Gannon Properties **Reference:** ABP-305316-19 **Status:** Grant Permission 13 December 2019	The development will consist of the construction of a mixed-use development (within 9 number blocks i.e. Blocks 6, 8, 11, 17, 25, 26, 27, 28 and 29) comprising of 1,030 number apartment units (421 number one-beds, 541 number two-beds, and 68 number three-beds) of which 352 number units are residential and 678 number units are 'build to rent' residential units with ancillary residential amenity facilities; two number crèches, 10 number retail units and one number gym.
Location Plots 4, 5 & 14 to the north of Main Street,Clongriffin, Dublin 13 **Applicant** Gerard Gannon Properties **Reference** ABP-305319 **Status:** Grant With Conditions 13/12/2019	The development will consist of the construction of a mixed-use development (within three number blocks i.e. Blocks 4, 5 and 14) comprising of 500 number apartment units (49 number studios, 167 number one-beds, 259 number two-beds, and 25 number three-beds) of which 235 number units are residential and 265 number units are 'build to rent' residential units with ancillary residential amenity facilities; one number crèche, one number community centre, one number men's shed, three number cafés/restaurants, six number retail/commercial units
Location Lands at Clongriffin Dublin 13 on plots known as 3 13 and 15 located to the south of Park Street east of Friars' Street and north of Main Street (plot 3) **Applicant** Gerard Gannon Properties **Reference** **Status:**	Planning permission is sought for development at lands at Clongriffin, Dublin 13, on plots known as 3, 13 and 15, located to the south of Park Street, east of Friars' Street and north of main Street (plot 3), to the north of Market Street, south of Dargan Street, east of Lake Street and west of Clongriffin Road (plot 13), to the north of Main Street, south of Market Street, west of Station Square and east of Market Lane (plot 15); all of which are located to the north of Main Street, Clongriffin, Dublin 13. The development will consist of the construction of a mixed-use development (within 3 no blocks, i.e. Blocks 3, 13 and 15) comprising of 420 no. apartment units (127 no. one beds, 273 no. two beds and 20 no. three beds) of which 233 no. units are residential and 187 no. units are 'build to rent' with ancillary residential amenity facilities; 14 no. retail units, 1 no. 8 screen cinema, 4 no. cafes/restaurants and 10 no. floors of commercial office suites.
Location: Blocks 25, 26 and 27, Marsfield Crescent, Clongriffin,	3 residential blocks: Block 25 (B25), Block 26 (B26) and Block 27 (B27) and all associated works required, including 181 car parking spaces over the 3 sites at Marsfield Crescent, Clongriffin, Dublin 13. Block 25 consists of 48 units over 7

Dublin 13 **Applicant**: Gannon Homes Ltd. **Reference**: 2648/17 **Status**: GRANT PERMISSION 05 Jan 2018	stories at a height of 31.5 m. Block 26 consists of 71 units over 14 stories and is 56.4 m at its highest point. Block 27 consists of 48 units over 6 stories with a height of 27.85 m. Block 27 also consists of a single storey underground basement car park and a crèche facility incorporated to part of Ground Floor Level. The 167 apartment units are made up of 42 one bedroom units, 99 two bedroom units, and 26 three bedroom units. The 3 residential blocks form part of the overall development plan for the Clongriffin development.
Location: Lands at Baldoyle, (formerly known as The Coast), Dublin 13 **Applicant:** Joint Statutory Receivers / Helsingor Limited (In Receivership) **Planning Reference:** F16A/0412 & PL06F.248970 **Status:** Grant Permission by An Bord Pleanala on 23 Nov 2017	550 no. residential units (379 no. apartments and 171 no. houses) and a village centre comprising C.1,585sq. m. of commercial floor space laid out in 13 no. blocks (Blocks A1, A2, A3, B1, B2, B3, B4, C1, C2, C3, C4, C5 and D1) ranging in height from two storeys to six storeys. All apartments and duplex apartments have private terraces or balconies and private communal amenity areas. The proposed development will also include 896 no. residential (including visitor) car parking spaces, 62 no. commercial car parking spaces, 551 no. residential bicycle spaces and 13 no. commercial bicycle spaces; pedestrian, vehicular and bicycle access will be via the existing Longfield Road and Red Arches Road and the proposed internal road network comprising Stapolin Avenue, Ireland's Eye Avenue and smaller access roads; construction access will be via existing haul road from the Coast Road; landscaping works including Stapolin Square (c. 0.4ha) which will provide access to Clongriffin Train Station via a series of terraces, steps and slopes, a range of public open spaces including pocket parks and amenity spaces, the largest of which will be Stapolin Haggard (c. 1.57ha); public lighting; a wetland area (c. 0.4ha.) for water quality treatment associated with the proposed development; all associated ancillary facilities including 8 no. ESB substations, switch rooms, refuse storage, water storage tanks and plant; and all associated site development works including the removal of existing roads and infrastructure where required and demolition of existing temporary lift and stair enclosure and associated infrastructure to Clongriffin Train Station. The subject site of C 15.89ha comprised Growth Area 1 of the Baldoyle-Stapolin Local Area Plan 2013-2019. This application is accompanied by an Environmental Impact Statement (E.I.S.)
Location: Block 17, Station Square, Clongriffin, Dublin 13 **Applicant**: Gannon Properties **Reference**: 3634/16 (PL 29N.248713) **Status**: Grant Permission by Dublin City Council and ABP 23 Nov 2017	Planning permission is sought for a development consisting of 28 one bedroom, 97 two bedroom and 14 three bedroom apartments with ancillary common facilities including meeting rooms, gym, cycle park, concierge, entrance courtyard and roof gardens; 5 retail units (c.427 sqm total); and with 139 carspaces and ancillary engineering facilities at basement level; ESB substation and provision for antennae at top roof level. All comprised in a building ranging in height from 6 to 16 floors accessed from Station Square, Station Hill and Dargan Lane, Clongriffin with parking access off existing Block 16 down ramp from Dargan Lane.
Location: 11, Station Square, Clongriffin, Dublin 13 **Applicant**: Gannon Properties **Reference**: 2955/17 **Status**: GRANT PERMISSION 23 Aug 2017	Revisions to development permitted under Reg.Ref.: 5945/04. Revisions consist of change of use (136 sq.m) from a retail unit use to use as a Community Meeting Room with a total floor area of 136 sq.m, and all ancillary works to facilitate this proposed use. Car parking provision is as permitted under Planning Reg. Ref. 5945/04 and signage is as permitted under Planning Reg.Ref. 2176/06.

Location: Block 19, Station Square, Clongriffin, Dublin 13 **Applicant**: Gannon Properties **Reference**: 2569/17 **Status**: GRANT PERMISSION, 28 Jun 2017	Permission is sought for development of a new hotel, located at the site known as Block 19, Station Square, Clongriffin, Dublin 13. The site is located on the south side of Station Square, Clongriffin, Dublin 13 and is bounded by station square to the North, Railway Road to the west and south west, Station Way to the south east and the proposed Block 17 (current planning application reg.Ref.3634/16) to the east. Heights vary from 7 storeys over basement carpark on Station Square to 4 and 5 storeys over basement on the other street frontages. The development will comprise principally. 209 guest bedrooms, hotel bar/restaurant/front of house reception areas, main and secondary function rooms and meeting rooms, kitchen/service/ancillary facilities, fitness suite, service and plant areas, 20 apartments (with balconies) for short term letting for holiday and business use, (4 x 3 bed, 8 x 2 bed, 4 x2 bed+study, 4 x 1 bed), basement carpark, controlled carpark access ramps, electrical substation, external illuminated signage, site services and site development works, minor repositioning of existing bus stop, soft and hard landscaping. Applicant: Gannon Properties.
Location: 4, Clongriffin Road, Clongriffin, Dublin 13 **Applicant**: Gannon Properties **Reference**: 2876/16 **Status**: GRANT PERMISSION 16 Aug 2016	Permission for change of use from previously approved shop unit to Day Activity Centre and associated minor alterations to front elevation including new double doors and signage panel.
Location: In townlands of Stapolin and Baldoyle, Co Dublin **Applicant:** Helsingor Ltd **Planning Reference:** F03A/1162/E3 **Status:** GRANT EXTENSION OF DURATION OF PERM. 07 Oct 2014	Construction of 478 residential units, comprising 35 no. 4 bedroomed semi-detached 2-storey and 3-storey terraced houses; 27 no. 3 bedroomed 2-storey semi detached and terraced houses; and 40 no. 2 bedroomed 2 storey terraced houses; 48 no. 1 bedroomed duplex apartments in 3 and 4 storey buildings; 48 no. 2 bedroomed duplex apartments in 3 storey buildings; 73 no. 3 bedroomed duplex apartments in 3 and 4 storey buildings; 33 no. 3 bedroomed and 33 no. 2 bedroomed duplex apartments in 3 storey buildings; 119 2 bedroomed apartments and 22 no. 3 bedroomed apartments in 4 and 5 storey buildings; 1 no. 2 storey retail unit (118 sq.m.) and 1 no. creche (545 sq.m.); basement, semi basement and surface car parking; and ancillary works including storm water storage pond, temporary water supply reservoir, roads and services infrastructure; on land (measuring c.25.7ha (63.5 acres) in Stapolin and Baldoyle townlands, with vehicular signal-controlled junction access from Grange Roundabout access from Strand Road (R106). The proposal comprises Phase 2 in the development of an integrated urban community as provided for in the Baldoyle Action Plan prepared by Fingal County Council. Provision has also been made for roads and services infrastructure to sustain future development of Sectors 42, 43, 47, 54-58 inclusive. In accordance with the requirements of that Action Plan, a Masterplan and EIS have been prepared for the development of a new urban area and have previously been lodged with Fingal County Council to establish the context within which the proposed phased development will be assessed. This Planning application is accompanied by an Environmental Impact Statement (Baldoyle Phase 2 EIS)

3.7 CONSULTATION

The Applicant and the project team have liaised with the relevant departments of Fingal County Council (FCC) and An Bord Pleanála (ABP) in advance of lodgement of this application.

In accordance with Section 5(2) of the Planning and Development (Housing) and Residential Tenancies Act, 2016 and pursuant to Section 247 of the Planning and Development Act, 2000 as amended, the Prospective Applicant's design team attended by Microsoft Teams pre-planning meetings with Fingal County Council, on 2nd September 2020, and 16th December 2020. The relevant planning and technical issues relating to the development proposals were identified and discussed between the design team and their respective opposite number in FCC.

In accordance with Section 5 of the Planning and Development (Housing) and Residential Tenancies Act 2016 and the Planning and Development (Strategic Housing Development) Regulations, 2017, a pre-application consultation request was submitted to An Bord Pleanála on 4th March 2021. A tri-partite Meeting was held with Fingal County Council, An Bord Pleanala, and the prospective applicant's design team on 20th May 2021. An Bord Pleanála issued its opinion on the 24th June 2021.

In addition, relevant specialists in the proposed development project team have liaised with statutory bodies (including the Water Services, Roads/Transportation, National Parks and Conservation, Irish Water and ESB, by correspondence during the course of the EIA Report preparation.

The structure, presentation and the non-technical summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. A 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. Public participation in the EIA process will be effected through the statutory planning application process. Information on the EIAR has also been issued for the Department of Housing, Planning and Local Government's EIA Portal.

3.8 SEVESO AND COMAH SITES

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous

substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The proposed development is not located within close proximity or within statutory consultation distances of any Seveso Site. The nearest Seveso Site is Exolum Aviation Ireland Ltd at Dublin Airport, at a c. 6 km linear distance from the proposed development. The statutory consultation distance for this Seveso Site is 400 m. There are also a cluster of Seveso Sites at Dublin Port and Ringsend (c. 7 – 8 km linear distance), but none of these are within consultation distance of the proposed development. It follows that the proposed development is not likely to be affected by an accident at any Seveso Site in the wider area; and vice versa, nor is any Seveso Site likely to be affected by the proposed development itself.

3.9 CONCLUSIONS

The proposed development is in accordance with the policies and objectives of the National Spatial Strategy, Draft Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly, and the Fingal Development Plan 2017 - 2023, and the Baldoyle-Stapolin LAP 2013-2019.

The proposed development is well located adjacent to existing high quality public transport services. Clongriffin DART station is just over 230 metres from the site. It caters for all DART services between Malahide and Greystones and a limited number of northern commuter services to and from Drogheda and Dundalk.

The site context does not include any significant Seveso / COMAH or Industrial Emissions licenced sites. The nearest Seveso Site is Exolum Aviation Ireland Ltd at Dublin Airport, at a c. 6 km linear distance from the proposed development. The statutory consultation distance for this Site is 400 m. There are also a cluster of Seveso Sites at Dublin Port and Ringsend (c. 7 – 8 km linear distance), but none of these are within consultation distance of the proposed development. It follows that the proposed development is not likely to be affected by an accident at any Seveso Site in the wider area; and vice versa, nor is any Seveso Site likely to be affected by the proposed development itself.

The proposed development site is zoned as 'RA – Residential Area' in the Development Plan, for which the zoning objective is to "*Provide for new residential communities subject to the provision of the necessary social and physical infrastructure*". The context of the site is described further in Chapter 2 (Description of Development) and Chapter 3 (Planning and Development Context).

In the Development Plan, a number of specific objectives are set out in relation to Baldoyle, including to "*Prepare and/or implement a LAP for lands at Baldoyle / Stapolin to provide for the strategic development of the area as a planned sustainable mixed use residential development subject to the delivery of the necessary infrastructure"*.

The development is an appropriate land use for the area and meets the requirements of the FCC zoning objectives. The development will minimise the potential environmental impacts as described in various chapters of this EIA Report.

4.0 ALTERNATIVES

4.1 INTRODUCTION

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6 of the Planning and Development Regulations, 2001, as amended ("the Regulation"), which state:

> *A description of the **reasonable alternatives [emphasis added]** 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.*

Schedule 6(2)(b) of the Regulations implement this requirement by requiring the following information:

> *(b) a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;*

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The regulations require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects to be presented in the EIAR.

The *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)* – states:

> *The Directive requires that information provided by the developer in an EIAR shall include a description of the reasonable alternatives studied by the developer. These are reasonable alternatives which are relevant to the project and its specific characteristics. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment.*
>
> *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.*

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

This section provides an outline of the reasonable alternatives examined during the design phase. It sets out the main reasons for choosing the development as proposed, taking into account and providing a comparison on the environmental effects.

This section assesses the evolution of development and the alternatives examined by the Applicant relating to the location, size and scale and project design and technology of the proposed development. This section provides a full justification for the proposed development and provides a comparison of the environmental effects of each alternative option.

The reasonable alternatives examined throughout the design process are set out as follows:

- Do Nothing Alternative;
- Alternative project locations;
- Alternative layout, size and scale;
- Alternative processes; and
- Alternative mitigation measures.

This chapter describes the alternatives that were considered for the proposed development, where applicable, under each of these headings and the reasons for the selection of the chosen options, including a comparison of environmental effects.

4.2 DO NOTHING ALTERNATIVE

In the event that the Proposed Development does not proceed, the specific need for this residential development would still exist for the site, and as such the Proposed Development would need to be built elsewhere.

The proposed development site is zoned as '*RA – Residential Area'* in the Development Plan, for which the zoning objective is to "*Provide for new residential communities subject to the provision of the necessary social and physical infrastructure*" in the Baldoyle-Stapolin LAP (2013 – 2019).

Consideration of an alternative location would equate to a 'do-nothing' alternative for the subject site. The lands would remain underutilized residential lands and would not maximise upon the development potential of the site

4.3 ALTERNATIVE PROJECT LOCATIONS

As noted in Section 4.13 of the 2018 Guidelines "*some projects may be site specific so the consideration of alternative sites may not be relevant."*

We also refer to the Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2017), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

The site of the proposed development ('the site') is c. 6.1 hectares located at Baldoyle-Stapolin, Dublin 13. The site located 8 km northeast of Dublin city centre, the site forms part of the overall Coast residential community that has been planned on c. 41 hectares of residential zoned land around Clongriffin DART station. The site and surrounding site context is shown on Figure 2.1 below.

Figure 4.1 Proposed Development Lands (Red boundary) (Source: Google Earth)

The site is zoned as '*RA – Residential Area'* in the Development Plan, for which the zoning objective is to "*Provide for new residential communities subject to the provision of the necessary social and physical infrastructure*" in the Baldoyle-Stapolin LAP (2013 – 2019). To facilitate proper phasing of the development of the subject lands, the LAP identifies three growth areas: GA1, GA2 and GA3. The subject site is identified as Growth Area 2 (GA2) occupying the northeast sector of the undeveloped lands and consists of an undeveloped greenfield site that is currently vacant, bounded by hoarding. GA1 is due southwest and GA3 is immediately west.

Therefore, the Proposed Development location represents alignment with the zoning goals of Baldoyle-Stapolin LAP (2013 – 2019) and the FCC Development Plan 2017 - 2023.

The location of the proposed development was also chosen to complement the associated proximal developments as mentioned at the GA1 and GA3 lands. Having regard to the site-specific nature of both the proposed development and future developments.

Given the current zoning of the site, the surrounding land uses, the proximity to similar associated developments, and the availability of necessary services and infrastructure, the proposed development is the most appropriate use for the location. Further consideration of alternative site locations is not considered essential in respect of the EIAR legislation and guidance.

4.4 ALTERNATIVE LAYOUT, SIZE AND SCALE, AND DESIGN

The project design team lead by CCH Architects undertook a comprehensive design process to determine an effective and efficient design and layout of the proposed residential development that had regard to the environmental sensitivities of the site, and the surrounding site context.

The Design Statement prepared by CCH Architects included with the application sets out the iterative design process undertaken. The design evolved as part of a multi-disciplinary process with input from the EIAR Team, design team, Applicant and advice received as part of the pre-planning process with representatives of Fingal County Council and An Bord Pleanála.

The alternative designs and layouts for the site were considered and assessed with regard to environmental effects prior to the finalisation of the site layout plan and design of the proposed development by the design team.

The arrangements considered the environmental sensitivities associated with surrounding land use and integration with the consented and proposed development in the area.

The reasonable site alternative layouts considered are as follows

- Option 1 – Consented Development
- Option 2 – Pre-Planning Design
- Option 3 – Chosen Design Submission

4.4.1 Option 1 – Consented Development

Option 1 considered was to proceed with the consent development at the site. The site holds planning permission by Regents Park Developments Limited Reg. Ref. F11A/0290 (PL 06F.239732) for 400 no. dwellings units, 3 no. retail units, a crèche, etc. and ancillary site development works. Planning permission was again refused by Fingal County Council for 7 no. reasons. That decision was appealed to An Bord Pleanála who overturned the local authority decision and granted planning permission subject to 23 no. conditions and reduced to 370 units.

In March 2018, an application to extend the duration of planning permission F11A/0290 was submitted to Fingal County Council. By order dated 10th May 2018, the Council issued a decision to extend the duration of the planning permission up to 23rd May 2023.

The full description of the consented development is as follows:

> *The construction of (i) 400 no. dwelling units consisting of 49 no. three storey 5 bed house units (25 no. with study @ 223 - 260 sq.m. and 24 no. @ 218 – 258 sq.m.), 7 no. three storey 4 bed live work units (205 - 232 sq.m.), 14 no. 3 bed duplex townhouses (152 - 176 sq.m.), 54 no. ground floor apartments with gardens (44 no. 3 bedroom units @ 123 – 180 sq.m. and 10 no. 2 bedroom units @ 92 – 115 sq.m.), 30 no. penthouse apartments with roof terraces (11 no. 4 bedroom units @ 194 – 228 sq.m., 17 no. 3 bedroom units @ 131 – 209 sq.m, and 2 no. 2 bedroom units @ 126 sq.m. each), 185 no. 3 bed apartments (123 – 180 sq.m.), and 61 no. 2 bed apartments (92 – 115 sq.m.). The dwelling units will be in fifteen buildings with varying building heights from three to eight storeys. The site comprises sectors 42, 43, 47 and 54 to 58 of the Stapolin village masterplan design guide and will be phase v of an overall urban community as provided for in the Baldoyle/Portmarnock action plan. All apartments and duplex townhouses have balconies and or terraces. (ii) A three storey crèche (430 sq.m.) with basement level storage and set down parking for 4 cars at grade and 6 no. staff car parking spaces at basement level; (iii) 3 no. retail units with basement level storage (total gross retail floor area of 356 sq.m.); (iv) 159 no. car parking spaces at surface level and 701 no. Underground car parking spaces for the entire proposed development; (v) 6 no. ESB sub-stations at surface level; (vi) bicycle stores, bin stores,*

private residential stores, services rooms, car park utility/storage area, plant rooms, etc. all at basement level; (vii) landscaping; and all ancillary site development works on a 4.98 hectares site in the townland of Stapolin, Grange Road, Baldoyle, Dublin 13. The total gross floor area of the proposed development is 68,867 sq.m.

The Applicant considered the development of the extant permission, however, the approved units are 3, 4 and 5 bed units and mainly apartments that are not in sync with current market conditions. The average unit size for the extant permission is in excess of 150 sqm, the current market conditions do not exist for units of this size. Further more recent with recent section 28 guidelines on Urban Development and Building Height, and the Apartment Guidelines from Dec 2020 there is the potential to increase residential yield on this highly connected and located site.

4.4.2 Option 2 – Pre-Planning Design

The Applicant and the project team have liaised with the relevant departments of Fingal County Council (FCC) and An Bord Pleanála (ABP) in advance of lodgement of this application. A tri-partite Meeting was held with Fingal County Council, An Bord Pleanala, and the prospective applicant's design team on 20th May 2021.

The design presented at the latest pre-planning meeting is set out as alternative layout Option 2 Pre-Planning Design this consisted of the following of 1,007 no. apartment dwellings units comprising the following types:

- 56no. Studio Apartments
- 286no 1-Bed Apartments
- 589no 2-Bed Apartments
- 76no 3-Bed Apartments
- an 820 sq.m creche, along with outdoor play area.

There are 1007 no residential units proposed in total for the Option 2 Pre-Planning Design. This constitutes a density of approx. 200 units / ha and it is comparable with developments to the south and west.

The Option 2 Pre-Planning Design seeks to harmonise with existing and proposed development in neighbouring Clongriffin in an appropriate manner by matching the architectural character and form of this neighbourhood. The Design solutions summary includes a review of the existing patterns of development in the surrounding area. These have helped to define a series of suburban blocks as well as a number of character "zones".

The following are the key development considerations used to develop the Option 2 Pre-Planning Design:

- The design allows for the local character of the area to be maintained by extending the urban footprint.
- All units overlook and take advantage of a Public Open Space.
- There is a variety of unit types within the development.
- The scheme utilises existing linkages to surrounding area.
- This is a confined site, affording minimum interference with the already existing residential areas nearby.

Apartment designs use a combination of materials common to the locality including selected coloured render, buff brick and zinc cladding.

Figure 4.2 Proposed Pre-Planning Layout

Sectors 54 & 55 as well as parts of sector 56 and 57 are higher in density and range from 6 to 9 stories in height. The proposed heights are appropriate for the edge of Racecourse Park and reflect the heights of developments which are proposed along the park edge to the west. 8 & 9 storey 'nodes' have been designed on this side to provide interest when viewing from a distance.

The sectors located away from the edge of Racecourse Park are lower in height; predominantly 4 and 5 storeys in height. "Node points" located on the eastern edge of Sectors 42 & 53 are taller and overlook Stapolin Haggard as per the Baldoyle Clongriffin LAP. These node points help to anchor these corners and provide focal points at key intersections. The proposed heights respect the scale of the already developed areas of Baldoyle, as well as the proposals earmarked for development to the south and west. Apartments, located in Sector 58 (as referenced on the Site Plan) are 4 & 5-storey in height and provide a transition between the 4 and 5 storey developments to the east.

As discussed above a tri-partite Meeting was held with Fingal County Council, An Bord Pleanala, and the prospective applicant's design team on 20th May 2021. A number of specific issues were raised in respect of Option 2 Pre-Planning Design, and constructive feedback was provided by the local authority which informed the design development:

- Further consideration and/or justification of the documents as they relate to the provision and delivery of Public and Communal Open Space required to serve the development having regard to, inter alia, the provisions of the Sustainable Urban Housing: Design Standards for New Apartments (2020), the Fingal County Development Plan 2017-2023 and the Baldoyle-Stapolin Local Area Plan.
- This further consideration/justification should clearly indicate where the public open space is to be provided, how it is going to be delivered and when it is

going to be delivered relative to the development of the proposed apartments it is to serve.

- Landscaping proposals for the public open space should be submitted and clarity provided around how the landscaping is to be delivered if the public open space area is not to be included within the application site boundary.
- Further consideration and/or justification of the documents as they relate to the design approach of the proposed development and the potential for any negative visual impact to the adjoining sites and surrounding environs.
- The further consideration/ justification should address the proposed design and massing, inter alia the visual impact along the former Racecourse to the north and the Coast Road to the east and relate specifically to the justification for any material contravention of the height strategy in the development plan and compliance with Section 3.2 of the Urban Development and Building Heights: Guidelines for Planning Authorities (2018).
- Particular regard should be had 12 criteria set out in the Urban Design Manual which accompanies the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (May 2009) and the requirement to provide a sense of place.
- The further consideration of these issues may require an amendment of the documents and/or design proposal submitted.

4.4.3 Option 3 – Chosen Design

The revised design Option 3 Chosen Design follows from the feedback Fingal County Council and An Bord Pleanala. The Design Statement prepared by CCH Architects included with the application sets out the iterative design process undertaken to address the feedback received. The Chosen Design consists consist of:

- The proposed residential development will consist of 1,007 no. residential apartments (58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units as follows:
- A ground floor crèche (gross floor area of 800 sq.m.) with dedicated outdoor play area of c. 208 sq.m. is proposed at Block 1, Sector 8A with 14 no. dedicated crèche car parking spaces.
- A total 743 no. car parking spaces are proposed at basement level (605 no. spaces) and at surface level (138 no. spaces including 14 no. crèche car parking spaces) and 1,754 no. bicycle parking spaces for residents and 500 no. bicycle spaces for visitors are proposed in covered and secure parking facilities at ground level throughout the scheme.
- Upgrade the public watermain for c. 170 metres along Red Arches Park to connect to the existing watermain at Red Arches Road as required by Irish Water.
- Pedestrian, cyclist, and vehicular access will be provided at Red Arches Park, Stapolin Avenue, Ireland's Eye Avenue, and Stapolin Way.
- The development will also provide for all associated ancillary site development infrastructure including: ESB sub-stations, bin stores, plant rooms, public lighting, new watermain connection to the south at Red Arches Road, foul drainage to the existing pumping station at Stapolin Haggarad, and surface water drainage to the west; roads and footpaths; landscaping; new boundary treatment to proposed Racecourse Park (ABP ref. JP06F.311315) and remove existing boundary to Red Arches Drive; and all associated site development works necessary to facilitate the proposed development.

The Option 3 Chosen Design is designed to respect its setting and to integrate with surrounding residential land uses and to complete the planned compact urban community at Baldoyle Stapolin. The additional population will provide demand for

existing and future planned public transport thus realising the investment in infrastructure at Baldoyle Stapolin. The additional population will also create a critical mass of population to sustain local services within the village centre at Stapolin.

The overall scale and massing of the 'Option 3 Chosen Design' has taken into consideration, how the amenity of theresidents will be affected. Care has been taken to provide sufficient space between balconies & private open space,and roadways for the benefit of residents' privacy. Accessible pathways also allow safe access and egress to andfrom each of the proposed apartment blocks

For the purpose of uniformity, and in line with development plan objectives, heights along the main streets (Stapolin Way, Stapolin Avenue, Irelands Eye Avenue etc.) have been maintained at a broadly consistent height to give uniformity to the street scape. Node points at the corners of Stapolin Way and Stapolin Avenue have been expressed with slightly higher elements in order to accentuate these corners. The key elevation to Racecourse Park has been developed with a variety of building heights, in order to "break up" the monotony of this long elevation. Point towers, 8-12 storeys in height are interspersed along this boundary. In terms of height, the proposal ties in with the existing heights of Red Arches (east) and Shoreline 2 (GA3) proposed to the west. The façade is broken up with greater gaps between the buildings, so that the ensemble doesn't read like a "wall" to Racecourse Park.

Figure 4.3 *Chosen Design*

4.5 ALTERNATIVE PROCESSES OR TECHNOLOGIES

This section typically examines the project processes in relation to likely emissions to air and water, sustainability and consumptions, likely generation of waste to determine the process that is least likely to impact on these parameters. In terms of the proposed development processes, the pre-planning initial design concept and the final design concept necessitate the same power requirements, and result in the same waste and

environmental emissions. The proposed development is guided by energy performance standards, Sustainable Energy Authority of Ireland (SEAI), including NZEB standards, legislative planning requirements, and Fingal County Council and statutory lighting standards etc. The flexibility to select alternative processes is limited for this type of development as opposed to an activity that has more complex equipment and processes.

Notwithstanding this, Ethos Engineering have prepared Sustainability & Commercial Energy Statement, and Sustainability & Residential Energy Statement which are include with the application. These documents set out the sustainability measures incorporated into the project design.

4.6 ALTERNATIVE MITIGATION

For each aspect of the environment, each specialist has considered the existing environment, likely impacts of the proposed development and reviewed feasible mitigation measures to identify the most suitable measures appropriate to the environmental setting of the proposed development. In making a decision on the most suitable mitigation measure the specialist has considered relevant guidance and legislation.

In each case, a comparison of environmental effects was made, and the specialist has reviewed the possible mitigation measures available and considered the use of the mitigation in terms of the likely residual impact on the environment.

The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction and offsetting (not required in this development). Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects.

The selected mitigation measures are set out in each of the EIA Report Chapters 5-17.

4.7 CONCLUSIONS ON ALTERNATIVES

The proposed development was carefully designed, taking into consideration the site context and existing neighboring commercial and residential properties and the local environmental conditions including air quality, noise and vibration and visual impact.

The proposal will allow the development potential of the site to be maximised within the Baldoyle area while integrating with the consented GA1 and GA3 developments.

The design chosen reflects comments from Fingal County Council following preplanning meetings on, 2nd September 2020 and, 15th December 2020. As well as the Pre-Application Consultation Opinion from ABP issued in June 2021 Reference Case Reference: ABP-309599-21.

4.8 REFERENCES

Department of Housing, Local Government and Heritage (2018) “Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment

Fingal County Council (2017) “Fingal City Council Development Plan 2017-2023”

Environmental Protection Agency (2017) “Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports”

5.0 HUMAN HEALTH AND POPULATION

5.1 INTRODUCTION

This chapter has been prepared to assess the likely significant impacts on with Human Health and Population in respect of the proposed development.

Directive 2011/92/EU of the European Parliament and of the Council 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 of the European Parliament and of the Council of 16 April 2014, ("the EIA Directive") provides that an EIA shall identify, describe and assess the likely significant effects of a project on, inter alia, "population and human health".

This chapter has been prepared in accordance with the Environment Protection Agency, *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* Draft (2017) *Advice Notes for Preparing Environmental Impact Statements* Draft (2015), and European Commission (EC)*, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (EU, 2017).

This chapter will follow these guidelines, and will examine the health effects relevant to the proposed development as they relate to the relevant study area defined in Section 5.2.4.

5.2 METHODOLOGY

As referenced in the Department of Housing, Planning and Local Government (2018) *Guidelines for Planning Authorities and An Bord Pleanala*, (taken from the European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017)), human health is;

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

The EPA Draft EIAR Guidelines advise 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."*

This chapter has considered the *"existence, activities and health of people"* with respect to *"topics which are manifested in the environment such as employment and housing areas, amenities, extended infrastructure or resource utilisation and associated emissions" (EPA, 2017)*. Issues examined in this chapter include:

- Population and Demographics;

- Socioeconomics;
- Population Health;
- Natural Resources;
- Tourism;
- Social Infrastructure;
- Health and Safety.

This chapter has considered the guidance, which sates the assessment of impacts on population and human health should refer to the assessment of those factors under which human health effects might occur, as addressed elsewhere in the EIA Report. The impacts on humans from other issues such as soils, geology and hydrogeology, water, air quality, noise and vibration, traffic and landscape are discussed in their respective EIAR chapters:

- Chapter 6 - Soils, Geology and Hydrogeology;
- Chapter 7 –Hydrology;
- Chapter 9 –Air Quality and Climate;
- Chapter 10 –Noise and Vibration;
- Chapter 11 –Landscape and Visual Impact; and
- Chapter 13 – Traffic and Transportation.

Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced in this Chapter.

This chapter incorporates the EU and Irish EIAR guidance and examines health effects relevant to the proposed development as they relate to a relevant, defined study area. The effects of the proposed development on the population and human health are analysed in compliance with the requirements of the EPA Guidelines.

5.2.1 Assessment of Significance and Sensitivity

The assessment of significance is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect.

Within any area, the sensitivity of individuals in a population will vary. As such, it would be neither representative of the population, nor a fair representation of the range of sensitivities in a population, were an overall sensitivity classification assigned to the population in question. As such, the precautionary principle has been adopted for this assessment, which assumes that the population within the study area is of a uniformly high sensitivity.

5.2.2 Magnitude of Impact

The magnitude of predicted impacts has been quantified in this assessment using the terms outlined in Table 5.1 below.

Table 5.1 Description of magnitude of predicted impacts

Magnitude	Description of Magnitude
High	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a major change to existing baseline conditions (adverse or beneficial)
Medium	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a moderate change to existing baseline conditions (adverse or beneficial)

Low	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a minor change to existing baseline conditions (adverse or beneficial)
Negligible	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would not result in change to existing baseline conditions at a population level, but may still result in an individual impact (adverse or beneficial)
No change	No change would occur as a result of the Proposed Development which would alter the exiting baseline conditions (adverse or beneficial)

5.2.3 Significance of Effects

The assessment of the significance of effects in this assessment is a professional appraisal and has been based on the relationship between the magnitude of the effects (Section 5.2.2) and the sensitivity of the receptor. The matrix below, Table 5.2, illustrates the significance of the effects as determined by the relationship between the magnitude of impact and the sensitivity of receptors

Table 5.2 *Significance of effects matrix*

		Magnitude of Impact			
		Negligible	Low	Medium	High
Sensitivity of Receptor	Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	Negligible or minor	Minor	Moderate	Moderate or major
	High	Minor	Minor or moderate	Moderate or major	Major

5.2.4 Study Area

The proposed development site is located in County Dublin, and in the Electoral Divisions (ED) of Baldoyle (ED 1227). The area selected for the assessment of the impact on human health has been defined as the ED of Baldoyle (ED 1227). And the adjacent division of Grange B (ED 3449).

As defined by the Nomenclature of Territorial Units for Statistics developed by Eurostat the site is located within NUTS3 Code, Dublin (IE061), that comprises of the county of Dublin. The site is within the administrative area of Fingal County Council.

5.3 EXISTING BASELINE CONDITIONS

The Site of the proposed development is c. 6.1 hectares located at Baldoyle-Stapolin, Dublin 13. The Site forms part of a substantial area of undeveloped residential zoned land within Baldoyle-Stapolin. Baldoyle is a coastal suburban area on the northern fringe of the Dublin Metropolitan Area. Sutton to the east; Clongriffin and Donaghmede to the west; Portmarnock to the north; and Kilbarrack and North Bull Island to the south. This area is subject to the objectives of the Fingal Development Plan (2017 – 2023) ('the Development Plan') and the Baldoyle-Stapolin Local Area Plan (LAP) (2013) (as extended).

It is approximately 10.5 km from O'Connell Street bridge in the centre of Dublin City, approximately 9 km from Main Street, Swords and 4 km from Howth. The Site forms part of the overall Coast residential community that has been planned on c. 41 hectares of residential zoned land around Clongriffin DART station.

The wider area is characterised by a predominantly residential uses as the Site surrounded by the residential centres of Donaghmede, Bayside and Clongriffin. The coastal towns of Portmarnock and Malahide are located further to the north. The Mayne Marsh Conservation Area and Baldoyle Estuary Nature Reserve is located beyond the future Racecourse Regional Park; these areas (including the bay itself), from part of the Baldoyle Bay Special Protection Area (SPA), Special Area of Conservation (SAC), proposed Natural Heritage Area (pNHA), and Ramsar Convention Wetland.

The surrounding area is described in further detail in Chapter 2 (Description of Development), and Chapter 3 (Planning and Development Context). This Section provides a description of the relevant aspects of the baseline environment in relation to population and human health.

5.3.1 Population and Demographics

5.3.1.1 Population

The CSO provides data on population and socio-economic aspects of the population at different levels from the State, county level, Local Electoral Area (LEA), individual Electoral Districts (ED) to Small Areas (SA) within each County. The most recent census by the CSO was undertaken in 2016.

The CSO data illustrates that the population of the Irish State increased between 2011 and 2016 by 3.8%, bringing the total population of the Irish State to 4,761,865, see Table 7.4 below. The rate of growth slowed from 8.1% in the previous Census (2011), attributable to the slower economic activity in the early part of the census period resulting in a reduced level of immigration, albeit offset to a degree by strong natural increase.

Baldoyle (ED) saw an increase in population in the 2016 census to 7,524 from 7,050 in the previous 2011 Census. This represents a c. 6.3% increase in population which is slightly below the Fingal average population change of c. 7.44%, and well exceeds the Dublin City average population change of c. 3.57%. The adjacent Grange B (ED) saw a 14.29% increase. The Baldoyle (ED) Grange B (ED) can be attributed to the redevelopment of many lands in areas from greenfield (or brownfield) to residential and mixed-use development. The CSO population statistics relevant are set out in Table 5.3.

The 2016 Census recorded a population of 296,020 in Fingal, the third highest in the country, behind Dublin City and Cork County.

Table 5.3 *Population change at National, primary and secondary hinterland level from 2011 – 2016 (Source: www.cso.ie)*

Area	2011	2016	% Change 2011-2016
Ireland – State	4,588,252	4,761,865	3.65%
Fingal County Council Administrative Area	273,991	296,020	7.44%
Baldoyle (ED)	7,050	7,524	6.30%
Grange B (ED)	4,565	5,326	14.29%

5.3.1.2 *Age Profile*

The age profile of the population, shown in Table 5.4, in an area is an important parameter as it provides a good insight into the potential labour force, the demand for schools, amenities, other facilities and the future housing demand.

Table 5.4 Age profile at National and County level 2016 (Source: www.cso.ie)

Area	0-14	15-24	25-44	45-64	65+	Total Persons
Ireland – State	21.0%	12.0%	30.0%	24.0%	13.0%	21.0%
Fingal County Council Administrative Area	24.5%	11.3%	33.6%	21.4%	9.1%	24.5%
Baldoyle (ED)	21.2%	10.5%	30.2%	23.0%	15.0%	21.2%
Grange B (ED)	24.6%	10.3%	44.0%	16.0%	5.1%	24.6%

This table shows that both the dominant age grouping of the total population is 25-44. This indicates a young working age population in the area, with the adjacent Grange B (ED) being above the national level.

5.3.2 Socioeconomics

5.3.2.1 *Employment* - Labour Force Survey

Employment statistics are a key source of economic information and a key determinant of the health of the local economy.

The Labour Force Survey (LFS) is a large-scale, nationwide survey of households in Ireland carried out every three months. It generates labour force estimates which include the official measure of employment and unemployment for the state.

The results nationally for Q4 2021 showed that there were 2,506,000 people employed in the State with 127,400 registered as unemployed. This represents a 4.9% unemployment rate.

The number of persons in employment was up 10.1% (229,100) from 2,276,800 over the year while the employment rate was up from 67.0% in Q4 2020.

5.3.2.2 Education

Census data presenting the highest level of education completed by people living in the Fingal Administrative Area and compared with State data is presented in Table 5.5.

The table presents key milestone education and ignores people undertaking studies or where information was not stated.

Table 5.5 *Highest level of education completed locally and at County level in 2016 for key educational levels (Source: www.cso.ie)*

Area	No formal education	Primary education	Secondary[1]	Higher Education[2]	Undergraduate Degree[3]	Postgraduate Degree[4]	Total Persons
State	1.6%	10.8%	23.2%	16.8%	12.4%	9.69%	3,097,052
Fingal	1.1%	6.6%	20.6%	17.4%	15%	11%	180,150

5.3.2.3 Income

The below data, obtained from CSO Statbank (CIA02), demonstrate that the levels of total income per person in the Dublin area are c. 9% higher over the study years, with the Dublin area marginally higher than the State.

Table 5.6 Total Income, and Disposable Income per Person (Euro) (Source: CSO Statbank CIA02)

Area	Income	2017	2018	2019
Dublin	Total Income per Person (€)	35,197	37,406	38,903
	Disposable Income per Person (€)	23,864	24,399	25,696
State	Total Income per Person (€)	29,239	30,575	31,812
	Disposable Income per Person (€)	20,714	21,153	22,032

5.3.2.4 Deprivation

Deprivation in small areas is mapped using the Pobal HP Deprivation Index. This Index draws on data from censuses and combines three dimensions of relative affluence and deprivation: Demographic Profile, Social Class Composition and Labour Market Situation. Figure 5.1 below shows graphical representation of how the concepts of Demographic Growth, Social Class Composition and Labour Market Situation are measured by ten key socio-economic indicators from the Census of Population.

In this EIA Report, the Relative Index Score is considered as the measure for deprivation, as these Relative Index Scores are rescaled such that the mean is 0 and standard deviation is 10 at each census wave. This allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in Table 5.7 below.

[1] Lower secondary and Upper secondary
[2] Higher Certificate, Advanced certificate/completed apprenticeship or Technical/vocational training
[3] Ordinary bachelor degree, Honours bachelor degree/professional qualification
[4] Postgraduate degree or Ph.D

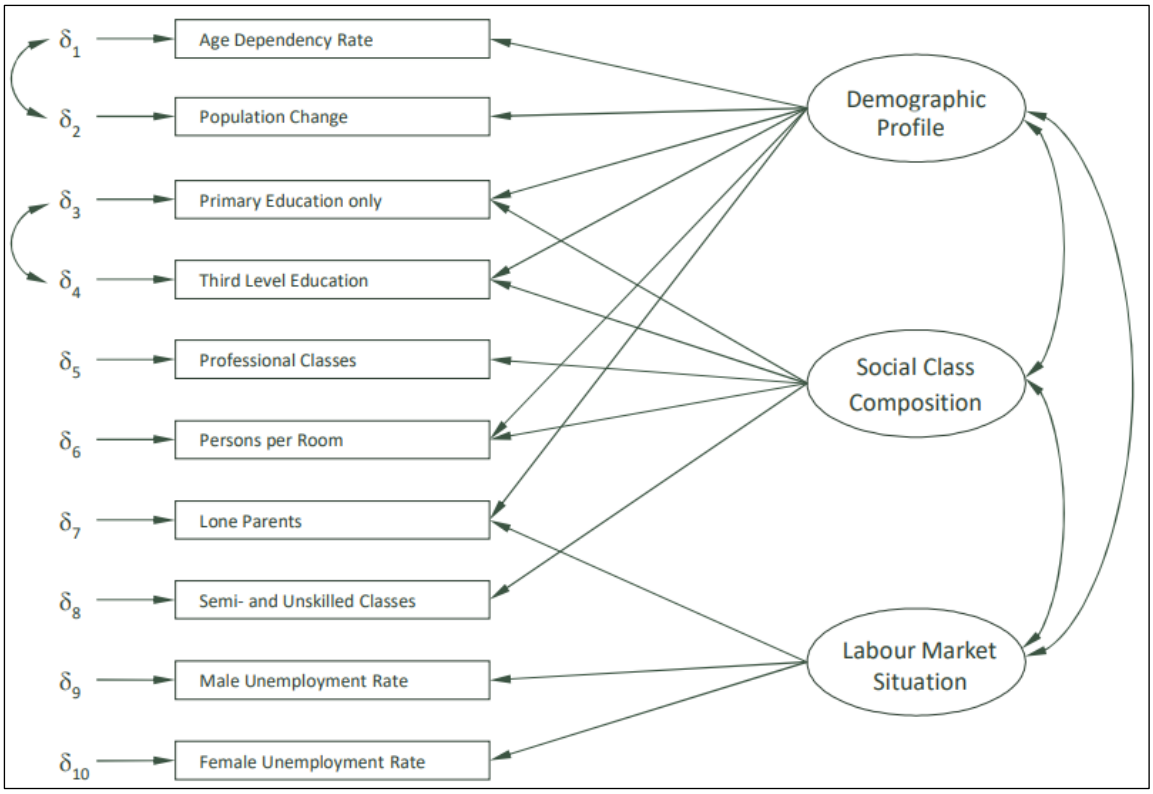

Figure 5.1 *Basic Model of the Pobal HP Deprivation Index*

Table 5.7 *Pobal HP Index Relevant Index Score labels (Source: Pobal HP Deprivation Index)*

Relative Index Score	Standard Deviation	Label
> 30	> 3	Extremely affluent
20 – 30	2 – 3	Very affluent
10 – 20	1 – 2	Affluent
0 – 10	0 – 1	Marginally above average
0 – -10	0 – -1	Marginally below average
-10 – -20	-1 – -2	Disadvantaged
-20 – -30	-2 – -3	Very disadvantaged
< -30	< -3	Extremely disadvantaged

The data in Table 5.8 shows that the population living within the Study Area are generally classified as 'Marginally above average', with a Relative Index Score between 0 – 10. The development site is located within Baldoyle which is classified as 'Marginally above average' with a Relative Index Score of 4.14. Figure 5.2 below presents the Pobal HP Index map illustrating the Study Area.

Table 5.8 *Pobal HP Index Relevant Index Score 2016 (Source: Pobal HP Deprivation Index)*

Area	Relative Index Score	Pobal HP Description
Fingal County Council	0.67	Marginally above average
Baldoyle (ED)	4.29	Marginally above average
Grange B (ED)	4.14	Marginally above average

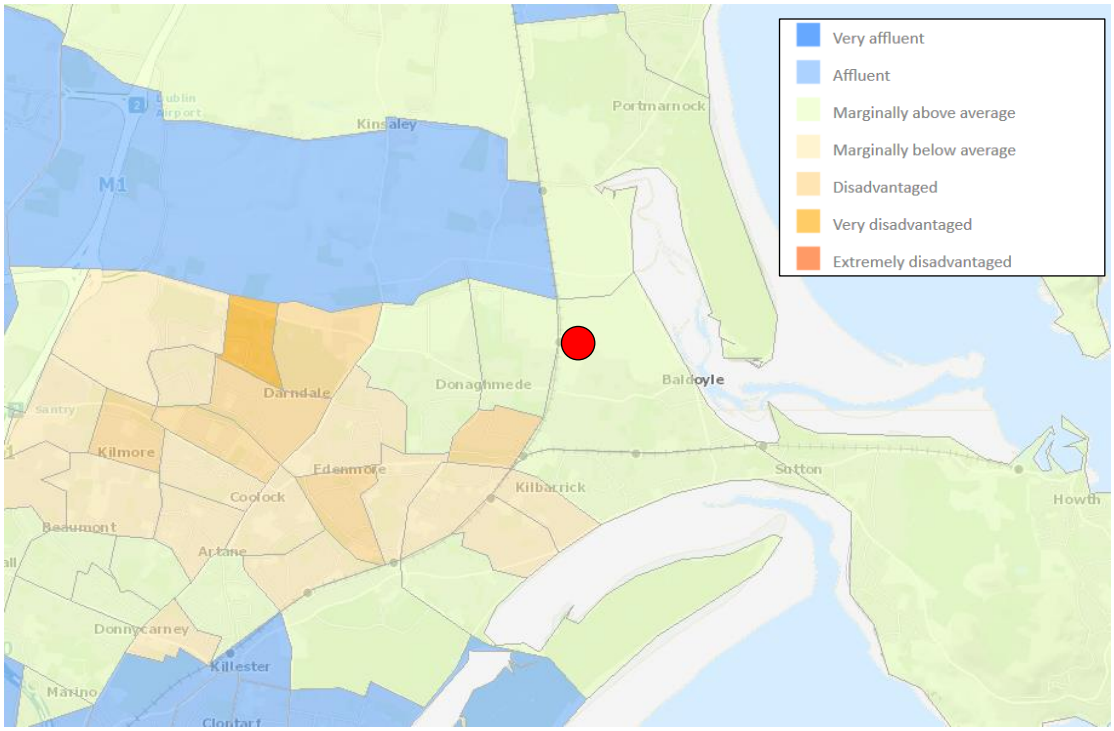

Figure 5.2 *Pobal HP Index maps illustrating the Study Area. The location of the Proposed Development site is indicated with a red dot (Source: Pobal HP Deprivation Index)*

5.3.3 Natural Resources

The EPA Extractive Industry Register and the GSI mineral database were consulted to determine whether there were / are any mineral sites close to the Site. The Huntstown Quarry is 11.5 km to the west of the Site of the proposed Project. One mineral site was identified in Portmarnock, c. 2.6 km to the north. The site is described as an old brick works that supplied good class red bricks to Dublin.

There will be a loss of soil available for agricultural economic use due to the development. However, within the overall context of Ireland available farmland, the loss is considered negligible. In addition, the employment created by the construction and operation of the proposed development counterbalances this economic loss.

5.3.4 Tourism

Tourism continues to play a hugely influential role in Irelands economic success.

The site is located within Fingal County which has scenic 88 km coastline and a number of attractive towns as well as several centres of residential, retail and service industries surrounding a traditional market gardening region. The Tourism Statement Of Strategy And Work Programme 2017 – 2022 outlines tourism in the county as a range of:

> *…coastal scenery and harbour towns, cultural and heritage attractions as well as the experiences of outdoor activities, retail and food. A comprehensive range of activities for the visitor is currently promoted. These include golf, angling, equestrian, shooting/archery, walking and cycling, watersports, tennis, as well as spectator sports of cricket, rugby, soccer and gaelic games. Water based tours are also available.*

The Fingal Tourism Strategy 2015–2018, seeks to provide an attractive, vibrant and sustainable tourism destination delivering a distinctive experience for local residents, domestic and international visitors.

While Dublin City Centre is the most important tourist destination in Ireland, the Baldoyle area does not currently feature any major tourist destinations, nor is it an important area in terms of tourist accommodation. However, there are a number of visitor attractions in the wider area, such as Portmarnock Golf Club (c. 1.5 km linear distance), Portmarnock Beach (c. 2 km linear distance), Malahide Golf Club (c. 2 km linear distance), Sutton Golf Club (c. 2.5 km linear distance), Howth (c. 4 km linear distance) and North Bull Island (c. 4 km linear distance).

Tourism is not a major industry in the immediate environs of the site.

5.3.5 Major Accidents/Hazards and Industrial Activities

Major Accidents - Seveso / COMAH Sites

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident.

The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the “COMAH Regulations”), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The Irish HSE records and Maps have been reviewed and the closest active COMAH site is the Lower Tier Establishment at Exolum Aviation Ireland Ltd (formerly CLH) Corballis Road, Dublin Airport, Dublin 2. This is located west over 6 km from Site. Due to the separation distance from the proposed development to this site, there are no potential impacts, interactions or cumulative impacts with the proposed development. This installation does not form a constraint to development at the proposed development site.

Industrial Activities - Industrial Emissions and Integrated Pollution Control

Industrial production processes account for a considerable share of the overall pollution in Europe due to their emissions of air pollutants, discharges of waste water and the generation of waste.

Directive 2010/75/EU of the European Parliament and the Council on industrial emissions (the Industrial Emissions Directive or IED) is the main EU instrument

regulating pollutant emissions from industrial installations[5]. The IED was adopted on 24 November 2010.

The Irish EPA records and Maps have been reviewed and the closest active IE Licenced site is Newport Synthesis Ltd. (EPA Reg. Ref: P0097) located in the Baldoyle Industrial Estate, Grange Road, Baldoyle, Dublin 13, Dublin over 1 km to the south of the Site. Due to the separation distance from the proposed development to this site, there are no potential impacts, interactions or cumulative impacts with the proposed development. This installation does not form a constraint to development at the proposed development site.

The EU has adopted in 1996 a set of common rules for permitting and controlling industrial installations in the Integrated Pollution Prevention and Control (IPPC) Directive (Directive 96/61/EC)[6]. The IPPC Directive has recently been codified (Directive 2008/1/EC). In essence, the IPPC Directive is about minimising pollution from various industrial sources throughout the European Union. Operators of industrial installations operating activities covered by Annex I of the IPPC Directive are required to obtain an environmental permit from the authorities in the EU countries.

The Irish EPA records and Maps have been reviewed and the closest active IPPC Licenced site is Wood-Printcraft Limited (EPA Reg. Ref: P0143) located at 17 Greencastle Parade, Coolock Industrial Estate, Dublin 17, Dublin. This site is 3.6 km from the proposed development site. Due to the separation distance from the proposed development to this site, there are no potential impacts, interactions or cumulative impacts with the proposed development. This installation does not form a constraint to development at the proposed development site.

5.3.6 Social Infrastructure

Social infrastructure covers a range of services and facilities that meet local and strategic needs and contribute towards a good quality of life. In this context it includes local business, residential areas, education, health facilities, emergency services, places of worship, and green infrastructure.

5.3.6.1 *Businesses and Residences*

The Site forms part of a substantial area of undeveloped residential zoned land within Baldoyle-Stapolin. The nearest existing residential locations to the proposed development are those located to the south within 'The Coast' development including Red Arcs Drive, Red Arches Close, and Red Arches Avenue; including Willow, Birch, Sycamore and Beech Houses.

The Dublin City Council administrative boundary is located just beyond the Dublin-Belfast / DART railway line and Clongriffin rail station. To the west of the railway lies the developing mixed use area of Clongriffin within Dublin City Council's wider North Fringe Area encompassing Northern Cross/Clare Hall/Belmayne to Clongriffin.

The Site is located to the south of the proposed Racecourse Park (c. 80 hectares), east of the Dublin-Belfast / DART railway line and Clongriffin rail station, north of Growth Area 1 ('GA1') and east of Growth Area 3 ('GA3'), as designated in the LAP

[5] https://ec.europa.eu/environment/industry/stationary/ied/legislation.htm

[6] https://ec.europa.eu/environment/archives/air/stationary/ippc/summary.htm

(see figure 2.2 below). The proposed development site is effectively Growth Area 2 ('GA2') *Baldoyle-Stapolin Local Area Plan (LAP) 2013 (as extended)*.

The wider area is characterised by a predominantly residential uses as the Site surrounded by the residential centres of Donaghmede, Bayside and Clongriffin. The coastal towns of Portmarnock and Malahide are located further to the north.

The closest shopping centres of note is the Donaghmede Shopping Centre c. 1.5 km south west of the site, or Clare Hall c. 2.5 km to the west. Dublin Airport is located c. 10.5 km east of the site.

5.3.6.2 *Education*

There are a number of childcare facilities, primary and secondary schools in the vicinity of the proposed development including:

- St. Mary's Secondary School for girls, 13 Main St, Baldoyle, Dublin;
- St. Peters and Pauls Boys National School, Brookstone Road;
- St. Mary's Girls National School, Bóthar Na Gráinsí, Baldoyle;
- St Michaels House Special School, Willie Nolan Rd, Baldoyle;
- St. Laurence's, Brookstone Road, Baldoyle, Brookstone Rd, Dublin 13;
- Pobalscoil Nessan Community School, Warrenhouse Road; and
- Grange Community College, Grange Road;

The Department of Education and Science has earmarked 1 no. primary school and 2 no. post-primary schools for future delivery in the wider area.

5.3.6.3 *Health and Emergency Services*

Healthcare in the vicinity of the proposed development includes a number of primary healthcare centres and a pharmacy. The nearest large-scale hospital is Beaumont Hospital, located 5 km to the south-west in Beaumont. There are also a range of primary care centres proximate to the proposed Project at Baldoyle, Portmarnock, Darndale, Raheny, Kilbarrack and Coolock

The Coolock Garda Station, Raheny District Garda, and Kilbarrack Fire Station Dublin are located within 3.5 km of the site.

5.3.6.4 Places of worship

Iin the vicinity of the proposed development include Church of the Holy Trinity, Donaghmede, St.Benedict's Church, Grange Park, St. John the Evangelist.

5.3.6.5 Green Infrastructure

Baldoyle and the surrounding area has a natural environment which incorporates both nationally and internationally important sites in terms of wildlife and habitats.

The Green Infrastructure Strategy seeks to maintain habitats and species within the Baldoyle Bay SPA and SAC at favourable conservation condition and ensure the ecological integrity of Baldoyle Bay.

An application is currently before ABP for Racecourse Park within the Baldoyle-Stapolin LAP lands and the open space areas within the Portmarnock LAP lands to the north, as Ecological Buffer Zones, which will help protect the ecological integrity of the

neighbouring nationally and internationally designated sites by providing suitable habitat for key species such as birds while minimising the impacts of adjacent residential land uses.

In terms of landscape amenity, large buildings and infrastructure are the dominant elements of the landscape and visual amenity is limited. This area can be considered of low sensitivity to the proposed development, which is of similar character. There are no listed or scenic views, no landscape or amenity designations or protected trees pertaining to the site, and no protected structures or National Monuments on the site.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 1,007 residential apartments (consisting of 58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units), communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a site located in the townland of Stapolin, Baldoyle, Dublin 13.

The development lands is a c. 6.1 hectares plot of partially greenfield, partially brownfield land located in the townland of Baldoyle-Stapolin, Dublin 13 ('the Site'). The lands are bound by existing and proposed residential areas to the west and south, and the future Racecourse Park to the north and northeast. The Site is also referred to as the Growth Area 2 ('GA2') Lands in *the Baldoyle-Stapolin Local Area Plan 2013 (as extended)* and which forms part of the wider landholding of lands formerly known as the Coast residential community that has been planned on c. 41 hectares of residential zoned land around Clongriffin DART station.

5.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The main potential impacts on population and human health from the proposed development are potential for spills/leaks, air emissions, noise, visual, and traffic impacts. These potential impacts, and the relevant mitigation measures, have been assessed within the corresponding specialist chapters; Chapter 6 (Soils, Geology and Hydrogeology); Chapter 7 (Hydrology); Chapter 9 (Air Quality and Climate), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual); and Chapter 13 (Traffic and Transportation)..

A summary of the potential impacts of construction, commissioning, operation and decommissioning of the proposed development is presented herein.

5.5.1 Potential Impacts on Businesses and Residences

5.1 The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

- Chapter 9 – Air Quality and Climate
- Chapter 12 – Noise and Vibration
- Chapter 13 – Landscape and Visual Impact
- Chapter 15 – Traffic and Transportation

The proposed development will result in increased job opportunities and improved accessibility to jobs during construction and operation. It is also anticipated that the proposed development will have indirect positive impact on employment in terms of construction material manufacture, maintenance contracts, equipment supply, landscaping etc. This may result in a short-term pressure for housing supply locally.

Employment opportunities create an indirect positive impact on mental health and well-being.

The impacts on the local population in terms of residents and businesses are considered to be mainly positive in the sense of creating direct employment opportunities and indirect additional business, both during the construction and operational phases.

Construction will have an indirect positive effect on support industries such as builder suppliers, construction material manufacture, maintenance contracts, equipment supply, landscaping and other local services. There will also be a need to bring in specialist workers on a regular basis that may increase the above estimated working population at times. Specialists are only likely to stay for shorter periods depending on the nature of the work. The construction phase, therefore, is considered to have the potential to have a ***moderate, short term*** *and* ***positive*** impact on the economy and employment of the local and wider area.

The proposed development will result in a moderately significant and positive impact to local residents in the area. The Proposed Development will primarily consist of residential units which will provide employment opportunities which will be of direct benefit, allowing members of community to work, and live within the Fingal area.

Chapter 10 (Microclimate - Wind) of this EIAR discusses the potential for alterations to wind-flow patterns within the proposed development. The wind conditions on nearby roads and existing surrounding areas are not expected to be adversely impacted by the proposed Growth Area 2 development.

Chapter 11 (Microclimate – sunlight daylight) of this EIAR the potential loss of daylight and sunlight to existing buildings and gardens following construction of the Proposed Development has been analysed and compared with the guidance in the BRE Report 'Site layout planning for daylight and sunlight: a guide to good practice'. There would be a minor adverse loss of daylight impact to some existing properties at Willow, Birch, Sycamore and Beech Houses. The primary cause of the loss of daylight is due to the design of the existing buildings themselves. Windows set back into the building with balconies or overhangs above force a reliance on daylight from the area of the proposal site. At other existing properties on Red Arches Park and Red Arches Drive there would be a negligible impact. Loss of sunlight would not be an issue to existing buildings, as the development site is to the north.

There would be a negligible impact on daylight to the consented GA1 scheme. Loss of sunlight would not be an issue since the proposed development site is to the north.

There would be an impact to some existing windows, but these results show that the primary cause of this impact is due to the design of the existing buildings themselves. Windows set back into the building with balconies or overhangs above force a reliance on daylight from the area of the proposal site. Therefore, the impact is assessed as a minor negative permanent effect.

5.5.2 Potential Impacts on Amenity and Tourism

The long-standing development strategy for the area is reflected in the landscape of the site's receiving environment. As discussed in Chapter 11 (Landscape and Visual Impact) the Fingal Landscape Character Assessment categorizes the site as an Estuary within the landscape character types. This is due to the site proximity to Baldoyle Bay and Estuary (500 m to the east).

The site is on the fringe of a recently developed (over past 10-15 years) residential development area. The site has been colonised by the flora typical of waste ground, primarily grasses, weeds and some small pioneer shrubs such as Buddleia or Willow in places.

It is not anticipated that the development will have any potential impact on local tourism.

Landscape impacts will generally be negligible due to the low value of the existing landscape of waste ground and construction spoil. The low character value of the existing brownfield landscape means that there will be no appreciable impact to the quality of the landscape due to construction activities.

In terms of visual amenity, for neighbouring residential areas, the completed proposed development site will remove vacant development land and replace it with attractive new residential streetscapes with a diversity of building types and extensive soft landscaping. No significant negative impacts on population and human health are anticipated to occur during the operational phase in relation to landscape and visual amenity. Visual impacts perceived by individual persons are highly subjective and difficult to characterise however, it is considered that the overall impact on the community will be ***neutral to positive*** and ***long term***.

5.5.3 Potential Impacts on Natural Resources and Material Assets

The proposed development will require power and gas supplied from the grid. No significant impact to Natural Resources is predicted, other than loss of a small portion of greenfield land.

In terms of groundwater resources, the area is serviced by Local Authority mains therefore it is unlikely that any nearby wells are used for potable supply. There are no groundwater source protection zones in the immediate vicinity of the site, and the GSI Well Card Index does not show any wells drilled or springs at the site. Regardless, in order to reduce impacts on the soils and geology environment a number of mitigation measures will be adopted to prevent the contamination of groundwater during the construction and operational phase; as described in Chapter 6 (Land, Soils, Geology & Hydrogeology).

The Proposed Development during construction and operation will require power supply, potable water and foul sewerage the requirements for this supply have been detailed in Chapter 15 (Material Assets) of this EIA Report. It is intended that the national grid will supply power to site. The utility providers have provided confirmation that there is sufficient capacity in the area network for the required power demand and as such there will be no impact on power supply to local residential or business users, who may be reliant upon these areas for healthcare.

Fingal County Council and Irish Water have been consulted and there is capacity within the public water system and the foul sewerage system[7] for the proposed development, and as such will not impact upon any individuals relying on these services for reasons.

5.5.4 Potential Impacts on Human Health from Air Quality and Climate

The key elements of construction and operation of the proposed development with potential impacts on human health from air quality and climate impacts are:

- Potential fugitive dust emissions from general site preparation and construction activities;
- Potential fugitive dust emissions from trucks associated with construction;
- Engine emissions from construction vehicles and machinery.
- A change in traffic flows on road links nearby the proposed development.
- Air emissions associated with the operation of the on-site boilers.

The construction phase impacts will be short-term in duration, the potential impacts during the operational phase of the proposed development are deemed long-term.

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. As per Table 9.6 (Chapter 9) significant PM_{10} emissions can occur within 25m of the site for a development of this scale. Therefore, in the absence of mitigation there is the potential for imperceptible, negative, short-term impacts to human health as a result of the proposed development.

Traffic related air emissions have the potential to impact air quality which can affect human health. 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. It can be determined that the impact to human health during the operational stage is long-term, negative and imperceptible.

5.5.5 Potential Impacts on Human Health from Noise and Vibration

Exposure to excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report 'Noise Impacts on Health', (European Commission, 2015), the most common effects of noise on the vulnerable include;

- Annoyance
- Sleep Disturbance
- Heart and circulation problems
- Quality of Life
- Cognitive Process
- Hearing

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher

[7] Please refer to Appendix 15.1 where it is stated by Irish Water that there will be sufficient capacity within the sewerage network subject to the completion of planned upgrade works.

magnitudes. Noise and vibration impacts associated with the development have been fully considered within Chapter 10 of the EIA Report.

5.5.6 Potential Impacts on Human Health from Traffic and Transportation

The World Health Organisation Report 'Health Effects and Risks of Transport Systems: The Hearts Project' (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects - ranking with smoking and diet as one of the most important determinants of health in Europe. The report states;

> *"Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians"*

In the Department of Communications, Climate Action & Environment document *Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy* vehicle emissions are included as a key source of health impacts in Ireland (DOCCA&E, 2017).

An assessment of the additional traffic movements associated with the proposed development during the construction and operational phases is presented in Chapter 13 (Traffic and Transportation).

5.5.7 Potential Impacts on Human Health from Health and Safety and/or Major Accident Hazards

The proposed development has been designed with consideration given to the health and safety risks of people living and working in the vicinity. The facility has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience based on a number of similar existing facilities operated by the applicant.

As outlined in Section 5.3.5 there is no heavy industry near or adjacent to the site; therefore there are no potential impacts.

A Site-Specific Flood Risk Assessment (FRA) has been prepared by JBA Consulting in accordance with the Planning System and Flood Risk Management Guidelines for Local Government (2009). This Site-Specific FRA is included with the planning application and is included as Appendix 7.2 to Chapter 7 (Hydrology), in addition to the FRA a 'Statement of Consistency with Ministerial Guidance The Planning and Flood Risk Management Guidelines for Local Authorities (2009)' (JB Barry) is included with the application documents. SSFRA states that all residential properties are located in Flood Zone C and are protected from inundation up to the 0.1% AEP Mid-Range Future Scenario (MRFS) flooding event. There is a low risk of flooding at the site, and no significant poteial impacts as a result of flooding.

5.6 REMEDIAL AND MITIGATION MEASURES

5.6.1 Construction Phase

The appointed contractor will be required to obtain formal agreement from the Local Authority on pollution prevention measures as well the overall approach and emergency procedures for all construction stages.

AWN Consulting have prepared an *Outline Construction Environmental Management Plan (CEMP)* (Appendix 7.3). All mitigation measures outlined therein will be implemented, as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The movement of material will be minimised to reduce degradation of soil structure and generation of dust (see Chapter 9 (Air Quality), and Appendix 9.3 Dust Management Plant for further details).

The Construction Surface Water Management Plan prepared by AWN (Appendix 7.4) aims to set out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the SWMP will be employed on site during the construction phase. All mitigation measures outlined within the SWMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

The Contractor will be responsible for the security of the site. The Contractor will be required to:

- Operate a site induction process for all site staff.
- Ensure all site staff shall have current ‘safe pass’ cards.
- Install adequate site hoarding to the site boundary.
- Maintain site security staff at all times.
- Separate pedestrian access from construction at the main site entrances provide a safe walkway for pedestrians along the site entrances.
- Ensure restricted access is maintained to the works.

As detailed in Chapter 6 Soil & Land, Geology and Hydrogeology of this EIAR, there is no evidence of a significant soil hazard on site. There is no significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

Chapter 7 (Hydrology) of this EIAR states that, there is no risk of flooding affecting the site from fluvial or coastal sources, however, the site is considered to be a risk of pluvial flooding. Design measures including localised ramping at ground floor entrance doorways to provide a threshold, overland flow routes directed away from the buildings and a surface water drainage network including attenuation storage designed to best practice guidelines are considered to be sufficient measures to provide protection to the development from the potential pluvial flooding risk.

Provided that the mitigation measures detailed in Chapter 12 (Noise and Vibration)are put in place, such as limiting the amount of high-noise activities at the closest boundary to the properties, and best practice noise and vibration control measures will be employed by the contractor during the construction phase, the likelihood of a significant impact will be reduced sufficiently.

5.6.2 Operational Phase

In light of the fact that any of the impacts associated with the operation of the Proposed Development on Human health and Population are either not significant or positive, no further mitigation measures are required. Notwithstanding the lack of need for mitigation measures, Section 12.6.2 of Chapter 10 of this EIAR outlines a number of noise mitigation measures during the detailed design which will further reduce the likely noise impacts arising from the building services plant.

The predicted change noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall effects from noise contribution of increased traffic is considered to be of negative, imperceptible to slight-moderate and long-term effect to nearby noise sensitive locations.

The remedial and mitigation measures to address the potential impacts on population and human health from the proposed development have been assessed within the corresponding specialist chapters; Chapter 6 (Soils, Geology and Hydrogeology); Chapter 7 (Hydrology); Chapter 9 (Air Quality and Climate), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual); Chapter 13 (Traffic and Transportation).

5.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

5.7.1 Residual Impacts on Businesses and Residences

It is predicted that there will be a slight positive impact on local business activity during the construction phase with the increased presence of 250 no. construction workers using local facilities. This job creation will result in a positive, local to regional, moderate, short-term socioeconomic impact.

The presence of these Site personnel in the area during the construction phase will create additional demand in the area for services, particularly for food from local shops, restaurants and cafés. There will also be economic benefits for providers of construction materials and other supporting services, e.g., quarries. This is predicted to result in a positive, local to regional, indirect, slight to significant, short-term socioeconomic impact.

Taking into account the mitigation measures outlined in Section 5.6.1 it is predicted that there will be no likely significant effect with regard to the construction phase on business and residences.

As stated in Chapter 13 (Landscape and Visual) mitigation measures at construction stage will have minimal effect on mitigating landscape impacts.

The residual impact on Businesses and Residences during construction in the absence of mitigation (by design) are due to the removal of vegetation is ***negative***, ***moderate*** and ***long term.***

5.7.2 Residual Impacts on Amenity and Tourism

The Proposed Development will provide increased childcare availability and space for commercial tenants, which will have slightly significant and positive impact on local amenities. Access to other amenities in the area will remain unaffected.

There are no significant potential impacts on Amenity and Tourism; therefore there are no residual impacts.

5.7.3 Residual Impacts on Natural Resources and Material Assets

There are no significant potential impacts on Natural Resources and Material Assets; therefore there are no residual impacts.

5.7.4 Residual Impacts on Human Health from Air Quality

As detailed in Chapter 9 (Air Quality and Climate), 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, localised*** and ***imperceptible*** with respect to human health.

5.7.5 Residual Impacts on Human Health from Noise and Vibration

As detailed in Chapter 12 (Noise and Vibration), during the construction phase of the project there will be a short-term noise impact on nearby noise sensitive properties from site activities and the close proximity of adjacent buildings. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration are kept to minimised. For the nearest noise sensitive locations within 20 m of the proposed development, negative, significant and temporary effects are likely.

For the majority of noise sensitive locations at greater distances from the proposed development, negative, moderate and short-term effects are likely.

The predicted change noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall effects from noise contribution of increased traffic is considered to be of negative, imperceptible to slight-moderate and long-term effect to nearby noise sensitive locations.

With the application of mitigation measures for building services noise as described in Chapter 12 (Noise and Vibration), the range of potential noise levels is not expected to add significantly to the existing noise environment. The resultant noise effect from this source will be of neutral, not significant, long-term impact.

5.7.6 Residual Impacts on Human Health from Traffic and Transportation

An assessment of the additional traffic movements associated with the proposed development during the construction and operational phases is presented in Chapter 15 (Traffic and Transportation).

There will be minor impacts on the safety and operation of the road network as a result of the construction phase of the Baldoyle GA2 development. Having consideration for the mitigation measures outlined above, likely impacts during the construction phase will be negligible. All construction related traffic will be outside the morning and evening peak hours and will not have a significant impact on the operation of the adjoining junctions.

The overall residual impact during the construction phase of the proposed development on traffic and transportation, after the implementation of mitigations measures outlined in Chapter 15, Section 15.6.1 will be ***short term, not significant and neutral***.

The overall residual impact during the operational phase of the proposed development on traffic and transportation, after the implementation of mitigations measures outlined in Chapter 15, Section 15.6.2 will be ***long-term, not significant and neutral***.

5.7.7 Predicted Impacts on Human Health from Health and Safety and/or Major Accident Hazards

There are no significant potential impacts on Human Health from Health and Safety and/or Major Accident Hazards; therefore there are no residual impacts.

5.8 MONITORING / REINSTATEMENT

5.8.1 Construction Phase

As set out in Chapter 12 (Noise and Vibration) During the construction phase consideration may be given to noise and vibration monitoring at the nearest sensitive locations, where high level of noise and or vibration are expected.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: “Acoustics – Description, Measurement and Assessment of Environmental Noise” and be located a distance of greater than 3.5m away from any reflective surfaces, e.g. walls, in order to ensure a free-field measurement without any influence from reflected noise sources.

Vibration monitoring should be conducted in accordance with BS 7385-1 (1990) Evaluation and measurement for vibration in buildings — Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings or BS 6841 (1987) Guide to Measurement and Evaluation of Human Exposure to Whole-Body Mechanical Vibration and Repeated Shock. With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2.

As set out in Chapter 9 (Air Quality and Climate) monitoring of construction dust deposition at 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/(m2*day) during the monitoring period between 28 - 32 days.

5.8.2 Operational

No ongoing monitoring is required during the operational phase of the proposed development.

5.9 CUMULATIVE IMPACT ASSESSMENT

The potential for cumulative impact of the proposed development with any/all relevant other planned or permitted developments as outlined in Chapter 3 (Planning and Development Context) are discussed in Sections 5.9.1 and 5.9.2 below for construction and operational phases.

5.9.1 Construction Phase

It is envisaged that the construction phase of GA1 and GA3 will overlap with that of the proposed development site, meaning that there is the potential for the accumulation of effects during the construction phase. The likely cumulative impact of the proposed development in conjunction with these cumulative developments upon health in relation to noise, dust generation, construction traffic, visual impacts, etc., associated with the works; have been assessed in the respective EIA Report Chapters.

The GA1 Grant of Permission ABP Reg. Ref.:311018-21 Condition 3 requires that the mitigation measures set out in the EIA must be carried out in full and Condition 4 request the mitigation and mitigation and monitoring measures as they relate to the Baldoyle Bay APA be implemented. Furthermore; Condition 22 states that prior to the commencement of works a Construction Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The GA3 Grant of Permission ABP Reg. Ref.:311016-21 Condition 5 states that prior to the commencement of works a finalised Construction and Environmental Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The implementation of mitigation measures within each chapter and detailed in Section 5.5.1; as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the proposed development. The residual impact of the proposed development in combination with other planned or permitted developments (as described in Chapter 3) is **short-term-imperceptible-neutral**.

5.9.2 Operational Phase

The proposed development in combination with any/all relevant other planned or permitted developments will have a ***positive*** impact in terms of employment opportunities and the associated economic and social benefits.

The traffic assessment indicates that the proposed development is not likely to result in significant adverse impacts either alone or in combination with any likely future projects.

Air dispersion modelling of emissions from the operational traffic emissions demonstrated compliance with the relevant air quality standards which are based on the protection of human health. Therefore the impact can be determined***, negative, imperceptible,*** *and* ***long-term***.

The noise and vibration impact assessment has found that predicted noise levels associated with the day to day operations of the site will be within the proposed criteria applicable to a site of this nature. The impact from building services, plant and traffic, is predicted to be ***negative, not significant, and long term.***

The overall cumulative impact is therefore concluded as ***negative*** and ***not significant*** with respect to human health.

6.0 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

6.1 INTRODUCTION

This chapter assesses and evaluates the potential impacts of the proposed development on the land, soil, geological and hydrogeological aspects of the proposed development site and the surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely environmental effects.

6.2 METHODOLOGY

6.2.1 Criteria for Rating of Effects

This chapter evaluates the effects, if any, which the proposed development will have on Land, Soils, Geology and Hydrogeology as defined in the Environmental Protection Agency (EPA) '*Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (EPA, 2017) as well as in line with Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (as amended) and Article 5 and Annex IV of the EIA Directive (2011/92/EU, as amended). The Draft EPA document entitled '*Advice Notes for Preparing Environmental Impact Statements'* (EPA, 2015) is also followed in this geological and hydrogeological assessment and classification of environmental effects. Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'* (IGI 2013). Finally, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII) formerly National Roads Authority (NRA) (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the land, soil, geological and hydrogeological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the Draft EPA Guidelines (2017) publication).

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

The TII (2009) criteria for rating the magnitude and significance of impacts on the geological related attributes and the importance of hydrogeological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-5 in Appendix 6.1.

The principal attributes (and effects) to be assessed include the following:

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

6.2.2 Sources of Information

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

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

Site-specific data was derived from the following sources:

- Chapter 9 of SHD at Baldoyle-Stapolin Growth Area 3 (GA3), Baldoyle, Dublin 13 Environmental Impact Assessment Report (EIAR) Volume 2 – Main Text July 2021
- Various design site plans and drawings; and
- Consultation with site engineers/ planners/ architects.

6.2.3 Forecasting Issues or Difficulties Encountered

There were no difficulties encountered in compiling this chapter of the EIAR.

6.3 RECEIVING ENVIRONMENT

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

6.3.1 General Description of the Site

6.3.1.1 Site Setting

The surrounding environment can be described as a mix of remnant agricultural, parkland to the north and residential to the south. The proposed Racecource Regional Park is located directly to the north.). A greenfield area known as the “Haggard” lies to the south with residential apartments at Red Arches Drive located south of this. The site location map for the proposed development is presented in presented in Figure 6.1 below.

Figure 6.1 Site Location with site layout (AWN, 2021)

6.3.1.2 Topography and Setting

The site is mostly flat at 6.0 m above Ordnance Datum (mAOD). The regional gradient falls from west to east towards the coast. Historic satellite imagery shows that the site was originally agricultural greenfield; however, site clearance commenced after 2005 and by 2009, the vast majority of the site of the proposed project and the surrounding had been cleared with areas of construction activity, roads and bare ground. Between 2010 and 2018 many areas reverted to recolonization.

There are some industrial and commercial units 900 m to the south, at Baldoyle Industrial Estate. The Dublin-Belfast / DART train line and Clongriffin Station is 330 m

to the west. The site is also bound by proposed GA01 to the southwest and GA03 to the west.

Baldoyle Racecourse Park bounds the site to the north and the Baldoyle Estuary is further east beyond the R106 Coast Road.

The proposed Project gradient varies between 10 m above Ordnance Datum (mAOD) in the south and 8 mAOD in the north.

6.3.1.3 Areas of Geological Interest and Historical Land Use

The GSI (2021) on-line mapping was reviewed to identify sites of geological heritage for the Site and surrounding area. There are no recorded sites on / at the Site of the proposed Project, or which could be considered suitable for protection under this programme or recorded in the Fingal Development Plan (2017 – 2023).

The nearest Geological Heritage Site is the North Bull Island, which is located c. 2.0 km to the south of the site. Due to the distance and the compact nature of the Calp limestone beneath the proposed Site, there is a negligible risk to this heritage site.

Details of the Site history and previous land use are included in Chapter 13 - Archaeology & Cultural Heritage. The assessment of site history confirms that until recently, the site has been in agricultural use since the earliest mapping available (1837 – 1842).

According to the EPA (2021), there are no licensed IPPC or IED facilities in the vicinity of the site. There is no record of any recorded landfills or licenced waste facilities in the vicinity of the site.

6.3.2 Soils

The Teagasc soil mapping indicates that the soils are comprised primarily of deep well drained mineral soil derived from limestones (BminDW) with areas of Poorly drained mineral soils derived from mainly basic parent materials (BminPD). The EPA have historically classed this area as agricultural land used for pastural farming and as a non-irrigated arable land. However, soils have been previously stripped and a parts of the area to the south is in use as a construction.

Figure 6.2 below presents the soils map indicating the soil lithologies discussed above.

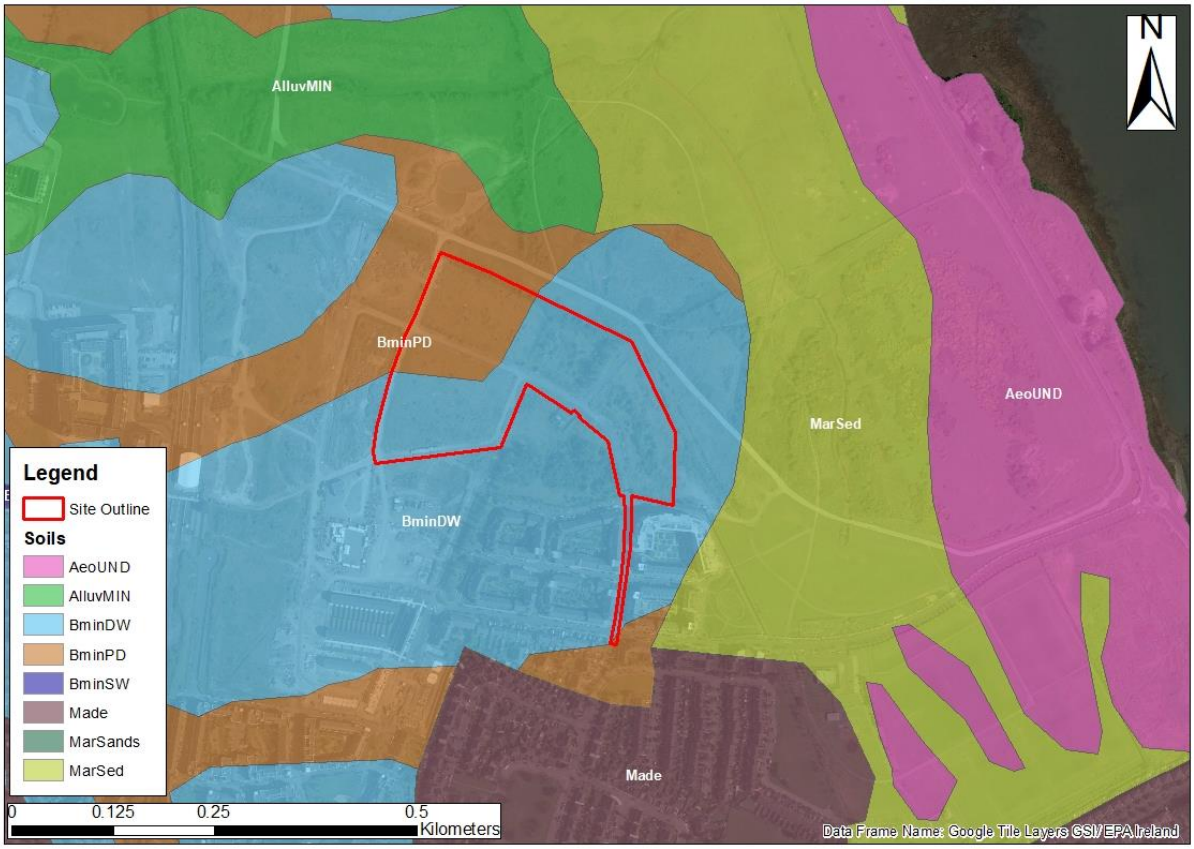

Figure 6.2 Soils Map with the proposed site layout (Source: EPA/ Teagasc, 2021)

6.3.3 Subsoils

The Quaternary geological period extends from about 1.5 million years ago to the present day and can be sub-divided into the Pleistocene Epoch, which covers the Ice Age period, and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

The GSI/ Teagasc mapping database of the subsoils in the area of the proposed development site indicates one (1) no. principal soil type, as shown in Figure 6.3 below. The subsoil types present across the site are:

- LIMESTONE till Carboniferous (TLs). A large section of the eastern boundary of the site is composed of limestone TILL. This till is made up of glacial CLAYs which are less permeable than alluvium subsoils.

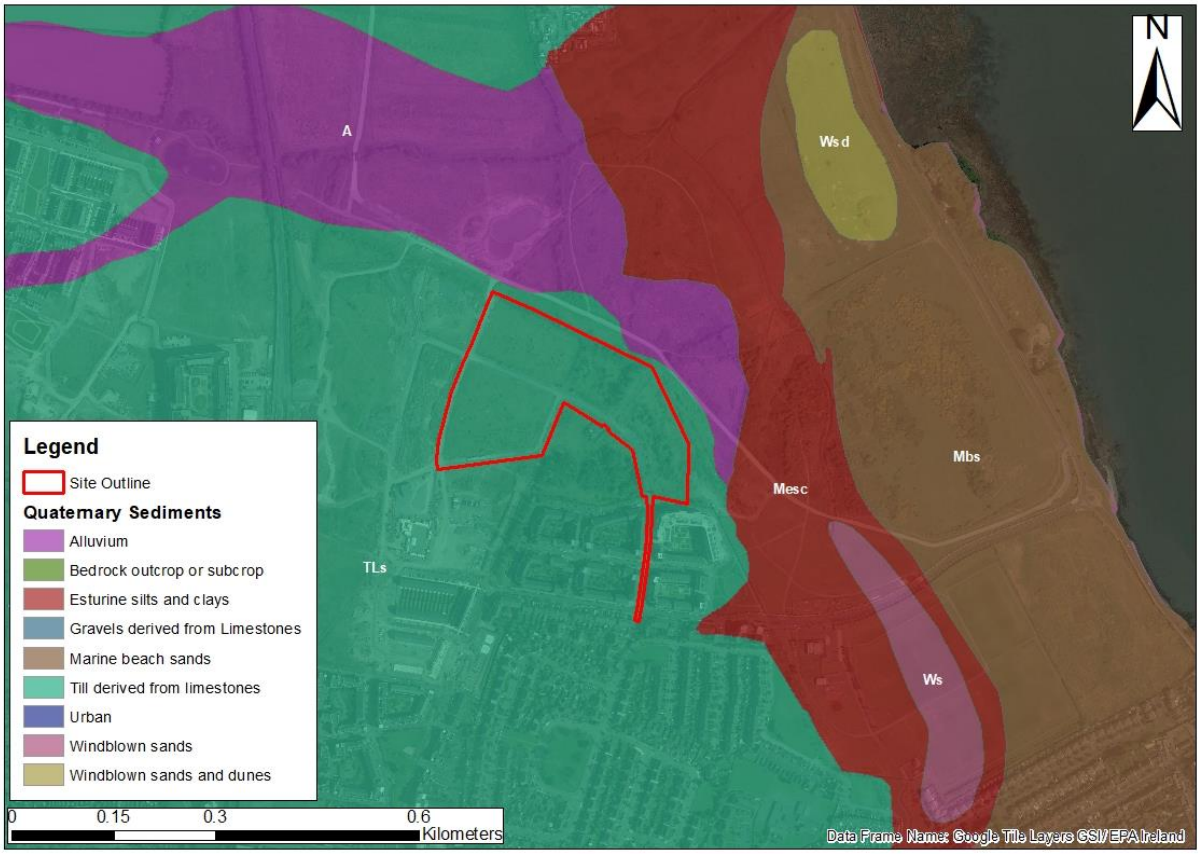

Figure 6.3 Subsoils Map with the proposed site layout (Source: GSI, 2021)

Ground Investigations Ireland (GII) carried out an environmental site investigation directly to the east of the proposed development site between October 2019 and February 2020 (BSM, 2021). The scope of works included trial pitting, borehole drilling, subsoil sampling, interpretation of chemical data and reporting. The sequence of subsoils deposits recorded during the site investigations are shown in Table 6.1. Site investigation locations are shown in Appendix 6.2. Site investigation works entailed the following:

- 12 No. Trial Pits to a maximum depth of 3.30 m mbgl
- 2 No. Soakaways to determine a soil infiltration value to BRE digest 365
- 12 No. Dynamic Probes to determine soil strength/density characteristics
- 2 No. Cable Percussion boreholes to a maximum depth of 7.00 m mbgl
- Installation of 2 No. Groundwater monitoring wells
- Geotechnical & Environmental Laboratory testing (12 No in total for environmental testing)

Table 6.1 *Strata Noted from Onsite Investigations (GII, 2020)*

Name	Depths/ Notes
Topsoil	0.0 m - 0.2 m below ground level (mbgl)
Made Ground	Made Ground deposits were encountered from surface or beneath the Topsoil and were present to a variable depth of between 0.50 m and 1.00 mbgl. These deposits were described generally as brown slightly sandy gravelly CLAY with occasional redbrick fragments. Hardcore containing pyrite was encountered underlying the existing roadways on the site.

Name	Depths/ Notes
Cohesive Deposits	Cohesive deposits were encountered beneath the Made Ground or Topsoil and were described typically as grey-brown slightly sandy gravelly CLAY with occasional cobbles and boulders overlying a grey slightly sandy gravelly CLAY with occasional cobbles and boulders.
Granular Deposits	The granular deposits were encountered within the cohesive deposits and were typically described as Grey brown or grey clayey gravelly fine to coarse SAND with occasional cobbles and rare boulders. The secondary sand/gravel and silt/clay constituents varied across the site and with depth while occasional or frequent cobble and boulder content also present where noted on the exploratory hole logs.

Additional investigations were undertaken directly to the south of proposed site boundary between November & December 2019 and similar strata was noted (BSM, 2021).

6.3.3.1 Soil Quality

During the 2019 and 2020 site investigations, samples were recovered from the on-site trial pit and borehole locations and sent for analysis. In order to assess materials, which may be excavated and removed from Site, in terms of waste classification, a selection of samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as hazardous or non-hazardous referred to as the 'RILTA Suite'. The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen. The total pollutant content analysis also provides analytical data which can be used to assess the quality of the subsoils underlying the Site and allow an assessment of their suitability for a range of proposed uses against generic assessment criteria.

The RILTA Suite also includes those parameters specified in the EU Council Decision Establishing Criteria for the Acceptance of Waste at Landfills (Council Decision 2003/33/EC), referred to as Waste Acceptance Criteria (WAC), which for the solid samples are pH; total organic carbon (TOC); speciated aliphatic and aromatic petroleum hydrocarbons; benzene, toluene, ethylbenzene and xylene (BTEX); phenol; polychlorinated biphenyls (PCB); and polycyclic aromatic hydrocarbons (PAH).

In line with the requirement of Council Decision 2003/33/EC, leachate was generated from the solid samples, which was in turn analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS). The suite was selected due to the unknown origin of the material underlying the Site and no evidence of specific contaminants of concern highlighted in the Site history. The laboratory testing was competed by Element Materials Technology (EMT) in the UK; EMT is a UKAS accredited laboratory(BSM, 2021)

The laboratory analysis did not identify any asbestos containing materials (ACMs) in any of the samples tested.

All of the samples collected at the site were categorised as inert (as per Council Decision annex 2003/33/EC). There was no evidence of waste deposited on-site

during Site investigation works (BSM, 2021). Please see Chapter 16 Waste Management for further discussion on waste categorisation and removal.

6.3.4 Bedrock Geology

Reference to the GSI Bedrock Geology Map indicates that the Site is underlain by Lower Carboniferous (Courceyan Stage) Limestones which is referred to as Malahide Formation (Rock Unit code: CDMALH). This geological formation comprises argillaceous bioclastic limestone and shale. The Bedrock Geology Map is shown in Figure 6.4, below.

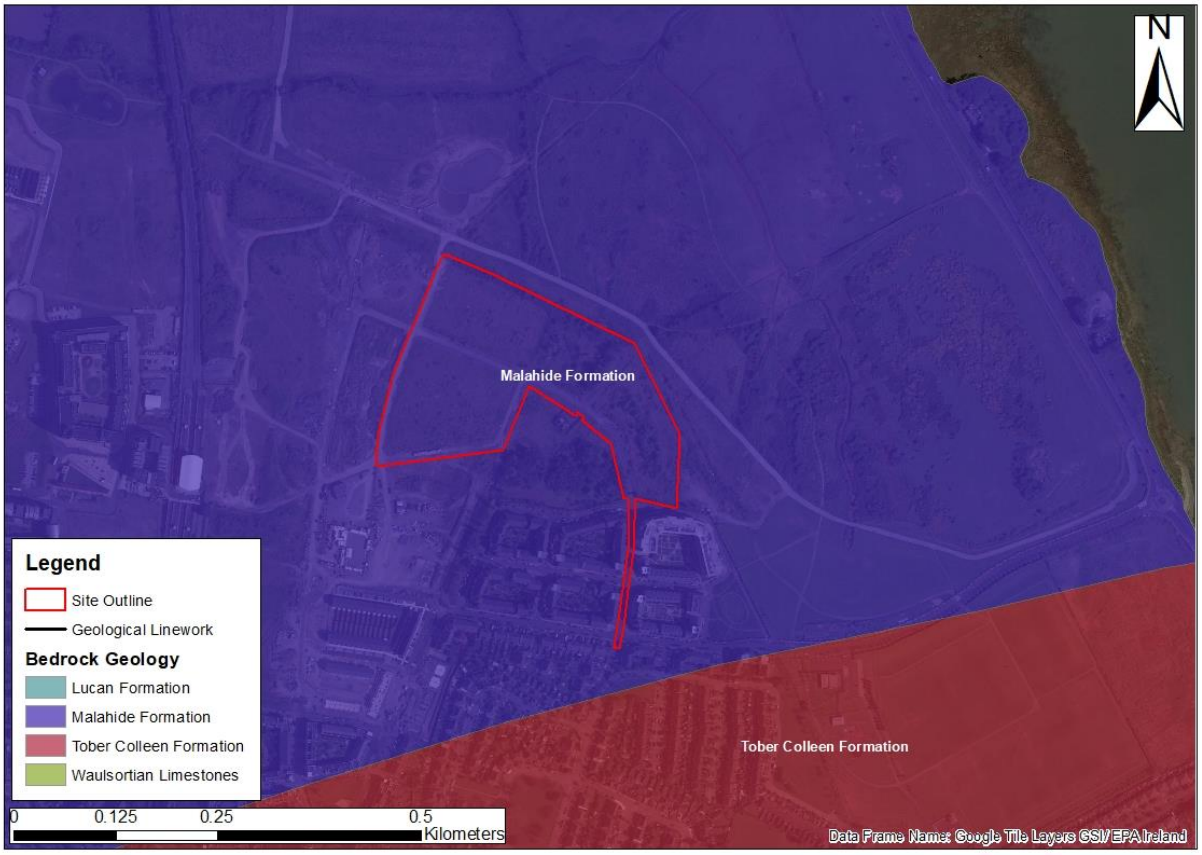

Figure 6.4 Bedrock Geology Map with the proposed site layout (Source: GSI, 2021)

6.3.5 Regional Hydrogeology

The GSI classifies the principal aquifer types as:

Bedrock Aquifer

- Lk - Locally Important Aquifer - Karstified.
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones.
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive. Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones.
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive.
- Rkd - Regionally Important Aquifer (karstified diffuse).

Gravel Aquifer

- Lg - Locally Important Aquifer - Sand & Gravel.
- Rg - Regionally Important Aquifer - Sand & Gravel.

Reference to the GSI National Draft Bedrock Aquifer Map for the Site (refer to Figure 6.5, below) indicates that the Site is underlain by a Locally Important Bedrock Aquifer (LI), which is described by the GSI as bedrock as being "moderately productive only in local zones".

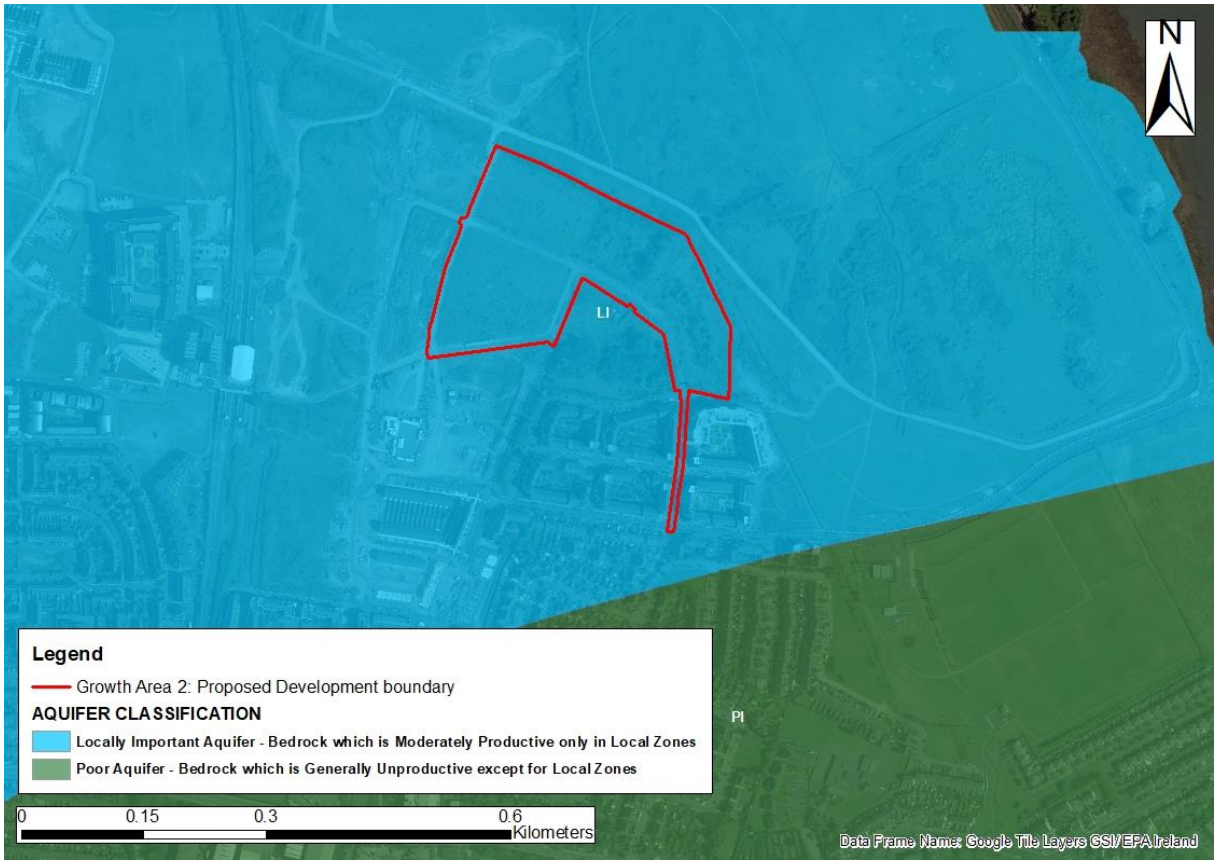

Figure 6.5 *Aquifer Classification Map with the proposed site layout (Source: GSI, reviewed 2021)*

6.3.6 Aquifer Vulnerability

Aquifer vulnerability' is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures / fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of or of mixtures of peat, sand, gravel, glacial till, clays or silts).

The GSI presently classifies the aquifer vulnerability in the region of the Site as 'Low' (L) which indicates that an overburden depth of c. 10 m of low permeability soil is present. This was confirmed in 2019 and 2020 investigations undertaken by GII. The aquifer vulnerability class in the region of the site is presented below as Figure 6.6.

Figure 6.6 *Aquifer Vulnerability Map with the proposed site layout (Source: GSI, 2021)*

Table 6.2 below presents the GSI vulnerability mapping guidelines with specific reference to subsoil thickness and characteristics.

Table 6.2 *Vulnerability Mapping Guidelines (Source: GSI, 2021)*

Vulnerability Rating	Hydrogeological Condition				
	Subsoil Permeability (type) and Thickness			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Moderate Permeability (e.g. sandy subsoil)	Low Permeability (e.g. clayey subsoil, clay, peat)	(Sand/ gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3 m	0 - 3 m	0 - 3 m	0 - 3 m	-
High (H)	> 3 m	3 - 10 m	3 - 5 m	> 3 m	n/a
Moderate (M)	n/a	> 10 m	5 - 10 m	n/a	n/a
Low (L)	n/a	n/a	> 10 m	n/a	n/a

Notes: (1) n/a: Not applicable

(2) Precise permeability values cannot be given at present

(3) Release point of contaminants is assumed to be 1-2 below ground surface

6.3.7 Description of the Groundwater Body

The Water Framework Directive (WFD) Directive 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional

(estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in waterbodies that are of lesser status at present, and retaining 'Good Status' or better where such status exists at present. The EPA co-ordinates the activities of the River Basin Districts (ERBDs), Local Authorities and State agencies in implementing the WFD, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland (ROI).

Presently, the groundwater body in the region of the site (Dublin GWB) is classified under review as per the WFD Risk Score system . The Dublin GWB achieved 'Good Status' in the period 2013 – 2018.

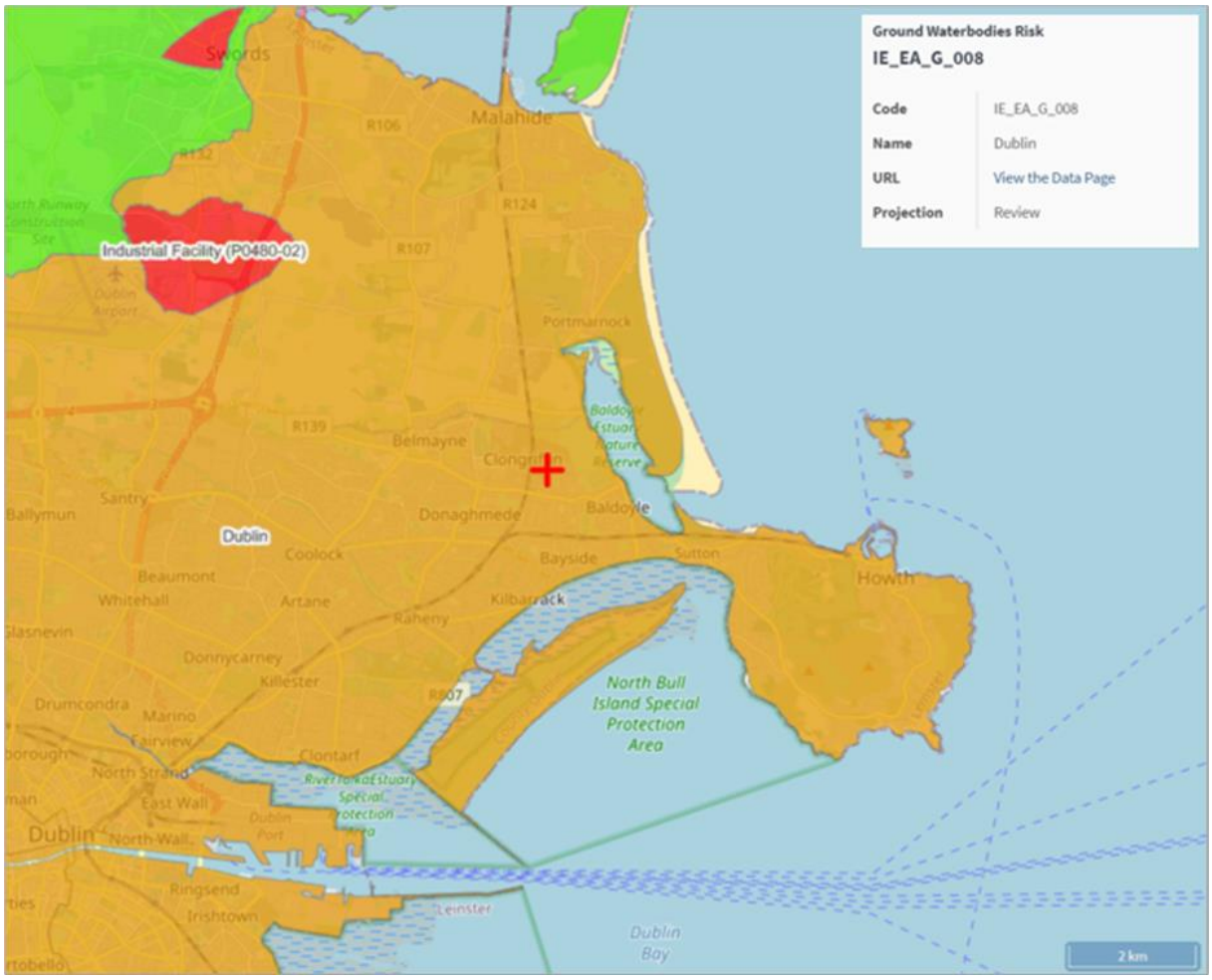

Figure 6.7 Groundwater Body Map (Source: GSI, 2021)

6.3.8 Groundwater Wells and Flow Direction

There is no licencing system for wells in Ireland at present and, as such, no complete data set. The GSI Well Card Index is a record of wells drilled in Ireland, kept by the GSI. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in ROI. This current index, however, indicates there are no groundwater wells, boreholes or dug wells within the Site boundary. In the immediate vicinity of the Site, specifically in the south-west side, there is one borehole recorded in the GSI Well Card within 2 km of the Site, drilled in 1988. It had a good yield (196 m^3/d) and a depth of 57 mbgl.

The flow direction in the overburden generally follows no fixed pattern or trend. Flows of this nature are typical of low permeability clay strata with discontinuous gravel lenses, where often the water level measures represent pore water seepages into the overburden monitoring well (opposed to bedrock wells) or perched groundwater conditions (not bedrock aquifer water). Bedrock was not proven during the Site investigation, so no accurate groundwater gradient can be derived. However, based on the Site's proximity to the coast, regional groundwater flow will be east towards the Malahide Estuary. Slow seepage of perched groundwater was recorded in some of the excavated soak away and trial pits, namely SA13 (0.7 mbgl) and TP111 (1.9 mbgl). Standing water levels (SWLs) were recorded in five overburden borehole locations (BH37, BH38, BH39, BH40 and BH41) indicating a non-continuous perched water table throughout the Site. Water table within bedrock was not proven during the site investigations.

There is no risk to any public water supply as the nearest drinking water protection area is located 22 km west of the Site in Co. Meath at Dunboyne.

Figure 6.8 GSI Well Search Map (Source: GSI, 2021)

6.3.9 Hydrogeological Features

There is no evidence of karstification at the vicinity of the Site according to the GSI Karst and well database. There is one spring (Saint Doolagh's) located 2.8 km north-west of the Site. The lithology of the spring is Limestone, clean (>=90% CaCO3) and unbedded.

6.3.10 Areas of Conservation

The closest Natura 2000 site is Baldoyle Bay Special Area of Conservation (SAC), which is 400 m from the proposed Project. The nearest Special Protection Area (SPA) to the Site of the proposed Project is the Baldoyle Bay SPA which is located 700 m from the Site. There are no designated Natural Heritage Areas (NHA) within a 15 km radius, however the nearest proposed NHA (Baldoyle Bay) is 400 m from the Site.

According to the NPWS (2021) online database, the following area of conservations are located closest to the Site:

- Baldoyle Bay SAC (Site Code 000199) – c. 400 m east of the Site. (Both the bay itself and saltwater marshland which extends over part of the lands of the former Baldoyle Racecourse).
- Baldoyle Bay SPA (Site Code 004016) – c. 700 m east of the Site.
- Baldoyle Bay pNHA – c. 400 m east of the Site.

6.3.11 Conceptual Site Model

A local cross section of the Site is presented below in Figure 6.9 (A-A' south-west to south-east) and a regional cross section is presented in Figure 6.10 (B-B' west to east). These cross sections and the description below present the Conceptual Site Model (CSM). The CSM was developed in order to identify any likely Source-Pathway-Receptor linkages relating to the site and the proposed development.

- The Site is mostly flat at 6 m AOD. The regional gradient falls from west to east towards the coast.
- No bedrock was encountered during the on-site investigations undertaken by GII in 2020. Bedrock is > 8.0 mbgl and comprises strong, medium to thinly bedded, grey, fine-grained limestone as per the GSI mapping. The limestone is classified by the GSI as a Locally Important Bedrock Aquifer (LI), which is described as 'moderately productive only in local zones'.
- The bedrock aquifer is well protected by low permeability clay and characterised by the GSI and confirmed by on site drilling as a low vulnerability area.
- Groundwater flow within the bedrock unit is eastward in line with the regional gradient. There is no continuous perched groundwater table on-site.
- The groundwater body in the region of the site (Dublin GWB) is classified under the WFD Risk Score system as currently 'Under Review'. Previously (2013-2018) the Dublin GWB was given 'Good Status'.
- The drainage comprises internal drainage ditches which discharge to the Mayne River located north of the Site, which then discharges into Baldoyle Bay SAC, c. 400 m from the Site boundary.
- All of the samples collected at the site can be categorised as inert (as per Council Decision annex 2003/33/EC). Soil comparison WAC category tables can be viewed in Appendix 6.3. There was no evidence of waste deposited on-site during Site investigation works.
- The proposed Project is outside of any delineated drinking water protection area. There are a number of domestic / agricultural wells in the surrounding lands.
- There are no groundwater dependent terrestrial ecosystems which have potential to be impacted by the proposed Project. The Baldoyle SAC does include an area of saltwater marsh to the east of the Site (c. 400 m). This is addressed in Chapter 10 (Hydrology) and Chapter 8 (Biodiversity).

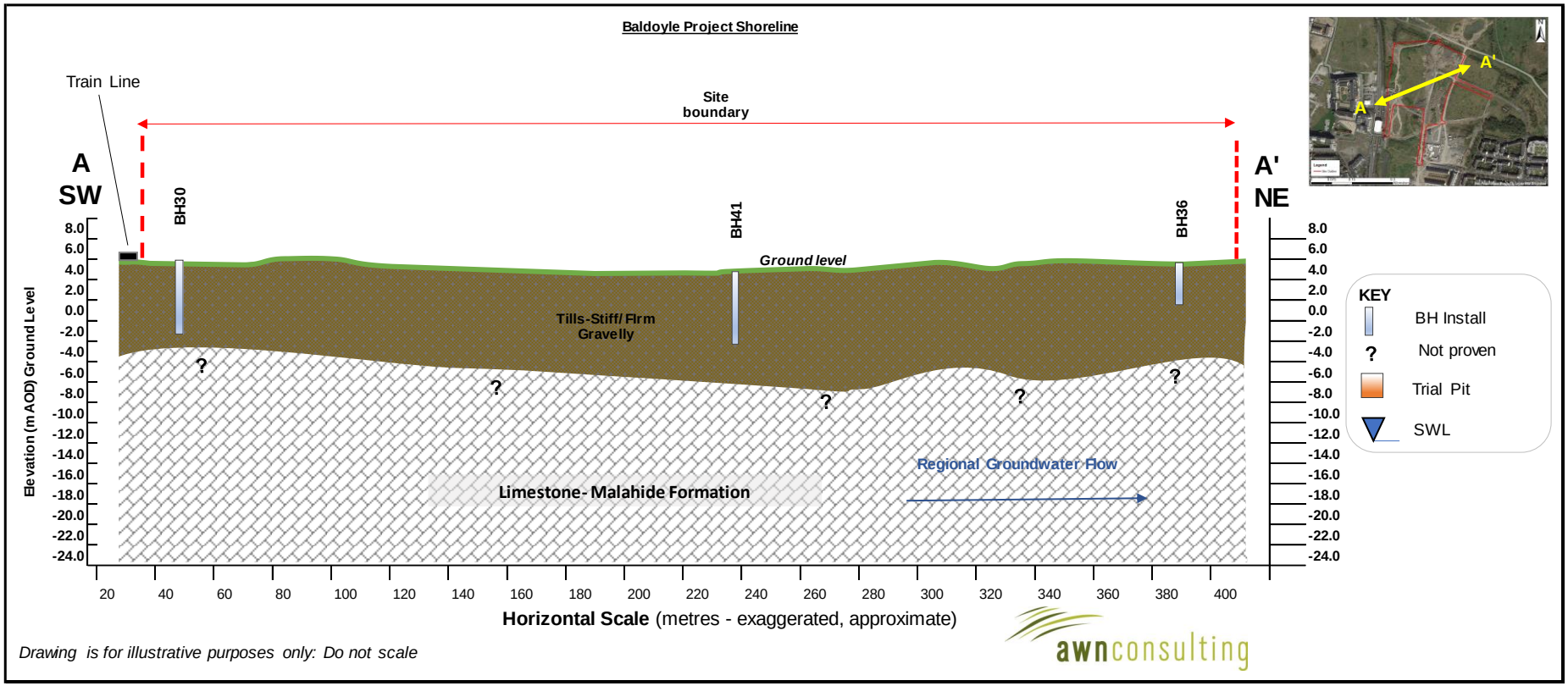

Figure 6.9 Site Conceptual Model, local cross section of the Site (A-A' south-west to south-east)

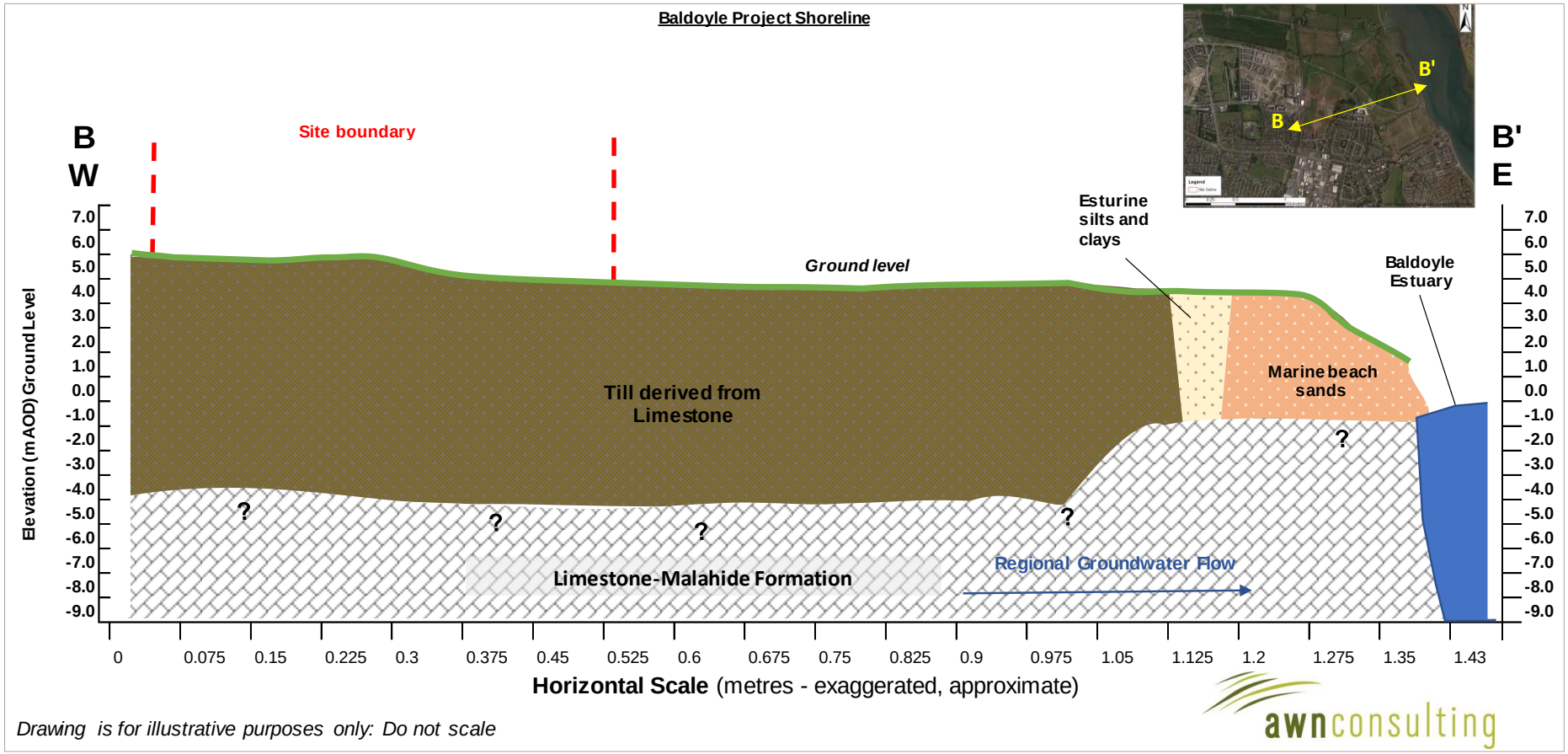

Figure 6.10 Site Conceptual Model, regional cross section (B-B' west to east).

6.3.12 Economic Geology

The EPA Extractive Industry Register and the GSI mineral database were consulted to determine whether there were / are any mineral sites close to the Site. The Huntstown Quarry is 11.5 km to the west of the Site of the proposed Project. One mineral site was identified in Portmarnock, c. 2.6 km to the north. The site is described as an old brick works that supplied good class red bricks to Dublin.

6.3.13 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland), the Site location is an area (10 km grid) where between 1 – 5% of the homes are estimated to be above reference level. This would be considered a 'Low' Radon area as per the EPA online mapping tool.

6.3.14 Geohazards

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly increased by human activities, e.g. construction, agricultural activities, etc. Mass movements / mass wasting (such as landslides, mud flows, bog bursts and debris flows) are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock; and where the sea constantly erodes the material at the base of a cliff, landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and there are no recorded landslides in the vicinity of the proposed Project. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the Site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland, operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to the Site of the proposed Project was in the Irish Sea (1.0 – 2.0 Ml magnitude) and ~55 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity at the Site.

There are no active volcanoes in Ireland so there is no risk from volcanic activity.

6.3.15 Rating of Importance of Geological and Hydrogeological Attributes

Based on the TII (previously NRA) methodology (2009) (See Appendix 6.1), criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as *'Medium Importance'* with medium significance or value on a local scale. This is due to the existence of reasonably well drained and/or high fertility soils across the site.

Based on the TII methodology (2009) (See Appendix 6.1) the importance of the hydrogeological features at this site is rated as '*Medium Importance'* based on the assessment is a Locally Important (Ll) bedrock aquifer which is moderately productive

6.3.16 Summary & Type of Geological/ Hydrological Environment

Based on the regional and site-specific information available the type of geological / hydrogeological environment at the Site, as per the IGI Guidelines, is:

Type B - Naturally Dynamic Hydrogeological Environment

- Historically the Site of the proposed Project is greenfield in nature, although it has been stripped and recolonised in places in recent years. There is no evidence of any historical waste disposal or source of contamination. However, there is a presence of pyrite within the hardcore underlying the existing roadways.
- The Site is underlain by a Locally Important aquifer.
- The Site is underlain by the Malahide Formation argillaceous bioclastic limestone and shales.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The activities associated with the proposed Project which are relevant to the land, soils, geology and hydrogeological environment are detailed in Table 6.2.

Table 6.2 *Summary of site activities*

Phase	Activity	Description
Construction	Discharge to Ground	Stormwater run-off percolating to ground at the construction site.
	Earthworks: Excavation of Superficial Deposits	Cut and fill will be required to facilitate construction of the proposed project, basements and associated ancillary services. Excess material which cannot be re-used on-site will be disposed off-site at a suitably licensed facility in accordance with the Construction and Demolition Waste Management Plan (C&D WMP) (Appendix 16.1). The maximum depth of excavation required to facilitate installation of services, basements and foundations, as specified by Project Engineers (J.B. Barry & Partners) is c. 4.7 m below ground level. There will be no excavation of bedrock required; therefore, no aquifer dewatering required. Subsoil stripping and localised stockpiling of soil will be required during construction. It is estimated that approximately 135,000 m^3 of soils will be excavated to facilitate construction of the proposed project. It is anticipated that 6,000 m^3 of the excavated material can be reused onsite for landscaping purposes Approximately 129,000 m^3 of material will be removed from site/ Suitable excavated material will be reused for site levelling, roads, car parking areas, berms and other landscaping purposes. Material removed from site may be re-used off-site for beneficial use on other sites with appropriate planning / waste permissions / derogations (e.g. in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011) as amended, or will be reused, recovered and / or disposed off-site at appropriately authorised waste facilities
	Storage of soils/aggregates	Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination. Temporary storage of spoil will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment and solid matter. Materials will be sent off site for recycling where possible and, if not suitable for recycling, materials will be disposed of to an appropriate permitted/licensed waste disposal facility.

Phase	Activity	Description
	Storage of hazardous Material	Temporary storage of fuel required for on site for construction traffic. Liquid materials i.e., fuel storage will be located within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage. These will be stored within the contractor yard.
Operation	Increase in hardstanding area	Altering of local recharge (percolation to ground) only due to increase in hard standing area of c. 42,640 m².
	Storage of hazardous Material	No bulk fuel or chemical storage at the Site. Only potential for minor fuel leaks from parked cars, service vehicles, HGV deliveries, etc.

The projected volumes of strip, cut and fill are presented in Table 5.5 below:

As outlined in Table 6.2, the activities required for the construction phase of the proposed project represents the greatest risk of potential impact on the geological environment. These activities primarily pertain to the site preparation, excavation, levelling and infilling activities required to facilitate construction of the proposed project, and ancillary services.

The potential geological and hydrogeological impacts during the construction and operational phases are presented below. Remediation and mitigation measures included in the design of the proposed Project to address these potential impacts are presented in Section 6.5.

6.4.1 Do Nothing Scenario

The Do-Nothing scenario refers to the environment as it would be in the future should the proposed Project not be carried out. Should the proposed Project not proceed the lands are zoned for residential development so would likely have some form of development at some stage in the future, the impacts of which cannot be assessed. There is also the possibility that no development would be progressed at the Site in this scenario, in which case there would be no impacts on the geological and / or hydrogeological environment at the Site.

6.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the proposed development on the land, soils, geology and hydrogeological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water (hydrology) the following impacts discussed will be considered applicable to both Chapter 6 and 7 (Hydrology) of the EIAR. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 6.6 below.

6.5.1 Construction Phase

In the absence of mitigation, the following potential effects to land, soil and groundwater (hydrogeology) have been considered:

- Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction phase. Rainfall and wind can also impact on non-vegetated / uncovered areas within the excavation or where soil is stockpiled. This can lead to run-off with high suspended solid content, which can impact on waterbodies. The potential risk from this indirect impact to waterbodies and / or habitats from contaminated water would depend on the magnitude and duration of any water quality impact.
- Following the findings of the on-site investigations, the risk of a large volume of contaminated soils being present on-site is low. Nonetheless, material that is exported from site, if not correctly managed or handled, could impact negatively on human beings (on-Site and off-Site), as well as water and soil environments.
- As with all construction projects, there is potential for water (rainfall and / or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer (receptor) via the unsaturated zone (subsurface pathway). The potential main contaminants (sources) include:
  - Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;
  - Cement / concrete (increase turbidity and pH) – arising from construction materials;
  - Hydrocarbons (ecotoxic) – accidental spillages from construction plant or on-Site storage; and
  - Wastewater (nutrient and microbial rich) – arising from poor on-Site toilets and washrooms.

There will be emissions to ground following attenuation from the sustainable drainage systems (SUDs) / attenuation pond to the north. All water from the proposed Project will discharge to this wetland before discharging to the Mayne River floodplain over a spillway / weir. The wetland / SUDs pond will serve as the final water quality treatment for the proposed Project of GA02, plus GA01 and GA03. Assuming implementation of the mitigation measures highlighted below (Section 6.6) and considering the low vulnerability of the underlying bedrock aquifer, there will be no impact to the Locally Important bedrock aquifer.

6.5.1.1 Loss of agricultural land

The Site of the proposed Project is zoned for residential development and is not being used for agricultural purposes. There will be no local loss of agricultural soil, and no impact to mineral resources in the area as a result of the proposed Project.

6.5.1.2 Accidental Spills

Machinery activities on site during the construction phase may result in contamination of runoff/ surface water. Potential impacts could arise from accidental spillage of fuels, oils, paints etc. which could impact surface water if allowed to infiltrate to runoff to surface water systems and/or receiving watercourses. However, implementation of the mitigation measures detailed below will ensure that this does not occur.

Concreting operations carried out near surface water drainage points during construction activities could lead to discharges to a watercourse. Concrete (specifically, the cement component) is highly alkaline and any spillage to the underlying subsoil and aquifer bedrock would be detrimental to water quality and local fauna and flora. However, employment of the mitigation measures highlighted above and within the CEMP will ensure that any impact will be mitigated.

6.5.1.3 Summary of Construction Phase Impacts

A summary of construction phase impacts for the proposed development (with and without mitigation) following EPA (2017) EIA guidelines is provided below.

The magnitude of the impact for the construction phase without mitigation (design) measures is *Temporary* in duration with a *Not Significant impact* rating to the underlying aquifer across the proposed development site.

However, with the implementation of design measures and mitigation measures (Section 6.6 below) for the proposed development site the impact of the construction phase is *Temporary* in duration with an *Imperceptible impact* rating.

6.5.2 Operational Phase

In the absence of mitigation, the following risks have been considered in relation to the operational phase of the proposed Project:

- There is a potential for leaks and spillages from vehicles along roads and in parking areas (source). Any accidental emissions of oil, petrol or diesel could cause soil / groundwater contamination (receptor) if the emissions are unmitigated.

Groundwater abstraction does not form part of the proposed Project. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed Project.

6.5.2.1 Summary of the Operational Phase Impacts

A summary of operational phase impacts for the proposed development (with and without mitigation) following EPA (2017) EIA guidelines is provided below.

The magnitude of the impact for the operational phase without mitigation and design measures is *Temporary* in duration with a *Not Significant impact* rating to the underlying aquifer and karst features present across the proposed development site.

However, with the implementation of design and mitigation measures for the proposed development site the impact of the operation phase is *Long-term* in duration with an *Imperceptible impact* rating.

6.6 REMEDIAL AND MITIGATION MEASURES

The design has taken account of the potential impacts of the development on the land, soils, geology and hydrogeological environment local to the area where construction is taking place]. Measures have been incorporated in the design to mitigate the potential effects on the surrounding soils, geology and hydrogeology. These are described below.

Due to the inter-relationship between soils, geology, hydrogeology, ecology and hydrology, the following mitigation measures discussed will be considered applicable to all. Waste Management is also considered an interaction in some sections.

6.6.1 Construction Phase

In order to reduce the potential for any adverse impacts on the existing hydrological environment, a number of mitigation measures will be adopted as part of the construction works on site.

AWN Consulting have prepared an *Outline Construction Environmental Management Plan (CEMP)* (2021) that is included with the application documentation. The construction phase mitigation measures set out in the EIAR are duplicated in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The CEMP follows best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association;
- CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association
- CIRIA (2005), Environmental Good Practice on Site (C650); Construction Industry Research and Information Association
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

6.6.1.1 Management of Soil Excavation

Subsoil will be excavated to facilitate the construction of foundations, basements access roads, car parking areas, expansion of drainage connections and other ancillary works. The proposed project will incorporate the ‘reduce, reuse and recycle’ approach in terms of soil excavations on-Site. The construction will be carefully planned to ensure only material required to be excavated will be, with as much material left in situ as possible. Excavation arisings will be reused on-site where possible.

It is unlikely that any contaminated material will be encountered during the construction phase of the proposed project. Nonetheless, any excavation works will be carefully monitored by a suitably qualified person to ensure any potentially contaminated soil is identified and segregated from clean / inert soil. In the unlikely event that any potentially contaminated soils are encountered, they should be tested and classified as hazardous or non-hazardous in accordance with the EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous publication, HazWasteOnline tool or similar approved method. The material will then need to be classified as inert, non-hazardous, stable non-reactive hazardous or hazardous in accordance with EC Decision 2003/33/EC. It should then be removed from site by a suitably permitted waste contractor to an authorised waste facility.

Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of an appropriate earthworks handling protocol during the construction phase. It is anticipated that any stockpiles will be formed within the boundary of the Site and there will be no direct link or pathway from this area to any surface waterbody.

Dust suppression measures (e.g., damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads. The main contractor will be responsible for the coordination, implementation, and ongoing monitoring of the Dust Management Plan (Appendix 9.3 to the EIAR). The key aspects of controlling dust are listed in Chapter 9 (Air Quality) Section 9.6.1.1. Suitable excavated material will be reused on-site, where possible, for site levelling, roads, car parking areas and other landscaping purposes. There will be waste materials generated from the excavation of soil and stones to facilitate site clearance, construction of new building foundations and installation of services. The volume of material to be excavated has been estimated by the project engineers at c. 135,000 $m^{3.}$ It is envisaged that 6,000 m^3 of the excavated material will be required to be removed from site. When material is to be removed off-site it will be taken for off-site reuse, recovery and / or disposal. Where material cannot be reused off-site it will be sent for recovery or disposal at an appropriately authorised facility. If any waste soil requires removal from the site, it should be classified by an experienced and qualified environmental professional to ensure that the waste soil is correctly classified for transportation and recovery / disposal off-site. Refer to Chapter 16 – Waste Management for further detail.

6.6.1.2 Construction Surface Water Management Plan (SWMP)

During construction the contamination of surface waters, and run-off from excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.

The Construction Surface Water Management Plan prepared by AWN (Appendix 7.4) aims to set out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the SWMP will be employed on site during the construction phase. All mitigation measures outlined within the SWMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

The main areas of water related concerns covered by the SWMP document are:

- Pre-Construction, Construction Phase drainage controls;
- Management of Earthworks and Materials Storage;
- Surface water runoff protection (sit fences, silt traps, diversion channels);
- Prevention of Accidental Releases (concrete, fuel, and chemical handling); and
- Surface Water Treatment and Discharge, and
- Foul Water And Onsite Sanitation.

The SWMP is live document and will be modified over time as detailed contractor methods of work are developed. If the development is permitted an updated version of this document will be issued to all parties involved in the construction process when appropriate changes are deemed necessary.

There shall not be discharge of ***untreated***, silty, or contaminated water from the works to any watercourse or stormwater network. Should any discharge of ***untreated***

construction water be required during the construction phase, the discharge will be to foul sewer following agreement with Fingal County Council / Irish Water.

There is no significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

The discharge of ***treated*** construction water from rainfall into excavated areas, or from any localised dewatering may be required during construction. This ***treated*** construction water will be discharged to the existing 1500 diameter concrete stormwater main, that traverses underneath the north fringe sewer and discharges to the Mayne River.

6.6.2 Operational Phase

During the operational phase of the proposed Project, there is limited potential for site activities to impact on the geological and hydrogeological environment of the area. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed project.

6.6.2.1 Increase in Hardstanding

A proportion of the development area will be covered in hardstanding (c. 53,526 m²). This will provide protection to the underlying aquifer but will also reduce local recharge in this area of the aquifer. As the area of aquifer is large, this reduction in local recharge will have no significant impact on the natural hydrogeological regime.

6.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

6.7.1 Construction Phase

The implementation of mitigation measures outlined above (Section 6.6) will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the construction phase and that the residual impact will be **short-term-imperceptible-neutral**. Following the TII criteria (refer to Appendix 6.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

6.7.2 Operational Phase

The implementation of the design and mitigation measures highlighted above (Section 6.6) will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the operational phase and that the residual impact will be **long-term-imperceptible-neutral**. Following the TII criteria (refer to Appendix 6.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

6.8 MONITORING

6.8.1 Construction Phase

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10 m from surface water receptors.

Regular inspection of surface water run-off and any sediment control measures (e.g. silt traps) will be carried out during the construction phase.

Regular auditing of construction / mitigation measures will be undertaken, e.g. concrete pouring, refuelling in designated areas, etc. A log the regular inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not occur.

6.8.2 Operational Phase

No future soil or groundwater monitoring is proposed as part of the proposed project as no bulk chemical storage on site. Petrol interceptors will be maintained and cleaned out in accordance with the manufacturer's instructions. Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to ground.

6.9 REINSTATEMENT

Any reinstatement from the construction activities on-site (excavations associated with ancillary / preparation works) will adhere to the design and architectural specifications presented in this application. All fill material to be used will be graded to Project Engineers' specifications.

6.10 CUMULATIVE IMPACT ASSESSMENT

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments (as described in Chapter 3) are discussed below.

6.10.1 Construction Phase

The anticipated cumulative effects of the proposed Project in combination with existing, permitted and proposed developments, as listed in Chapter 3 (Planning and Development Context) are addressed below.

In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, those key engineering works which would have additional impacts above are as follows:

- Run-off containing large amounts of silt could cause damage to surface water systems and receiving watercourses. Run-off for the proposed Project will therefore need to be managed to limit silty discharges by following mitigation methods described in this Chapter and Chapter 7 (Hydrology) and the project-specific Construction Environmental Management Plan (CEMP); and
- Contamination of soils and groundwater underlying the Site from accidental spillage and leakage from construction traffic and construction materials may

occur unless project-specific CEMP are put in place and complied with. The project-specific CEMP will be put in place for the proposed project.

The works contractors for other planned or permitted developments (as described in Chapter 3) will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

In respect of substantial developments that may result in in-combination effects in respect of material assets are the adjacent residential development GA1 (ABP Reg. Ref.:311018-21) and GA3 (ABP Reg. Ref.:311016-21) are the relevant projects considered in detail.

The GA1 Grant of Permission ABP Reg. Ref.:311018-21 Condition 3 requires that the mitigation measures set out in the EIA must be carried out in full and Condition 4 request the mitigation and mitigation and monitoring measures as they relate to the Baldoyle Bay APA be implemented. Furthermore; Condition 22 states that prior to the commencement of works a Construction Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The GA3 Grant of Permission ABP Reg. Ref.:311016-21 Condition 5 states that prior to the commencement of works a finalised Construction and Environmental Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The implementation of mitigation measures within each chapter and detailed in Section 6.5.1; as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the proposed development. The residual impact of the proposed development in combination with other planned or permitted developments (as described in Chapter 3) is **short-term-imperceptible-neutral**.

6.10.2 Operational Phase

Overall, the proposed development in combination with existing, permitted and proposed developments, as listed in Chapter 3 (Planning and Development Context) will result in aa local change in recharge to ground pattern due to the increase in hardstand. However, based on the overall size of the underlying aquifer and measures to protect soil and water quality there will be no overall change on the groundwater body status. The operation of the proposed development is concluded to have a *long-term, imperceptible* significance *with a neutral* impact on soil and water quality.

In relation to the potential cumulative impacts from the operational phase, the following would apply:

- Overall increase in hardstanding: Cumulatively this development and others in the area will result in localised reduced recharge to ground and increase in

surface run-off. The aquifer underlying the Site is a locally important aquifer (Li). Based on site specific and regional geological investigations there is c. >10 m of overburden overlying the bedrock aquifer, classifying it as 'Low' vulnerability (GSI classification). As such, the cumulative impact is considered to be imperceptible. The reduction in recharge rate to ground will be mitigated somewhat by the use of SuDs measures on site.

- Localised accidental discharge of hydrocarbons could occur in car parking areas and along roads unless diverted to surface water drainage system with petrol interceptors. However, all developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (primarily the Water Framework Directive 2000/60/EC) such that they would be required to manage run-off and fuel leakages.
- There will be a small loss of greenfield area locally as part of the proposed Project.

The implementation of mitigation measures within each chapter and detailed in Section 6.5.2; as well as the compliance of adjacent development with their respective planning permissions means that the residual cumulative effect on land, soils, geology and hydrogeology for the operational phases is anticipated to be long-term, neutral in terms of quality and of imperceptible significance.

6.11 REFERENCES

- Brady Shipman Martin (BSM) Chapter 9 of SHD at Baldoyle-Stapolin Growth Area 3 (GA3), Baldoyle, Dublin 13 Environmental Impact Assessment Report (EIAR) Volume 2 – Main Text July 2021
- Chartered Institute of Environmental Health (CIEH) (2015). *The LQM/CIEH S4Uls for Human Health Risk Assessment*.
- Construction Industry Research and Information Association (CIRIA) (2011). *Environmental Good Practice on site; Construction Industry Research and Information Association Publication C692 (3rd Edition - an update of C650 (2005*) (I. Audus, P. Charles and S. Evans).
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7.0 HYDROLOGY (WATER)

7.1 INTRODUCTION

This chapter of the EIAR has been prepared by AWN Consulting Ltd. and assesses and evaluates the potential for significant impacts on the surrounding water and hydrological environment associated with the proposed Strategic Housing Development (SHD) (referred to as "the proposed development"), located at Baldoyle-Stapolin Growth Area 2 (GA02), Baldoyle, Dublin 13.

In assessing likely impacts, account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

7.2 METHODOLOGY

The methodology used in this assessment follows current European and Irish guidance as outlined in:

- EPA (2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- EPA (2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

The rating of potential environmental impacts on the hydrological environment is based on the quality, significance, duration and type of impact characteristic identified. Consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that cited attribute. The Draft EIAR Guidelines (2017) tables are Chapter 1 - Introduction.

The TII criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-3 in Appendix 7.1.

The principal attributes (and effects) to be assessed include the following:

- River and stream water quality in the vicinity of the site (where available);
- Surface watercourses near the site and potential impact on surface water quality arising from proposed development related works including any discharge of surface water run-off;
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.

7.2.1 Sources of Information

This assessment was considered in the context of the available baseline information, potential impacts, consultations with statutory bodies and other parties, and other available relevant information. In collating this information, the following sources of information and references were consulted:

- Latest EPA Maps & Envision water quality monitoring data for watercourses in the area (these data can be accessed at https://gis.epa.ie/EPAMaps/ and www.catchments.ie
- *National River Basin Management Plan 2018 – 2021.*
- Department of the Environment, Heritage and Local Government (DEHLG) and the Office of Public Works (OPW) (2009). *The Planning System and Flood Risk Management, Guidelines for Planning Authorities.*
- Office of Public Works (OPW). *Flood mapping data*, accessed at www.floodmaps.ie
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports.
- Eastern Regional Fisheries Board. *Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites*.
- Dublin City Council (2005). *Greater Dublin Strategic Drainage Study (GDSDS): Technical Documents of Regional Drainage Policies.*
- *Greater Dublin Regional Code of Practice for Drainage Works: Version Draft 6.0* (Wicklow County Council, South Dublin County Council, Meath County Council, Kildare County Council, Fingal County Council, Dún Laoghaire-Rathdown County Council & Dublin City Council).
- Construction Industry Research and Information Association (CIRIA) (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532)*.

Other relevant documentation consulted as part of this assessment included the following:

- Chapter 9 of SHD at Baldoyle-Stapolin Growth Area 3 (GA3), Baldoyle, Dublin 13 Environmental Impact Assessment Report (EIAR) Volume 2 – Main Text July 2021
- Lismore Homes Limited (2021) Residential Development Baldoyle GA2 Water Services Report
- Lismore Homes Limited (2021) GA2 Residential Development Baldoyle Flood Risk Assessment

7.2.2 Forecasting Methods and Difficulties Encountered

There were no difficulties encountered in compiling this chapter of the EIAR.

7.3 BASELINE ENVIRONMENT

The proposed development is located within the previously defined Eastern River Basin District (ERBD), now the Ireland River Basin District, in Hydrometric Area No. 09 of the Irish River Network. It is within the River Liffey catchment and mayne Sub-catchment (Mayne_SC_010). The River Liffey catchment encompasses an area of approximately 1,369 km2. The River Liffey extends from the mountains of Kippure and Tonduff in County Wicklow to the sea at Dublin Bay. The main channel covers a distance of c. 120 km west to east. The Snugborough Stream lies 650 m to the east and the Mayne River lies 550 m to the north (EPA designations). The Snugborough rises to the south and is culverted between Seagrange Park and the Red Arches Road.

According to the NPWS (2021) online database, the following area of conservations are located closest to the Site:

- Baldoyle Bay Special Area of Conservation (SAC) (Site Code 000199) – c. 400 m east of the Site. (Both the bay itself and saltwater marshland which is part of the old Baldoyle Racecourse).
- Baldoyle Bay Special Protection Area (SPA) (Site Code 004016) – c. 700 m east of the Site.
- Baldoyle Bay proposed Natural Heritage Area (pNHA) – c. 400 m east of the Site.

Refer to Chapter 8 - Biodiversity for further information on Designated Sites.

Figure 7.1 *Local Hydrological Environment*

7.3.1 Surface Water Quality

The European Communities Directive 2000/60/EC establishing a framework for community action in the field of water policy, commonly known as the Water Framework Directive (WFD), requires 'Good Water Status' for all European waters by 2015, to be achieved through a system of river basin management planning and extensive monitoring. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'. The second cycle River Basin Management Plan was published in April 2018, and replaced the first cycle plan (2009 – 2015). The impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g. water regulation structures). The purpose of this exercise was to identify waterbodies at risk of failing to meet the objectives of the WFD and include a programme of measures to address and alleviate these pressures.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003).
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014).
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended by S.I. No. 77 of 2019).
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 as amended by S.I. No. 366 of 2016).
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010).
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011).

Figure 7.2, below, presents the EPA surface water quality monitoring points in the context of the Site and regional drainage setting, as well as the waterbodies' WFD risk category. Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the Site of the proposed development, the nearest EPA monitoring station is situated upstream at the Hole-In-Wall Bridge to the west of the Site on the Mayne River.

The EPA assesses the water quality of rivers and streams across Ireland using a biological assessment method (Q-Value), which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 – Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

The surface water quality data for the nearest monitoring station (Hole in the Wall Bridge) to the Site of the proposed development (upstream) for the Mayne River (including the Snugborough Stream) shows a Q rating of Q2-3 denoting a poor (moderately polluted) status as shown in Figure 10.2.

In accordance with the WFD, each river catchment within the former Eastern River Basin District (ERBD) was assessed by the EPA and a Water Management Plan detailing the programme of measures was put in place for each. Currently, the EPA classifies the WFD risk score of 1a, 'At risk of not achieving good status' for the River Mayne. The WFD Status for the Mayne River waterbody was previously denoted as 'Poor' (2nd Cycle Status 2013-2018). The transitional waterbodies of the Mayne Estuary and North Bull Island WFD status is currently 'under review' and these had a of "Moderate" for the previous cycle (2013 – 2015). The Irish Sea Dublin (HA 09) and the Dublin Bay Coastal Waterbodies to the east and south-east of the Site have a 'Good Status' and are listed as 'Not at Risk' by the EPA.

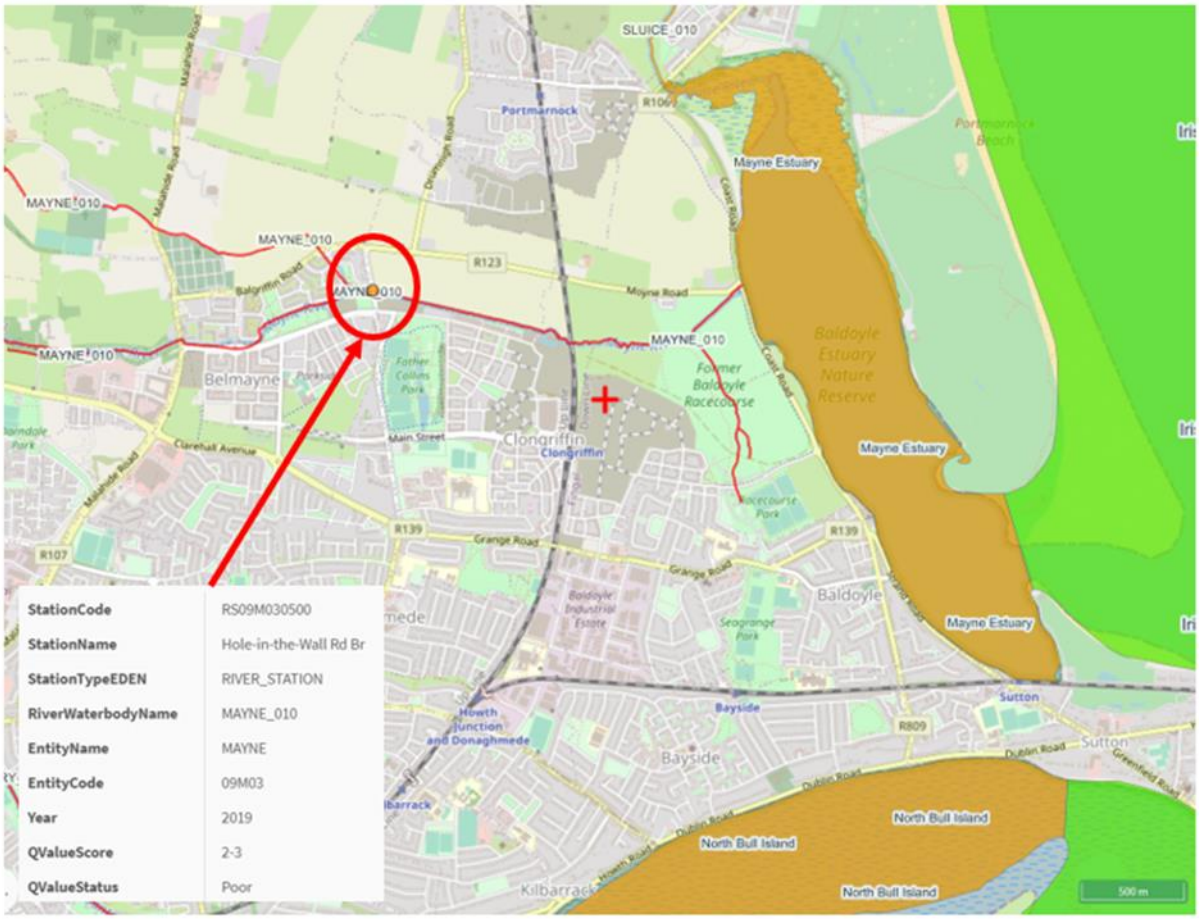

Figure 7.2 *Local Hydrological Environment and current WFD Ring including location of Hole in the Wall River Station. (Site location shown with red cross)*

7.3.2 Local Drainage

Currently, storm water run-off discharges through an existing 1500 mm stormwater culvert passing underneath the north Fringe Sewer, flowing south to north, which discharges into the Mayne River. It is noted that there is an existing stormwater drainage network located within the Site; however, due to its poor condition it is not intended to make use of the existing network and therefore it will be removed and a new network constructed in its place . Although these culverts currently traverse the Site, they are not connected to any storm / surface water drainage (i.e. gullies, swales) on-site to the Mayne River or Snugbourough Stream, so currently there is no direct hydraulic connection to these surface water features (pre-construction of permitted sustainable drainage systems (SUDs) constructed wetland (discussed below)). However, there is an indirect hydraulic connection via the stormwater system which is discharged to the Mayne River. The Mayne River ultimately discharges to the Baldoyle Estuary.

7.3.3 Flooding and Flood Risk Assessment

The proposed development was subject to Site Specific Flood Risk Assessment (SSFRA) undertaken by JBA Consulting Ltd in accordance with OPW Flood Risk Management Guidelines and is included as Appendix 7.2 entitled *Residential Development Baldoyle GA2, Flood Risk Assessment*.

This Flood Risk Assessment, contains a hydraulic study of the Mayne River, has been carried out (as required by Objective FRM3 of the Baldoyle-Stapolin LAP). Reference to the basements is contained in Section 5.3 of the Flood Risk Assessment as required by Objective FRM4 of the Baldoyle-Stapolin LAP.

A review of the historic flood information does not provide any evidence of flooding at the site. The nearest flood event is situated along Coast Road, 600 m east of the site, Review of the FEM FRAM (Fingal East Meath Flood Risk Assessment and Management Study) predictive flood maps confirms that the majority of the site is not at risk of flooding. In summary, the SSFRA states that all residential properties are located in Flood Zone C and are protected from inundation up to the 0.1% AEP Mid-Range Future Scenario (MRFS) flooding event. The Flood Risk Assessment was undertaken in accordance with OPW's 'The Planning System and Flood Risk Management' guidelines. The FRA is in agreement with the core principles contained within the Planning Guidelines.

7.3.4 Areas of Conservation

The closest Natura 2000 site is Baldoyle Bay SAC, which is 350 m northeast from the proposed development. The nearest SPA is the Baldoyle Bay SPA, which is located 700 m from the site. There are no designated Natural Heritage Areas (NHA) within a 15 km radius; however, the Baldoyle Bay pNHA is located c. 400 m from the Site.

The North Dublin Bay SAC is c. 1.8 km south of the Site. Currently, stormwater is discharged to the Mayne River from the Site via historical services compromising a 1500 mm storm sewer which underlies the north fringe sewer and discharges to the Mayne River and ultimately into the Baldoyle Estuary.

7.3.5 Rating of Site Importance of Hydrological Features

There are no open water features within the Site of the proposed development. The nearest rivers and open water are 550 m from the Site (refer to Figure 7.1). However, currently stormwater is discharged to the Mayne River from the proposed site, which discharges into the Malahide Estuary (via overland flows and historical surface water system). Based on the NRA criteria for rating the importance of hydrological features (refer to Appendix 7.1), the features at this site are rated as being of high importance due to the River Mayne's biotic index and a section of the river being within a protected European site.

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of 1,007 apartments (consisting of 58 no. studio units (38.1 – 52.3 sq.m.), 247 no. 1 bedroom units (48.9 – 79.7 sq.m.), 94 no. 2 bedroom 3 person units (67.3 – 80.42 sq.m.), 563 no. 2 bedroom 4 person units (77.7 – 106.1 sq.m.), and 45 no. 3 bedroom units (93.5 – 130.66 sq.m.), 6 no. communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a c. 6.1 hectare site.

A full description of the proposed development can be found in Chapter 2 - Description of the Proposed Development.

The activities associated with the proposed development which are relevant to the hydrological environment are as follows;

7.4.1 Construction Phase

The activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the hydrological environment. These activities primarily pertain to the site preparation, excavation, levelling and infilling activities required to facilitate construction of the proposed development, and ancillary services.

Site preparation, excavation, levelling and infilling activities

Land clearing, earthworks and excavations will be required for construction phase operations to facilitate site clearance, construction of new building, basements, foundations and installation of services. This will include site levelling, construction, and building foundation excavation, this will necessitate the removal of vegetation cover and the excavation of soil and subsoils.

The volume of material to be excavated has been estimated by the project engineers at c. 135,000 m^3. It is envisaged that 129,000 m^3 of the excavated material will be required to be removed from site as either a waste or by-product (see Chapter 16 Waste Management).

Storage of hazardous construction materials

Construction activities will include the storage of fuel and use of machinery, and temporary storage of fuel required for on site for construction traffic. Liquid materials i.e., fuel storage will be located within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage. These will be stored within the contractor yard.

Foul Drainage During Construction

Welfare facilities will be provided for the contractors via portable sanitary facilities within the construction compound site during the construction works. It is an anticipated that initially, waste collected by tanker and disposed of appropriately, and that temporary connections to the existing services will be established to provide service and utilities subject to relevant applications and approvals.

There shall not be discharge of silty (contaminated) water from the works to any watercourse, should any discharge of contaminated construction water be required during the construction phase, the discharge will be to foul sewer following agreement with Fingal County Council / Irish Water.

Surface Water Discharge During Construction

There shall not be discharge of ***untreated***, silty, or contaminated water from the works to any watercourse or stormwater network. Should any discharge of ***untreated*** construction water be required during the construction phase, the discharge will be to foul sewer following agreement with Fingal County Council / Irish Water.

There is no significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised

pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

The discharge of ***treated*** construction water from rainfall into excavated areas, or from any localised dewatering may be required during construction. This ***treated*** construction water will be discharged to the existing 1500 diameter concrete stormwater main, that traverses underneath the north fringe sewer and discharges to the Mayne River.

7.4.2 Operational Phase

Surface Water Discharges and Infrastructure

It is the requirement of the Baldoyle-Stapolin Local Area Plan (LAP) that a constructed wetland be installed within the flood plain, just beyond the line of the existing North Fringe foul sewer to provide the required water quality treatment for this proposed development and other developments on the LAP lands. This wetland has been consented (FCCReg Ref.: F16A/0412) and constructed, and can be seen on Figure 7.1, this has been designed and constructed to provide water quality treatment for this proposed development.

Therefore, it is proposed to connect surface water runoff from the proposed development to a new surface water sewer network within the Baldoyle Stapolin LAP lands to the west to allow connection into this wetland.

This new network will discharge to a new permitted network to be installed by The Shoreline Partnership for Growth Area 3 (ABP ref. 311016-21). This discharges to a new outfall pipe which traverses over the North Fringe Sewer and discharges into a new permitted wetland in the open space area. The wetland discharges to the Mayne River and ultimately to Baldoyle Estuary through a series of flap valves.

In accordance with Section 4.3 of Appendix 1 of the Baldoyle-Stapolin Local Area Plan (LAP), since the site is located adjacent to the tidal estuary at Baldoyle and as there is no downstream development before out falling to the Irish Sea, the proposed development is not required to provide full attenuation for the 100-year return storm as per the requirements in Section 6.6, Volume 2 of the Greater Dublin Strategic Drainage Study (GDSDS). In addition, the lands discharge into salt wetlands which are the flood estuary of the Mayne River and extend over c. 40 ha (100-year flood plain). Therefore, the principal issue is the quality of water discharging from the LAP lands and not the quantity of water being discharged to the estuary.

According to the Water Services Report (JB Barry, 2022) the total area (hardstanding, roofs, roads & paving) which drains positively to the surface water network is 42,640 m^2 which requires a interception storage volume equating to 213 m^3. The total interception storage provided via green roofs and podiums is 239.37m^3 which is 12% more than the minimum requirement. As full interception storage has been provided, treatment storage is not required.

The various SuDS measures proposed for Baldoyle GA2 are discussed below under the following headings:

Source Controls.

Source Control measures can be defined as: “the control of runoff at or near its source”. In the case of this development, this relates to the individual buildings and associated footpaths.

SuDS measures proposed, within the curtilage of dwellings, include the following:

- Green Roofs.
- Podiums including Permeable Paving

Site Controls

Site control is defined as: “a control which is designed to control storm water quality and/or quantity for a small development or site”.

SuDS measures proposed as site controls within public road carriageways and the public open space include the following:

- Bio-retention areas/tree pits.
- Swales running parallel to road carriageways/footpaths.
- Filter drains running parallel to footpaths.
- Silt and Hydrocarbon interceptors for road carriageways/carpark areas.

Regional Controls

Regional Control is defined as: “a storm water control practice which is designed to control storm Water quality and/or quantity from a large urban development, or a group of developments.”

Planning permission F16A/0412 requires that a storm water wetland is provided in the open space amenity lands to the north of the proposed development as a regional control as recommended in the SuDS Strategy Briefing Document, Baldoyle Stapolin LAP. All storm water from the proposed development will pass through the wetland for attenuation and treatment prior to discharge to Baldoyle Estuary. The wetlands comply with the Storm Water Wetland Briefing Paper, GDSDS.

The storm water run-off from the Development will pass through a minimum of 2 SuDS Devices. This treatment train approach complies with Volume 2, New Development, GDSDS and the LAP Appendix 1.

The green roofs will be designed and supplied by an approved supplier and subject to the approval of Fingal County Council’s Water Services Department.

The storm water system will be in accordance with “The Regional Code of Practice for Drainage Works.

Further details on the proposed design of the surface water drainage is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

Foul Effluent Drainage and Infrastructure

It is proposed to connect the foul sewerage from the proposed development to the existing foul sewer network in the Baldoyle Stapolin LAP lands. The network discharges to an existing pumping station in Stapolin Haggard from where it is pumped to the North Fringe Sewer. The pumping station has not been taken in charge. This pumping station will be upgraded as required by Irish Water in conjunction with the developer of Growth Areas 1 and 3 consistent with the conditions of sale between Helsingor Limited (the current registered owners per Folio 3241 County Dublin in the Land Registry) and Penshanko Limited that applies to the application site.

All foul effluent generated at the proposed development site during the operational phase shall be collected in a new foul drainage network for the proposed development designed in accordance with Irish Water Code of Practice for Wastewater Infrastructure.

There is no trade effluent associated with this development.

The project engineers JB Barry have projected foul flow from the residential units as follows:

- Combined 1 DWF = 5.20 + 0.52 = 5.72 litres/sec
- Combined 6 DWF = 31.20 + 3.12 = 34.32 litres/sec

A Pre-Connection Enquiry (PCE) was submitted to Irish Water on 20th July 2020 on the basis of the foul water flows for the proposed development site. A Confirmation of Feasibility was issued by Irish Water on the 28th of January 2021 and a copy is included in Appendix 1 to the Water Services Report (JB Barry, 2022). A Design Acceptance submission was submitted to Irish Water on 16th August 2021. A Confirmation of Design Acceptance was issued by Irish Water on 18th November 2021 and copy of this is also included in Appendix 1 to the Water Services Report (JB Barry, 2022).

Further details on the proposed design of the foul water drainage is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

Water Supply Requirements and Infrastructure

It is proposed to connect the proposed Baldoyle GA2 development to the existing watermain network in the Baldoyle Stapolin LAP lands which is fed by the adjacent North Fringe Watermain. It is a requirement of Irish Water that the new network is connected to the 300mm watermain in Red Arches Road c. 170m from the boundary of the subject development.

The project engineers JB Barry have estimated the water demand for the residential units is as follows:

- The combined Average Hour Water Demand = 5.90 + 0.65 = 6.55 litres/sec
- The combined Peak Hour Water Demand = 29.5 + 3.25 = 32.75 litres/sec

The proposed water supply network will be designed and installed to the requirements and specifications set out in the Irish Water Code of Practice for Water. Measures are

proposed to minimise water use during the operational phase, including low consumption sanitary fittings, leak detection systems and rainwater harvesting.

A Pre-Connection Enquiry (PCE) was submitted to Irish Water on 20th July 2020 on the basis of the water supply requirements for the proposed development site. A Confirmation of Feasibility was issued by Irish Water on the 28th of January 2021 and a copy is included in Appendix 1 to the Water Services Report (JB Barry, 2022). A Design Acceptance submission was submitted to Irish Water on 16th August 2021. A Confirmation of Design Acceptance was issued by Irish Water on 18th November 2021 and copy of this is also included in Appendix 1 to the Water Services Report (JB Barry, 2022).

7.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the proposed development on the hydrological environment during the construction and operational phases is outlined below. Due to the inter-relationship between surface water (hydrology) and soils, geology and hydrogeology, the following impacts discussed will be considered applicable to both Chapters 6 (Lands, Soils, Geology and Hydrogeology) and this Chapter of this EIAR. The potential for significant impacts to arise as a result of the interaction between these topics / environmental media has been comprehensively addressed herein.

The potential hydrological impacts during the operational phases are presented below. Remediation and mitigation measures included in the design of the proposed Project to address these potential impacts are presented in Section 7.5.

7.5.1 Construction Phase

During the construction phase of the proposed development the potential impacts in relation to hydrology (in the absence of mitigation) are assessed in the following sections.

7.5.1.1 Potential for sediment contaminated surface water runoff or drainage from construction works

Land clearing, earthworks and excavations will be required for construction phase operations to facilitate site clearance, construction of new building, basements, foundations and installation of services. This will include site levelling, construction, and building foundation excavation, this will necessitate the removal of vegetation cover and the excavation of soil and subsoils.

The gradual introduction of impermeable surfaces and the compaction of soils across the construction site will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading, which could potentially impact local drainage if not adequately mitigated.

In the absence of mitigation, surface water run-off during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may damage downstream water quality.

However, it is noted that there are no open watercourse within or close the proposed development Site, there is no direct connection from the site to the Mayne River; via

onsite drainage (streams, ditches etc.). Measures to mitigate this possibility are discussed in section 7.6.1.

A Hydrological Risk Assessment (HRA) has been prepared by AWN Consulting Ltd and is included as Appendix 7.3. The HRA assess the potential for any likely significant impacts on receiving waters and protected areas during construction or post-development.

The discharge of ***treated*** construction water from rainfall into excavated areas, or from any localised dewatering may be required during construction. This ***treated*** construction water will be discharged to the existing 1500 diameter concrete stormwater main, that traverses underneath the north fringe sewer and discharges to the Mayne River.

Therefore there is the ***potential*** for water quality impact from the proposed construction works is an ***indirect*** hydrological link to the Baldoyle Bay via the Mayne River, and therefore in the absence of mitigation there is potential for indirect and temporary water quality impacts Baldoyle Bay and the Natura 2000 sites located therein.

Furthermore, in the absence of mitigations there is the potential for impacts to the River Mayne and downstream protected sites via overland flow during periods of high rainfall to their WFD status. There is no potential for permanent impacts on water quality due to the short-term construction phase, only possible increase in sediment laden water on a temporary basis and therefore no potential for impact on WFD status or habitat requirements.

The potential impact due to land clearing, earthworks and excavations as a result of the construction phase is ***negative, indirect, slight, temporary***.

7.5.1.2 Potential for non-sediment contaminated surface water runoff or drainage from construction works

Non-sediment contaminants consist of general site and materials management measures that directly or indirectly discharge into receiving environments from site activities. During the construction phase, in the absence of mitigation, there is a risk of accidental pollution incidences from the following sources:

- Spillage or leakage of oils and fuels stored on-site or refuelling on-site;
- Spillage of oil or fuel from refuelling machinery on-site;
- Spillage or leakage of oils and fuels from construction machinery or Site vehicles; and
- Alkaline run-off from the use of wet concrete and cement.

In the absence of mitigation, surface water run-off during the construction phase may contain increased levels of hydrocarbons, and other pollutants. These pollutants such as hydrocarbons that are a known carcinogen (cause cancer) in many animals and suspected to be carcinogenic to humans and changes in water pH in runoff water may resulting in adverse changes in water chemistry (Dissolved Oxygen content , Biological Oxygen Demand etc). These pollutants could have a temporary impact (exceeding statutory guideline levels until adequately diluted (likely in a few days) on downstream water quality.

However, there are no open watercourse within or close the proposed development Site, there is no direct connection from the site to the Mayne River; therefore, there is no potential for a direct water quality impact from the proposed construction works.

The discharge of ***treated*** construction water from rainfall into excavated areas, or from any localised dewatering may be required during construction. This ***treated*** construction water will be discharged to the existing 1500 diameter concrete stormwater main, that traverses underneath the north fringe sewer and discharges to the Mayne River.

A Hydrological Risk Assessment (HRA) has been prepared by AWN Consulting Ltd and is included as Appendix 7.3. The HRA assess the potential for any likely significant impacts on receiving waters and protected areas during construction or post-development.

Therefore there is the potential (in the absence of mitigation) for temporary (a number of days) water quality impact from the proposed construction works by an indirect hydrological link to the Baldoyle Bay via the Mayne River. As the hazard would primarily be an increase in silt content there is no likely impact on the Natura 2000 sites located therein or WFD status.

The potential impact due to land clearing, earthworks and excavations as a result of the construction phase (without mitigation) is ***negative, indirect, slight,*** and ***temporary***.

7.5.2 Operational Phase

During the operational phase of the proposed development the potential impacts in relation to hydrology (in the absence of mitigation) are assessed in the following sections.

7.5.2.1 Increase in Hardstanding and Potential for Increase in Surface Water Runoff

The proposed increase in hardstanding area has the potential to resulting in increase in run-off from the site if not adequately mitigated. An increase in surface water run off can have an adverse effect on the hydrological regime of downstream environments via flooding and inundation to downstream properties.

However, the proposed development stormwater drainage network design includes sustainable drainage systems (SuDS) these measures by design ensure the stormwater leaving the site is of a suitable quality and quantity. SuDS are drainage systems that are environmentally beneficial, causing minimal or no long-term detrimental damage.

The SuDS measures set out in Section 7.4.2 above include green roofs, podiums including permeable paving, bio-retention areas/tree pits, swales running parallel to road carriageways/footpaths, filter drains running parallel to footpaths, silt and hydrocarbon interceptors for road carriageways/carpark areas.. Further details on the proposed design of the surface water drainage is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

In addition to the source control SuDS measures the constructed wetland to the north of the site that the stormwater network discharges to features shallow pond system and marshy areas with a high density of aquatic vegetation. It will detain flows for an

extended period, allowing suspended solids to settle out and facilitating treatment of contaminants, before discharging via a weir into the Mayne River floodplain.

Taking into account the designed measures (characteristics) of the proposed development the potential impact due the increase in hardstanding and potential for increase in surface water runoff as a result of the operational phase is ***neutral, imperceptible, long-term***, on the downstream surface waters.

7.5.2.2 Potential for Contaminated Surface Water Drainage

Surface water runoff from roads and car parking areas can potentially contain elevated levels of contaminants such as hydrocarbons. These pollutants such as hydrocarbons that are a known carcinogen (cause cancer) in many animals and suspected to be carcinogenic to humans and changes in water pH in runoff water may resulting in adverse changes in water chemistry (Dissolved Oxygen content , Biological Oxygen Demand etc).

A Hydrological Risk Assessment (HRA) has been prepared by AWN Consulting Ltd and is included as Appendix 7.3. The HRA assesses the potential for any likely significant impacts on receiving waters and protected areas during operation of the development, and potential for source-pathways. The HRA has outlined the indirect connection to the Mayne River and Baldoyle Bay and potential for hydrocarbons discharge to surface water or ground. The HRA concludes that there is no perceptible risk – taking into account the extent of loading of contaminant, distance between the source and Baldoyle Bay is c. 350 m and significant dilution in the projected wetland and Mayne River will ensure any released hydrocarbons are at background levels (i.e., with no likely impact above water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019).

The SuDS strategy adopted for the proposed development provides a comprehensive approach to the management of storm water on the site in line with the SuDS triangle namely, water quality, water quantity and amenity/biodiversity. The treatment train approach has been adopted for the design of the storm water system for the development. This approach uses suitable SuDS measures in providing source, site and regional controls. The SuDS recommendations included in the Baldoyle Stapolin LAP have been assessed and have been included where deemed appropriate and suitable for this development. The storm water wetland to the north of the siteis included as one of the essential SuDS measures for the development. Further details on the proposed design of the surface water drainage is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

Taking into account the designed measures (characteristics) of the proposed development the potential impact due contaminated surface water drainage as a result of the operational phase is ***neutral, imperceptible, long-term***, on the downstream surface waters.

7.5.2.3 Potential for increased flooding risk

With reference to JBA Site Specific Flood Risk Assessment the following design mitigation are included within the project design in respect of flood risk.

As per the Fingal SFRA requirements it is necessary to place residential areas 0.5m above the 0.1% AEP flood event, which equates to 3.66m OD in accordance with the

FRA guidelines. The provided minimum residential FFL for the site is 6.2mOD which provides a freeboard of 3.16 m above the 0.1% AEP tidal event (3.04mOD).

The primary access route onto the development is from the southern boundary of the site which is connected to the existing road network. The site access is situated within Flood Zone C and therefore access to the site can be maintained during a flood event.

The provided minimum FFL onsite is 6.2 mAOD which provides a freeboard of 1.79 m over the 0.1% AEP HEFS tidal flood event, which produces the highest flood level adjacent to the site. This FFL also protects the development from all modelled flood events, including climate change and residual risks.

Due to the design of characteristics and design of the proposed development there is ***neutral, imperceptible, long-term*** in respect of flood risk on hydrology.

7.5.2.4 Potential impacts in relation to wastewater loading

A Pre-Connection Enquiry was submitted to Irish Water on 20th July 2020. A Confirmation of Feasibility was issued by Irish Water on the 28th of January 2021 and a copy is included in Appendix 1 of the Water Services Report (JB Barry, 2022). A Design Acceptance submission was submitted to Irish Water on 16th August 2021. A Confirmation of Design Acceptance was issued by Irish Water on 18th November 2021 and copy of this is also included in Appendix 1 of the Water Services Report (JB Barry, 2022).

A Hydrological Risk Assessment (HRA) has been prepared by AWN Consulting Ltd and is included as Appendix 7.3. The HRA assess the potential for any likely significant impacts on receiving waters and protected areas during operation of the development, and potential for source-pathways. The HRA has outlined the indirect connection to the Dublin Bay from foul effluent discharge to sewer.

With regard to the HRA (Appendix 7.3.) there is an indirect connection through the foul sewer which will eventually discharge to the Ringsend WWTP and ultimately discharges to South Dublin Bay SAC/SPA/pNHA. The future development has a peak foul discharge that would equate to 0.29% of the licensed discharge at Ringsend WWTP (peak hydraulic capacity). The HRA States:

> *Even without treatment at the Ringsend WWTP, the peak effluent discharge, calculated for the proposed development as 32.7 l/s (which would equate to 0.29% of the licensed discharge at Ringsend WWTP [peak hydraulic capacity]), would not have a measurable 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).*

On the basis of the HRA and the design of characteristics of the proposed development, and feasibility of the connection with Irish Water to Ringsend WWTP, there are ***neutral, imperceptible, long-term*** in respect of wastewater loading.

Further details on the proposed design of the foul water drainage is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

7.5.2.5 Potential impacts in relation to potable water usage

A Confirmation of Design Acceptance was issued by Irish Water on 18th November 2021 and copy of this is also included in Appendix 1 of the WSR.

Watermain works, Water Conservation Measures, Metering and Pressure Control will be strictly in accordance with Irish Water and Fingal County Council requirements, specifications and standard details.

Further details on the proposed design of the water supply is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on the accompanying drawing 20211-JBB-00-XX-DR-C-01002.

Due to the design of characteristics and design of the proposed development, and agreement with Irish Water, there is ***neutral, imperceptible, long-term*** in respect of potable water consumption.

7.6 MITIGATION MEASURES

The design of the proposed development has taken account of the potential impacts of the proposed development and the risks to the water environment specific to the areas where construction is taking place. These measures seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

7.6.1 Construction Phase

7.6.1.1 Implementation of the Construction Surface Water Management Plan

During construction the contamination of surface waters, and run-off from excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.

The Construction Surface Water Management Plan prepared by AWN (Appendix 7.4) aims to set out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the SWMP will be employed on site during the construction phase. All mitigation measures outlined within the SWMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

The main areas of water related concerns covered by the SMP document are:

- Pre-Construction, Construction Phase Drainage Controls;
- Management of Earthworks and Materials Storage
- Surface water runoff protection;
- Prevention of Accidental Releases;
- Wastewater and on-site sanitation.
- Surface Water Treatment and Discharge.
- Wastewater and On-site Sanitation.

The SWMP is live document and will be modified over time as detailed contractor methods of work are developed. If the development is permitted an updated version of

this document will be issued to all parties involved in the construction process when appropriate changes are deemed necessary.

There shall not be discharge of ***untreated***, silty, or contaminated water from the works to any watercourse or stormwater network. Should any discharge of ***untreated*** construction water be required during the construction phase, the discharge will be to foul sewer following agreement with Fingal County Council / Irish Water.

There is no significant dewatering required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

The discharge of ***treated*** construction water from rainfall into excavated areas, or from any localised dewatering may be required during construction. This ***treated*** construction water will be discharged to the existing 1500 diameter concrete stormwater main, that traverses underneath the north fringe sewer and discharges to the Mayne River.

7.6.1.2 Implementation of the Construction Environmental Management Plan

AWN Consulting have prepared an *Outline Construction Environmental Management Plan (CEMP)* (Appendix 7.5). All mitigation measures outlined therein will be implemented, as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The movement of material will be minimised to reduce degradation of soil structure and generation of dust (see Chapter 9 (Air Quality), and Appendix 9.3 Dust Management Plant for further details).

The construction Contractor will provide a further detailed CEMP (in agreement with FCC and the Project Ecologist) that will include any subsequent planning conditions relevant to the proposed development and set out further detail of the overarching vision of how the construction Contractor of the proposed development manage the Site in a safe and organised manner.

7.6.1.3 Foul Drainage During Construction

Welfare facilities will be provided for the contractors via portable sanitary facilities within the construction compound site during the construction works. It is an anticipated that initially, waste collected by tanker and disposed of appropriately, and that temporary connections to the existing services will be established to provide service and utilities subject to relevant applications and approvals.

There shall not be discharge of silty (contaminated) water from the works to any watercourse, should any discharge of contaminated construction water be required during the construction phase, the discharge will be to foul sewer following agreement with Fingal County Council / Irish Water. Operational Phase

7.6.1.4 Mitigation Measures for Increase in Hardstanding and Potential for Increase in Surface Water Runoff

In order to mitigate any potential impacts in relation to the increase in hardstanding and potential for increase in surface water runoff the designed SuDS measures set out in Section 7.4.2 above, and the Water Services Report (JB Barry, 2022) will be implemented. These measures include green roofs, podiums including permeable paving, bio-retention areas/tree pits, swales running parallel to road carriageways/footpaths, filter drains running parallel to footpaths, silt and hydrocarbon interceptors for road carriageways/carpark areas.

The proposed new storm water drainage arrangements will be designed and carried out in accordance with the:

- Greater Dublin Strategic Drainage Study Volume 2.
- Greater Dublin Regional Code of Practice for Drainage Works.
- BS EN – 752:2008, Drains & Sewer Systems Outside Buildings.
- Part H, Building Drainage of the Building Regulations.

There are a number of SUDs design measures that will be put in place to manage storm water drainage from the Site of the proposed development, as follows:

- Constructed Wetland (permitted under F16A/0412) – Shallow ponds and marshy areas with a high concentration of aquatic vegetation. The wetland will detain flows for an extended period allowing sediments to settle and to remove contaminants by facilitating adhesion to vegetation and aerobic decomposition. Located within existing Mayne River floodplain, prior to discharge to the floodplain.
- Swales: shallow drainage channels covered in grass which can treat, convey and attenuate run-off, at source, and can infiltrate to the ground where the subgrade is suitable. Swales also can promote biodiversity. Swales will be running parallel to road carriageways/footpaths.
- Bio-retention Areas: Shallow landscaped depressions, which are under drained with engineered soils and enhanced vegetation and planting on the surface which manage and treat run-off, at source, and promote biodiversity development. Located generally at suitable low points along roads in lieu of gullies throughout site.
- Green Roofs: Green roofs provide ecological, aesthetic and amenity benefits and intercept and retain rainfall, at source, reducing the volume of run-off and attenuation peak flows. Green roofs absorb most of the rainfall that they receive during ordinary events and they will only contribute to attenuation of flows for larger events. Additionally, green roofs treat surface water through removal of atmospherically deposited urban pollutants.
- Podiums including Permeable Paving and Bio-Retention
- Silt and Hydrocarbon interceptors for road carriageways/carpark areas.

7.6.1.5 Mitigation measures for Potential for Contaminated Surface Water Drainage

In order to mitigate any potential impacts in relation to the Contaminated Surface Water Drainage the designed SuDS measures set out in Section 7.4.2 above, and the Water Services Report (JB Barry, 2022) will be implemented.

These measures include green roofs, podiums including permeable paving, bio-retention areas/tree pits, swales running parallel to road carriageways/footpaths, filter

drains running parallel to footpaths, silt and hydrocarbon interceptors for road carriageways/carpark areas.

7.6.1.6 Mitigation for in relation to wastewater loading

Foul drainage for the proposed development will be in accordance with the relevant standards for design and construction as detailed within the Water Services Report (JB Barry, 2022) and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

A Confirmation of Design Acceptance was issued by Irish Water on 18th November 2021 and copy of this is also included in Appendix 1 of the WSR. The foul waste water generated from the proposed development will be treated off site at Ringsend waste water treatment plant.

No further mitigation measures are required.

7.6.1.7 Mitigation measures in relation to potable water usage

All watermain works, Water Conservation Measures, Metering and Pressure Control will be strictly in accordance with Irish Water and Fingal County Council requirements, specifications and standard details.

Water conservation measures to be adopted in the design of the proposed development will include the following:

- Dual Flush Toilets – provides the option to use a smaller volume of water for flushing.
- Toilet Cistern Bags – filled with water and fitted in the cistern displacing volume and reducing the amount of water in the cistern.
- Aerator Taps – introduces air into the water flow reducing the volume of water used.
- Aerator Shower Heads – introduces air into the water flow reducing the volume of water used.
- Shower Timer – timer set to reduce the time spent in the shower.

In addition, emerging conservation technologies will be kept under review and adopted if deemed appropriate.

During the operational stage of the project, a Water Conservation Plan will be developed by the Management Company which will encourage the residents to adopt water conservation measures in their day to day activities.

No further mitigation measures are required.

7.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

The proposed development with mitigation will have no significant impact on the natural surface water regime either qualitatively or quantitatively.

7.7.1 Construction Phase

7.7.1.1 Residual Impacts for increases in sediment runoff from earthworks

Following the implementation of mitigation measures detailed in Section 7.6.1, the predicted impact as a result of increase sediment runoff on the environment during the construction phase is considered to be ***neutral, imperceptible*** and ***short-term****.*

With reference to the HRA (Appendix 7.3) while there is an indirect connection to the Mayne River and Baldoyle Bay and the Designated Sites located therein, there will be no impact to the quality of these watercourses or the Designated Sites due to the lack of direct hydraulic connectivity, nature of the hazard (suspended sediment primarily), very temporary (couple of days) should mitigation fail and the mitigation measures set out in the SWMP (Appendix 7.4). Furthermore, following the implementation of mitigation measures; it is expected that there would be no change in the habitat requirements in relation to water quality and the current water quality status under the WFD of the Mayne River or Baldoyle Bay.

7.7.1.2 Residual impacts for non-sediment contaminated surface water runoff or drainage from construction works

Following the implementation of mitigation measures detailed in Section 7.6.1, the predicted impact as a result to contaminated surface water on the surface water environment during the construction phase is considered to be ***neutral, imperceptible*** and ***short-term.***

With reference to the HRA (Appendix 7.3) while there is an indirect connection to the Mayne River and Baldoyle Bay and the Designated Sites located therein, it is concluded that there are no pollutant linkages as a result of the operation of the Proposed Development which could result in a water quality impact which could alter the habitat requirements of the Natura 2000 sites within Baldoyle Bay or Dublin Bay. Furthermore, following the implementation of mitigation measures; it is expected that there would be no change in habitat requirements in relation to water quality and the current water quality status under the WFD of the Mayne River or Baldoyle Bay.

7.7.2 Operational Phase

7.7.2.1 Residual Impact for increase in Surface Water Runoff

Following implementation of the project design, and mitigation measures proposed in Section 7.6.2, the residual impact on the surface water environment once the proposed development is constructed and operational is considered to be *neutral, imperceptible* and *long-term*.

There will be a ***neutral, imperceptible, and long-term,*** residual impact to local watercourses or nearby Designated Sites due to the lack of direct hydraulic connectivity and the mitigation measures cited. Overall, the attenuation proposed for the project and installation of interceptors will maintain flood management and water quality.

7.7.2.2 Residual Impact for Contaminated Surface Water Drainage

Following implementation of the project design, and mitigation measures proposed in Section 7.6.2, the residual impact on the surface water environment once the proposed

development is constructed and operational is considered to be *neutral, imperceptible* and *long-term*.

There will be no impact to the quality of local watercourses or nearby Designated Sites due to the lack of direct hydraulic connectivity and the mitigation measures cited. Overall, the attenuation proposed for the project and installation of interceptors will improve flood management and water quality.

With reference to the HRA (Appendix 7.3) while there is an indirect connection to the Mayne River and Baldoyle Bay and the Designated Sites located therein, it is concluded that there are no pollutant linkages as a result of the operation of the Proposed Development which could result in a water quality impact which could alter the habitat requirements of the Natura 2000 sites within Baldoyle Bay or Dublin Bay. Furthermore, following the implementation of mitigation measures; it is expected that there would be no change in the current water quality status which could have an impact on habitat requirements or potential for change in the WFD status of the Mayne River or Baldoyle Bay.

7.8 CUMULATIVE IMPACT ASSESSMENT

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments (as described in Chapter 3) are discussed below.

7.8.1 Construction Phase

In relation to the potential cumulative impact on hydrology during the construction phases, the construction works which would have potential cumulative impacts are as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses. There are no notable surface water features on-site. Stockpiled material will be stored on hardstand away from surface water drains, and gullies will be protected during works to ensure there is no discharge of silt-laden water into the surrounding surface water drainage system.
- Contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials is possible unless project-specific CMPs are put in place for each development and complied with. As stated, there are no notable surface water features on-site and no direct hydrological pathways to off-site surface waterbodies.

The works contractors for other planned or permitted developments (as described in Chapter 3) will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

In respect of substantial developments that may result in in-combination effects in respect of material assets are the adjacent residential development GA1 (ABP Reg. Ref.:311018-21) and GA3 (ABP Reg. Ref.:311016-21) are the relevant projects considered in detail.

The GA1 Grant of Permission ABP Reg. Ref.:311018-21 Condition 3 requires that the mitigation measures set out in the EIA must be carried out in full and Condition 4 request the mitigation and mitigation and monitoring measures as they relate to the Baldoyle Bay APA be implemented. Furthermore; Condition 22 states that prior to the commencement of works a Construction Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The GA3 Grant of Permission ABP Reg. Ref.:311016-21 Condition 5 states that prior to the commencement of works a finalised Construction and Environmental Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The implementation of mitigation measures within each chapter and detailed in Section 6.5.1; as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the proposed development. The residual impact of the proposed development in combination with other planned or permitted developments (as described in Chapter 3) is **short-term-imperceptible-neutral**.

7.8.2 Operational Phase

- Increased hard standing areas will reduce local recharge to ground and increase surface water run-off potential if not limited to the green field run-off rate from the Site.
- Increased risk of accidental discharge of hydrocarbons from car parking areas and along roads is possible unless diverted to surface water system with petrol interceptor.
- Additional foul discharges to be discharge to the foul sewer system.

Increase in wastewater loading and water supply requirement is an impact of all development. Each development will require approval from the IW confirming available capacity in the water and wastewater infrastructure. The surface water and foul drainage infrastructure and water supply requirements for the proposed development have been designed to accommodate the proposed development. IW have confirmed connection to its water and foul network can be facilitated subject to a connection agreement.

Development will result in an increase in hard standing which will result in localised reduced recharge to ground and increase in run-off rate (see Chapter 6 Land, Soils, Geology & Hydrogeology). Each permitted development is required by the Local Authority and IW to comply with the Local Authority and IW requirements by providing suitable attenuation on-site and ensure that there is no increase in off-site flooding as a result of the development in question.

All developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (Water Framework Directive and associated legislation) such that they would be required to manage run-off and fuel leakages.

The residual cumulative impact on water and hydrology for the construction and operational phases is anticipated to **be long-term and neutral in terms of quality and of imperceptible significance**, assuming appropriate mitigation measures to manage water quality run-off, in compliance with legislative requirement, are put in place for other developments.

7.9 MONITORING

7.9.1 Construction Phase

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10 m from surface water receptors.

Regular inspection of surface water run-off and any sediment control measures (e.g. silt traps) will be carried out during the construction phase. Regular auditing of construction / mitigation measures will be undertaken, e.g. concrete pouring, refuelling in designated areas, etc. A log the regular inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

7.9.2 Operational Phase

No future surface water monitoring is proposed for the proposed development due to the low hazard potential at the Site. Oil interceptors will be maintained and cleaned out in accordance with the manufacturer's instructions. Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to surface water.

7.10 REINSTATEMENT

Reinstatement of excavations during the construction phase of the proposed development will meet the design criteria presented in the design specification of this application. All fill material used will be clean and graded to engineers' specifications.

7.11 REFERENCES

- Brady Shipman Martin (BSM) Chapter 9 of SHD at Baldoyle-Stapolin Growth Area 3 (GA3), Baldoyle, Dublin 13 Environmental Impact Assessment Report (EIAR) Volume 2 – Main Text July 2021
- Environmental Protection Agency (EPA) (2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Environmental Protection Agency (EPA) (2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- Barry & Partners (2022) Lismore Homes Limited Residential Development Baldoyle GA2 Water Services Report
- JBA Consulting (2022) Residential Development Baldoyle GA2 Flood Risk Assessment Final Report Report Ref:2021s1085
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

8.0 BIODIVERSITY

8.1 INTRODUCTION

The proposed Strategic Housing Development (SHD) (referred to as "*the proposed Project*"), is located at Baldoyle-Stapolin Growth Area 2 (GA02), Baldoyle, Dublin 13.

This Chapter of the EIAR was prepared by Altemar Ltd. and assesses the biodiversity value of the proposed Project area and the potential impacts of the proposed Project on the ecology of the surrounding area within the potential zone of influence (ZOI). The project is limited in scale and extent and the potential zone of influence is restricted to the immediate vicinity of the proposed development. However, in the absence of mitigation measures there is potential for silt laden material or pollution to enter nearby watercourses and impact on local biodiversity and designated sites immediately downstream from the works.

This Chapter also outlines the biodiversity value of the site, the potential for impacts and the standard construction, operational and monitoring measures that will be in place to minimise potential impacts and to improve the biodiversity potential of the proposed development project. Desk studies were carried out to obtain relevant existing biodiversity information within the Potential Zone of Influence (ZOI). The assessment extends beyond the immediate proposed Project Site to include those species and habitats that are likely to be impacted upon by the proposed Project.

The Site lies within a larger landholding, which is the subject of the *Baldoyle-Stapolin Local Area Plan (LAP) 2013 (as extended).* It is situated directly to the south of the proposed Racecourse Park (ABP Ref ABP-311315-21), east of the Dublin-Belfast / DART railway line and Clongriffin rail station, north of Growth Area 1 (GA1) and east of Growth Area 3 (GA3), as designated in the LAP. The Site of the proposed Project incorporates the entire area known as Growth Area 02 (GA2), as designated in the LAP.

The Site is on the edge of the urban extent of Dublin City. It is within the administrative area of Fingal County Council (FCC), and adjacent to the Dublin City Council administrative boundary at Clongriffin to the west. Surrounding land uses to the west, south and east are predominately residential in nature.

The programme of work in relation to biodiversity aspects of the EIAR have been designed to identify and describe the existing ecology of the area and detail sites, habitats or species of conservation interest. It also assesses the significance of the likely impacts of the proposed Project on the biodiversity elements and outlines measures to alleviate identified impacts. Full details of all the mitigation measures and the phasing of the proposed Project are contained in the accompanying outline Construction Environmental Management Plan (CEMP) and Construction Surface Water Management Plan (SWMP). A Wintering Bird Survey Report has also been prepared by MKO and included at Appendix 8.1 to this chapter.

8.1.1 Background to Assessment

Altemar Ltd. is an established environmental consultancy that is based in Greystones and has been in operating in Ireland since 2001. Refer to Table 1.1 of Chapter 1 (Introduction) for full details on the author of this Chapter. Appendix 8.1 to this chapter contains the Wintering Bird Survey Report, which had been prepared for the adjacent

permitted development at GA1 (ABP Ref: Ref.:311018-21) and GA3 (ABP Ref: Ref.:311016-21) by Patrick Manley (B.Sc.) an Ornithologist with MKO, Ian Hynes (B.Sc.) and Senior Ornithologist, Padraig Cregg (M.Sc.), but also covers the proposed development site.

A bat survey was carried out by Bryan Deegan of Altemar Ltd. (Appendix 8.2)., which included a bat emergent and detector survey. There are no buildings or trees of bat roosting potential on-Site A separate Appropriate Assessment (AA) Screening and Natura Impact Statement (NIS), in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced. It was determined in the NIS that:

"Following the implementation of the mitigation measures outlined, the construction and presence of this development would not be deemed to have a significant impact on the integrity of European sites. No significant impacts are likely on European sites, alone and in combination with other plans and projects based on the implementation of standard construction phase mitigation measures.

On the basis of the content of this report, the competent authority is enabled to conduct an Appropriate Assessment and consider whether, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European site.

No significant effects are likely on European sites, their features of interest or conservation objectives. The proposed project will not will adversely affect the integrity of European sites."

8.2 METHODOLOGY

A pre-survey data search (desktop study) was carried out. This included examining records and data from the National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC), and Environmental Protection Agency (EPA); in addition to aerial, 6-inch maps and satellite imagery. Field surveys were carried out based on the schedule of fieldwork elements outlined in Table 8.1. The assessment was carried out in accordance with the following best practice methodology: *Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EPA, 2017)*, Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013), *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (European Commission, 2017), and *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM, 2018)*. The site was surveyed in accordance with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Habitats were identified in accordance with Fossitt's *Guide to Habitats in Ireland* (2000)). The project is limited in scale and extent and the potential ZoI is restricted to the immediate vicinity of the proposed development. However, in the absence of mitigation measures there is potential for silt laden material or pollution to enter the watercourse and impact on local biodiversity and European sites immediately downstream from the works.

Table 8.1 Fieldwork Dates

Survey	Dates
Flora/ Habitat	11/09/2021
Wintering Bird	18/12/2019, 23/12/2019, 15/01/2020, 15/01/2020, 28/01/2020, 28/01/2020, 10/02/2020, 24/02/2020, 24/02/2020, 11/03/2020, 24/03/2020, 24/03/2020
Bat Survey	11/09/2021
Mammal	05/12/2021

Figure 8.1 *Satellite Image of the Site of the Proposed Project*

8.2.1 Proximity to Designated Conservation Sites and Habitats or Species of Conservation Interest

Designated conservation sites within 15 km of the Site boundary and those with direct or indirect pathways were studied. This 15 km distance is a guidance only and a zone of influence (ZOI) of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on a European site, having regard to its Qualifying Interests and Site Conservation Objectives. In accordance with the OPR Practice Note, PN01, the ZOI should be established on a case-by-case basis using the Source- Pathway-Receptor framework and not by arbitrary distances (such as 15 km).

This study included sites of National importance ((Natural Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA) and Ramsar sites, in addition to European sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPAs)).

It has been determined that there is no direct or indirect pathway to designated sites beyond 15 km of the proposed development site. These sites beyond 15km are considered to be outside the ZOI and no impacts are foreseen.

Up to date geographic information systems (GIS) data (NPWS Web Map Service (WMS) data in addition to shapefiles) were acquired and plotted against 5 km, 10 km and 15 km buffers from the Site of the proposed Project. Where there was a potential for the ZOI to be influenced by natural biodiversity corridors (e.g. rivers or woodland), these were also take into account and the assessment extended. A data search of rare and threatened species within 5 km of the Site was provided by NPWS. Additional information on rare and threatened species was obtained through the NBDC maps data search and previous planning applications in the vicinity.

8.2.2 Habitats, Flora and Avian Ecology

Following the desktop study (as described above), walk-over assessments of the Site were carried out on the 11th September 2021 and the 5th December 2021. Habitat mapping was carried out according to Fossitt (2000), using AcrGIS 10.5 and displayed on Bing satellite imagery (shown in Figure 8.12).

The flora, bat and habitat assessments were carried out on the 11th September 2020. Any rare or protected species were noted. Additional observations were noted on species within the field and additional records were noted. A survey for mammals was carried out on the 5th December 2021 by means of a thorough search within the study area. The presence of mammals is indicated principally by their signs, such as resting areas, feeding signs or droppings – though direct observations are also occasionally made. The survey also included a search for habitats suitable for amphibians and reptiles.

8.2.3 Bat Fauna

A bat assessment was undertaken on 11th September 2021 by Bryan Deegan, within the optimal survey period. The on-site habitats were visually assessed for their favourability for bats. The site survey was supplemented by a review of BCIreland *National Bat Records Database*. The bat assessment was undertaken within the active bat period (March – October) when a detector survey is possible. Temperatures were 12°C after sunset. Winds were light and there was no rainfall.

8.2.4 Invasive Species

On the 11th September 2021, the Site of the proposed Project was surveyed and an assessment carried out for the presence of invasive species that are listed under the European legislation, the Birds and Natural Habitats Regulations 2011 (S.I. No. 477 of 2011), Section 49(2) which prohibits the introduction and dispersal of species listed in the Third Schedule whereby "*any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence"*.

8.2.5 Difficulties Encountered

No difficulties were encountered in the preparation of the Biodiversity Chapter of this EIAR. Several fieldwork dates were within in the initial stages of the Covid-19 pandemic. The Site surveys were carried out on-Site by a single outdoor fieldworker with no contact with any other person. Surveys were undertaken within optimal survey periods.

8.3 RECEIVING ENVIRONMENT

8.3.1 Designated Conservation Sites

Designated sites are presented in Figures 8.2 (SAC within 15 km), 8.3 (SPA within 15 km), 8.4 (NHA and pNHA within 15 km), 8.5 (Ramsar sites within 15 km), 8.6 (watercourses in proximity to the Site), 8.7 (watercourses and SAC within 1 km), 8.8 (watercourses and SPA within 1 km), 8.9 (watercourses and pNHA within 1 km), and 8.10 (watercourses and Ramsar sites within 1 km).

It should be noted that the Site of the proposed Project is not wholly or partly within a designated conservation site. The closest European site is Baldoyle Bay SAC, which is 0.19 km from the proposed Project. The nearest SPA is the Baldoyle Bay SPA, which is located 0.55 km from the Site. There are no designated NHA within a 15 km radius; however, the nearest pNHA (Baldoyle Bay) is 0.19 km from the Site. The nearest Ramsar site (Baldoyle Bay) is 0.54 km from the Site. The distance and details of the conservation sites within 15 km of the proposed Project are presented in Table 8.2.

There will be a direct pathway from the proposed Project to the Baldoyle Bay SAC, SPA and pNHA via the new surface water outfall pipe and to the recently constructed wetland to the north of the proposed development (consented under F16A/0412). The wetland discharges to the Mayne River and ultimately to Baldoyle Estuary through a series of flap valves.

Table 8.2 *Distances to Designated Conservation Sites within 15 km*

Name	Distance (km)	Type
SAC		
Baldoyle Bay SAC	0.19	SAC
North Dublin Bay SAC	1.6	SAC
Malahide Estuary SAC	3.5	SAC
Howth Head SAC	4.2	SAC
Rockabill to Dalkey Island SAC	4.7	SAC
Ireland's Eye SAC	4.8	SAC
South Dublin Bay SAC	6.9	SAC
Rogerstown Estuary SAC	10.2	SAC
Lambay Island SAC	11.6	SAC
SPA		
Baldoyle Bay SPA	0.55	SPA
North Bull Island SPA	1.6	SPA

Name	Distance (km)	Type
Malahide Estuary SPA	4.2	SPA
Ireland's Eye SPA	4.5	SPA
South Dublin Bay and River Tolka Estuary SPA	5.7	SPA
Howth Head Coast SPA	5.7	SPA
Rogerstown Estuary SPA	9.6	SPA
Lambay Island SPA	11.5	SPA
Dalkey Island SPA	13.8	SPA
NHA/ pNHA / Ramsar		
Baldoyle Bay pNHA	0.19	pNHA
Sluice River Marsh pNHA	1.8	pNHA
North Dublin Bay pNHA	1.6	pNHA
Malahide Estuary pNHA	3.5	pNHA
Feltrim Hill pNHA	4.2	pNHA
Howth Head pNHA	4.2	pNHA
Ireland's Eye pNHA	4.7	pNHA
Santry Demesne pNHA	6.3	pNHA
South Dublin Bay pNHA	6.9	pNHA
Dolphins, Dublin Docks pNHA	7.5	pNHA
Royal Canal pNHA	8.3	pNHA
Potraine Shore pNHA	8.3	pNHA
Grand Canal pNHA	8.7	pNHA
Rogerstown Estuary pNHA	10.3	pNHA
Booterstown Marsh pNHA	10.6	pNHA
Lambay Island pNHA	11.8	pNHA
Dalkey Coastal Zone and Killiney Hill pNHA	12.1	pNHA
Liffey Valley pNHA	14.7	pNHA
Baldoyle Bay	0.54	Ramsar site
North Bull Island	1.7	Ramsar site
Broadmeadow Estuary	5.1	Ramsar site
Sandymount Strand/Tolka Estuary	6.9	Ramsar site
Rogerstown Estuary	10.4	Ramsar site

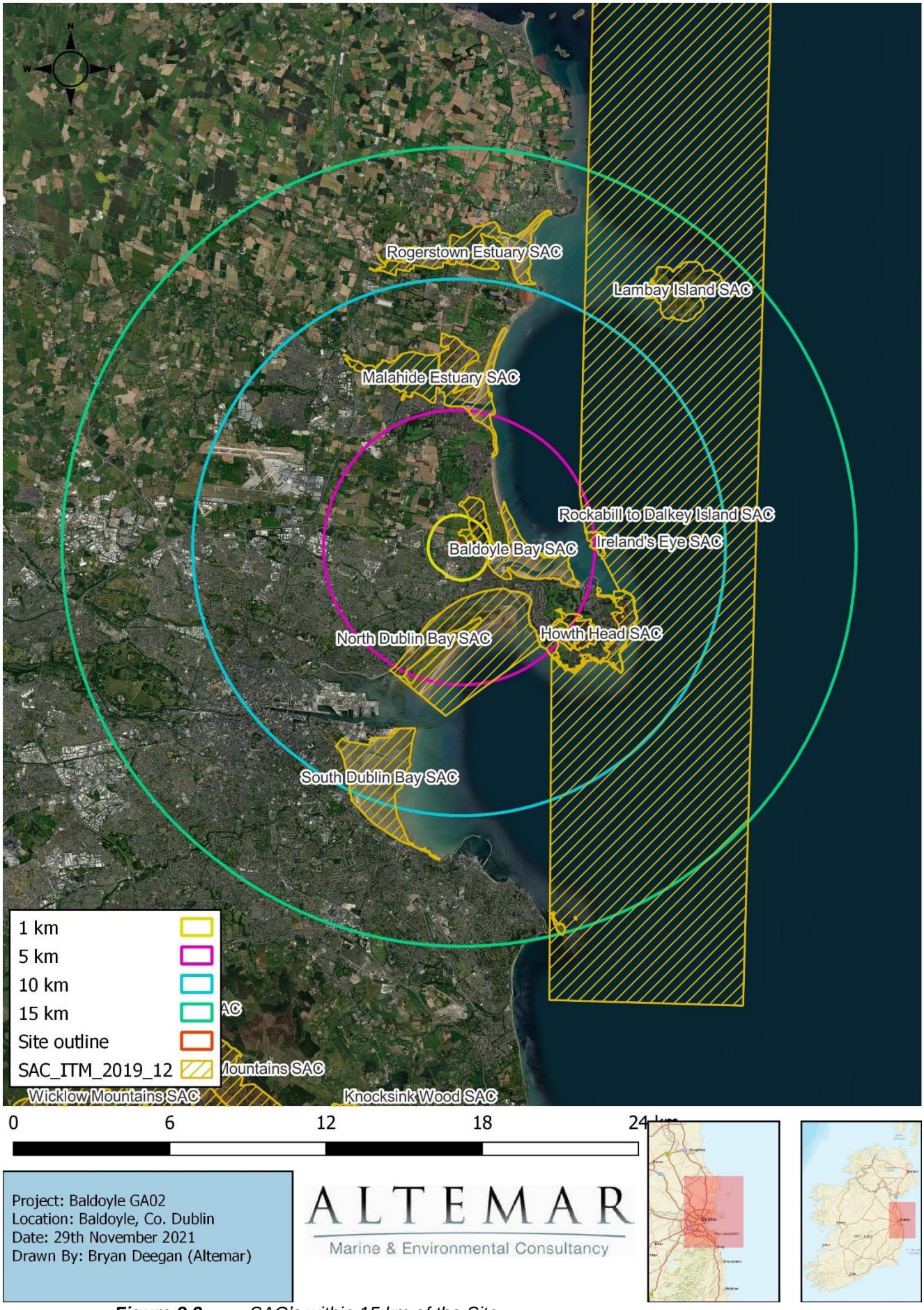

Figure 8.2 *SAC's within 15 km of the Site.*

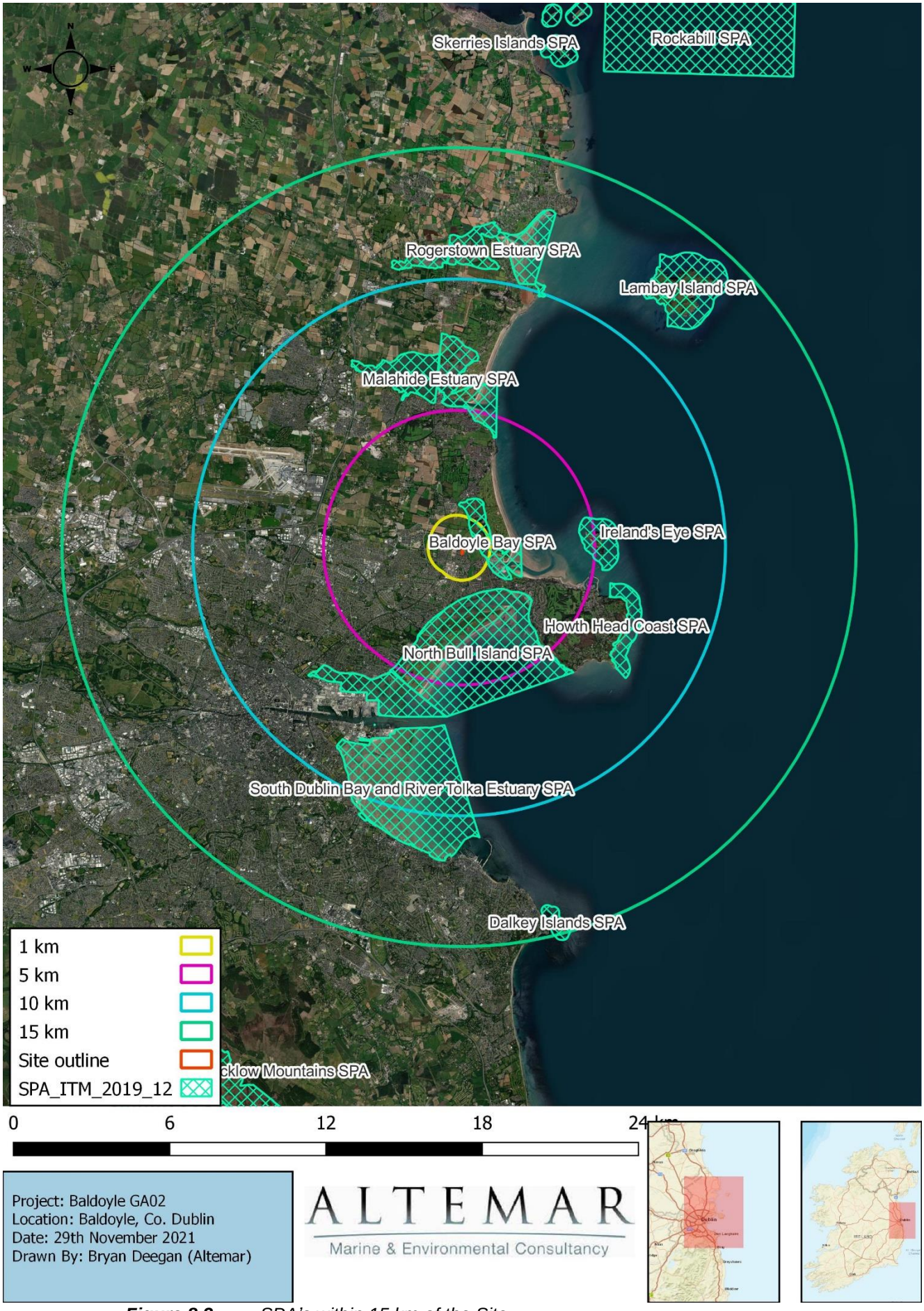

Figure 8.3 *SPA's within 15 km of the Site*

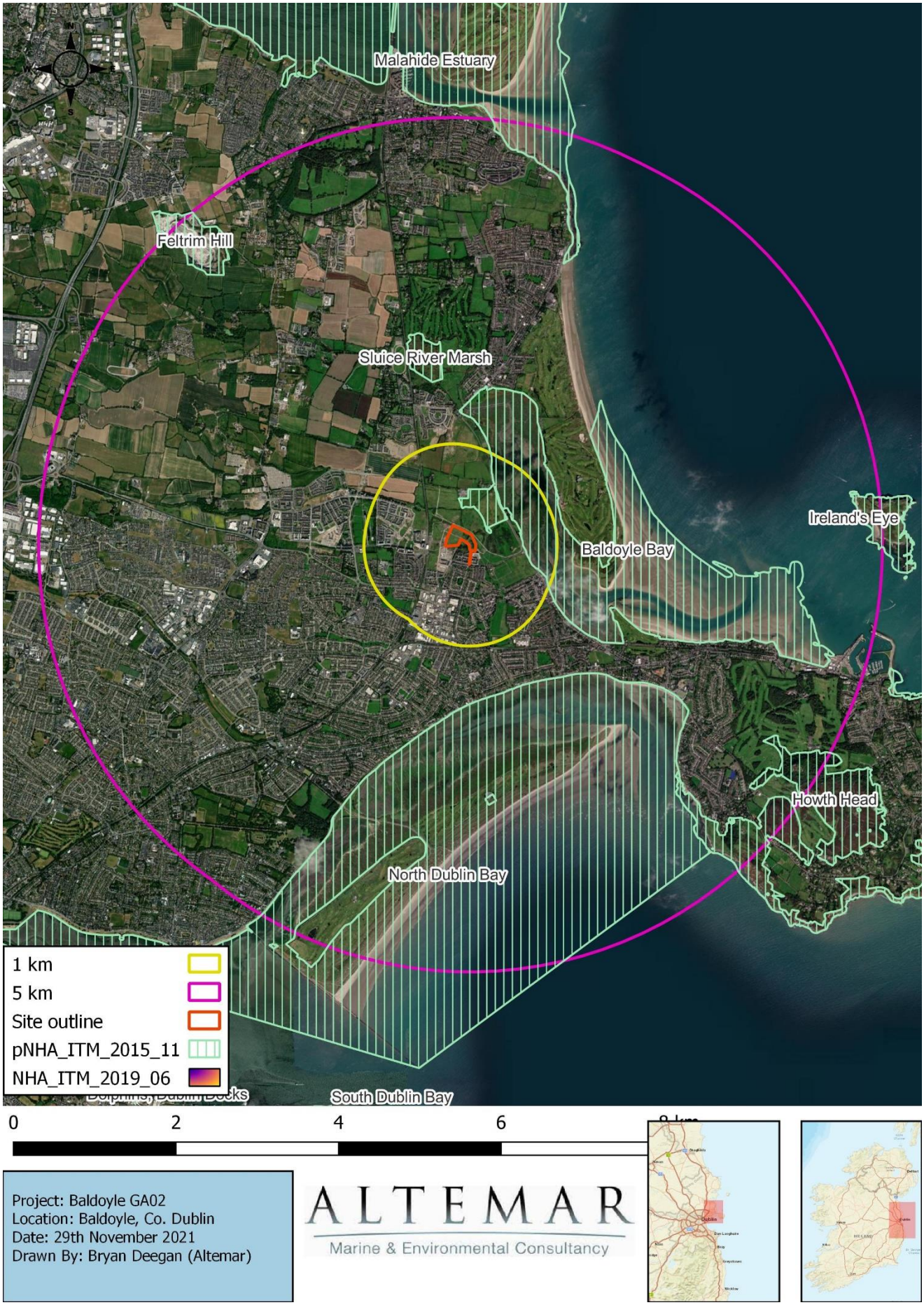

Figure 8.4 *NHA (none) and pNHA within 5 km of the Site.*

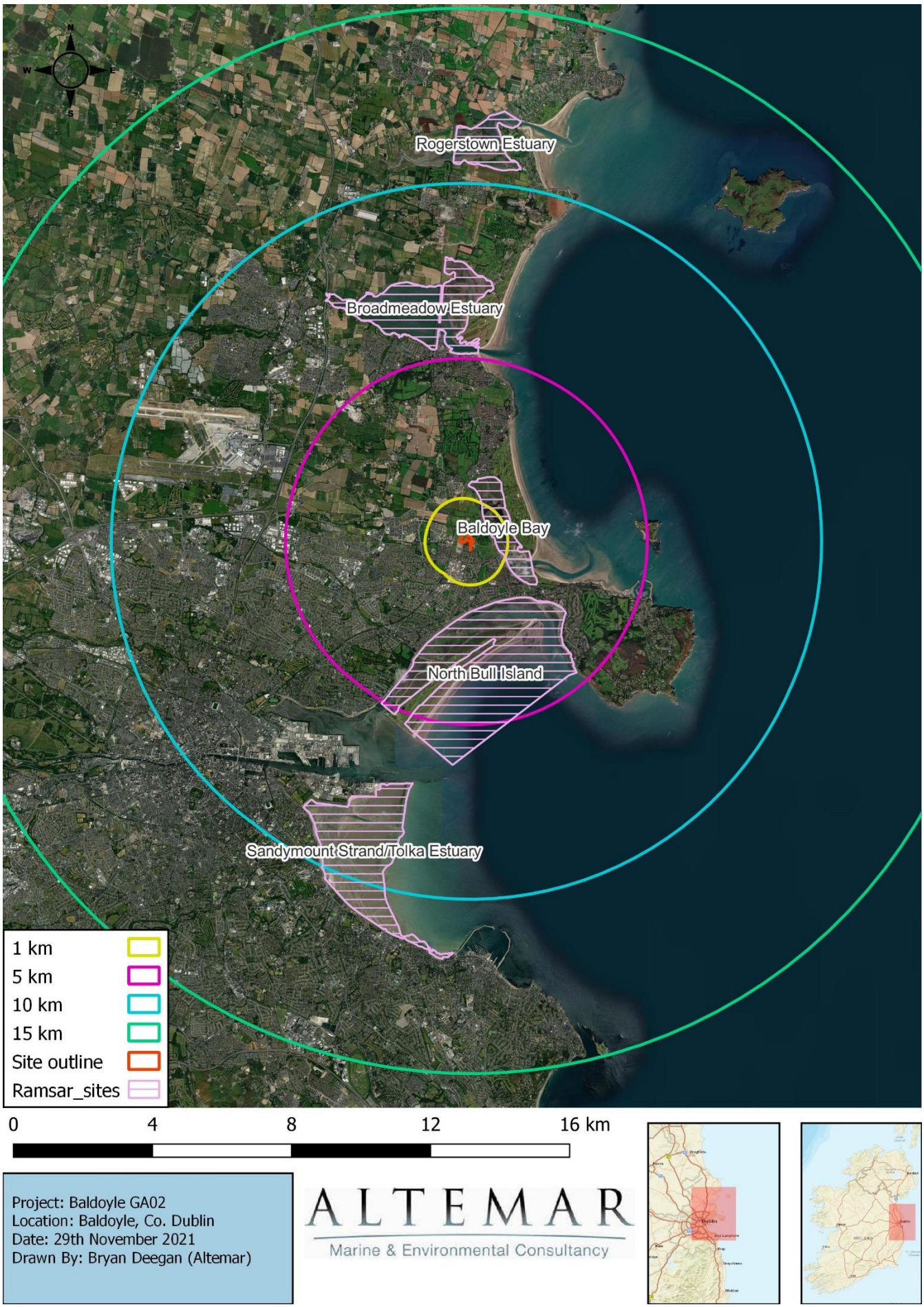

Figure 8.5 *Ramsar sites within 15 km of the Site*

Figure 8.6 *Watercourses within 1 km of the Site (EPA-WFD)*

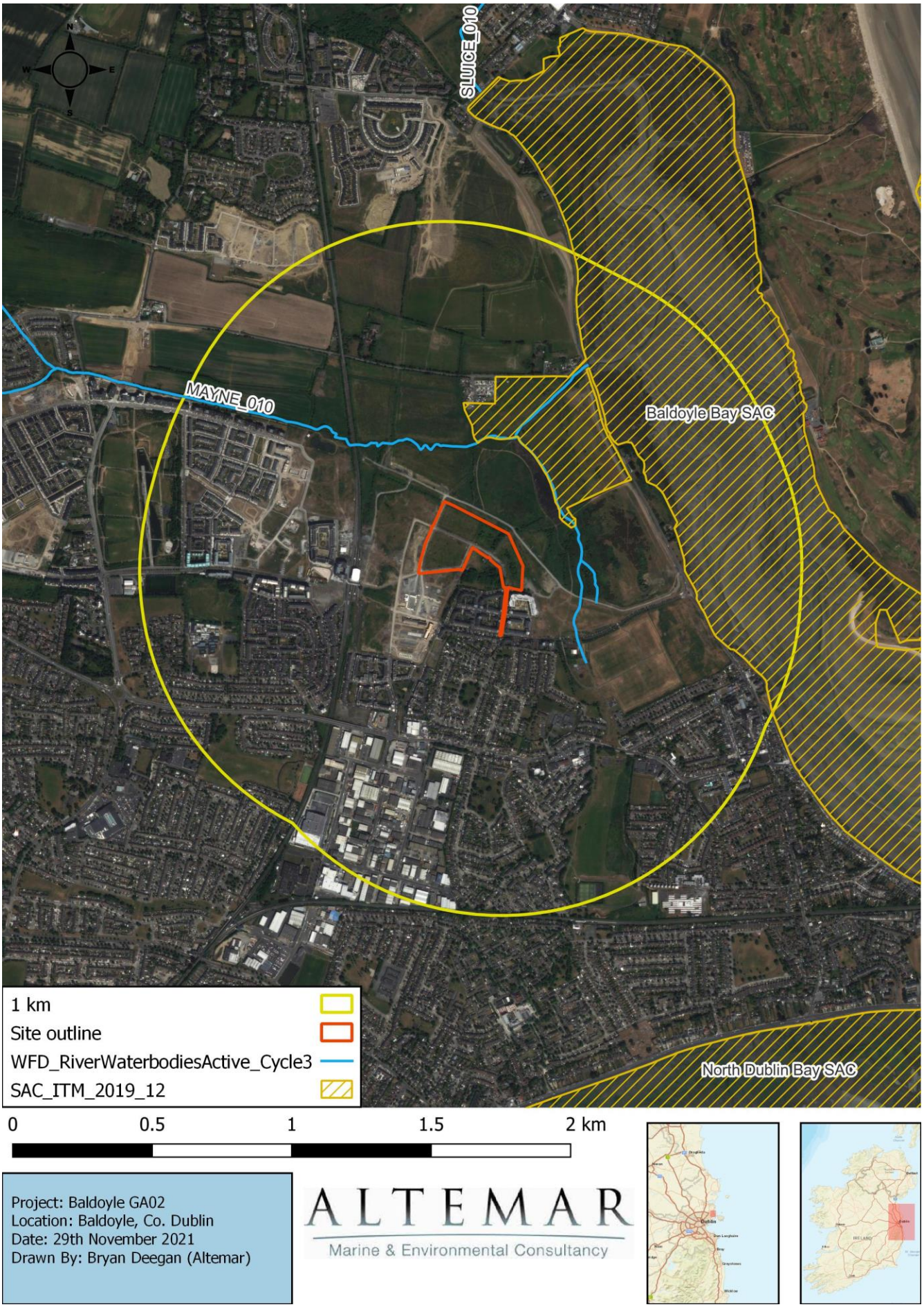

Figure 8.7 *Watercourses and SAC's within 1 km of the Site (EPA-WFD)*

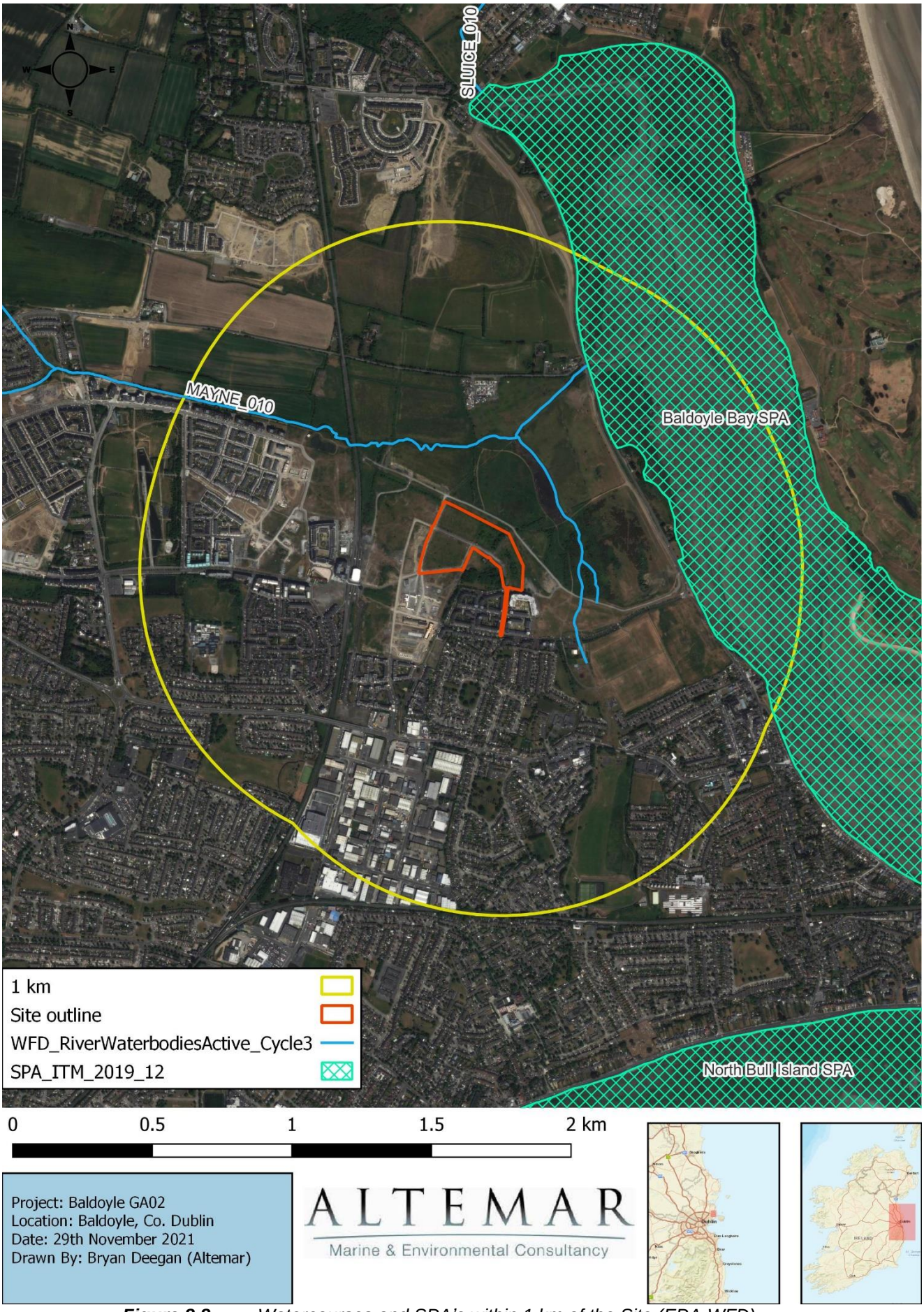

Figure 8.8 *Watercourses and SPA's within 1 km of the Site (EPA-WFD)*

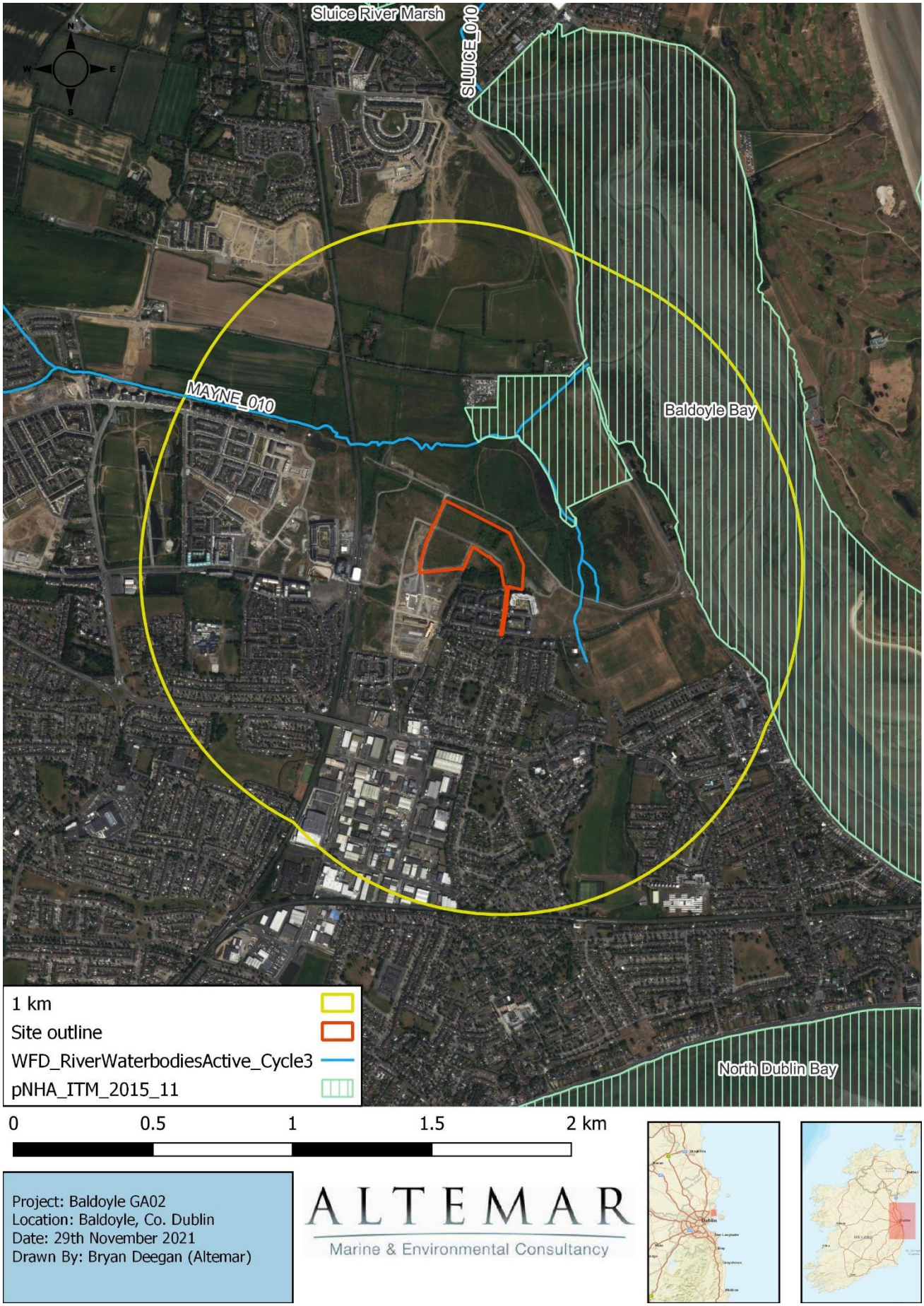

Figure 8.9 *Watercourses and pNHA's within 1 km of the Site (EPA-WFD)*

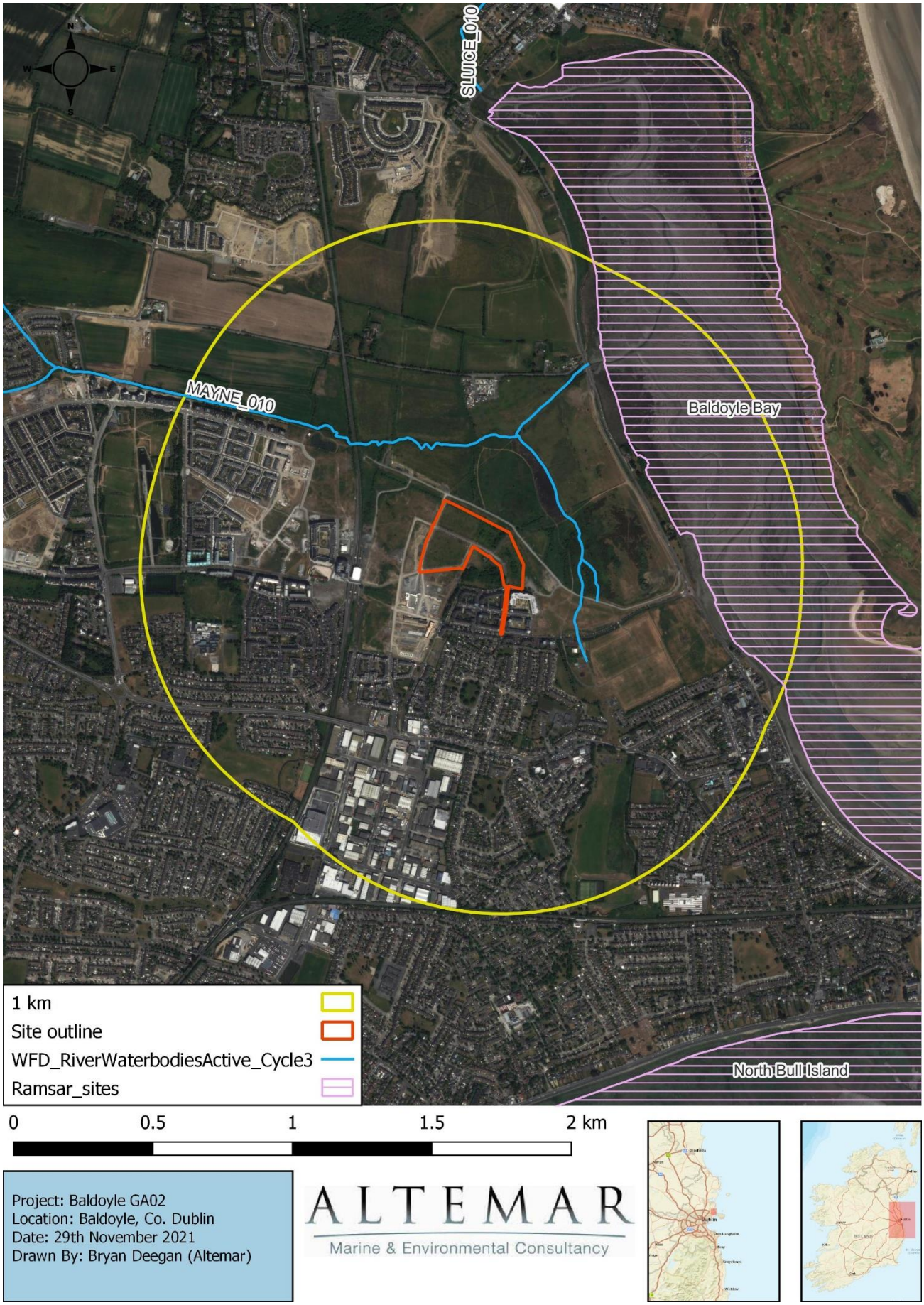

Figure 8.10 *Watercourses and Ramsar sites within 1 km of the Site (EPA-WFD)*

8.3.2 Biodiversity Records

The NBDC's online viewer was consulted in order to determine the extent of biodiversity and species of interest in the area. An assessment of the Site-specific area was carried out and it recorded no species of interest. Following this, a 2 km^2 grid was assessed (O24F). Table 8.3 provides a list of all species recorded in the 2 km^2 grid area.

Table 8.3 *NBDC Records of Rare, Protected and Invasive Species within the 2 km^2 grid (O24F)*

Common Frog (*Rana temporaria*)	Mew Gull (*Larus canus*)
Barn Swallow (*Hirundo rustica*)	Mute Swan (*Cygnus olor*)
Black-headed Gull (*Larus ridibundus*)	Northern Lapwing (*Vanellus vanellus*)
Black-tailed Godwit (*Limosa limosa*)	Rock Pigeon (*Columba livia*)
Brent Goose (*Branta bernicla*)	Short-eared Owl (*Asio flammeus*)
Common Kestrel (*Falco tinnunculus*)	Sky Lark (*Alauda arvensis*)
Common Linnet (*Carduelis cannabina*)	Spotted Flycatcher (*Muscicapa striata*)
Common Redshank (*Tringa totanus*)	Stock Pigeon (*Columba oenas*)
Common Shelduck (*Tadorna tadorna*)	Yellowhammer (*Emberiza citrinella*)
Common Snipe (*Gallinago gallinago*)	Bombus (*Bombus lucorum*)
Common Starling (*Sturnus vulgaris*)	Large Red Tailed Bumble Bee (*Bombus (Melanobombus lapidarius*)
Common Swift (*Apus apus*)	Moss Carder-bee (*Bombus (Thoracombus) muscorum*)
Common Wood Pigeon (*Columba palumbus*)	Eurasian Pygmy Shrew (*Sorex minutus*)
Eurasian Curlew (*Numenius arquata*)	European Otter (*Lutra lutra*)
Eurasian Oystercatcher (*Haematopus ostralegus*)	European Rabbit (*Oryctolagus cuniculus*)
Eurasian Teal (*Anas crecca*)	Irish Hare (*Lepus timidus subsp. hibernicus*)
Eurasian Tree Sparrow (*Passer montanus*)	Irish Stoat (*Mustela erminea subsp. hibernica*)
Eurasian Wigeon (*Anas penelope*)	Soprano Pipistrelle (*Pipistrellus pygmaeus*)
Eurasian Woodcock (*Scolopax rusticola*)	West European Hedgehog (*Erinaceus europaeus*)
Great Cormorant (*Phalacrocorax carbo*)	
Herring Gull (*Larus argentatus*)	
House Martin (*Delichon urbicum*)	
House Sparrow (*Passer domesticus*)	***Invasive Species***
Little Egret (*Egretta garzetta*)	Butterfly-bush (*Buddleja davidii*)
Mallard (*Anas platyrhynchos*)	Giant Hogweed (*Heracleum mantegazzianum*)
	Harlequin Ladybird (*Harmonia axyridis*)

An assessment of files received from the NPWS (Code No. 2020_185), which contain records of rare and protected species and grid references for sightings of these species, was carried out. There are no recorded sightings within the Site itself, however Common Frog (*Rana temporaria*) was noted 100 m the south-west and 100 m to the east of the proposed development site. No other species of conservation importance were noted at high resolution within 1 km^2 based on NPWS records. However, it should be noted that the Baldoyle Bay SAC and SPA are proximate to the Site. These are designated conservation sites of European importance.

8.3.2.1 Terrestrial Ecology

Habitats encountered were classified according to Fossitt (2000) and are presented in Figure 8.11. Each habitat type and species encountered are assessed in detail.

GS2-Dry Meadows and Grassy Verges

As can be seen from Figure 8.11, the vast majority of the site of the proposed Project consists of Dry Meadows and Grassy Verges (GS2). Based upon an examination of historic satellite imagery (Google Historic Imagery and Geohive[1]), the site was originally an agricultural field and it appears that site clearance commenced in January 2005. By May 2008, the roads were constructed on site and works were carried on the eastern portion of the site to construct the boundary fence. Much of the site appears to have been abandoned since then and the grassland habitats have remained unmanaged with scrub beginning to encroach across the site. Species within this Dry Meadows and Grassy Verges habitat included common birds-foot-trefoil (*Lotus corniculatus*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), creeping buttercup (*Ranunculus repens*), docks (*Rumex spp*.), winter heliotrope (*Petasites pyrenaicus*), colt's-foot (Tussilago farfara), creeping cinquefoil (*Potentilla reptans*), common ragwort (*Senecio jacobaea*), plantains (*Plantago spp*.), thistles (*Cirsium arvense & C. vulgare*), dandelion (T*araxacum spp*.), oxeye daisy (*Leucanthemum vulgare*), butterfly-bush (*Buddleja spp.*`), common mouse-ear (*Cerastium fontanum*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), field-rose (*Rosa arvensis*), daisy (*Bellis perennis*), lesser trefoil (*Trifolium dubium*), common vetch (*Vicia sativa ssp. Segetalis*), meadowsweet (*Filipendula ulmaria*), rosebay willowherb (*Chamaenerion angustifolium*), hoary willowherb *(Epilobium parviflorum*), nettle (*Urtica dioica*), rushes (*Juncus sp*.), ivy (*Hedera helix*), gorse (*Ulex spp*), wild carrot (*Daucus carota*) and a single plant of Sea-buckthorn (*Hippophae rhamnoides*) (Invasive species-Figure 8.11) was noted on site.

Figure 8.11 *Dry Meadows and Grassy Verges*

[1] GEOHIVE (2021). Available at: www.geohive.ie

Figure 8.12 *Fossitt (2000) Classification of the Site and the Proposed Project*

WS1- Scrub

Much of the site is undergoing succession to scrub and it would be expected that scrub will be the dominant habitat on site in the medium term. Species in this area included the species noted in the Dry Meadows and Grassy Verges in addition to birch (Betula sp.) alder (Alnus glutinosa), firethorn (Pyracantha sp.), honeysuckle (*Lonicera periclymenum*), willow (*Salix sp*.), Sycamore (*Acer pseudoplatanus*), gorse (*Ulex spp*.) and elder (*Sambucus nigra*).

Figure 8.13 *Scrub*

BL-Built Land /ED2-Bare Ground

As seen in Figure 8.11, existing roads cross the site and form the built land within the site. No biodiversity of conservation value was noted in these areas.

Figure 8.14 *BL3 Built land*

WL2-Treelines

As seen in Figure 8.11, a single treeline exists on site. No biodiversity of conservation value was noted in these areas. Species in this area included sycamore (*Acer pseudoplatanus*), gorse (*Ulex spp*.) Ivy groundcover and treecover (*Hedera helix*), elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*) and bramble (*Rubus ruticosus agg*.). Species noted in the Dry Meadows and Grassy Verges were also present within the wider treeline area. A single tree of bat roosting potential was noted on the eastern end of the treeline.

8.3.2.2 Evaluation of Species and Habitats On-site

Evaluation of Habitats

Portions of the site consists of cleared land (2009) that is recolonising. Access roads are existing on site. Grassland habitats on site are succumbing to scrub. The Site is relatively poor in biodiversity value. No rare or protected habitats were noted.

Plant Species

The plant species encountered at the various locations on-Site are detailed above. No protected species were noted. Records of rare and threatened species from NPWS were examined. No rare or threatened plant species were recorded in the vicinity of the Site of the proposed Project.

Mammals

A mammal survey was carried out. No signs of mammals of conservation importance were noted on-site. No badger setts or otter holts were noted. There are no watercourses on-site; however, foxes (*Vulpes vulpes*) and rabbits were noted on-site. Hedgehogs have been recorded by NBDC within the 10 km square but not within the 2 km square, at a finer resolution. No hedgehogs were seen during the site visit.

Amphibians

No common frogs (*Rana temporaria*) or newts (*Triturus vulgaris*) were observed on-Site. Frogs have been recorded by the NBDC within the 10 km square grid, but not at finer resolution. No ponds or water features are noted on site.

Bats

A bat survey was carried out, which included a bat emergent and detector survey. There are no buildings or trees of bat roosting potential on-Site. A single tree of bat roosting potential was noted on site and minor bat activity of a Soprano pipistrelle (*Pipistrellus pygmaeus*) was also noted (Appendix 8.2).

Avian Fauna

The Site of the proposed Project was previously agricultural land, and based on an examination of satellite imagery, works on a previously granted development appeared to continue until 2009, when it appeared to cease. Since then the land has remained unmanaged,

As seen in the Wintering Bird Survey Report (Appendix 8.1), snipe (*Gallinago gallinago*), which is red-listed (of high conservation concern) per the Birds of Conservation Concern in Ireland (2020 – 2026) ("BoCCI4") and has been noted proximate to, but not within, the proposed development site. This species is not a qualifying interest of Baldoyle Bay SPA.

Grey Heron (*Ardea cinerea* – green conservation status) and Herring Gull (*Larus argentatus* – BoCCI4 amber-listed (of medium conservation concern)) have also been observed proximate to the site. Neither species are recognised as a qualifying interest of Baldoyle Bay SPA. No works are proposed in the vicinity of the Mayne River where roosting habitat was noted. During the non-wintering bird assessments, no birds of conservation importance were noted on-Site. The Site is deemed not to be an important area for wintering or breeding birds.

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

8.4.1 Description of the site

LISMORE HOMES LIMITED, intend to apply to An Bord Pleanála for permission for a strategic housing development at a site of c. 6.1 ha in the townland of Stapolin, Baldoyle, Dublin 13, referred to as Growth Area 2 (GA2) Lands in the Baldoyle-Stapolin Local Area Plan 2013 (as extended) and which forms part of the wider landholding of lands formerly known as the Coast, Baldoyle, Dublin 13. The lands are bound by existing and proposed residential areas to the west and south, and the future Racecourse Park to the north and northeast. The development will consist of the construction of 1,007 apartments (consisting of 58 no. studio units (38.1 – 52.3 sq.m.), 247 no. 1 bedroom units (48.9 – 79.7 sq.m.), 94 no. 2 bedroom 3 person units (67.3 – 80.42 sq.m.), 563 no. 2 bedroom 4 person units (77.7 – 106.1 sq.m.), and 45 no. 3 bedroom units (93.5 – 130.66 sq.m.), 6 no. communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a c. 6.1 hectare site.

The proposed development will integrate with the permitted Strategic Housing Developments at the GA1 lands to the south (ABP ref. TA06F.310418) and GA3 lands to the west (ABP ref. TA06F.311016) for which an overall total of 2,202 residential units were approved by An Bord Pleanála.

8.4.2 Characteristics of the site

The proposed development consists of the construction of 1,007 residential apartments (consisting of 58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units), communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a site located in the townland of Stapolin, Coast Road, Baldoyle, Dublin 13.

The Landscape Architect's Report composed by Murray & Associates states that:

> *'The site is on the fringe of a recently developed (over past 10-15 years) residential development area. The site has been colonised by the flora typical of waste ground, primarily grasses, weeds and some small pioneer shrubs such as Buddleia or Willow in places. There are also some mature trees on the site, which are of moderate and low arboricultural value. There are 13 trees in total, all non-native, 12 of which are Sycamore and one is Alder.'*

The report also states that:

> *'This area is centred on the Mayne River and includes Mayne Marshlands, a brackish marsh and a considerable area of wetland and grassland of local and regional importance. Baldoyle Estuary also forms part of the landscape context for the site, which is a sensitive coastal landscape with high value under international designations. The site area is also designated as being on the edge of a 'Highly Sensitive Landscape' area.'*

8.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

8.5.1 Construction Phase

8.5.1.1 Designated European Sites

The proposed Project is not wholly or partly within a designated conservation site. However, Baldoyle Bay SAC, SPA, pNHA and Ramsar site are proximate to the Site, and there is a direct pathway from the proposed Project to the designated sites via the existing attenuation pond and Mayne River.

Noise from the construction phase would be localised to the vicinity of the works and would not impact on the qualifying interests of the Baldoyle Bay SPA, which is 0.55 km from the Site.

It should also be noted that the existing busy coastal road (R106) is located between the proposed Project and the Baldoyle Bay SPA, which is 0.55 km from the Site. Works have the potential to lead to silt-laden and contaminated run-off entering the downstream attenuation pond and Mayne River, with potential downstream impacts on designated sites. Ensuring water quality and compliance with the Water Pollution Acts,

as set out in the SWMP, would be seen as the primary method of ensuring no significant impact on watercourses and designated sites.

Potential Impacts: ***Negative, slight, short-term, unlikely, localised.*** Mitigation is required.

8.5.1.2 Ecology

The construction of the proposed Project would potentially impact on the existing ecology of the Site and the surrounding area. These potential construction impacts would include impacts that may arise during the Site clearance, re-profiling of the Site, and the building phases of the proposed Project.

Construction phase mitigation measures are required on Site, particularly as significant re-profiling of the Site is proposed, which will remove the majority of existing terrestrial habitats within the Site boundary. Works have the potential to lead to silt-laden and contaminated run-off entering the downstream attenuation pond and Mayne River, with potential downstream impacts on biodiversity.

Potential Impacts: ***Negative, slight, short-term*****,** ***likely, localised***. Mitigation is required.

8.5.1.3 Terrestrial Ecology

During the Site visits, no protected flora or terrestrial mammalian species of conservation importance were recorded on-Site or in NPWS or NBDC records. Loss of habitat and habitat fragmentation may affect some common mammalian species. No protected mammals were noted on-Site. Frogs and reptiles were not observed on-Site. The common lizard may occur on-Site but was not observed. The proposed Project will remove some potential foraging habitats on-Site. As a result, a pre-construction survey will be carried out.

Potential Impacts: ***Negative, slight, short-term, unlikely, localised****.* Mitigation is required.

8.5.1.4 Bats

No bat species recorded on site (according to the National Biodiversity Data Centre). A tree with bat roosting potential was noted on site. No bats were observed emerging from onsite trees. There are no buildings on site. However, a single Soprano Pipistrelle (*Pipistellus pygmaeus*) was noted briefly in the vicinity of the treeline on site. The treeline is to be retained. Foraging is expected to continue on site. Therefore, no significant negative impacts on the roosting of these animals are expected to result from the proposed Project.

Potential Impacts: ***Neutral, slight, negative, temporary, localised****.* Mitigation is not required.

8.5.1.5 Avian Fauna

As can be seen from Appendix 8.1, the wintering bird survey covered the Site of the proposed Project in addition to the larger land bank area to the boundary with the SAC. It concluded that:

> *"the proposed development area is not within the Baldoyle Bay SPA, however given the proximity of the SPA to the development, there is*

potential for impacts to result during construction and operational phases of the proposed development. These potential impacts could include:

Disturbance during construction works and the operational phase to Special Conservation Interest of the SPA including through movement of machinery, personnel, noise, vibration and/or noise associated with domestic dwellings.

Pollution of surface water through accidental spillage or discharge of polluting substances, or via elevated suspended solids and siltation through run-off to watercourses.

The maximum likely distance at which disturbance will impact SCIs from the Baldoyle Bay SPA is 300m (Cutts et al., 2013). The magnitude of this impact and its potential significance will require further consideration at the assessment stage of any future planning application.

The proposed housing scheme may result in disturbance of SCI's of the adjacent SPA. However, it is likely that habituation will occur to this new source of disturbance given that the SCIs of the SPA are already accustomed to the disturbance associated with Baldoyle village and existing surrounding housing developments. This should be considered in further detail at the assessment stage of any future planning application.

A wide range of environmental factors are required to support water bird species including good water quality and clarity and a good supply of food resources. Thus, water quality impacts resulting from the proposed development (i.e. during the construction and operational phases) could result in a reduction in the availability of suitable habitat for water bird species. The effect of such a reduction in water quality has the potential to be ecologically significant. However, it is likely that best practice design and mitigation can be implemented that would avoid or reduce such impacts. This should be considered in greater detail at the assessment stage of any future planning application."

It should be noted that baseline noise environment includes the busy R106 that links Portmarnock to Howth, which is between the proposed development and the SPA and within zone C in relation Aircraft Noise (≥ 54dB and < 63dB LAeq, $_{16hr}$ and ≥ 48dB and < 55dB L_{night}). Based on Noise assessment (AWN Consulting Ltd. EIAR Chapter 12) the loudest Construction Noise Level at the SPA boundary from the construction works would be 41db which is below ambient noise levels including that of Aircraft within the SPA.

Given the nature of the works, all of these effects would be expected to be localised in nature restricted to the immediate vicinity of the site and would have little effect on European sites.

It should be noted that the proposed Project is 0.55 km from the Baldoyle Bay SPA (at its closest). Based on the fact that the "*maximum likely distance at which disturbance will impact SCIs from the Baldoyle Bay SPA is 300m"*[2], disturbance from the proposed works would not be expected. Snipe (*Gallinago gallinago*) is red-listed (BoCCI4) and has been noted within the Site of the proposed project. This species is not a qualifying

[2] Cutts et al., (2013).

interest of Baldoyle Bay SPA[3]. Grey Heron (*Ardea cinerea* – green conservation status) and Herring Gull (*Larus argentatus* – amber-listed (BoCCI4)) have also been observed proximate to the site. Neither species are recognised as a qualifying interest of Baldoyle Bay SPA. No works are proposed in the vicinity of the Mayne River, where roosting habitat was noted. However, there is potential pollution of surface water through accidental spillage or discharge of polluting substances, or via elevated suspended solids and siltation through run-off to watercourses. Scrub is also noted on-Site and there is potential for breeding birds on-Site. Mitigation measures will be required to protect wintering birds (Snipe) and breeding / nesting birds.

Potential Impacts: ***Negative, slight, short-term*****,** ***likely, localised*****.** Mitigation is required.

8.5.2 Operational Phase

Once constructed, all on-Site drainage will be connected to separate foul and surface water systems. Surface water run-off will comply with SUDS. The biodiversity value of the Site would be expected to improve as the landscape measures mature. It would be expected that the localised ecological impacts in the long-term would be neutral once the landscape has established.

8.5.2.1 Designated Conservation Sites

The proposed Project must comply with drainage requirements and the Water Pollution Acts. Measures will be in place to prevent downstream impacts. No significant impacts on designated sites are likely during operation. The presence of additional residents in the vicinity of Baldoyle Bay may result in an increase of disturbance of biodiversity within the Baldoyle SPA and SAC. Fingal County Council has submitted an application for a significant amenity area (Racecourse Park (ABP Ref ABP-311315-21)) proximate to the proposed development site.

Potential Impacts: ***Negative, slight, short-term*****,** ***likely, localised*****.** Mitigation is required.

8.5.2.2 Terrestrial Ecology

As the landscape measures improve with maturity, it would be expected that the biodiversity value of the Site to birds and flora would also increase.

Potential Impacts: Localised, likely. ***Slight negative*** in the ***short-term***, to ***slight positive*** in the ***long-term*** / ***permanent*** time frame.

8.5.2.3 Bats

The proposed Project will result in increased roosting opportunities for bats, but would also see an increase in lighting in the area. The buildings are solid structures with strong reflective properties and would be expected to be clearly visible to bats. Bat collisions with the buildings would not be expected.

Potential Impacts: ***Negative, slight, long-term, likely, localised, Not significant***

[3] Snipe is suffering severe declines and now red-listed is a result.

8.5.2.4 Avian Fauna

The presence of additional residents in the vicinity of Baldoyle Bay may result in an increase of disturbance of biodiversity within the Baldoyle Bay SPA and SAC. By the very nature of the estuarine and saltmarsh environment, it would be expected that the increase in human disturbance would not be within the estuarine environment of Baldoyle Bay itself, but may result in an increase in activity on the surrounding roads and on Portmarnock Beach. The presence of buildings and landscaping on-Site could result in nesting opportunities. Fingal County Council has submitted an application for a significant amenity area (Racecourse Park (ABP Case reference: ABP-311315-21)), located to the to the north and northeast, adjoining to the proposed development site.

Potential Impacts: ***Negative, slight, long-term, likely, localised***. Mitigation is required.

8.6 REMEDIAL AND MITIGATION MEASURES

8.6.1 Construction Phase

Mitigation measures will be incorporated into the proposed Project to minimise the potential negative impacts on the ecology within the ZOI. These measures are outlined below in sequence, and incorporate elements outlined elsewhere in this EIAR.

The main potential vector for impacts to designated sites and aquatic ecology outside the proposed Project Site would be via the direct pathway to the Mayne River via the surface water network which discharges into the newly constructed wetland area (consented under FCC Reg Ref.: F16A/0412). The wetland discharges to the Mayne River and ultimately to Baldoyle Estuary through a series of flap valves.

Mitigation measures will in place to protect the biodiversity downstream of the pond from in-stream pollution and dust. No additional mitigation measures are required besides those outlined below, during the construction phase of the proposed Project, to protect against potential negative impacts on designated conservation sites. During the construction phase these potential impacts (in the absence of mitigation) are considered to be primarily from surface water/contaminated runoff, noise, dust, construction lighting and site clearance taking place during bird nesting season.

An Ecological Clerk of Works will be appointed to oversee works and will be appointed prior to works commencing on-Site. In addition, the following mitigation will be in place on site:

8.6.1.1 Implementation of the Construction Surface Water Management Plan

During construction the contamination of surface waters, and run-off from excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.

The Construction Surface Water Management Plan prepared by AWN (Appendix 7.4) aims to set out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the SWMP will be employed on site during the construction phase. All mitigation measures outlined within the SWMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

The main areas of water related concerns covered by the SMP document are:

- Pre-Construction, Construction Phase Drainage Controls;
- Management of Earthworks and Materials Storage
- Surface water runoff protection;
- Prevention of Accidental Releases;
- Wastewater and on-site sanitation.
- Surface Water Treatment and Discharge.
- Wastewater and On-site Sanitation.

The SWMP is live document and will be modified over time as detailed contractor methods of work are developed. If the development is permitted an updated version of this document will be issued to all parties involved in the construction process when appropriate changes are deemed necessary.

There shall not be discharge of ***untreated***, silty, or contaminated water from the works to any watercourse or stormwater network. Should any discharge of ***untreated*** construction water be required during the construction phase, the discharge will be to foul sewer following agreement with Fingal County Council / Irish Water.

There is no significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

The discharge of ***treated*** construction water from rainfall into excavated areas, or from any localised dewatering may be required during construction. This ***treated*** construction water will be discharged to the existing 1500 diameter concrete stormwater main, that traverses underneath the north fringe sewer and discharges to the Mayne River.

8.6.1.2 Implementation of the Construction Environmental Management Plan

AWN Consulting have prepared an *Outline Construction Environmental Management Plan (CEMP)* (Appendix 7.5). All mitigation measures outlined therein will be implemented, as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The movement of material will be minimised to reduce degradation of soil structure and generation of dust (see Chapter 9 (Air Quality), and Appendix 9.3 Dust Management Plan for further details).

The construction Contractor will provide a further detailed CEMP (in agreement with FCC and the Project Ecologist) that will include any subsequent planning conditions relevant to the proposed development and set out further detail of the overarching vision of how the construction Contractor of the proposed development manage the Site in a safe and organised manner.

The CEMP includes the following measures that will mitigate potential impacts on biodiversity:

Noise

During the construction phase works, the appointed Contactor shall comply with:

- The mitigation measures in this Environmental Impact Assessment Report.
- Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration.
- Refer to Chapter 12 (Noise and Vibration) for further mitigation measures.

Migrating Dust & Dirt Pollution

The appointed Contractor will ensure that all construction vehicles that exit the Site onto the public roads will not transport dust and dirt to pollute the external roadways. This will be achieved through a combination of the following measures:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential Site traffic.
- Any road that has the potential to give rise to fugitive dust must 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 must be enforced rigidly. On any unsurfaced Site road, this will be 20 kph, and on hard surfaced roads as Site management dictates.
- Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Public roads outside the Site will be regularly inspected for cleanliness and cleaned as necessary.
- 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.

The use of appropriate water-based dust suppression systems will greatly reduce the amount of dust and windborne particulates as a result of the construction process. The main Contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan (refer to Appendix 9.3). Refer to Chapter 9 (Air Quality and Climate) for further mitigation measures.

8.6.1.3 Mitigation to prevent impacts on habitats, plants and birds

Additional measures to be carried out to prevent impacts on habitats, plants and birds:

- Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will need be followed (i.e. do not remove trees or shrubs during the nesting season (1 March to 31 August, inclusive)). Snipe will be protected on site with the presence on ecologist during initial site clearance.
- Pre-construction inspections will be carried out for bats and terrestrial mammals of conservation importance. Appropriate derogation licences will be

acquired and conditions implemented if roosting bats or resting/breeding places of terrestrial mammals are noted on site or impacted by the proposed development.

- Boundary vegetation, treelines and hedgerows may serve as commuting corridors for bats (and other wildlife) and will remain unlit during the construction phase.
- Mitigation measures outlined in Section 9.5 and in the Dust Management Plan (Appendix 9.3) shall be implemented.

8.6.1.4 Nocturnal wildlife and Construction Lighting

Construction lighting will be designed so as to be sensitive to the potential presence of nocturnal wildlife within and external to the site. Construction lighting will adhere to the following guidance:

- Bats & Lighting: Guidance Notes for Planners, engineers, architects and developers (Bat Conservation Trust, 2010);
- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2011);
- Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2008).

8.6.2 Operational Phase

The proposed Project will have to comply with SUDS, legislative requirements in relation to pollution control and the provision of additional measures such as petrochemical interceptors and silt interception. The surface water will enter the newly constructed wetland. The wetland discharges to the Mayne River and ultimately to Baldoyle Estuary through a series of flap valves.

The applicant has identified c. 6.14 hectares of land for the provision of Class 1 and 2 public open space for the proposed development.

This comprises c. 5.1 hectares for Class 1 public open space at Mayne Road, and 1.037 hectares for Class 2 public open space. The minimum requirement for Class 1 public open space in relation to the scale of the proposed development is 3 hectares, therefore the proposed development is indicating 2.1 hectares in excess of the minimum requirement. The minimum requirement for Class 2 public open space in relation to the scale of the proposed development is 1 hectares, therefore the proposed development will provide in excess of the minimum requirement.

Furthermore, the proposed scheme also includes c. 1.385 hectares of communal open space within the residential courtyards throughout the scheme. The minimum requirement for communal open space in relation to the scale of the proposed development is 0.64 hectares, therefore the proposed development is providing 0.745 hectares in excess of the minimum requirement.

It should also be noted that permission has been sought by Fingal County Council directly to An Bord Pleanála, for a significant amenity space (Racecourse Park ABP Ref ABP-311315-21).

8.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

8.7.1 Construction Phase

The successful implementation of the preliminary CEMP and additional measures outlined in this chapter of the EIAR would be seen as important elements to the successful mitigation of the loss of biodiversity on-Site in addition to ensuring that works do not impact on the downstream aquatic ecology and designated sites.

The proposed Project has satisfactorily addressed the current ecology on-Site in its design. The application of the mitigation measures outlined in this EIAR and in the CEMP will help reduce the impact on biodiversity ecology such significant impacts do not arise.

The potential impacts on Designated European Sites during construction will be avoided by the provision of mitigation measures outlined above, within the SWMP, CEMP and in particular those measures that related to mitigating surface water impacts. The residual impact is considered ***neutral***, **imperceptible** and **long-term**.

The potential impacts on Ecology during construction will be avoided by the mitigation measures outlined above and in the SWMP and CEMP. The residual impact is considered ***neutral***, **imperceptible** and **long-term**.

The potential impacts on Terrestrial Ecology during construction will be avoided by the mitigation measures outlined above and in the SWMP and CEMP The residual impact is considered ***neutral***, **imperceptible** and **long-term**.

The potential impacts on Bats during construction will be avoided by will be avoided by appropriate avoidance timing and the employment of a bat specialist to monitor tree felling and enforce time sensitive additional measures. The residual impact is considered ***neutral***, **imperceptible** and **long-term**.

Potential impacts on Avian Fauna during construction will be avoided by appropriate avoidance timing and/or surveying for nests. The residual impact is considered ***neutral***, **imperceptible** and **long-term**.

8.7.2 Operational Phase

The potential impacts on designated conservation sites during operation will be avoided by providing additional significant additional open space than is required. The applicant has identified c. 6.14 hectares of land for the provision of Class 1 and 2 public open space for the proposed development.

This comprises c. 5.1 hectares for Class 1 public open space at Mayne Road, and 1.037 hectares for Class 2 public open space. The minimum requirement for Class 1 public open space in relation to the scale of the proposed development is 3 hectares, therefore the proposed development is indicating 2.1 hectares in excess of the minimum requirement. The minimum requirement for Class 2 public open space in relation to the scale of the proposed development is 1 hectares, therefore the proposed development will provide in excess of the minimum requirement.

Furthermore, the proposed scheme also includes c. 1.385 hectares of communal open space within the residential courtyards throughout the scheme. The minimum requirement for communal open space in relation to the scale of the proposed

development is 0.64 hectares, therefore the proposed development is providing 0.745 hectares in excess of the minimum requirement.

As a result, it is considered that the proposed development is not reliant on Racecourse Park to provide additional mitigation to offset the increased cumulative impact during the operational phase. The residual impact is considered ***neutral***, **imperceptible** and **long-term**.

No potential impacts are foreseen on Terrestrial Ecology of ecological importance during operation. Potential Impacts: Localised, likely. Slight negative in the short-term, to slight positive in the long-term / permanent time frame.

The proposed Project will result in increased roosting opportunities for bats, but would also see an increase in lighting in the area. The buildings are solid structures with strong reflective properties and would be expected to be clearly visible to bats. Bat collisions with the buildings would not be expected. Potential Impacts: Negative, slight, long-term, likely, localised, Not significant

Potential impacts on Avian Fauna during construction will be avoided by appropriate avoidance timing and/or surveying for nests. The residual impact is considered *neutral*, imperceptible and long-term.

It is considered that, where possible, biodiversity enhancement measures have been incorporated into the design for the benefit of the overall biodiversity value of the Site. Additional amenity Class 1 and Class 2 public open space, and communal open space has been provided on site.

The overall residual impact of the proposed Project on biodiversity will be a long-term, slight, minor adverse, not significant impact. This is primarily as a result of the loss of terrestrial habitats on-Site (of poor biodiversity importance), supported by the creation of additional terrestrial biodiversity features, mitigation measures and landscaping strategy in an area of existing development.

8.8 MONITORING OR REINSTATEMENT

8.8.1 Monitoring

An Ecological Clerk of Works will be appointed to monitor the Site during pre-construction surveys, construction phase and landscaping.

8.8.2 Reinstatement

If required, the reinstatement of the Site will be monitored by the appointed Ecologist.

8.9 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

The cumulative impact (as far as practically possible) of the proposed development with any/all relevant existing or permitted developments as set out in Chapter 3. The likelihood of cumulative effects are discussed in Sections 8.8.1 and 8.8.2 below for construction and operational phases.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 3 has been undertaken., it is considered that cumulative effects with other existing and proposed developments in proximity to the Site would be unlikely, neutral,

not significant and localised. It is concluded that no significant effects on biodiversity will be seen as a result of the proposed Project alone or combination with other projects. Mitigation measures will be in place to reduce the potential impact of the proposed development.

8.9.1 Construction Phase

During the construction phase of the proposed development the potential for cumulative impacts can be excluded given that other permitted development has been granted only on condition of not having significant effects on biodiversity.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 3, EIAR has identified the only simultaneous construction projects capable of combining with the proposed development is the GA1 and GA3.

In the event that there is any overlap between the construction phase the respective CEMPs incorporate measures to protect water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019). Thus the potential for downstream in-combination effects impacts is considered highly unlikely.

An NIS was prepared for the proposed development which takes into account the in combination and cumulative impacts with other permitted developments and the Natura 2000 network.

The residual cumulative impact on biodiversity for the construction phase of the proposed development is anticipated to be ***short-term***, ***neutral*** and ***imperceptible*** significance, once appropriate mitigation measures are implemented.

8.9.2 Operational Phase

During the operational phase of the proposed development the potential for cumulative impacts can be excluded given that other permitted development has been granted only on condition of not having significant effects on biodiversity.

An NIS was prepared for the proposed development which took into account the in combination and cumulative impacts of the with other permitted developments and the Natura 2000 network.

It is concluded in the NIS that there are no predicted in-combination effects given that it is predicted that the proposed development will have no effect on any European site.

An increase anthropocentric pressures would be foreseen due to an increase in density of development in the area. However, this has been offset by the provision of an additional open space than is required.

The residual cumulative impact on biodiversity for the operational phase of the proposed development is anticipated to be ***short-term***, ***neutral*** and ***imperceptible*** significance, once appropriate mitigation measures are implemented.

Cumulative Impact: *Minor adverse, **slight, temporary, localised**, not significant.*

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9.0 AIR QUALITY AND CLIMATE

9.1 INTRODUCTION

This chapter assesses the likely air quality and climate impacts associated with the proposed development located in the townland of Stapolin, Baldoyle, Dublin 13. A full description of the development is available in Chapter 2.

9.2 METHODOLOGY

9.2.1 Criteria for Rating of Impacts

9.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the 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 9.1). 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).

Table 9.1 *Ambient Air Quality Standards*

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 $PM_{2.5}$

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

9.2.1.2 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 9.2.1.1 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.

9.2.1.3 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, inter alia, 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 Fingal County Council Climate Change Action Plan published in 2019 (Fingal County Council and Codema, 2019) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management. Some of the measures promoted within the Action Plan under the 5 key areas involve building retrofits, energy master-planning, development of segregated cycle routes, the promotion of bike share schemes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the Fingal to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Action Plan and incorporate climate friendly designs and measures where possible.

9.2.2 Construction Phase

9.2.2.1 Air Quality

The 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 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 following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. The use of the UK guidance is recommended by the TII (2011) in the absence of specific Irish guidance, 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 scoping 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.

9.2.2.2 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.

9.2.3 Operational Phase

9.2.3.1 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). Transport Infrastructure Ireland (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 Transport Infrastructure Ireland (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 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, 2021a).

The key pollutant reviewed in this assessment is NO_2. Modelling of operational NO_2 concentrations has been conducted for the do nothing and do something scenarios for the base year (2021) opening year (2026), and design year (2041).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 9.2.2 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 4 no. sensitive receptors within 200m of impacted road links were included within the modelling assessment (see Figure 9.1), these are all high sensitivity residential properties.

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 9.2, Table A9.2.1 and Table A9.2.2. 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 NO_X 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 NO_x for Ireland. The "All Non-Urban 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 JB Barry Consulting for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the base year 2021, opening year 2026 and design year 2041 were provided. The traffic data in AADT is detailed in Table 9.2 along with the % HGV. Only road links that met the DMRB scoping criteria outlined in Section 9.2.2 and that were within 200m of receptors were included in the modelling assessment. Background concentrations have been included as per Section 9.3.3 of this chapter based on available EPA background monitoring data (EPA, 2021a).

Table 9.2 *Traffic Data Used in Air Quality Modelling Assessment*

Road Name	Base Year	Do-Nothing		Do-Something		Speed (kph)
	2021	2026	2041	2026	2041	
Coast Road North	12,250	13,750	15,300	15,150	16,700	50
Coast Road South	12,500	14,000	1,500	15,800	17,300	50
Grange Road West	16,750	18,500	21,000	19,820	22,320	50
Longfield Road	1,750	2,350	2,500	4,550	4,700	50

Figure 9.1 *Location of Sensitive Receptors used in Air Quality Modelling Assessment*

9.2.3.2 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 9.3.3). 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 meets one or more of 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 five road links that will experience an increase of 10% or more in the AADT. These road links have been included in the detailed climate assessment (see Table 9.3).

Table 9.3 *Traffic Data Used in Climate Assessment*

Road Name	Base Year	Do-Nothing		Do-Something		Speed (kph)
	2021	2026	2041	2026	2041	
Coast Road North	12,250	13,750	15,300	15,150	16,700	50
Red Arches Road	2,000	3,000	3,200	6,200	6,400	50
Coast Road South	12,500	14,000	1,500	15,800	17,300	50
Grange Road West	16,750	18,500	21,000	19,820	22,320	50
Longfield Road	1,750	2,350	2,500	4,550	4,700	50

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 project that causes a change in traffic. The inputs to the air dispersion model consist of information on road link lengths, AADT movements and annual average traffic speeds (see Table 9.3).

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 Building Design Statement prepared in relation to this assessment 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.

9.2.3.3 Air Quality Impact on Ecological Sites

For routes that pass within 2 km of a designated area of conservation (either Irish or European designation) the TII requires consultation with an ecologist (TII, 2011). However, in practice the potential for impact to an ecological site is highest within 200m of the proposed scheme and when significant changes in AADT (>5%) occur. Only sites that are sensitive to nitrogen deposition should be included in the assessment. In addition, the UK Highways Agency (2019) states that a detailed assessment does not

need to be conducted for areas that have been designated for geological features or watercourses.

Transport Infrastructure Ireland's *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (2009) and *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

If both of the following assessment criteria are met, an assessment of the potential for impact due to nitrogen deposition should be conducted: -

- A designated area of conservation is located within 200 m of the proposed development.
- A significant change in AADT flows (>5%) will occur.

The Baldoyle Bay Special Area of Conservation (SAC) and Proposed Natural Heritage Area (pNHA) (site code 000199), along with the Baldoyle Bay Special Protection Area (SPA) (site code 004016) are to the direct east of the proposed development within 200m. An assessment of the impact with regards to nitrogen deposition was conducted for the SAC, pNHA and SPA. Dispersion modelling and prediction was carried out at typical traffic speeds at this location. Ambient NOx concentrations were predicted for the opening year of 2026 along a transect of up to 200 m within the pNHA in line with the UK Highways Agency (2019a) and TII (2011) guidance. The road contribution to dry deposition along the transect was also calculated using the methodology outlined in Appendix 9 of the *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011).

9.2.4 Difficulties Encountered

These were no difficulties encountered when conducting this assessment.

9.3 RECEIVING ENVIRONMENT

9.3.1 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 Dublin Airport meteorological station, which is located approximately 5 km west of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 9.2). For data collated during

five representative years (2016 - 2020), the predominant wind direction is westerly to south-westerly with generally moderate wind speeds (Met Eireann, 2021).

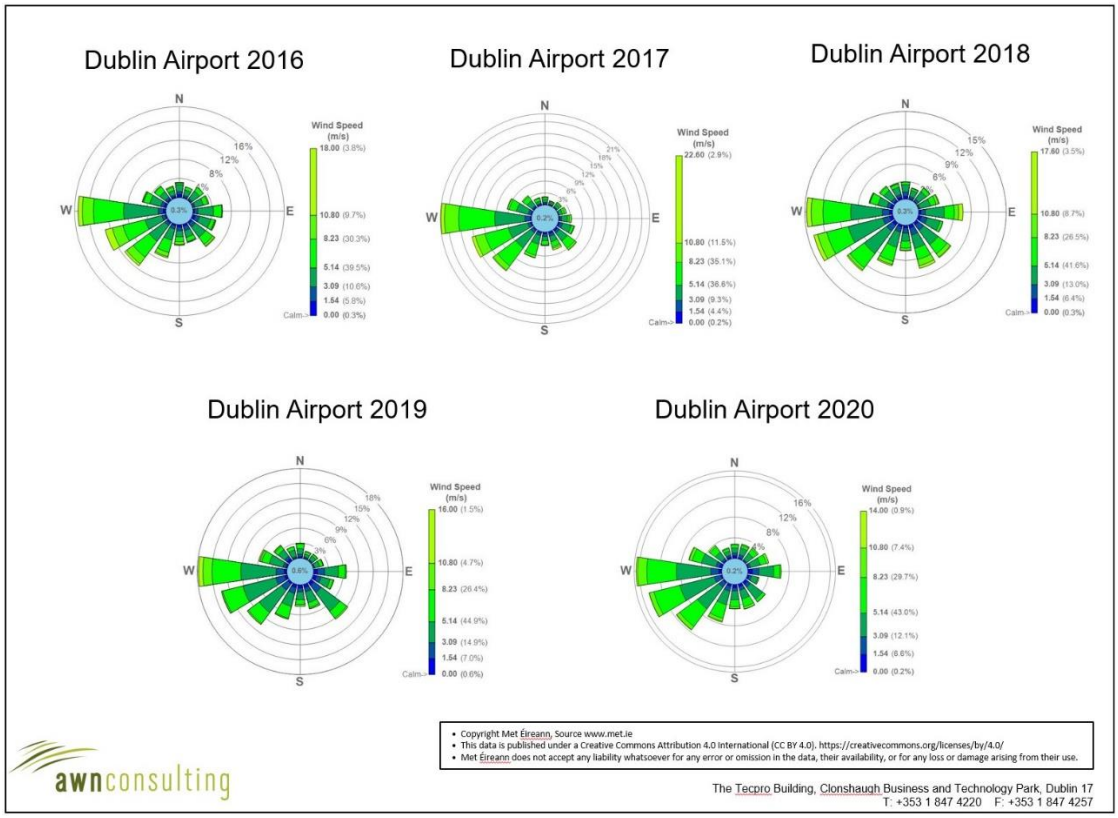

Figure 9.2 *Dublin Airport Met Station Windrose 2016 – 2020 (Met Eireann, 2021)*

9.3.2 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 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 2020' (EPA 2021a). 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 air monitoring locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA report '*Air Quality in Ireland 2020*' details the effect that the Covid-19 restrictions had on 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. Long-term monitoring data from previous years has been used to inform estimated background concentrations for this assessment.

NO_2

With regard to NO_2, continuous monitoring data from the EPA (EPA, 2020) at suburban Zone A locations in Ballyfermot, Dun Laoghaire, Swords and Rathmines show that current levels of NO_2 are below both the annual and 1-hour limit values, with annual average levels ranging from 15 – 22 µg/m^3 in 2019 (see Table 9.4). Sufficient data is available for all stations to observe the long-term trend since 2015 (EPA, 2020) (see Table 9.4), with results ranging from 13 – 22 µg/m^3 and few exceedances of the one-hour limit value. The station in Swords is approximately 7 km north-west of the proposed development site and monitored background concentrations would be representative of the site location. Concentrations of NO_2 at the Swords site over the period 2015 – 2019 ranged from 13 - 16 µg/m^3. Based on the above information, an estimate of the background NO_2 concentration in the region of the proposed development is 16 µg/m^3.

Table 9.4 *Background NO_2 Concentrations In Zone A Locations (µg/m^3)*

Station	Averaging Period Note 1,2	Year				
		2015	2016	2017	2018	2019
Rathmines	Annual Mean NO_2 (µg/m^3)	18	20	17	20	22
	Max 1-hr NO_2 (µg/m^3)	106	102	116	138	183
Dún Laoghaire	Annual Mean NO_2 (µg/m^3)	16	19	17	19	15
	Max 1-hr NO_2 (µg/m^3)	103	142	153	135	104
Swords	Annual Mean NO_2 (µg/m^3)	13	16	14	16	15
	Max 1-hr NO_2 (µg/m^3)	170	206	107	112	108
Ballyfermot	Annual Mean NO_2 (µg/m^3)	16	17	17	17	20
	Max 1-hr NO_2 (µg/m^3)	142	127	148	217	124

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).

Note 2 1-hour limit value - 200 µg/m^3 as a 99.8th%ile, i.e. not to be exceeded >18 times per year (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

PM_{10}

Continuous PM_{10} monitoring carried out at the Zone A locations of Rathmines, Phoenix Park and Dún Laoghaire showed 2015 – 2019 annual mean concentrations ranging from 9 – 15 µg/m^3 (Table 9.5), with at most 9 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 (35 exceedances are permitted per year). The most representative location is Phoenix Park which had an average annual mean concentration of 10.8 µg/m^3 over the five year period. Based on the EPA data (Table 9.5) a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 13 µg/m^3.

Table 9.5 *Background PM_{10} Concentrations In Zone A Locations ($\mu g/m^3$)*

Station	Averaging Period Note 1,2	Year				
		2015	2016	2017	2018	2019
Rathmines	Annual Mean PM_{10} ($\mu g/m^3$)	15	15	13	15	15
	24-hr Mean > 50 $\mu g/m^3$ (days)	5	3	5	2	9
Phoenix Park	Annual Mean PM_{10} ($\mu g/m^3$)	12	11	9	11	11
	24-hr Mean > 50 $\mu g/m^3$ (days)	2	0	1	0	2
Dún Laoghaire	Annual Mean PM_{10} ($\mu g/m^3$)	13	13	12	13	12
	24-hr Mean > 50 $\mu g/m^3$ (days)	3	0	2	0	2

Note 1 Annual average limit value of 40 $\mu g/m^3$ and 24-hour limit value of 50 $\mu g/m^3$ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 24-hour limit value - 50 $\mu g/m^3$ as a 90.4th%ile, i.e. not to be exceeded >35 times per year (EU Council Directive 1999/30/EC & S.I. No. 180 of 2011).

$PM_{2.5}$

Continuous $PM_{2.5}$ monitoring carried out at the Zone A location of Rathmines showed $PM_{2.5}/PM_{10}$ ratios ranging from 0.60 – 0.68 over the period 2015 – 2019. Based on this information, a conservative ratio of 0.7 was used to generate a background $PM_{2.5}$ concentration in the region of the proposed development of 9.1 $\mu g/m^3$.

Background concentrations for Opening Year 2024 and Design Year 2041 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).

9.3.3 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 CO2eq) with 44.38 MtCO2eq 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 CO2.

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 MtCO2eq, 2.94 MtCO2eq, 5.57 MtCO2eq,6.85 MtCO2eq and 6.73 MtCO2eq 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 12.2MtCO2eq 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).

9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development involves the construction of a strategic housing development located at the townland of Stapolin, Baldoyle, Dublin 13. A full description of the development is available in Chapter 2. When considering a development of this nature, the potential air quality and climate impact on the surroundings must be considered for each of two distinct stages:

- Construction phase, and;
- Operational phase.

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 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.

9.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

9.5.1 Construction Phase

9.5.1.1 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 and PM_{10}/$PM_{2.5}$ emissions. While construction dust tends to be deposited within 350m of a construction site, the majority of the deposition occurs within the first 50m. The proposed development can be considered major in scale and therefore, there is the potential for significant dust soiling impacts within 100m of the site (Table 9.6). The closest high sensitivity receptors (residential properties) to the site are approximately 20 m to the south of the site. In the absence of mitigation there is the potential for short-term, negative, slight impacts to nearby sensitive receptors as a result of construction dust emissions.

As the proposed development is considered major in scale there is the potential for vegetation effects within 25m of the site (Table 9.6). In the absence of mitigation there is the potential for a short-term, negative, and slight impact to nearby vegetation.

Table 9.6 *Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place (TII, 2011)*

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 roads	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites, with limited use of haul roads	25m	10m	10m

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

9.5.1.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. GHGs can be emitted from vehicles and embodied energy associated with materials used in the construction of a development. Embodied energy refers to the sum of the energy needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. There is the potential for a number of embodied GHGs and GHG emissions during the construction phase 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 potential impact on climate from construction vehicles is considered to be imperceptible, neutral and short term.

In order to assess the potential embodied carbon associated with the proposed development the default value is 50 tonnes CO_{2eq} per 3-bedroom house (Monahan & Powell, 2011) was used to help estimate the impact from the proposed development. Using the above figure there will be approximately 48,310 tonnes CO_{2eq} associated with the proposed development. Approximately 45% embodied carbon is derived from cement and as a result, mitigation measures outlined in Section 9.6.1.2 show concrete specifications for the project will include a minimum of 40% of GGBS (unless otherwise specified by the project Engineer for particular abnormal circumstances) as a direct substitute for normal Portland cement thus significantly reducing the CO_2 footprint of the concrete used in the project. Therefore, the potential impact on climate from

embodied carbon in the absence of mitigation is considered to be significant, negative and long term.

9.5.1.3 Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. As per Table 9.6 significant PM_{10} emissions can occur within 25m of the site for a development of this scale. Therefore, in the absence of mitigation there is the potential for imperceptible, negative, short-term impacts to human health as a result of the proposed development.

9.5.2 Operational Phase

9.5.2.1 Air Quality

The 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. The assessment was carried out at 4 no. high sensitivity residential receptors (R1 - R4) (see Figure 9.1).

Transport Infrastructure Ireland'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 2026 are shown in Table 9.7 and for design year 2041 are shown in Table 9.8. The annual average concentration is in compliance with the limit value at the worst-case receptor in 2026 and 2041. Concentrations of NO_2 are at most 51% of the annual limit value in 2026 and at most 52% in 2041 for the do-something scenario. In addition, the hourly limit value for NO_2 is 200 $\mu g/m^3$ and is expressed as a 99.8th 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 9.9).

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 small increases in NO_2 concentrations at receptors R1, R2 and R4 and NO_2 concentrations are predicted to be imperceptible at receptors R3 for the opening year of 2026. There is predicted to be a large increase in NO_2 concentrations at receptor R2 in the design year of 2041. Concentrations will increase by at most 2.6% of the annual limit value in 2026 and by 14.3% in 2041 at worst case receptors (R2 and R4 respectively). Using the assessment criteria outlined in Appendix 9.2, Table A9.2.1 and Table A9.2.2 the impact of the proposed development in terms of NO_2 is considered negligible at receptors R1, R3 and R4. However, in 2041 receptor R2 will experience a slight adverse impact as a result of NO_2 emissions. Therefore, the overall impact of NO_2 concentrations as a result of the proposed development is long-term, negative and imperceptible to slight.

Concentrations of PM_{10} were modelled for the baseline year of 2021. 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 as per the UK Highways Agency guidance (2019a). Concentrations reached at most 0.79 µg/m^3 excluding background concentrations. When a background concentration of 13 µg/m^3 is included the overall impact is 34% of the annual limit value at the worst case receptors (R1 and R2).

The impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, negative and imperceptible to slight.

Table 9.7 *Predicted Annual Mean NO_2 Concentrations – Opening Year 2024 (µg/m^3)*

Receptor	Impact Opening Year 2024				
	DN	DS	DS-DN	Magnitude	Description
R1	20.4	20.9	0.49	Small Increase	Negligible
R2	20.4	20.9	0.56	Small Increase	Negligible
R3	19.4	19.5	0.10	Imperceptible Increase	Negligible
R4	17.1	18.0	0.94	Small Increase	Negligible

Note 1 Based on UK Highways Agency IAN technique for predicting future NO_2 concentrations

Table 9.8 *Predicted Annual Mean NO_2 Concentrations – Design Year 2041 (µg/m^3)*

Receptor	Impact Design Year 2041 Note 1				
	DN	DS	DS-DN	Magnitude	Description
R1	20.4	20.6	0.21	Imperceptible Increase	Negligible
R2	14.9	20.6	5.74	Large Increase	Slight Adverse
R3	19.1	19.2	0.11	Imperceptible Increase	Negligible
R4	16.7	17.7	1.04	Small Increase	Negligible

Note 1 Based on UK Highways Agency IAN technique for predicting future NO_2 concentrations

Table 9.9 *Predicted 99.8th percentile of Daily Maximum 1-hour NO_2 Concentrations (µg/m^3)*

Receptor	Opening Year 2024		Design Year 2041	
	DN	DS	DN	DS
R1	71.5	73.3	71.4	72.2
R2	71.3	73.3	52.1	72.2
R3	68.0	68.3	66.7	67.1

R4	59.7	63.0	58.3	62.0

9.5.2.2 Air Quality Impact on Sensitive Ecosystems

The existing road network and the proposed development both impact a section of Baldoyle Bay Special Area of Conservation (SAC) and Proposed Natural Heritage Area (pNHA) (site code 000199), along with the Baldoyle Bay Special Protection Area (SPA) (site code 004016) to the direct east of the proposed development.

Modelling has been conducted at the worst-case location in closest proximity to the road links impacted by the proposed development. The NO_X emissions resulting from traffic associated with the current road network and proposed development have been calculated and are detailed in Table 9.10. Ambient NO_X concentrations have been predicted for the opening year of 2024 as per the UK Highways Agency (2019) and TII (2011) guidance. Concentrations are predicted along a transect of up to 200m within the SAC, pNHA and SPA.

The predicted annual average NO_X concentration within the SAC, pNHA and SPA, is below the limit value of 30 µg/m^3 for the existing "Do Nothing" scenario and the "Do Something" scenario. Concentrations are at most 98% of the annual limit value, including a background concentration of 23 µg/m^3, for the protection of ecosystems for the existing scenario without the proposed development in place. The proposed development is predicted to increase NO_X concentrations by at most 0.55 µg/m^3.

Appendix 9 of the TII guidelines (2011) state that where the scheme is expected to cause an increase of more than 2 µg/m^3 and the predicted concentrations (including background) are close to, or exceed the standard, then the sensitivity of the habitat to NO_X should be assessed by the project ecologist. While NO_X concentrations are predicted to be close to the limit value either with or without the proposed development in place, the proposed development will only increase NO_X concentrations by a maximum of 0.55 µg/m^3 at the worst-case location, therefore, effects are not predicted to be significant.

The contribution to the NO_2 dry deposition rate along the 200m transect within the pNHA, SAC and SPA is also detailed in Table 9.10. The change in the maximum NO_2 dry deposition rate is 0.030 Kg(N)/ha/yr. This is well below the critical load for coastal habitats of 10 -20 Kg(N)/ha/yr (TII, 2011).

Overall, the air quality effect on the Baldoyle Bay SAC, pNHA and SPA, is considered negative, long-term and imperceptible.

Table 9.10 *Assessment of NO_X Concentrations and NO_2 Dry Deposition Impact on the Baldoyle Bay SAC, pNHA and SPA*

Distance to Road (m)	NO_X Concentration (µg/m^3) Note 1			NO_2 Dry Deposition Rate Impact
	Do Nothing	Do Something	Change in NO_X Concentration	Kg N ha^{-1} yr^{-1}
10	28.80	29.35	0.55	0.03
20	27.39	27.81	0.42	0.022
30	26.37	26.69	0.32	0.017
40	25.62	25.88	0.25	0.013
50	25.06	25.26	0.20	0.01
60	24.62	24.78	0.16	0.009
70	24.28	24.40	0.12	0.007
80	24.01	24.10	0.10	0.005
90	23.79	23.86	0.08	0.004
100	23.62	23.67	0.06	0.003
110	23.48	23.53	0.05	0.002
120	23.37	23.41	0.04	0.002
130	23.30	23.32	0.03	0.001
140	23.24	23.26	0.02	0.001
150	23.20	23.22	0.02	0.001
160	23.18	23.20	0.02	0.001
170	23.17	23.19	0.02	0.001
180	23.15	23.16	0.01	0.001
190	23.12	23.13	0.01	0.001
200	23.09	23.10	0.01	0

Note 1 Based on a background NO_X concentration of 23 µg/m^3 in 2026

9.5.2.3 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. A detailed flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. Therefore, the impact will be imperceptible.

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development from traffic generation. The predicted concentrations of CO_2 for the future years of 2024 and 2041 are detailed in Table 9.11. These are significantly less than the 2024 and 2030 target set out under EU legislation (targets past 2030 are not available). It is predicted that in 2024 the proposed development will increase CO_2 emissions by 0.00044% of the EU 2024 target. In 2041 CO_2 emissions will increase by 0.00109% of the 2030 target. Therefore, the climate impact of the proposed development is considered negative, long-term and imperceptible.

Table 9.11 *Climate Impact Assessment*

Year	Scenario	CO_2 (tonnes/annum)
2026	**Do Nothing**	941
	Do Something	1107
2041	**Do Nothing**	851
	Do Something	1215
Increment in 2026		165.6 Tonnes
Increment in 2041		364.6 Tonnes
Emission Ceiling (kilo Tonnes) 2026		**37,869** Note 1
Emission Ceiling (kilo Tonnes) 2030		**33,381** Note 1
Impact in 2026 (%)		0.00044 %
Impact in 2041 (%)		0.00109 %

Note 1 *Target under Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013*

In addition, the proposed development has been designed to reduce the impact to climate where possible, the following measures have been incorporated into the design of the development: The use of photovoltaics as a means of providing a renewable source of energy for the building is being considered. The proposed development aims to be a “Near Zero – Energy Building” meaning it will have a very high energy performance.

9.5.2.4 Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. 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. It can be determined that the impact to human health during the operational stage is long-term, negative and imperceptible.

9.6 REMEDIAL AND MITIGATION MEASURES

9.6.1 Construction Phase

9.6.1.1 Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 9.3. These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site.

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 must 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 must 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 outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- 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.

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.

9.6.1.2 Climate

Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

During the construction phase the use of 'low carbon cement' such as ground granulated blast furnace slag GGBS. The typical CO_2 footprint of GGBS cement is 50 Kg/tonne as opposed to 700-800 Kg/tonne for regular (Portland) cement. Low carbon GGBS cement is whiter in colour with reduced artificial lighting required in underground car parks for example.

Concrete specifications for the project (substructures and superstructures) will include a minimum of 40% of GGBS (unless otherwise specified by the project Engineer for particular abnormal circumstances) as a direct substitute for normal Portland cement thus significantly reducing the CO2 footprint of the concrete used in the project.

9.6.2 Operational Phase

The impact of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

The proposed development has been designed to minimise the impact to climate where possible during operation. Details of the measures to be incorporated into the design of the development are outlined within the Building Design Statement prepared in support of this planning application.

9.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

9.7.1 Construction Phase

9.7.1.1 Air Quality

Once the dust minimisation measures outlined in Section 9.6 and Appendix 9.3 are implemented, the impact of the proposed development in terms of dust soiling will be short-term, negative and imperceptible at nearby receptors.

9.7.1.2 Climate

According to the IAQM guidance (2014) site traffic, plant and machinery are unlikely to have a significant impact on climate. Therefore, the residual impact on climate from construction vehicles is considered to be imperceptible, neutral and short term.

Considering the potential for embodied carbon associated with the proposed development, the residual impact on climate with the implementation of mitigation is not significant, negative, and long term.

9.7.1.3 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, localised and imperceptible with respect to human health.

9.7.2 Operational Phase

9.7.2.1 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 to slight. Therefore, the operational phase impact to air quality is long-term, localised, negative and imperceptible to slight.

9.7.2.2 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 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 during operation.

9.7.2.3 Human Health

As the air dispersion modelling has shown that emissions of air pollutants are 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.

9.7.2.4 Worst Case Impact

Conservative background concentrations were used in order to ensure a robust assessment. Thus, the predicted results of the operational stage assessment are worst-case and will not cause a significant impact on either air quality or climate.

9.8 MONITORING OR REINSTATEMENT

9.8.1 Construction Phase

Monitoring of construction dust deposition at 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/(m2*day) during the monitoring period between 28 - 32 days.

9.8.2 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.

9.9 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

9.9.1 Construction Phase

The anticipated cumulative effects of the proposed Project in combination with existing, permitted and proposed developments, as listed in Chapter 3 (Planning and Development Context) are addressed below.

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction phase of any other developments within 350m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors.

In respect of substantial developments that may result in in-combination effects in respect of material assets are the adjacent residential development GA1 (ABP Reg. Ref.:311018-21) and GA3 (ABP Reg. Ref.:311016-21) are the relevant projects considered in detail.

The GA1 Grant of Permission ABP Reg. Ref.:311018-21 Condition 3 requires that the mitigation measures set out in the EIA must be carried out in full and Condition 4 request the mitigation and mitigation and monitoring measures as they relate to the Baldoyle Bay APA be implemented. Furthermore; Condition 22 states that prior to the commencement of works a Construction Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The GA3 Grant of Permission ABP Reg. Ref.:311016-21 Condition 5 states that prior to the commencement of works a finalised Construction and Environmental Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The implementation of mitigation measures within each chapter and detailed in Section 9.6 and Appendix 9.3; as well as the compliance of adjacent development with their respective planning permissions, significant cumulative dust impacts are not predicted during the construction phase of the proposed development. The residual impact of the proposed development in combination with other planned or permitted developments (as described in Chapter 3) is **short-term-imperceptible-neutral**.

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the proposed development in combination with the nearby consented development (GA1 and GA3). 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. In addition the construction phase of the proses project and these consented development (GA1 and GA3) is deemed to be ***short-term*** in duration.

Therefore there is a low potential for significant CO_2 and N_2O emissions the likelihood of significant cumulative impact is similarly low. The cumulative impacts to climate as a result of construction vehicles, generators etc., considered imperceptible.

The embodied carbon for other developments in the area including GA1 and GA3 have been estimated to allow for a cumulative view of the area surrounding the proposed development. There will be approximately 52,323 tonnes CO_{2eq} associated with GA1

and approximately 66,9994 tonnes CO_{2eq} associated with GA3. The Institute of Environmental Management and Assessment (IMEA) guidance *Assessing Greenhouse Gas Emissions and Evaluating their Significance* published in 2022 outlines that when considering the cumulative assessment, all global cumulative GHG sources are relevant to the effect on climate change. As a result the effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed. This is due to the fact that there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other. As a result it is not appropriate to conduct a cumulative assessment of embodied carbon for the proposed development.

9.9.2 Operational Phase

The traffic data used to assess the operational stage impacts to air quality and climate included the cumulative traffic associated with the proposed development as well as other existing and permitted developments in the local area where such information was available. 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.

9.10 REFERENCES

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10.0 MICROCLIMATE - WIND

10.1 INTRODUCTION

This Chapter assesses the potential effects of the proposed Development on the pedestrian level wind microclimate around the proposed buildings and proposed open spaces and amenity areas and in the areas immediately surrounding the Site.

The Chapter describes the methods used to assess the effects at the Site and around its immediate neighbours. The potential direct and indirect effects arising from the Development have been assessed from a desk-based assessment.

This assessment is based upon the professional opinion of an experienced BRE wind engineering expert who is a Chartered Civil and Structural Engineer with over 40 years of experience in this field. It is recognised that this opinion is qualitative in nature although the assessment of wind speed conditions for the Site is based on measured meteorological data and is therefore quantitative. This approach is widely accepted by planners and developers as being an appropriate methodology to support planning applications.

This Chapter has been written by the Building Research Establishment (BRE).

10.2 METHODOLOGY

This is a desk-based wind microclimate assessment. For this particular development a wind tunnel study was not considered necessary because the height and massing of the development is not significantly different from surrounding buildings. This study has considered the likely wind conditions around the site for all approaching wind directions. Critical wind directions (i.e. the prevailing wind direction, or wind directions where the orientation, size and spacing of buildings, or specific features of an individual building, could create high winds) have been considered.

Wind conditions for pedestrian comfort are generally based on the Beaufort wind scale which describes wind effects on land for a range of mean wind speeds. Table 10.1 shows the Beaufort wind scale and describes the effects attributable to each wind speed range.

The wind microclimate assessment in this study is based upon a set of comfort criteria developed by Lawson with respect to people's perception of the suitability of the wind conditions for a range of activities from 'long-term sitting' (for example at open-air cafés), through 'standing' and 'strolling' and finally to 'business walking'. The more sedentary the activity, the lower the acceptable comfort threshold will be. Table 10.2 gives a description of the Lawson comfort criteria and the threshold wind speeds. The use of the Lawson comfort criteria has been shown to represent good standards of environmental practice and is widely accepted by Local Planning Departments.

It should be recognised that the full Lawson comfort assessment can only be carried out with quantitative measurements of pedestrian level mean and gust wind speeds obtained from a wind tunnel study. The wind microclimate assessment carried out in this study uses expert judgement and experience to qualitatively apply the Lawson comfort criteria to the pedestrian microclimate around the development.

Table 100.1 *The Beaufort scale of wind effects on land*

Beaufort scale	Description	Mean wind speed range		Effects
		(m/s)	(mph)	
B0	Calm	0–0.2	0–0.5	No noticeable wind, smoke rises vertically
B1	Light air	0.3–1.5	0.7–3.4	Direction of wind shown by smoke drift but not wind vanes
B2	Light breeze	1.6–3.3	3.6–7.4	Wind felt on face, leaves rustle
B3	Gentle breeze	3.4–5.4	7.6–12.1	Wind extends light flag, leaves in constant motion
B4	Moderate breeze	5.5–7.9	12.3–17.7	Raises dust and loose paper; hair disarranged, clothing flaps
B5	Fresh breeze	8.0–10.7	17.9–24.0	Small trees in leaf begin to sway; limit of agreeable wind on land
B6	Strong breeze	10.8–13.8	24.2–30.9	Umbrellas used with difficulty; force of the wind felt on the body; wind noisy, frequent blinking
B7	Near gale	13.9–17.1	31.1–38.3	Inconvenience felt when walking; difficult to walk steadily; hair blown straight
B8	Gale	17.2–20.7	38.5–46.4	Generally impedes progress; walking difficult to control; great difficulty with balance in gusts
B9	Strong gale	20.8–24.4	46.6–54.7	People blown over by gusts; slight structural damage
B10	Storm	24.5–28.4	54.9–63.6	Seldom experienced inland; trees uprooted, significant structural damage
B11	Violent storm	28.5–32.2	63.8–72.1	Very rarely experienced; accompanied by widespread structural damage
B12	Hurricane	> 32.3	> 72.4	Countryside devastated; winds of this force only occur in hurricanes and tornadoes

Table 100.2 *The Lawson comfort criteria and threshold mean wind speeds*

Activity	Lawson comfort criteria	
	Unacceptable	Tolerable
Roads and car parks, business walking, fast walking from A to B	10.7 m/s (B5) > 6%	10.7 m/s (B5) > 2%
People at work, workers around buildings	10.7 m/s (B5) > 2%	7.9 m/s (B4) > 2%
Pedestrian strolling, slow walking with occasional stops, shopping, short-term standing eg at bus stops	7.9 m/s (B4) > 4%	5.4 m/s (B3) > 6%
Long-term sitting – in open-air cafes, parks, etc. for periods of more than about 10 min	5.4 m/s (B3) > 6%	3.3 m/s (B2) > 6%
Entrances and exits of buildings or areas where there is a risk of sudden exposure to wind	5.4 m/s (B3) > 6%	3.3 m/s (B2) > 4%
Covered areas – pedestrian seating areas under cover, places of high cultural significance	5.4 m/s (B3) > 1%	3.3 m/s (B2) > 4%

10.2.1 Forecasting Methods and Difficulties Encountered

As noted above, while it is recognised that the full Lawson comfort assessment can only be carried out with quantitative measurements of pedestrian level mean and gust wind speeds obtained from a wind tunnel study.

The wind microclimate assessment carried out in this study uses expert judgement and experience to qualitatively apply the Lawson comfort criteria to the pedestrian microclimate around the development.

The method undertaken is the pragmatic approach to scope the detail of the assessment and had found that further analysis i.e. a wind tunnel study is not required.

There is always a degree of uncertainty when assessing balcony wind conditions from a desk study because they are influenced by the local massing and detailing, such as balustrades. Nevertheless, high level balconies at exposed corners are likely to have wind conditions that are suitable for strolling throughout the year. Less exposed balconies tend to have wind conditions that range from being suitable for sitting throughout the year to sitting during the summer and strolling during the winter.

The wind conditions measured at the nearby Dublin Airport meteorological station are shown in Figure 10.1 and are expected to be representative of the general wind conditions for the Baldoyle area.

10.3 RECEIVING ENVIRONMENT

The assessment of the wind microclimate is based on the Lawson criteria as defined in Section 10.2 and includes a series of assumptions regarding the receiving environment and the expected pedestrian activities, as described in the Wind Microclimate Technical Report (Appendix 10.1 to the EIAR).

The wind microclimate assessment has been assessed qualitatively by means of a desk-based assessment which considers the expected wind microclimate in pedestrian areas at ground level around the development on roads, pedestrian footpaths and public amenity areas in the courtyards. This assessment determines the suitability of the receiving pedestrian wind microclimate environment for the intended pedestrian usage. The occurrence of strong winds which have the potential to cause distress to pedestrians have also been considered.

The receiving environment has been considered assuming that the proposed Growth Area 1 (GA1) and Growth Area 3 (GA3) developments will be constructed.

The wind conditions measured at the nearby Dublin Airport meteorological station are shown in Figure 10.1 and are expected to be representative of the general wind conditions for the Baldoyle area. This figure shows the wind speed and wind frequency by direction. It can be seen from this figure that the prevailing wind direction is strongly south-westerly.

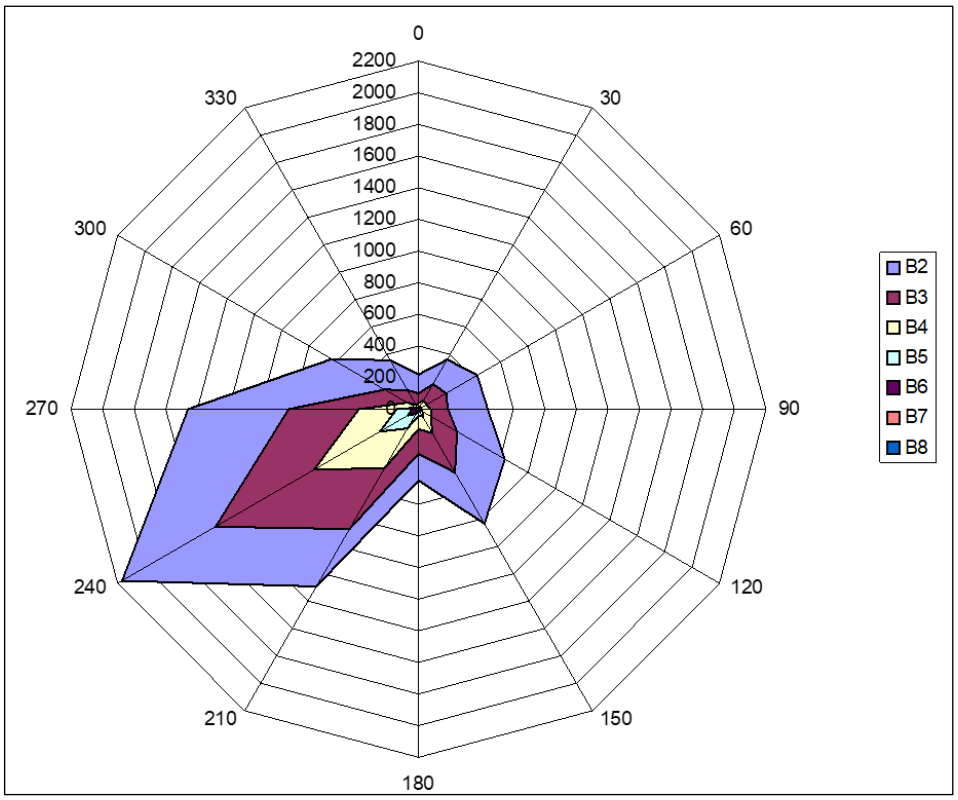


Figure 10.1 Wind rose for the Baldoyle area given for Beaufort wind speed ranges

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The buildings comprising the proposed GA2 development are arranged in three sectors around courtyards (Sectors 6, 7 and 8) and comprise of building between four and 12 storeys tall as described in Chapter 2 Description of the Proposed Development. The buildings are graduated in height from south to north.

10.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

10.5.1 Construction Phase

The site is currently undeveloped so initially the wind microclimate will generally be expected to be suitable for Strolling and other more strenuous activities throughout the year and Long-term sitting during the summer. As construction procedures the wind microclimate will change. Locally the wind conditions could become windier or more sheltered depending on the construction sequence. However, throughout the construction phase the local wind conditions are expected to be suitable for People at work and workers around buildings, see Table 10.2, which are the expected pedestrian activities around the site.

10.5.2 Operational Phase

During operational conditions when the development has been completed, the wind microclimate around proposed Growth Area 2 development is expected to be generally suitable for the intended pedestrian activities and there are not expected to be any significant adverse impacts.

The specific wind effects during the operational phase are expected to be as follows:

The proposed Growth Area 2 development will be generally well sheltered from the prevailing south-westerly winds and the graduated increase in building heights from south to north will further help to minimise adverse wind effects by deflecting the wind away up and over the buildings.

Some buildings of Sectors 7 and 8 will exposed to northerly winds and to a lesser extent to easterly winds. Winds from these directions are infrequent and of low intensity at this site, see Figure 10.1, so exposure to northerly winds and easterly winds is not expected to have a significant adverse impact on the pedestrian level wind microclimate.

The ground level wind conditions around the proposed Growth Area 2 development are expected to be generally suitable for the intended pedestrian activities of Strolling on all footpaths and walkways and Long-term sitting in the public realm courtyard areas during the summer months.

The main pedestrian entrances to the buildings of the proposed Growth Area 2 development generally face into the courtyard areas and are expected to be sheltered from the wind and suitable for entrance usage.

The wind conditions on nearby roads and existing surrounding areas are not expected to be adversely impacted by the proposed Growth Area 2 development.

There are not expected to be any exceedances of the distress wind speed conditions.

10.6 REMEDIAL AND MITIGATION MEASURES

10.6.1 Construction Phase

No additional specific wind mitigation measures are required.

10.6.2 Operational Phase

No additional specific wind mitigation measures are expected to be required. The general massing and graduated height of the blocks increasing from south to north will provide natural wind mitigation by minimising large faces exposed to the prevailing southwesterly wind. This will cause the wind to blow up and over the blocks thereby minimising downwash and adverse ground level wind effects. The proposed landscaping, which includes trees alongside the new roads combined with the existing trees around the development will provide effective additional ground level wind mitigation.

10.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

10.7.1 Construction Phase

The overall residual impact during the construction phase of the proposed development on microclimate wind, will be ***short term, imperceptible to slight and neutral***.

10.7.2 Operational Phase

The overall residual impact during the operational phase of the proposed development on microclimate wind, after the implementation of mitigations measures outlined in Section 10.6.2 above will be ***long-term*** and within the range ***imperceptible to slight*** depending on location within the development. The quality of the impact will be positive within the sheltered courtyard areas and generally neutral in other public amenity areas and on footpaths. Cumulative Impacts Of The Proposed Development

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments (as described in Chapter 3) are discussed below.

10.8 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

10.8.1 Construction Phase

In relation to the potential cumulative impact on microclimate wind during the construction phase, the only planned and permitted developments capable of combining with the proposed development that may result in a cumulative impact are the GA1 and GA3 developments. The assessment in Section 10.5.2 assumed that the GA1 and GA3 developments would be constructed at about the same time as the GA2 development. Therefore the cumulative impact has been included in the Section 10.5.2 assessment and no separate cumulate impact assessment has been carried out.

Wind conditions are expected to be suitable for the intended pedestrian activities.

The cumulative impact during the construction phase of the proposed development in combination with other existing or permitted development on microclimate wind, after

the implementation of mitigations measures outlined in Section 10.6.2 above will be ***short-term, imperceptible to slight*** and ***neutral***.

10.8.2 Operational Phase

In relation to the potential cumulative impact on microclimate wind during the operational phase, the only planned and permitted developments capable of combining with the proposed development that may result in a cumulative impact are the GA1 and GA3 developments. The assessment in Section 10.5.2 assumed that the GA1 and GA3 developments would be constructed at about the same time as the GA2 development. Therefore the cumulative impact has been included in the Section 10.5.2 assessment and no separate cumulate impact assessment has been carried out.

The cumulative impact during the operational phase of the proposed development in combination with other existing or permitted development on microclimate wind, after the implementation of mitigations measures outlined in Section 10.6.2 above will be ***long-term*** and within the range ***imperceptible to slight*** depending on location within the development. The quality of the impact will be positive within the sheltered courtyard areas and generally neutral in other public amenity areas and on footpaths.

10.9 MONITORING OR REINSTATEMENT

10.9.1 Construction Phase

Not applicable for microclimate wind.

10.9.2 Operational Phase

Not applicable for microclimate wind.

11.0 MICROCLIMATE – DAYLIGHT AND SUNLIGHT

11.1 INTRODUCTION

This chapter assesses of loss of daylight and sunlight to surrounding areas and overshadowing. Provision to rooms at the development itself is also considered. This chapter summarises the methodology and results. The full daylight and sunlight assessment is given as an appendix to this chapter.

The calculations in this assessment are based on 3D models and floor plans of the site and each sector provided by CCH Architects. These included 3D models of each sector with associated floor plans and elevations dated 22-10-21 with minor revisions provided on 04 03 222 and 07 03 22. These are used in conjunction with site model and site plan dated 22-11-21 and available details of surrounding buildings at Red Arches Park and Red Arches Drive and consented proposals at GA1 and GA3, where available from the local authority planning website. No site visit was undertaken.

11.2 METHODOLOGY

11.2.1 Loss of daylight to existing dwellings

Guidance on the loss of light to existing buildings following construction of new development nearby is given in the BRE Report 'Site layout planning for daylight and sunlight: a guide to good practice'. This report is widely used by local authorities to help determine planning applications. The assessment has been carried out with reference to the second edition of the report, which was published in October 2011.

The advice in the BRE Report is widely used throughout Ireland and the United Kingdom to help determine planning applications. The Fingal Development Plan 2017-2023 Development Management Standards recommends the use of the BRE Report.

The guidance in the BRE Report is advisory in nature and is intended to assist with good design. There is no formal requirement to comply with the advice it contains.

The guidelines in the BRE Report usually apply to habitable rooms including living rooms, kitchens and bedrooms.

In the BRE Report loss of daylight (light from the sky, calculated on an overcast day) and sunlight (direct light from the sun) are assessed separately.

11.2.1.1 Loss of daylight – vertical sky component

The BRE Report recommends the calculation of the vertical sky component to assess loss of daylight. This is the ratio of the direct sky illuminance falling on the outside of a window, to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE Overcast Sky is used and the ratio is usually expressed as a percentage. The maximum value is almost 40% for a completely unobstructed vertical wall. The vertical sky component on a window is a good measure of the amount of daylight entering it.

A BRE computer program was used to calculate the vertical sky component, which has the same basis as the skylight indicators in the BRE Report.

The BRE Report sets out the following two guidelines for vertical sky component:

- Where the vertical sky component at the centre of the existing window exceeds 27% with the new development in place, then enough sky light should still be reaching the existing window.

- Where the vertical sky component with the new development is both less than 27% and less than 0.8 times its former value, then the area lit by the window is likely to appear more gloomy, and electric lighting will be needed for more of the time.

11.2.1.2 Loss of daylight - daylight distribution

The BRE report also gives guidance on the distribution of light in the existing buildings, based on the areas of the working plane (0.85m above floor level) which can and cannot receive direct skylight before and after.

These calculations require knowledge of room geometry. Since access was not available to collect the data for existing buildings, this calculation could not be carried out.

11.2.1.3 Loss of sunlight - existing dwellings

The BRE Report recommends that loss of sunlight should be checked for main living rooms of dwellings, and conservatories, if they have a window facing within 90° of due south.

If the centre of the window can receive more than one quarter of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March, then the room should still receive enough sunlight. If the window already receives less than this, a reduction to less than 0.8 times its current value and a reduction of more than 4% of annual probable sunlight hours over the year may lead to the room it serves appearing colder and less cheerful and pleasant.

Existing buildings on Red Arches Drive and the GA1 development would be to the south of the development site and therefore loss of sunlight would not be an issue.

The nearest relevant windows at GA3 have been assessed for sunlight provision.

11.2.1.4 Loss of sunlight - existing gardens and open spaces

For outdoor amenity areas, the 2011 edition of the BRE Report 'Site layout planning for daylight and sunlight: a guide to good practice' recommends that at least half of the space should receive at least two hours of sunlight on 21st March.

There are large areas of open space to the north and east of the site. Only spaces close to proposed buildings may lose some sun. There are no existing garden areas with the potential to be impacted.

11.2.1.5 Impact Assessment

Appendix I of the BRE Report gives advice when assessing a loss of daylight and sunlight for an Environmental Impact Assessment.

Where the loss of skylight or sunlight fully meets the guidelines, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines, and a large number of windows or open space area are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight in the affected building or open space.

Where the loss of skylight or sunlight does not meet the guidelines in the BRE Report, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact would be:

- only a small number of windows or limited area of open space are affected
- the loss of light is only marginally outside the guidelines
- an affected room has other sources of skylight or sunlight
- the affected building or open space only has a low level requirement for skylight or sunlight.

Factors tending towards a major adverse impact include:

- a large number of windows or large area of open space are affected
- the loss of light is substantially outside the guidelines
- all the windows in a particular property are affected
- the affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight.

11.2.1.6 Shadow Plotting

The BRE Report states that where a large building or development is proposed which may affect a number of open spaces it is often illustrative to plot a shadow plan showing the location of shadows at different times of day and year.

Shadow plots have been created for 21st March (spring equinox), 21st June (summer solstice) and 21st December (winter solstice) at clock times 8am, 10am, 12pm, 2pm and 4pm (plus 6pm for June only).

In an An Bord Pleanála pre-application consultation opinion it was requested that “A month-by-month assessment of average daylight (sic) [sunlight] hours within the public open space should be provided within the daylight and sunlight analysis document to allow for a full understanding of the year round level of overshadowing of the primary outdoor recreation areas for the development should be submitted.”

In order to satisfy this, plots are also shown for January, February, April and May. This gives a month-by-month assessment of sunlight provision at and around the site to allow for a full understanding of the year round level of overshadowing.

The shadows for 21st September (autumn equinox) are the same as those for 21st March (spring equinox). The shadows for 21st January, 21st February, 21st April and

21st May are the same as those at or around the 21st of November, October, August and July respectively.

In the plots, the times given are clock times. Between the end of March and the end of October, Irish Standard Time (IST) applies. The plots for September and October therefore correspond to the shadows produced one hour later in summer time; thus at 1pm IST in September/October, the shadows are as plotted on the 12pm GMT diagram for March/February. The March and February plots therefore correspond to 9am, 11am, 1pm, 3pm and 5pm IST in September and October.

The only numerical guidelines for overshadowing of open spaces are those described in the BRE Report for two hours of sunlight on 21st March. The shadow plots are therefore shown for illustrative purposes.

The shadow plots are shown in the full daylight and sunlight assessment which is an appendix to this chapter.

11.2.2 Daylight and sunlight provision to proposed habitable rooms

Guidance on daylight and sunlight to new dwellings, including numerical target values, is given in EN17037:2018 “Daylight in buildings”. In the UK, this standard supersedes BS8206 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting. The Fingal Development Plan 2017-2023 recommends the use of BS8206 or any update on the document.

The Department of Housing, Local Government and Heritage document Sustainable Urban Housing: Design Standards for New Apartments December 2020 states “Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.”

11.2.2.1 Daylight provision

EN17037 recommends minimum, medium and high target illuminances over at least 50% of a reference plane (0.85m from the floor) in a room, with further targets for 95% of the reference plane. Equivalent values of daylight factor for locations in Europe are also given. The daylight factor is the ratio of the illuminance at a point in on the working plane in a room divided by the illuminance of an unobstructed surface outside. It is measured using the CIE standard overcast sky and takes into account factors such as surface reflectances and glazing transmittance.

The assessment has been undertaken using the daylight factor methodology.

In general, the recommendations are much more ambitious than those in BS8206 Part 2, which the standard supersedes, and were intended for internal areas of all types, not just a domestic setting. The target values would be very difficult to achieve for domestic rooms in an urban environment.

A UK National Annex recognises this and sets alternative targets for living rooms, kitchens and bedrooms. This is based on the equivalent daylight factor needed to

achieve a certain illuminance on at least 50% of the reference plane. It is the opinion of the UK committee that the recommendation of a target illuminance level across 95% of the working plane need not be applied in dwellings.

The median illuminances recommended in the UK National Annex to be achieved over half the reference plane are 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens. For Dublin these would correspond to recommended equivalent median daylight factors, over at least 50% of the calculation plane, of 0.7% for a bedroom, 1.0% for a living room and 1.3% for a kitchen. For a room of combined use, the higher value should apply. However, for combined living/dining/kitchen rooms, local authorities may in practice accept the living room value in order to avoid small closed-off kitchen areas to force compliance with the standard.

The results are compared to UK National Annex equivalent targets as these recommendations have replaced those in BS8206 for the UK.

For this assessment the daylight factor was calculated at a series of points spaced at up to 0.3m apart on a reference plane (0.85m from the floor) in example worst-case rooms in each sector using software based on a Radiance ray tracing engine. The reference plane excluded main areas within 0.3m of a room's wall.

Results have also been assessed with reference to the older average daylight factor methodology in BS8206 Part 2. This standard recommended an average daylight factor of 1.0% in bedrooms, 1.5% in living rooms and 2.0% in kitchens. The daylight factor at a series of points in the room has been calculated in a same way as described above, but the entire room is used for the reference plane (areas 0.3m from the walls are not excluded).

The below table summarises the daylight recommendations used in the assessment.

Table 11.1 *Daylight recommendations used for assessment of proposed rooms.*

Room	EN17037 UK National Annex equivalent for Dublin. Median daylight factor value	BS8206-2:2008 recommendation. Average Daylight Factor value
Bedroom	0.7%	1.0%
Living Room	1.0%	1.5%
Kitchen	1.3%	2.0%

It would be impractical to analyse all rooms throughout a scheme of this size. In these cases it is usual to analyse a selection of rooms to assess the daylighting potential.

The assessment has been undertaken by analysing a selection of representative rooms on the lowest floor of each sector, including worst-case areas. Where rooms are below the recommendations on the lowest floors, equivalent rooms on higher floors have been analysed until the recommendations are met or the top floor reached. Combined living/dining/kitchen areas have been compared against the living room and kitchen recommendations.

The results have then been used to estimate an extrapolation of the results at other rooms in similar areas or that are similarly, or less, obstructed. For example, if the most obstructed bedrooms in a sector meet the recommendations it would be reasonable to assume that all bedrooms in that sector meet the recommendations. Or if a living/dining/kitchen area meets the recommendations then similar, less deep, or less

obstructed rooms on the façade or in the sector would also be assumed to meet the recommendations.

The overall percentage of rooms that appear capable of meeting the recommendations has been estimated based on the above assumptions. These overall estimates carry uncertainty and should be seen as an indication of the overall results, rather than a definitive value.

Further details, and the results of the analysis for each sector, are given in the full daylight and sunlight assessment which is an appendix to this chapter.

11.2.2.2 Sunlight to proposed dwellings

EN17037 gives minimum, medium and high recommended levels for sunlight exposure. This is measured via the duration received to a point on the inside of a window on a selected date (21st March). This assessment assumes a cloudless sky and therefore represents a maximum possible amount of sunlight. The assessment is undertaken using the calculation of sun position based on the geometrical equations in the standard.

The standard gives a minimum target of 1.5 hours, medium target of 3 hours and high target of 4 hours.

The calculation point is 1.2m above the floor level (or 0.3m above sill level) at the middle of the aperture on the position of the inner wall. Frames are not included in the calculations. This point has been used assuming that sunlight would be able to penetrate any glazing or panelling in the aperture.

Using example calculation points, a diagram showing the areas able to receive the recommendations are shown for the worst-case ground floor. In areas where sunlight provision could increase, example points are also calculated on higher floors and a summary of the number of units in each sector with at least one room able to meet at least the minimum recommendation are shown for each sector.

11.2.2.3 Sunlight to proposed open spaces

The BRE Report 'Site layout planning for daylight and sunlight: a guide to good practice' recommends that at least half of a proposed space should receive at least two hours of sunlight on 21st March.

The courtyard areas at each proposed sector have been assessed using this methodology.

In an An Bord Pleanála pre-application consultation opinion it was requested that “A month-by-month assessment of average daylight (sic) [sunlight] hours within the public open space should be provided within the daylight and sunlight analysis document to allow for a full understanding of the year round level of overshadowing of the primary outdoor recreation areas for the development should be submitted.”

In order to satisfy this, the areas able to receive at least two hours of sunlight on have also been calculated for other months. There are guidelines only for 21st March and therefore the additional analysis is for information purposes only.

The areas of the proposed courtyards able to receive at least two hours of sunlight on 21st December (winter solstice), 21st January, 21st February, 21st April, 21st May and

21st June (summer solstice) have been calculated. The results for 21st September (autumn equinox) are the same as those for 21st March (spring equinox). The shadows for 21st January, 21st February, 21st April and 21st May are the same as those at or around the 21st of November, October, August and July respectively.

11.2.3 Difficulties Encountered

No difficulties encountered.

11.3 RECEIVING ENVIRONMENT

The below figure shows the site and surroundings.

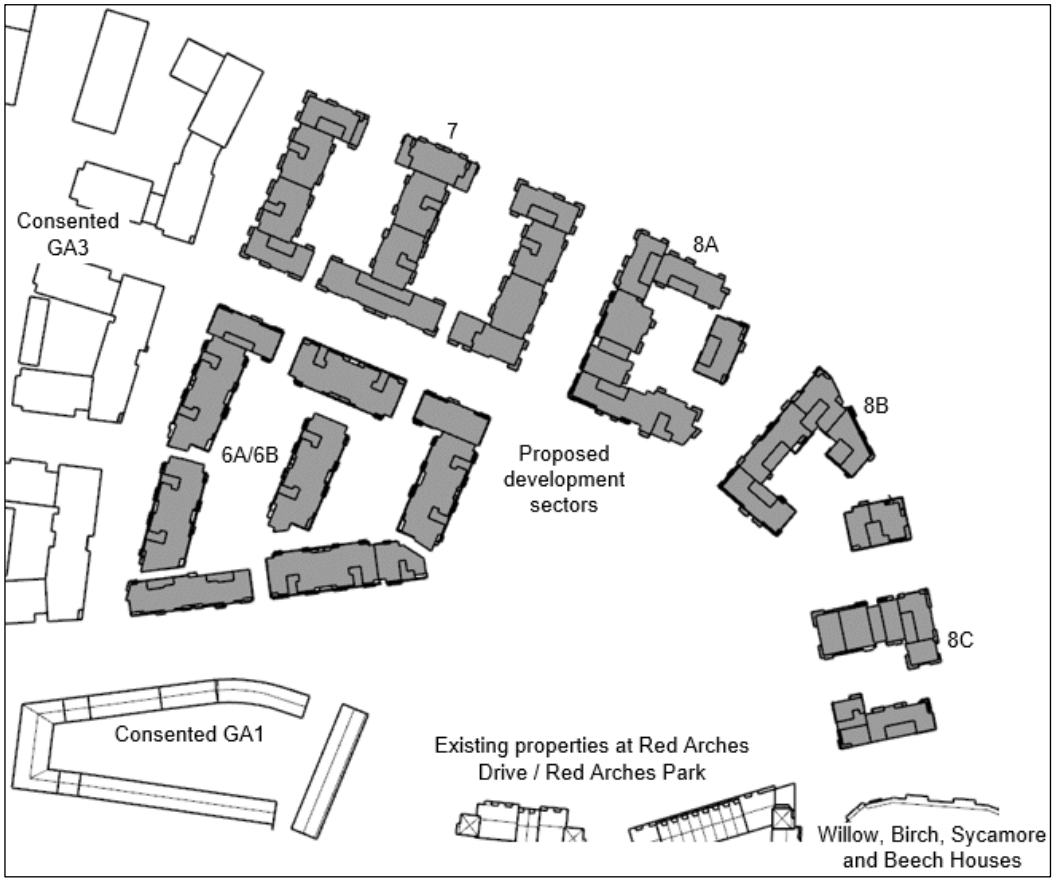


Figure 11.1 *Site and receiving environment.*

The existing site has no significant obstruction of daylight and sunlight to surrounding areas.

There are existing dwellings with a view of the proposal site to the south east of the site (to the south of Sector 8C) on Red Arches Drive. These are the closest existing dwellings to the site. Willow, Birch, Sycamore and Beech Houses are apartment buildings with a mix of setback windows to enclosed balcony areas and windows on the main façade. Setback areas and balconies restrict daylight provision and can force a reliant on light from the area opposite. Properties at Red Arches Drive are typically of a townhouse and terrace style. Habitable rooms at these properties would have the potential for loss of daylight from the proposal site. Since the development site is to the north, these properties would not be sensitive to loss of sunlight.

Future development GA3 is located to the west. The nearest part of consented scheme GA1 is to the south of Sectors 6A/6B. These buildings do not exist yet. The nearest part of GA1 is terrace housing. Since the proposal site to the north, this area is not sensitive to a loss of sunlight. Facades at GA3 contain apartments with a mix of windows to balcony areas and on the main façade.

There are large areas of open space to the north and east of the site. Only spaces close to proposed buildings may lose some sun. There are no existing garden areas with the potential to be impacted.

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is described in detail in Chapter 2 (Description of the Proposed Development)."

Important characteristics for loss of daylight and sunlight to surrounding areas are the height and size of proposed buildings. The development comprises a series of apartment blocks. Sector 8C of the development is closest to the existing properties on Red Arches Drive. Sectors 6A/6B and 7 are closest to the consented GA1 and GA3 schemes.

11.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

11.5.1 Construction Phase

During the construction phase, as new buildings are constructed, daylight and sunlight provision to surrounding areas gradually decreases until the buildings reach their final size and height. It is rare for cranes and other construction equipment to block significant amounts of daylight and sunlight, and therefore the impact on daylight and sunlight during the construction phase is generally less than during the operational phase. Accordingly the analysis in this chapter has focused on the impacts during the operational phase, since these will represent the worst case impacts.

11.5.2 Operational Phase

Based on available details and photography of the existing buildings, worst-case windows have been assessed for loss of daylight (and where applicable, sunlight) in line with the methodologies in the BRE Report "Site Layout Planning for Daylight and Sunlight: a Guide to Good Practice".

11.5.2.1 Willow, Birch, Sycamore and Beech Houses

Willow, Birch, Sycamore and Beech Houses are blocks of flats in the same building, directly to the south of Sector 8C. West and north facing windows have been analysed for loss of daylight. North east facing windows would have less view of the development site and therefore would be less impacted.

The details of windows analysed and results are given in the full daylight and sunlight assessment which is included as an appendix to this chapter.

The results suggest that 46 windows would be below the BRE vertical sky component guidelines by having values less than 27% and less than 0.8 times those before. However, the design of the existing building has enclosed balconies and overhangs which restrict daylight provision. This can be seen in the existing low values of vertical

sky component. Windows that are not part of enclosed balconies or do not have an overhang above them would meet the guidelines. The layout of the building façade, showing the enclosed balconies and overhangs is shown in Figure 11.2 and in the full daylight and sunlight assessment which is an appendix to this chapter.

Figure 11.2 *View of apartments on Red Arches Drive. The existing set back balconies limit skylight provision and could force a reliance on daylight from the area of Sector 8C.*

The BRE Report "Site layout planning for daylight and sunlight: a guide to good practice" gives further advice in these situations and suggests that to assess the impact of existing balconies the calculations could be repeated without them in place.

Windows below the initial BRE guidelines have been recalculated without the balconies and overhangs in place. The results are shown in the full daylight and sunlight assessment which is an appendix to this chapter.

Without the balcony overhangs, eight windows would be below the BRE vertical sky component guidelines. However, these windows would still be set back behind the main façade of the building as part of the enclosed area. The obstruction of projecting parts of the building still restricts daylight provision. When these windows were also analysed on a flat façade, without set back enclosing or overhangs, (shown in the full daylight and sunlight assessment which is an appendix to this chapter), all windows would meet the BRE guidelines.

There would be an impact to some existing windows, but these results show that the primary cause of this impact is due to the design of the existing buildings themselves. Windows set back into the building with balconies or overhangs above force a reliance on daylight from the area of the proposal site.

Therefore, the impact is assessed as a minor negative permanent effect.

Loss of sunlight would not be an issue since the proposal site lies to the north.

11.5.2.2 Properties at Red Arches Drive / Red Arches Park

The closest windows to the proposal site at properties on the corner of Red Arches Drive / Red Arches Park have been analysed for loss of daylight. The windows analysed and vertical sky component results are shown in the full daylight and sunlight assessment which is an appendix to this chapter.

All windows would meet the BRE vertical sky component guidelines since they would have values greater than 27% with the proposed development in place or more than 0.8 times those before.

The impact is assessed as a neutral, negligible and permanent effect.

Loss of sunlight would not be an issue since the proposal site lies to the north.

11.5.2.3 Future developments to west

A comparison between the empty site and the proposal is less appropriate here since the developments have been designed knowing that a development would be on the site at GA2.

The BRE states that with a vertical sky component of at least 27% conventional window design will usually give reasonable results. Between 15% and 27% special measures such as changes to room layouts and larger windows may be needed for adequate daylight. Between 5% and 15% it is very difficult to achieve adequate daylighting unless very large windows are used. With a vertical sky component of less than 5% it is often impossible to achieve reasonable daylight.

The results for windows with the proposed development in place have therefore been compared to this guidance.

GA1

The nearest part of the consented GA1 development is to the south of proposed Sectors 6A/6B. This area contains two storey houses. The worst-case ground floor windows facing Sectors 6A/6B have been analysed for daylight. Vertical sky components have been calculated with the development in place. The results are shown in the full daylight and sunlight assessment which is an appendix to this chapter.

All windows would receive at least 27% vertical sky component with the proposed development in place.

The loss of daylight would be assessed as a neutral, negligible and permanent effect.

Loss of sunlight would not be an issue since the windows face northerly.

GA3

The detailed scheme for GA3 has recently been consented. This is located to the west of the proposal site. East facing facades of Block F1, F2 and G5 would have a view of the proposed development Sectors 6A/6B and 7.

The vertical sky component at all east facing windows to habitable rooms on the ground and first floors have been calculated with the proposed development in place. The calculations have been carried out with any balconies in place, and repeated with them removed. The results are shown in the full daylight and sunlight assessment which is an appendix to this chapter.

Of the windows at GA3 on the ground and first floors facing the proposal site, 3% would have values of vertical sky component greater than 27%, 60% would have values between 15% and 27%, 36% would have values between 5% and 15% and 1% would have values less than 5%. These results include balconies at GA3, which restrict daylight provision from higher angles and may force a reliance on an area directly opposite.

If these are theoretically removed, 33% of windows on the ground and first floor would have values of vertical sky component greater than 27%, with 66% of windows with values between 15% and 27%. This suggests that the balconies are responsible for some of the restriction in daylight.

The results suggest that special measures would be needed in the design of GA3. The recently consented development has recognised this, and large floor to ceiling windows are provided to rooms as part of the design.

The proposal for GA3 also contained a daylight and sunlight assessment. Of the worst-case rooms chosen facing GA2, the analysis suggested that daylight provision would be adequate. It is understood this analysis included an account for obstruction from GA2, but not in the exact form now proposed. However, the results and the above assessment does suggest that there is the potential for adequate daylight provision.

When compared to the existing empty site there would be a significant impact to daylight to the east facing façade of GA3. However, this would only be the case if future residents of GA3 experienced conditions with the empty GA2 site; the development has been designed knowing GA2 would be the site of future development. Special measures of larger windows are in place in the design of GA3 and any reduced values of vertical sky component may be at least partly due to existing balconies. The BRE Report suggest the guidelines should be interpreted flexibly. In special circumstances a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings.

The daylight impact is assessed as a minor negative permanent effect.

Since the east facades of Blocks F1, F2 and G5, looking towards the proposed development, face just south of due east, potential sunlight provision has been assessed. Windows on the ground and first floor have been assessed. The results have been calculated with and without balconies to GA3, and the results are shown in the full daylight and sunlight assessment which is an appendix to this chapter.

With balconies to GA3 in place, 36% of windows on the ground and first floor would be able to receive at least 25% annual probable hours, including at least 5% in the winter months, meeting the BRE guidelines. When balconies are removed, 94% of the windows would be able to meet these targets. Adequate sunlight at GA3 is therefore achievable with the proposed development at GA2 in place; any restriction of sunlight appears predominately due to the provision of balconies at GA3, rather than the proposed development.

The sunlight impact is assessed as a minor negative permanent effect.

11.5.2.4 Daylight and sunlight provision to the proposed development

Daylight provision has been assessed to example rooms in each sector using the methodology in the UK National Annex of EN17037. A comparison to the older BS8206 is also included. Example rooms, including those in worst-case areas, have been analysed on the lowest floors. Where rooms would be below the recommendations, values have been calculated for equivalent rooms on higher floors until the recommendations are met or the top floor is reached.

The results have been used to estimate the overall percentage of rooms that appear likely to be able to meet the recommendations. This gives an indication of the overall result across the scheme.

Ground floor windows have also been assessed for sunlight provision in each sector to get an indication of potential provision. Where there is the potential for sunlight to increase on upper floors, higher windows have also been assessed for a summary of the total number of units in each sector with at least one room able to receive at least the minimum 1.5 hours of sunlight recommended in EN17037. Windows facing northerly would be naturally limited for sunlight and therefore may be expected to be below the recommendations. Balconies have been included in the calculations.

Full details and results per proposed sector are given in the daylight and sunlight assessment which is an appendix to this chapter.

Daylight summary

It has been estimated that 93% of rooms would meet the recommendations in the UK National Annex of EN17037 using the bedroom target and living room target for combined living/dining/kitchen or studio areas. 83% of rooms meet these recommendations with the higher kitchen target used for the combined spaces. Overall results are similar using the older BS8206 recommendations (92% using the bedroom target and living room target for combined living rooms and 81% using the kitchen target for combined rooms). For combined living/dining/kitchen rooms, local authorities may in practice accept the living room value in order to avoid small closed-off kitchen areas to force compliance with the standard.

The vast majority of bedrooms would appear likely to meet the bedroom recommendations in either standard.

Although a high proportion of living areas seem likely to be able to meet the living room or kitchen recommendation in either standard, there would be a number below the recommendation. However, these requirements would need to be balanced with other benefits of the scheme.

The Department of Housing, Local Government and Heritage document Sustainable Urban Housing: Design Standards for New Apartments December 2020 states “Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.”

The analysis suggests the majority of living areas below the recommendations would be on lower floors and have access to a balcony area. To improve daylight provision an alternative would involve removal of balconies. Although this would improve daylight provision future residents would lose a valuable private amenity space. Larger glazing areas would also increase daylight but could create privacy concerns.

Sunlight to units summary

The sunlight analysis has calculated potential provision to the worst-case ground floor. In areas where sunlight may increase on upper floors further analysis has also been undertaken to get an understanding of sunlight provision across all units.

Northerly facing facades would be naturally limited in the sunlight they receive, but would have a view of the park to the north.

In general, southerly facing outer facades have the potential to meet the recommendations. Sunlight to these areas is impacted by balcony/façade design and proximity to other blocks. Areas facing into courtyards are more obstructed, but provision improves on upper floors.

Overall, the analysis suggests that around 70% of proposed units will have at least one habitable room able to receive at least the minimum 1.5 hours sunlight recommendation in EN 17037.

Sunlight to proposed courtyards

An assessment of sunlight provision to the proposed internal courtyards at each sector has been carried out. The areas able to receive at least two hours of sunlight on 21st March have been calculated. The BRE Report states that to be adequately sunlit, a space should be able to receive at least two hours of sunlight over at least half of its area.

A visual representation and numerical values are given in Figure 11.3.

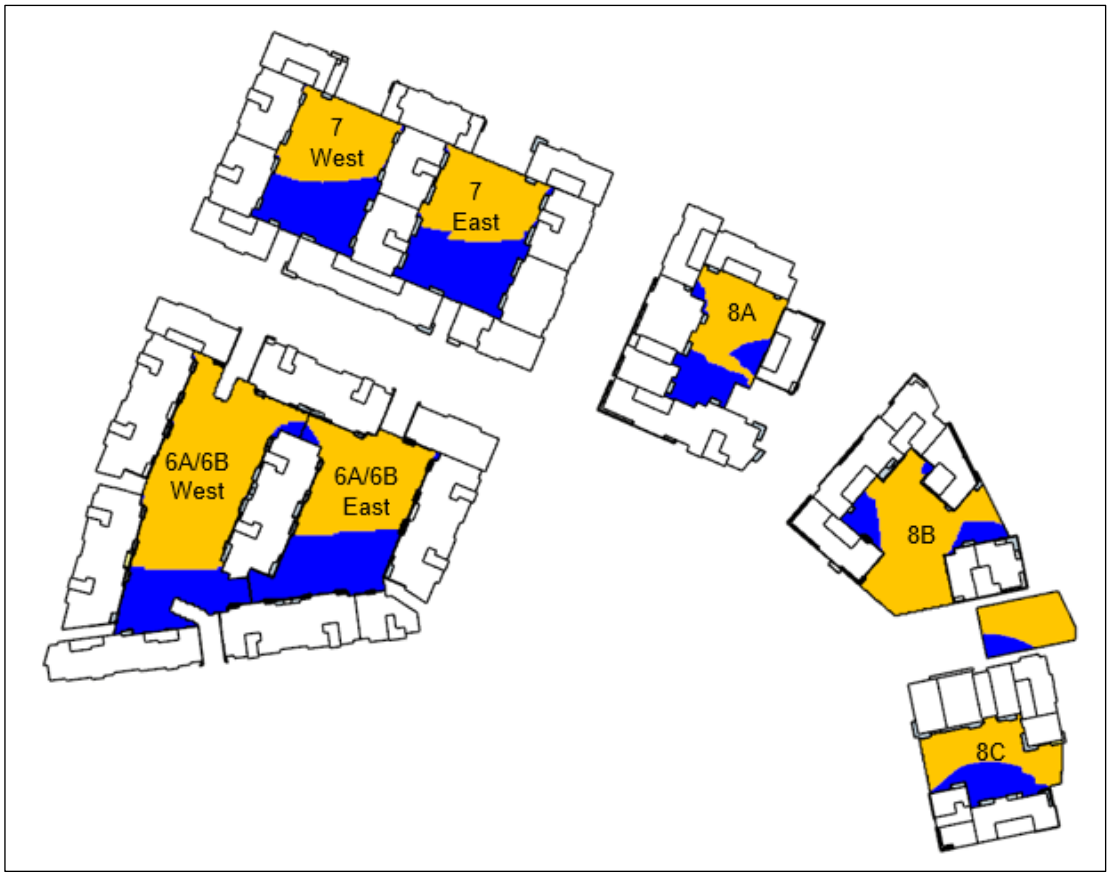


Figure 11.3 *Sunlight provision to proposed courtyards. Areas in orange would receive more than two hours of sunlight on 21st March. Areas in blue would receive less than two hours sunlight on 21st March.*

In order to respond to an An Bord Pleanála pre-application consultation opinion request "for a full understanding of the year round level of overshadowing of the primary outdoor recreation areas for the development" the areas able to receive at least two hours of sunlight have also been calculated for other months. There are guidelines only for 21st March and therefore the additional analysis is for information purposes only. To further illustrate overshadowing, monthly shadow plotting has also been carried out (see next section and full daylight and sunlight assessment in the appendix to this chapter).

The areas of the proposed courtyards able to receive at least two hours of sunlight on 21st December (winter solstice), 21st January, 21st February, 21st April, 21st May and 21st June (summer solstice) have been calculated. The results for 21st September (autumn equinox) are the same as those for 21st March (spring equinox). The shadows for 21st January, 21st February, 21st April and 21st May are the same as those at or around the 21st of November, October, August and July respectively.

Visual representation of the results for other months are given in the full daylight and sunlight assessment given as an appendix to this chapter. The numerical results are given in Table 11.2.

Table 11.2 *Percentage of space able to receive at least two hours of sunlight in proposed courtyards throughout the year.*

Sector Courtyard	21 December	21 January / November	21 February / October	21 March / Sept	21 December	21 January / November	21 February / October
6A/6B West side	1%	13%	54%	74%	88%	94%	96%
6A/6B East side	0%	0%	31%	58%	78%	92%	95%
7 West side	0%	0%	21%	55%	75%	85%	88%
7 East side	0%	0%	16%	53%	73%	84%	88%
8A	0%	0%	14%	60%	82%	91%	93%
8B	21%	52%	74%	82%	94%	99%	100%
Between 8B and 8C	2%	23%	48%	83%	100%	100%	100%
8C	0%	6%	29%	64%	87%	95%	98%

As expected, the courtyards would receive less sunlight in the winter due to the lower angle sun. The BRE guidelines would be met on 21 March and sunlight provision would increase throughout spring. In the summer months the vast majority of the courtyard spaces would be able to receive at least two hours of sunlight.

Shadow Plotting

Shadow plots have been created for 21st March (spring equinox), 21st June (summer solstice) and 21st December (winter solstice) at clock times 8am, 10am, 12pm, 2pm and 4pm (plus 6pm in summer).

Plots are also shown for January, February, April and May. This gives a month-by-month assessment of sunlight provision at and around the site to allow for a full understanding of the year round level of overshadowing.

The shadows for 21st September (autumn equinox) are the same as those for 21st March (spring equinox). The shadows for 21st January, 21st February, 21st April and 21st May are the same as those at or around the 21st of November, October, August and July respectively.

In the plots, the times given are clock times. Between the end of March and the end of October, Irish Standard Time (IST) applies. The plots for September and October therefore correspond to the shadows produced one hour later in summer time; thus at 1pm IST in September/October, the shadows are as plotted on the 12pm GMT diagram for March/February. The March and February plots therefore correspond to 9am, 11am, 1pm, 3pm and 5pm IST in September and October.

The plots are shown in the full daylight and sunlight report which is an appendix to this chapter.

The below discussion focuses on the equinoxes and solstices, since they are the midpoint and extremes of shading conditions.

Spring / Autumn equinoxes

The shadow plots for 21st March suggest that around the equinoxes the proposed courtyards would be mostly shaded in the early morning, but large areas would receive sun as the day progresses, as can be seen in the above results for areas able to receive at least two hours of sunlight on this date. Only areas directly to the north of blocks would be prevented from receiving any sun at this time.

Although the shadow of the proposed buildings would reach neighbouring areas, it would mostly be confined to roadways and areas close to the buildings.

Summer solstice

The shadow plots for 21st June show that there would only be significant shading of the courtyard areas in the early morning and evening. For the majority of the day, large areas of the courtyards would be able to receive sun.

Shading of surrounding areas would mostly be confined to roadways and areas close to the proposed buildings.

Winter solstice

The shadow plots for 21st December show that the low angle winter sun would mean that all buildings, either proposed, existing or potential future developments, would cast longer shadows. Some courtyard areas would be able to receive at least some sun in this worst-case condition.

11.6 REMEDIAL AND MITIGATION MEASURES

11.6.1 Construction Phase

No mitigation required.

11.6.2 Operational Phase

No mitigation is required to existing and consented surrounding buildings. Any minor impact to daylight and sunlight impacts at existing or consented surrounding properties are at least partly caused by balconies and setbacks at the surrounding properties forcing a reliance on daylight from the area of the development site, rather than the proposed development itself.

For rooms at the proposed development below the daylight recommendations, mitigation by removal of the balconies would not be appropriate as future residents would lose a valuable private amenity space.

11.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

11.7.1 Construction Phase

Not relevant for daylight and sunlight.

11.7.2 Operational Phase

The predicted impacts are the same as those presented above in the potential impacts section.

11.8 MONITORING OR REINSTATEMENT

11.8.1 Construction Phase

Not relevant for daylight and sunlight.

11.8.2 Operational Phase

Not relevant for daylight and sunlight.

11.9 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

11.9.1 Construction Phase

Not relevant for daylight and sunlight.

11.9.2 Operational Phase

Not relevant as nearby consented schemes at GA1 and GA3 have already been included in the above assessment.

12.0 NOISE AND VIBRATION

12.1 INTRODUCTION

This document prepared by AWN Consulting Ltd. (AWN) to assess the potential noise and vibration impacts of the proposed development in the context of current relevant standards and guidance.

This assessment has been prepared by Mike Simms BE MEngSc MIOA MIET, Senior Acoustic Consultant at AWN, who has worked in the field of acoustics for 20 years and has been a consultant since 1998. He has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, energy, industrial, commercial and residential.

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 associated with the proposed development, during both the short-term construction phase and the long-term operational phase, on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

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.

12.2 ASSESSMENT METHODOLOGY

The assessment of impacts 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. In addition to specific guidance documents for the assessment of noise and vibration impacts which are discussed further in the relevant sections, the following guidelines were considered and consulted for the purposes of this chapter: -

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports Draft August 2017.
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

The study has been undertaken using the following methodology: -

- An environmental noise survey has been undertaken in the vicinity of the subject site in order to characterise the existing baseline noise environment.
- 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 during the construction phase of the project at the nearest sensitive locations to the development site.
- Predictive calculations have been performed to assess the potential impacts associated with the operational of the development at the most sensitive locations surrounding the development site.

- A schedule of mitigation measures has been proposed to reduce, where necessary, the identified potential outward impacts relating to noise and vibration from the proposed development.

12.2.1 Difficulties Encountered

There were no difficulties encountered in the preparation of this EIAR chapter.

12.2.2 Construction Phase Criteria

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local Authorities typically control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.

The approach adopted here calls for the designation of an NSL into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. A threshold noise value is applied to each category. Exceedances (construction noise only) of the threshold value, at the facade of a sensitive receptor during construction, indicates a potential significant noise impact associated with the construction activities. The threshold values recommended by BS5228-1 are set out in Table 12.1.

Table 12.1 *Example Threshold of Significant Effect at Dwellings*

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

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

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

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

Note D) *19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.*

It should be noted that this assessment method is only valid for residential properties.

For the appropriate period (e.g. daytime) the ambient noise level is determined and rounded to the nearest 5dB. Based on review of existing noise levels obtained from the noise survey, relevant BS5228-1 threshold values at the various assessment locations are presented in the Table 12.3

Table 12.2 *Rounded Baseline Noise Levels and Associated Categories.*

Period	**Construction Noise Threshold Value $L_{Aeq,1hr}$ (dB)**	**Baseline Noise Category**

Daytime (07:00 – 19:00) and Saturdays(07:00 – 13:00)	65	A
Evening(19:00 to 23:00hrs)	55	A
Night time (23:00 to 07:00hrs)	45	A

See Section 12.4.1 for the assessment in relation to this development. If the construction noise level exceeds the appropriate category value, then a potential significant effect is deemed to occur.

Guidance on the degree of significance is presented the UK document Design Manual for Roads and Bridges (2020) LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2. The approach is as follows: -

- To determine the threshold value for construction noise according to the method from BS5228 described above.
- To compare the predicted construction noise level with the existing noise levels and the threshold value according to the criteria in the table below.

Potentially this procedure is to be followed separately for each noise-sensitive location, however in this instance as the existing noise levels at all survey locations correspond to Category A according to table above, all noise-sensitive locations are considered together.

Similarly, for this proposed development the vast majority of construction works will take place within the 'Daytime' period, i.e. 07:00 – 19:00 on Mondays to Fridays and 07:00 – 13:00 on Saturdays.

The magnitude of the construction noise impact according the DMRB is mapped to the EPA significance terms as detailed in Table 12.3.

Table 12.3 *Description of Construction Noise Impacts based on DMRB.*

Construction Noise Level	Magnitude of Impact (DMRB)	EPA Significance of Effect
Below or equal Baseline Noise Level	Negligible	Not Significant
Above Baseline and below or equal to threshold	Minor	Slight – Moderate
Above threshold and below or equal to threshold + 5dB	Moderate	Moderate – Significant
Above threshold + 5dB	Major	Significant – Very Significant

Notwithstanding the outcome of this assessment, the overall acceptable levels of construction noise are set out in the Transport Infrastructure Ireland (TII) publication Guidelines for the Treatment of Noise and Vibration in National Road Schemes, which should not be exceeded at noise sensitive locations during the construction phase of the development. Table 12.4 sets out these levels.

Table 12.4 *Maximum permissible noise levels at the facade of dwellings during construction.*

Days and Times	Noise Levels (dB re. 2x10-5 Pa)	
	LAeq(1hr)	LAmax
Monday to Friday 07:00 to 19:00hrs	70	80

Days and Times	Noise Levels (dB re. 2x10-5 Pa)	
	LAeq(1hr)	LAmax
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

*Note: Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

12.2.2.1 Construction Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5 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 duration. For example, rock breaking and piling, two of the primary sources of vibration during construction, are typically tolerated at vibration levels up to 12 mm/s and 5 mm/s respectively. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant of such activities during the night.

Guidance relevant to acceptable vibration within buildings is contained in the following documents: -

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

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

BS 5228 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 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. Below these values minor damage is unlikely. Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50%. BS 5288-2 also comments that important buildings which are difficult to repair might require special consideration on a case by case basis.

The TII document Guidelines for the Treatment of Noise and Vibration in National Road Schemes also contains information on the permissible construction vibration levels as follows: -

Table 12.5 *Allowable Vibration during Construction Phase.*

Allowable Vibration (in Terms of Peak Particle) at the Velocity Closest Part of Sensitive Property to the Source of Vibration, at a Frequency of		
Less than 10 Hz	10 to 50 Hz	50 to 100 Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

12.2.3 Operational Phase Criteria

12.2.3.1 Additional Traffic on Surrounding Roads

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with the development. In order to assist with the interpretation of the noise associated with additional vehicular traffic on public roads, Table 12.6, taken from Design Manual for Roads and Bridges (DMRB), LA 111 Noise and vibration Revision 2 (UK Highways Agency et al, 2020) offers guidance as to the likely degree of impact associated with any long-term change in traffic noise level.

Table 12.6 *Significance in Change of Noise Level*

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact	EPA Significance of Effect
0	Inaudible	No impact	Imperceptible
0.1 – 2.9	Barely Perceptible	Negligible	Not significant
3 – 4.9	Perceptible	Minor	Slight, Moderate
5 – 9.9	Up to a doubling of loudness	Moderate	Significant
10+	Doubling of loudness and above	Major	Very significant

The guidance outlined in Table 12.6 will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely long-term impacts during the operational phase.

12.2.3.2 Building Services Plant Noise

The most appropriate standard used to assess the impact of a new continuous source (i.e. plant items) to a residential environment and that often applied by Dublin City Council is BS 4142 *Methods for Rating and Assessing Industrial and Commercial Sound* (2014). This standard describes a method for assessing the impact of a specific noise source at a specific location with respect to the increase in "background" noise level that the specific noise source generates. The standard provides the following definitions that are pertinent to this application:

Specific sound level, $L_{Aeq, Tr}$ — Is equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T. This level has been determined with reference to manufacturers information for specific plant items.

Rating level $L_{Ar,T}$ — Is the specific noise level plus adjustments for the character features of the sound (if any).

Background noise level	Is the sound A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T. This level is expressed using the LA90 parameter. These levels were measured as part of the baseline survey.

The assessment procedure in BS4142: 2014 is outlined as follows: -

1. Determine the specific noise level.
2. Determine the rating level as appropriate.
3. Determine the background noise level.
4. Subtract the background noise level from the specific noise level in order to calculate the assessment level.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. A difference of +10dB or more is a likely to be an indication of a significant adverse impact. A difference of around +5dB is likely to be an indication of an adverse impact, dependent on the context. Where the rated plant noise level is equivalent to the background noise level, noise impacts are typically considered to be neutral.

Based on the measured noise levels presented in Section 12.2.7, the rated noise criterion of 40 dB $L_{Aeq,T}$ for building services is considered appropriate at nearby noise-sensitive locations, both within the development at existing nearby residences.

12.2.3.3 Inward Noise Impact

Fingal Development Plan Policy on Aircraft Noise

The members of Fingal County Council resolved to adopt Variation No. 1 of the Fingal Development Plan 2017-2023 at a Council meeting on 9 December 2019. Variation No. 1 outlines revised Noise Zones and policy objectives in relation to aircraft noise from Dublin Airport.

Four noise zones (Zone A to D) are now indicated representing potential site exposure to aircraft exposure. The council will actively resist residential development within Zone A, and resist in Zone B and C pending independent acoustic advise and mitigation measures. Certain specific residential developments located in Zone D may be required to demonstrate that aircraft noise intrusion has been considered in the design.

Table 12.7 outlines the objectives to be adhered to by applicants for developments in each zone.

Table 12.7 *Aircraft Noise Zones.*

Zone	Indication of Potential Noise Exposure during Airport Operations	Objective
D	≥ 50 dB and < 54 dB LAeq, 16hr and ≥ 40 dB and < 48 dB Lnight	To identify noise sensitive developments which could potentially be affected by aircraft noise and to identify any larger residential developments in the vicinity of the flight paths serving the Airport in order to promote appropriate land use and to identify encroachment. All noise sensitive development within this zone is likely to be acceptable from a noise perspective. An associated application would not normally be refused on noise grounds,

		however where the development is residential-led and comprises non-residential noise sensitive uses, or comprises 50 residential units or more, it may be necessary for the applicant to demonstrate that a good acoustic design has been followed. Applicants are advised to seek expert advice.
C	≥ 54 dB and < 63 dB LAeq, 16hr and ≥ 48 dB and < 55 dB Lnight	To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure, where appropriate, noise insulation is incorporated within the development Noise sensitive development in this zone is less suitable from a noise perspective than in Zone D. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed. The noise assessment must demonstrate that relevant internal noise guidelines will be met. This may require noise insulation measures. An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the development's design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels. Applicants are strongly advised to seek expert advice.
B	≥ 54 dB and < 63 dB $L_{Aeq, 16hr}$ And ≥ 55 dB L_{night}	To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure noise insulation is incorporated within the development. Noise sensitive development in this zone is less suitable from a noise perspective than in Zone C. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed. Appropriate well-designed noise insulation measures must be incorporated into the development in order to meet relevant internal noise guidelines. An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the development's design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels. Applicants must seek expert advice.
A	≥ 63 dB LAeq, 16hr and/or ≥ 55 dB Lnight	To resist new provision for residential development and other noise sensitive uses. All noise sensitive developments within this zone may potentially be exposed to high levels of aircraft noise, which may be harmful to health or otherwise unacceptable. The provision of new noise sensitive developments will be resisted.

Notes:
'Good Acoustic Design' means following the principles of assessment and design as described in ProPG: Planning & Noise – New Residential Development, May 2017.
Internal and External Amenity and the design of noise insulation measures should follow the guidance provided in British Standard BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'.

Dublin Agglomeration Noise Action Plan 2019 - 2023

The Dublin Agglomeration NAP states the following with respect to assessing the noise impact on new residential development: -

> *"In the scenario where new residential development or other noise sensitive development is proposed in an area with an existing climate of environmental noise, there is currently no clear national guidance on appropriate noise exposure levels. The EPA has suggested in the interim, that Action Planning Authorities should examine planning policy guidance notes, such as ProPG (2017). Such guidance notes have been produced with a view to providing practitioners with guidance on a recommended approach to the management of noise within the planning system."*

In addition, the following is provided: -

> *"In advance of any national guidance relating to noise in the planning process, the following actions relating to planning and development will be considered for implementation: -*
>
> *a) To integrate Noise Action Plans into the County Development Plans.*
>
> *b) To develop guidelines relating to Noise and Planning for FCC. These guidelines should outline the considerations to be taken into account when determining planning applications for both noise-sensitive developments and for those activities which will generate noise. They should introduce the concept of a risk based approach to assessment of noise exposure, and for Good Acoustic Design to be encouraged as part of all new residential developments in FCC.*
>
> *c) To require developers to produce a noise impact assessment and mitigation plans, where necessary, for any new development where the Planning Authority considers that any new development will impact negatively on pre-existing environmental noise levels within their Council area.*
>
> *d) To ensure that future developments are designed and constructed in such a way as to minimise noise disturbances in accordance with Department of the Environment, Community and Local Government planning guidelines such as the Urban Design Manual. e.g. the position, direction and height of new buildings, along with their function, their distance from roads, and the position of noise barriers and buffer zones with low sensitivity to noise.*
>
> *e) To ensure that new housing areas and in particular brown field developments will be planned from the outset in a way that ensures that at least the central area is quiet. This could mean designating the centre of new areas as pedestrian and cycling zones with future developments to provide road design layouts to achieve low speed areas where appropriate.*

f) To incorporate street design in new developments, which recognise that residential streets have multi-function uses (e.g. movement, recreation) for pedestrians, cyclists and vehicles, in that priority order. The noise maps will be used to identify and classify the priority areas and streets. In the design of streets, cognisance should be given to the Irish Manual for Roads and Streets 2013.

g) To require sound proofing for all windows, in all new residential developments, where noise maps have indicated undesirable high noise levels. This may also lead to a requirement to install ducted ventilation.

h) To advise during pre-planning meetings regarding site specific design, the orientation of sensitive rooms and balconies away from noise, designing the layout and internal arrangement in apartments to ensure that similar rooms in individual units are located above each other or adjoin each other and that halls are used as buffer zones between sensitive rooms and staircases."

In accordance with this NAP policy, the following Acoustic Design Statement (ADS) has been incorporated into this chapter to comply with the requirements of this policy.

ProPG: Planning & Noise

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

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

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

A key component of the evaluation process is the preparation and delivery of an Acoustic Design Statement (ADS) which is intended for submission to the planning authority. This document is intended to clearly outline the methodology and findings of the Stage 1 and Stage 2 assessments, so as the planning authority can make an informed decision on the permission. ProPG outlines the following possible recommendations in relation to the findings of the ADS: -

A. Planning consent may be granted without any need for noise conditions.
B. Planning consent may be granted subject to the inclusion of suitable noise conditions.

C. Planning consent should be refused on noise grounds in order to avoid significant adverse effects (“avoid”).
D. Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects (“prevent”).

Section 3.0 of the ProPG provides a more detailed guide on decision making to aid local authority planners on how to interpret the findings of an accompanying Acoustic Design Statement (ADS).

A summary of the ProPG approach is illustrated in Figure 12.1

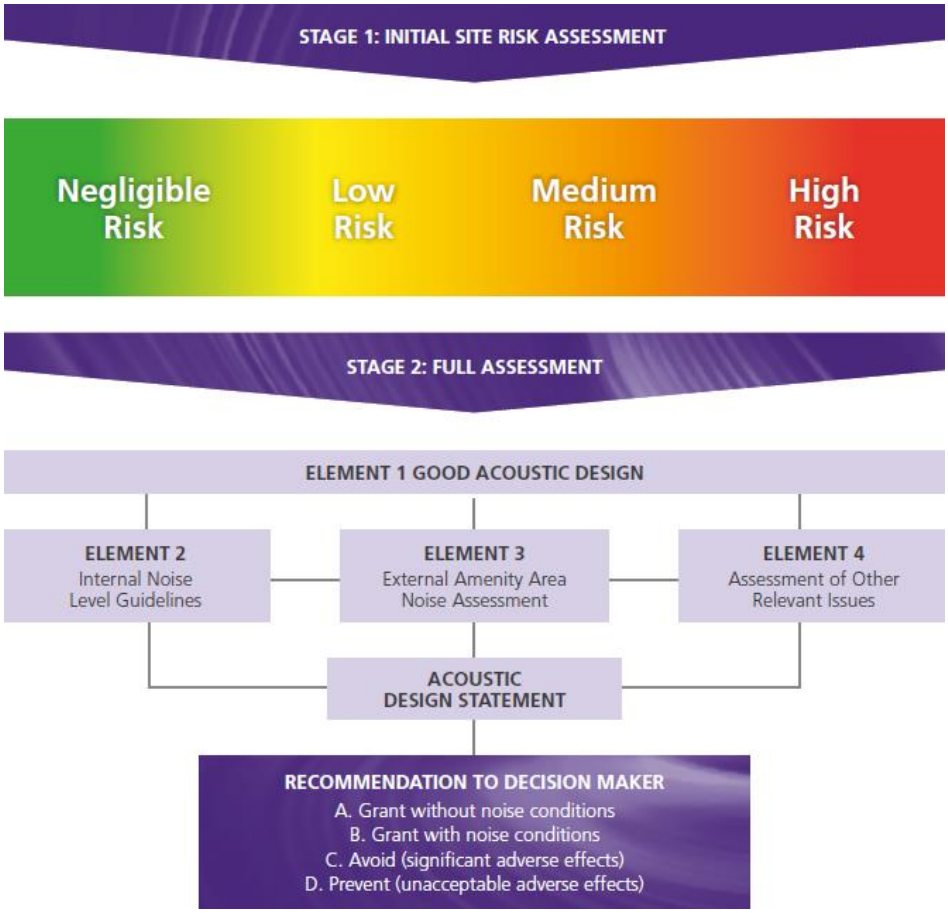


Figure 12.1 *ProPG Approach (Source: ProPG).*

WHO Environmental Noise Guidelines for Europe

The World Health Organisation (WHO) have published in October 2018 Environmental Noise Guidelines for the European Region. The objective of these guidelines is to provide recommendations for protecting human health from exposure to environmental noise from transportation, wind farm and leisure sources of noise. The guidelines present recommendations for each noise source type in terms of L_{den} and L_{night} levels above which there is risk of adverse health risks.

However, It should be noted that the WHO guideline values referred to here are recommended to serve as the basis for a policy-making process to allow evidence based public health orientated recommendations. They are not intended to be noise limits and the WHO document states the following regarding the implementation of the guidelines: -

> *"The WHO guideline values are evidence-based public health-oriented recommendations. As such, they are recommended to serve as the basis for a policy-making process in which policy options are considered. In the policy decisions on reference values, such as noise limits for a possible standard or legislation, additional considerations – such as feasibility, costs, preferences and so on – feature in and can influence the ultimate value chosen as a noise limit. WHO acknowledges that implementing the guideline recommendations will require coordinated effort from ministries, public and private sectors and nongovernmental organizations, as well as possible input from international development and finance organizations. WHO will work with Member States and support the implementation process through its regional and country offices."*

It is therefore not intended to refer to the WHO guidelines in an absolute sense as part of this assessment and it will be a decision for national and local policy makers to adopt the WHO guidelines and propose noise limits for use.

ProPG: Stage 1 – Noise Risk Assessment

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment. Figure 12.2 presents the basis of the initial noise risk assessment, it provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

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

Paragraph 2.9 of ProPG states that: -

> *"The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a "typical worst case" 24 hour day either now or in the foreseeable future."*

In this instance it is proposed to use the noise maps produced by Fingal County Council and daa as part of the noise mapping requirements under the European Noise Directive (END). These maps present the noise levels incident across the site over the course of an annual average day or night, in addition the noise zone contour produced by Fingal County Council for the future operation of Dublin Airport including the North Runway will be used to characterise the future noise environment.

ProPG states the following with respect to the initial risk assessment: -

> *"The risk assessment should not include the impact of any new or additional mitigation measures that may subsequently be included in development proposals for the site and proposed as part of a subsequent planning application. In other words, the risk assessment should include*

the acoustic effect of any existing site features that will remain (e.g. retained buildings, changes in ground level) and exclude the acoustic effect of any site features that will not remain (e.g. buildings to be demolished, fences and barriers to be removed) if development proceeds."

In this instance there are no buildings to be demolished and the site topography is not expected to change significantly during construction.

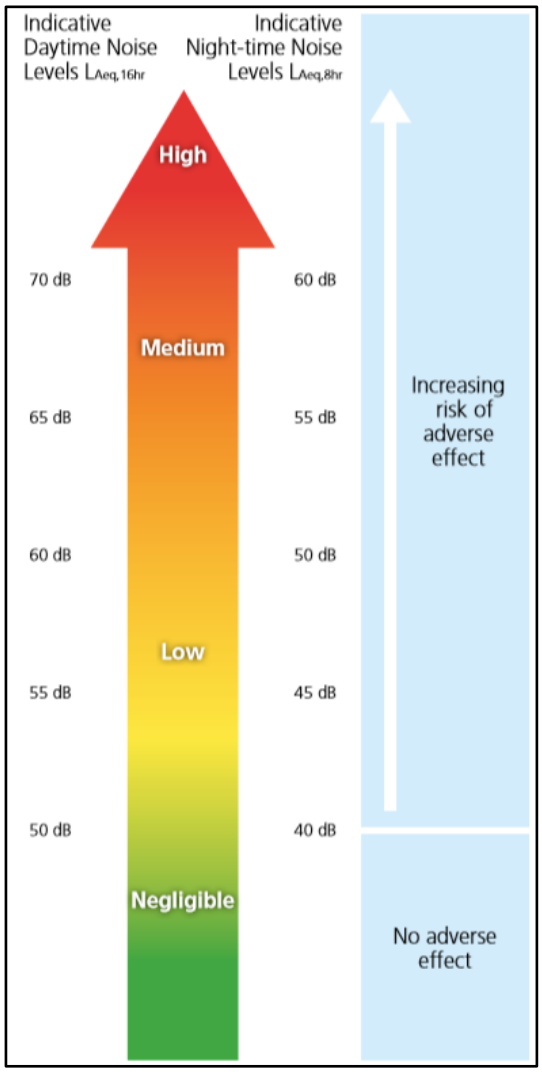


Figure 12.2 ProPG Stage 1 – Initial Noise Risk Assessment.

Receiving Environment

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*.

12.2.4 Noise Survey Locations

Two attended locations one unattended location were chosen to inform the outward impact of the proposed development: -

- **ATN1:** Along Red Arches road at the edge of an open area to the east of the constructed apartment buildings.
- **ATN2:** At the west end of Red Arches Drive to the north east of the constructed apartment buildings
- **UN1:** Within the proposed development site near the grounds of the existing pumping station. The meter was installed at a location where the pumping station was not audible.

These locations are shown in Figure 12.3 below.

Figure 12.3 *Noise Survey Locations*

12.2.5 Survey Periods

The attended noise survey was carried out on Wednesday 13 October 2021. Noise levels were measured over 15-minute periods on a cyclic basis at each measurement location.

The weather during the survey period was dry with varying cloud cover. Wind speeds were moderate; however they were not considered to have had a detrimental effect on the noise measurements.

Unattended noise measurements were carried out between 13:10 hrs on Wednesday 13 October and 12:00 hrs on Friday 15 October 2021.

12.2.6 Personnel and Instrumentation

AWN installed and collected the noise monitoring equipment. The following instrumentation was used in conducting the noise and surveys: -

Table 12.8 *Instrumentation Details.*

Equipment	Type	Serial Number	Calibration Date
Unattended Sound Level Meter	Bruel & Kjaer 2250 Light	3008402	Nov 2019
Attended Sound Level Meter	Bruel & Kjaer 2250 Light	3028635	March 2021

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

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

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 chapter are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

12.2.7 Survey Results

12.2.7.1 Attended Noise Measurements

The survey results for the attended monitoring are given in Table 12.9.

Table 12.9 *Attended Noise Survey Results*

Location	Start Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)			
		L_{Aeq}	L_{AFmax}	L_{A10}	L_{A90}
ATN1	12:30	52	67	57	41
	12:50	53	66	58	41
	13:10	53	73	57	38
ATN2	13:31	52	69	56	44
	13:50	54	69	58	44
	14:10	59	85	62	51

At the attended measurement locations, noise levels were dominated by distant construction noise and occasional local traffic movements. Birdsong and distant traffic were also audible.

12.2.7.2 Unattended Noise Measurements

The results of the unattended monitoring survey at Location UN1 are summarised for daytime periods in Table 12.10 and for night-time periods in Table 12.11.

Table 12.10 *Summary of Daytime Unattended noise measurements at UN1*

Monitoring Period/ Range		Measured Noise Levels (dB re. 2x10-5 Pa)	
		L_{Aeq}	L_{A90}
Wednesday 13 October 2021	Highest	52	45
	Lowest	40	36
	Average	48	39
Thursday 14 October 2021	Highest	56	45
	Lowest	43	38
	Average	50	42
Friday 15 October 2021	Highest	51	45
	Lowest	45	32
	Average	49	39
Average		49	40

Table 12.11 *Summary of Night-time Unattended noise measurements at UN1*

Monitoring Period/ Range		Measured Noise Levels (dB re. 2x10-5 Pa)	
		L_{Aeq}	L_{A90}
Wednesday 13 October to Thursday 14 October 2021	Highest	51	42
	Lowest	31	28
	Average	45	33
Thursday 14 October to Friday 15 October 2021	Highest	51	38
	Lowest	28	24
	Average	44	30
Average		45	32

During daytime periods, average noise levels were in the range 48 to 50 dB L_{Aeq} and 39 to 42 dB L_{A90}. During night-time periods, average noise levels were in the range 44 to 45 dB L_{Aeq} and 30 to 33 dB L_{A90}.

L_{Aeq} and L_{AFMax} values were measured at 15-minute intervals over the duration of the survey. Figure 12.4 and Figure 12.5 present the number of measured L_{Aeq} and L_{AFMax} events for each decibel level during the day and night periods. It is noted Figure 12.6 the noise level of 68 dB L_{Amax} is not normally exceeded.

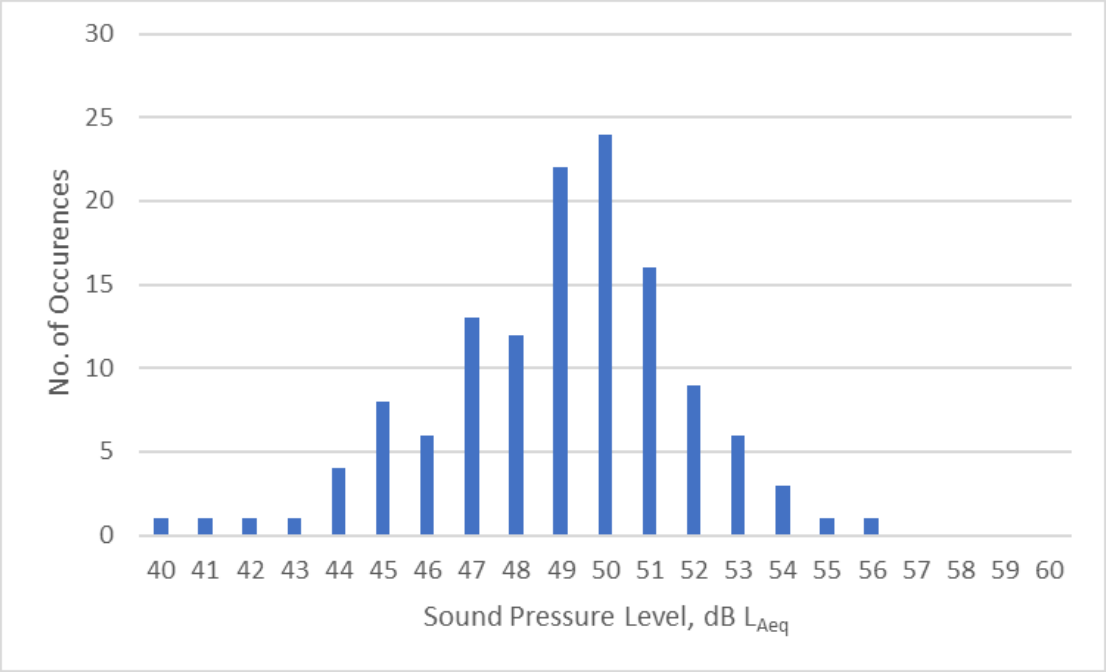


Figure 12.4 *Number of Events at Each Decibel Level – Day*

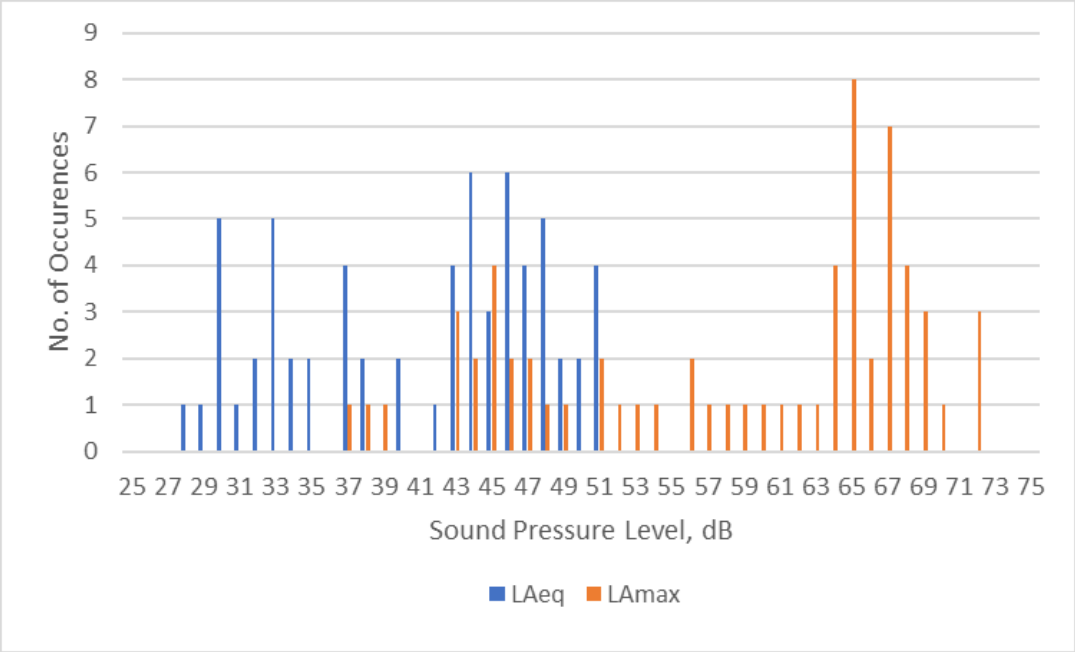


Figure 12.5 *Number of Events at Each Decibel Level – Night*

12.2.8 Comparison with EPA Noise Maps

To assist in establishing a representative baseline noise environment in the vicinity of the site, reference has been made to the Environmental Protection Agency strategic noise mapping for Dublin Airport. The noise maps are provided for the overall day

evening night period in terms of L_{den} and for the night-time period in terms of L_{night}. All data has been taken from the EPA Mapping website http://gis.epa.ie.

Figure 12.6 and Figure 12.7 present the predicted noise levels across the development site for road and air traffic in terms of L_{den} and L_{night} for roads and similarly for rail, in Figure 12.8 and Figure 12.9.

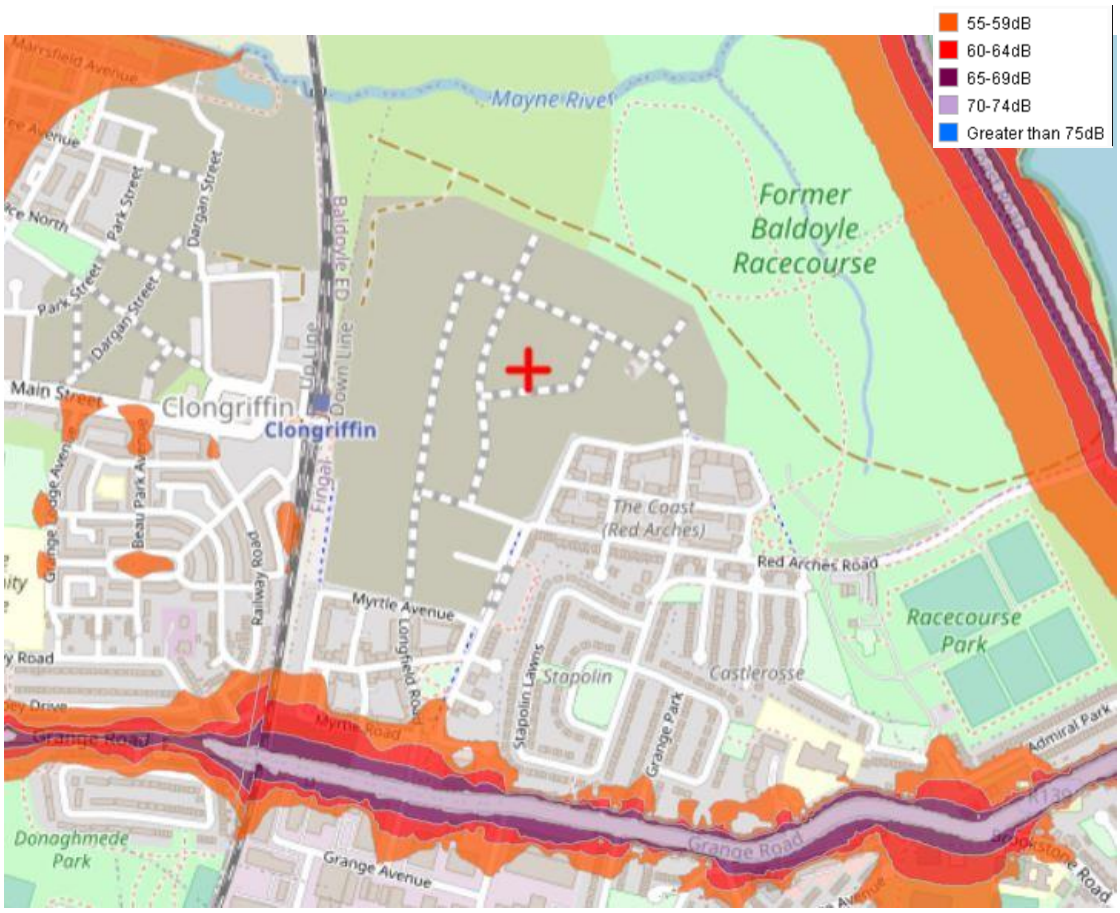


Figure 12.6 *EPA Round 3 Noise Map for Roads, L_{den}.*

Figure 12.7 *EPA Round 3 Noise Map for Roads, L_{night}.*

Figure 12.8 *EPA Round 3 Noise Map for Rail, L_{den}.*

Figure 12.9 *EPA Round 3 Noise Map for Rail, L_{night}.*

12.2.9 Future Noise Environment

The major change to the local infrastructure that is likely to alter the noise environment is the development of the North Runway at Dublin Airport. To address this Fingal have produced noise zone maps for the area surrounding the airport. These maps present noise contours as follows: -

- Zone A – ≥ 63 dB $L_{Aeq,16hr}$ and/or ≥ 55 dB L_{night}.
- Zone B – ≥ 54 dB $L_{Aeq,16hr}$ and < 63 dB $L_{Aeq,16hr}$ and ≥ 55 dB L_{night}.
- Zone C – ≥ 54 dB $L_{Aeq,16hr}$ and < 63 dB $L_{Aeq,16hr}$ and ≥ 48dB L_{night} and < 55 dB L_{night}.
- Zone D – ≥ 50 dB $L_{Aeq,16hr}$ and < 54dB $L_{Aeq,16hr}$ and ≥ 40dB L_{night} and < 48dB L_{night}.

Error! Reference source not found. presents the current development site in the context of these zones. Note that road traffic noise is not expected to change significantly into the future.

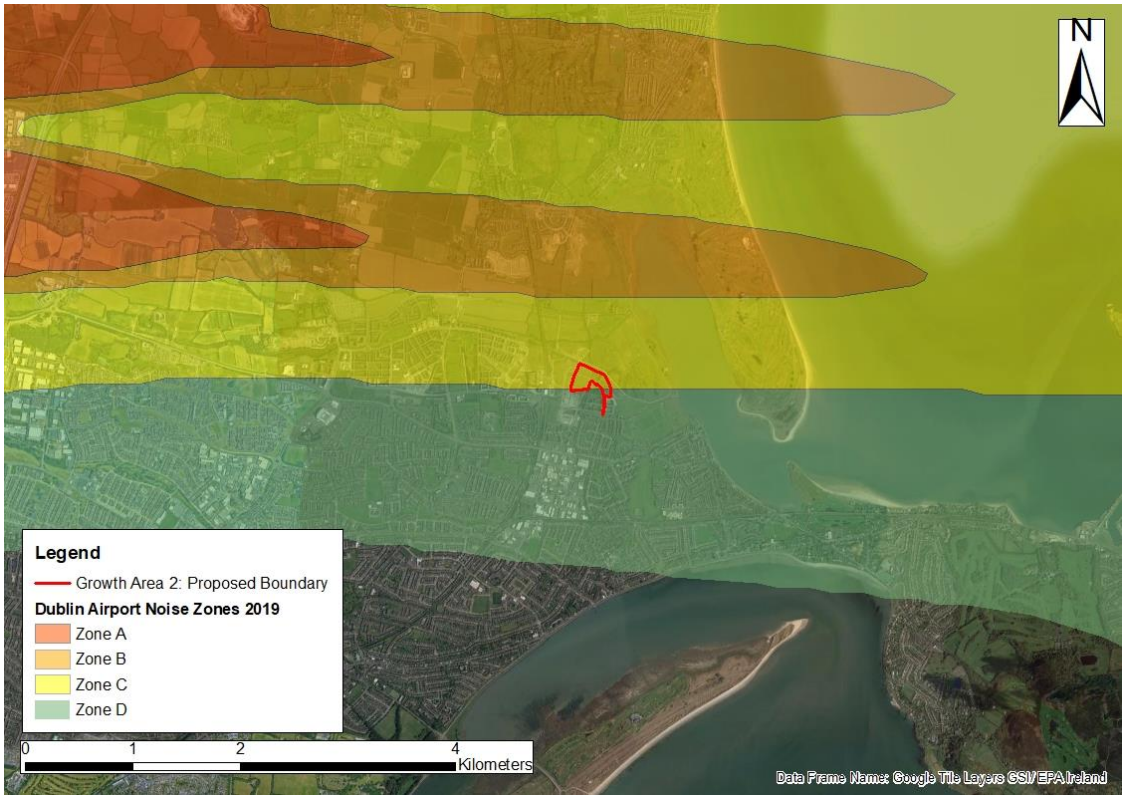


Figure 12.10 *Dublin Airport Noise Zones.*

It is noted that the development site is located within Zone C. Based on the noise Zones, the worst-case noise levels incident to dwellings and external amenity areas falling within these zone can be summarised as: -

- **Daytime:** 63 dB $L_{Aeq,16hr}$.
- **Night-time:** 55 dB L_{night}.

12.2.10 Noise Risk Assessment Conclusion

Giving consideration to the noise levels presented in the previous sections, the initial site noise risk assessment has concluded that the level of risk across the site is Low to Medium Noise Risk. ProPG states the following with respect to various levels of risk:

Negligible Risk	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.
Low Risk	At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
Medium Risk	As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an

ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.

Given the above it can be concluded that the development site may be categorised as 'low to medium' risk and as such an Acoustic Design Strategy will be required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development. Appropriate mitigation measures are set out in Section 12.6 of this chapter.

It should be noted that ProPG states the following with regard to how the initial site noise risk is to be used: -

> *"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."*

Therefore, following the guidance contained in ProPG does not preclude residential development on sites that are identified as having medium or high-risk noise levels. It merely identifies the fact that a more considered approach will be required to ensure the developments on the higher risk sites are suitable designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG is to ensure that the best possible acoustic outcome is achieved for a particular site.

12.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A Strategic Housing Development for the construction of 1,007 residential apartments (consisting of 58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units), communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a site located in the townland of Stapolin, Baldoyle, Dublin 13.

12.4 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The potential impacts of the proposed development are considered for the short-term construction phase and long-term operational phase. These are set out in the following sections.

12.4.1 Construction Phase

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

The nearest noise-sensitive locations to the proposed development are the existing apartment buildings to the southeast at a distance of 25m from the proposed Sector 8C Block 2 building. Based on the results of the baseline noise surveys undertaken, the ambient daytime noise level at these properties was found to be between 52 and 59 dB $L_{Aeq,T}$.

Thresholds for significant noise from construction can be determined by referring to Table 8.1 (BS 5228-1) and the baseline ambient noise levels, as outlined in the assessment criteria section.

The daytime significance threshold for construction noise at the site is set at 65 dB $L_{Aeq,T}$. A night-time threshold is not included as construction work will not be taking place at night.

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

Guidance on the approximate attenuation achieved by barriers surrounding the site is also provided in BS 5228-1. It states that when the top of the plant is just visible to the receiver over the noise barrier, an approximate attenuation of 5 dB can be assumed, while a 10 dB attenuation can be assumed when the noise screen completely hides the sources from the receiver.

The latter scenario can be assumed in this case due to the proximity of the noise-sensitive locations, i.e. a barrier height will be chosen so as to completely hide the source. Table 12.12 shows the potential noise levels calculated at various distances based on the assumed sound power level and attenuation provided by the barrier of 10 dB.

Table 12.12 *Potential construction noise levels at varying distances assuming attenuation of 10 dB from site barrier*

Description of Noise Source	Sound Power Level (dB Lw(A))	Calculated noise levels at varying distances (dB LAeq,T)				
		10	20	30	50	100
3 no. items each with SPL of 81 dB at 10 m operating simultaneously.	114	76	70	66	62	56

The calculated noise levels in Table 12.12 show that there is potential for the maximum permissible daytime noise level to be exceeded at distances up to 30 m from the works. This indicates that additional mitigation measures will be required to prevent likely significant impacts at residential properties. These measures are detailed in Section 12.5.1.

In terms of the numbers of noise-sensitive location in the proposed development surroundings, in the majority of cases, the construction noise impact is Slight-Moderate. When works are carried out close to existing noise-sensitive locations, the impact has the potential to be Significant, though the duration of these predicted worst-case impacts will be temporary.

12.4.2 Operational Phase – Outward Impact

The main potential noise outward noise impact to the surrounding will be from additional vehicles on the surrounding road network and building services and mechanical plant serving the development.

Potential impacts from each of these sources are discussed below.

12.4.2.1 Additional Vehicular Traffic on Surrounding Roads

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the proposed development (Growth Area 2) and other planned developments on surrounding roads, namely Growth Area 1 and Growth Area 3.

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 surrounding the subject site with and without development using the Annual Average Daily Traffic (AADT) data.

The predicted change in noise levels due to an increase in road traffic has been calculated for each of these roads. Projected traffic data used for the purpose of this assessment includes committed and planned developments in the vicinity of the project site as listed in Chapter 15 Traffic and Transportation of this EIAR.

The impact from the increase in traffic from the proposed development has been assessed for the design year of 2038 relative to the Do Nothing scenario along the sections of road detailed in Table 15.15.

Table 12.13 *Predicted Change In Noise Level associated with Vehicular Traffic*

Road Link	Noise level (dB L_{A10}) Increase between Do Nothing and Do Something based on AADT Traffic Data	
	2026	2041
R106 North of Roundabout	0.4	0.4
R106 South of Roundabout	0.5	0.5
Red Arches Road west of R106	3.2	3.0
R809 west of Industrial Estate	2.9	2.7
R809 east of Industrial Estate	0.3	0.2
Longfield Road	2.9	2.7

The predicted increase in traffic flows associated with the development in the design year of 2041 will result in an increase of less than 1dB along the R106 and along the R809 east of the industrial estate. Along Red Arches Road, R809 west of Industrial Estate and Longfield Road, the increases in noise level are of the order of 3dB. The effect is therefore negative, imperceptible to slight-moderate and long-term.

Using data from the traffic and transport chapter, the traffic noise level along Red Arches Road accessing the proposed development is expected to increase from 51 to 54 dB $L_{Aeq,1hr}$, during peak periods in the opening year.

12.4.2.2 Building Services Plant

It is expected that the principal items of building and mechanical services plant will be for heating and ventilation of the buildings. These items and their location will be selected at the detailed design stage to ensure that noise emissions to sensitive receivers both external and within the development itself will be within the relevant criteria set out in Section 12.2.3.2. The effects are considered neutral, not significant and long-term.

12.4.3 Operational Phase – Inward Impact

Element 1 – Good Acoustic Design Process

12.4.3.1 ProPG Guidance

In practice, good acoustic design should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life of occupants or compromising other sustainable design objectives. It is important to note that ProPG specifically states that good acoustic design is not equivalent to overdesign or "gold plating" of all new development but that it seeks to deliver the optimum acoustic environment for a given site.

Section 2.23 of the ProPG outlines the following checklist for Good Acoustic Design: -

- Check the feasibility of relocating, or reducing noise levels from relevant sources;
- Consider options for planning the site or building layout;
- Consider the orientation of proposed building(s);
- Select construction types and methods for meeting building performance requirements;
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc;

- Assess the viability of alternative solutions; and,
- Assess external amenity area noise.

In the context of the proposed development, each of the considerations listed above have been addressed in the following subsections.

12.4.3.2 Application of GAD Process to Proposed Application

Relocation or Reduction of Noise from Source

The main noise sources are located outside the redline boundary of the site and therefore it is beyond the scope of this development to introduce any noise mitigation at source.

Planning, Layout and Orientation

The site lies completely within the Noise Zone C for Dublin Airport and as such it would not have been possible to reduce the noise due to aircraft overhead by designing the layout in a different way. The assessment in this chapter is appropriate for sites of this nature in Noise Zone C.

Select Construction Types for meeting Building Regulations

Masonry constructions will be used in constructing the external walls of the development. This construction type offers high levels of sound insulation performance. However, as is typically the case the glazed elements and any required ventilation paths to achieve compliance with Part F of the Building Regulations will be the weakest elements in the façade in terms of sound insulation performance.

Consideration will therefore be given to the provision of upgraded glazing and acoustic ventilators where required. For units where it will not be possible to achieve the desirable internal acoustic environments with windows open, the proposal here will be to provide dwelling units with glazed elements and ventilators that have good acoustic insulation properties so that when the windows are closed the noise levels internally are good. Inhabitants will be able to open the windows if they wish, however, doing so will increase the internal noise level. This approach to mitigation is supported in ProPG where it states the following (note emphasis has been added in bold): -

> *"2.22 Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided; occupants generally prefer the ability to have control over the internal environment using openable windows, even if the acoustic conditions would be considered unsatisfactory when open. Solely relying on sound insulation of the building envelope to achieve acceptable acoustic conditions in new residential development, when other methods could reduce the need for this approach, is not regarded as good acoustic design. Any reliance upon building envelope insulation with closed windows should be justified in supporting documents"*
>
> *Note 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be*

assessed in the "open" position and, in this scenario, the internal LAeq target levels should not normally be exceeded

2.34 Where the LPA accepts that there is a justification that the internal target noise levels can only be practically achieved with windows closed, which may be the case in urban areas and at sites adjacent to transportation noise sources, special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment. In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide "whole dwelling ventilation" in accordance with Building Regulations Approved Document F (e.g. trickle ventilators) in the open position (see Supplementary Document 2). Furthermore, in this scenario the internal LAeq target noise levels should not generally be exceeded."

It is very important to note that it is impractical to achieve the good internal noise levels with windows open across the vast majority of development sites in close proximity to major infrastructure such as roads or airports. Such sites would need to be classified as having a negligible risk in accordance with the ProPG noise risk assessment approach. For this reason, there are no guidance documents either at a local level or an international level that AWN is aware of which would support the approach of achieving the ideal internal noise levels only in the open window scenario. It is therefore considered entirely correct and justifiable to provide building facades with a moderate degree of sound insulation such that with windows closed but vents opened a good internal acoustic environment is achieved.

Impact Of Noise Control Measures on Fire, Health And Safety Etc

The good acoustic design measures that have been implemented on site, e.g. using suitable glazing and vents to be cost neutral and do not have any significant impact on other issues.

Assess Viability of Alternative Solutions

The site lies within Dublin Airport Noise Zone C. Due to the height at which aircraft noise would be incident to the dwellings and external amenity areas, an acoustic barrier or similar would be ineffective and is not proposed anywhere on the site.

Assess External Amenity Area Noise

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."

External noise levels across the site during the daytime, with the North Runway in operation, are expected fall in the region of 63 dB $L_{Aeq,16hr}$.

It is noted that whilst external amenity areas located in Zone C would be above the desirable level of 55 dB $L_{Aeq,16hr}$ it is not possible to reduce the noise level across external spaces due to aircraft noise being the dominant noise source.

Summary

Considering the constraints of the site, in so far as possible and without limiting the extent of the development area, the principles of Good Acoustic Design have been applied to the development.

In terms of viable alternatives to acoustic treatment of façade elements, currently it is not considered likely that there will be further options for mitigation outside of proprietary acoustic glazing and ventilation.

12.4.3.3 Element 2 – Internal Noise Guidelines

Internal Noise Criteria

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233 (2014). The recommended indoor ambient noise levels are set out in Table 12.14 and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur, such as New Year's Eve.

Table 12.14 *ProPG Internal Noise Levels*

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB $L_{Amax,T}$*

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

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

Discussion on Open / Closed Windows

In the first instance, it is important to note the typical level of sound reduction offered by a partially open window falls in the region of 10 to 15 dB .

Considering the design goals outlined in Table 12.14 and a sound reduction across an open window of 15 dB, the free-field noise levels that would be required to ensure that internal noise levels do not exceed good (i.e. at or below the internal noise levels) or reasonable internal noise levels (i.e. 5 dB above the internal noise levels) have been summarised in Table 12.15

Table 12.15 *External Noise Levels Required to Achieve Internal Noise Levels*

Level Desired	Day 07:00 to 23:00hrs	Night 23:00 to 07:00hrs
Good (i.e. at or below the internal noise levels)	50 – 55dB $L_{Aeq,16hour}$	45dB $L_{Aeq,8hour}$
Reasonable	55 – 60dB $L_{Aeq,16hour}$	50dB $L_{Aeq,8hour}$

(i.e. 5 dB above the internal noise levels)		

In this instance the external noise levels are such that it will not be possible to achieve the desired good internal noise levels with windows open for properties located within Zone C and therefore appropriate acoustic specifications to windows and passive vents will be provided to ensure the rooms are adequately ventilated and achieve the good internal noise levels detailed here.

Proposed Façade Treatment

The British Standard BS EN 12354-3: 2000: Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound provides a calculation methodology for determining the sound insulation performance of the external envelope of a building. The method is based on an elemental analysis of the building envelope and can take into account both the direct and flanking transmission paths.

The Standard allows the acoustic performance of the building to be assessed taking into account the following: -

- Construction type of each element (i.e. windows, walls, etc.)
- Area of each element.
- Shape of the façade.
- Characteristics of the receiving room.

The principals outlined in BS EN 12354-3 are also referred to in BS8233 and Annex G of BS8233 provides a calculation method to determine the internal noise level within a building using the composite sound insulation performance calculated using the methods outlined in BS EN 12354-3. The methodology outlined in Annex G of BS8233 has been adopted here to determine the required performance of the building facades. This approach corrects the noise levels to account for the frequency content of aircraft noise which has been determined by AWN from numerous noise surveys in the vicinity of Dublin Airport.

Glazing

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. In this instance the facades will be provided with glazing that, when closed, achieve the minimum sound insulation performance as set out in Table 12.16

Table 12.16 *Sound Insulation Performance Requirements for Glazing, SRI (dB)*

Octave Band Centre Frequency (Hz)						**Rw**
125	**250**	**500**	**1k**	**2k**	**4k**	
29	25	32	34	36	38	34

The acoustic specification listed in Table 12.16 can be achieved using a double-glazed unit with slightly thicker than standard glass. This performance could also be achieved using a suitably specified triple glazing window.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing system. In the context of the acoustic performance specification the ‘glazing system’ is understood to include any

and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

Wall Construction

In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 50 dB R_w for this construction.

Ventilation

The ventilation strategy for the development will be in accordance with Part F of the Building Regulations and will be finalised at the detail design stage. Options which will be considered to achieve compliance with background ventilation requirements will be adjustable hit and miss acoustic ventilators or trickle vents built into the façade or window frames respectively. Table 12.17 presents the acoustic specification for the vents:

Table 12.17 *Sound Insulation Performance Requirements for Ventilation, SRI (dB)*

Octave Band Centre Frequency (Hz)						**Rw**
125	**250**	**500**	**1k**	**2k**	**4k**	
29	30	37	39	36	42	39

Roof

There is the potential for the roof structure to allow the passage of sound into the rooms. In order to control potential sound transmission via this route the ceiling / roof construction will need to provide a sound reduction in excess of that required for the windows. The proposed reinforced concrete roof with thermal insulation and plasterboard ceiling below will provide suitable level of sound insulation.

Any penetrations through the ceiling constructions must be as small as possible and made good by fully filling with plaster or with an acoustic sealant.

Internal Noise Levels

Taking into account the external façade levels and the specified building envelope the internal noise levels have been calculated. In all instances the good internal noise criteria are achieved for daytime and night-time periods.

12.4.3.4 Element 3 – External Amenity Area Noise Assessment

As previously discussed, external amenity areas are not expected to achieve the recommended 55dB $L_{Aeq,16hr}$ noise level recommended in ProPG. However, it is not possible to reduce the noise level across external spaces due to aircraft noise being the dominant noise source.

12.4.3.5 Element 4 – Assessment of Other Relevant Issues

Element 4 gives consideration to other factors that may prove pertinent to the assessment, these are defined in the document as: -

- 4(i) compliance with relevant national and local policy.

- 4(ii) magnitude and extent of compliance with ProPG.
- 4(iii) likely occupants of the development.
- 4(iv) acoustic design v unintended adverse consequences.
- 4(v) acoustic design v wider planning objectives.

Each is discussed in turn below.

Compliance with Relevant National and Local Policy

There are no National policy documents relating to the acoustic design of residential dwellings. Locally, the Adopted Variation No 1 to Fingal Development Plan 2017 – 2023 contains Objective DA07 relating to development within the Airport Noise Zones. This objective states: -

> *"Objective DA07*
>
> *Strictly control inappropriate development and require noise insulation where appropriate in accordance with table 1 above within Noise Zone B and Noise Zone C and where necessary in Assessment Zone D, and actively resist new provision for residential development and other noise sensitive uses within Noise Zone A, as shown on the Development Plan maps, while recognising the housing needs of established families farming in the zone. To accept that time based operational restrictions on usage of a second runway are not unreasonable to minimize the adverse impact of noise on existing housing within the inner and outer noise zone."*

Furthermore, the Fingal Noise Action Plan recommends that the guidance contained within ProPG should be used in assessing the noise impact on new residential developments being introduced to existing noise sources.

This Acoustic Design Statement has been prepared in compliance with the requirements of ProPG and therefore complies with the requirements of local policy.

Magnitude and Extent of Compliance with ProPG

As discussed within this chapter the following conclusions have been drawn with regards to the extent of compliance with ProPG: -

- All dwellings as part of the development have been designed to achieve the good level of internal noise levels specified within ProPG. The units require closed windows and open vents to achieve this level;
- External amenity areas have been assessed and while the noise levels externally will not comply with the recommended criterion set out in ProPG. However as the development is considered desirable – the land is zoned for residential development – then the criteria can be relaxed to a value of the order of the current daytime noise levels; and
- An assessment of the potential for adverse noise impacts during the overheating condition has also been included and it has concluded that there is a medium risk of an adverse impact which is considered acceptable if the overheating condition occurs for a limited period.
- Based on the preceding it is concluded that the proposed development is in full compliance with the requirements of ProPG.

Likely Occupants of the Development

The criteria adopted as part of this assessment are based on those recommended for permanent dwellings and are therefore considered robust and appropriate for the likely occupants.

Acoustic Design v Unintended Adverse Consequences

Unintended adverse consequences did not occur on this project.

Acoustic Design v Wider Planning Objectives

With reference to the Proposed Variation No 1 to Fingal Development Plan 2017 – 2023, the proposed development site is within Zone C. This assessment has demonstrated the noise insulation measures required to ensure that the proposed dwelling units achieve a good internal noise environment.

12.4.4 Do-Nothing Impact

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations and within the development site will remain largely unchanged resulting in a neutral impact in the long-term.

12.5 REMEDIAL AND MITIGATION MEASURES

In order to ameliorate the likely noise impacts, a schedule of noise control measures has been formulated for both construction and operational phases.

12.5.1 Construction Phase

With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2.

BS5228 includes guidance on several aspects of construction site practices, including, but not limited to: -

- Selection of quiet plant.
- Control of noise sources.
- Screening (boundary, and or localised plant screening).
- Hours of work.
- Liaison with the public.
- Monitoring.

Detailed 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.

12.5.1.1 Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. 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.

12.5.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration should 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.

BS5228 states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators.

BS5228 makes a number of recommendations in relation to "*use and siting of equipment*". These are all directly relevant and hence are reproduced below. These recommendations will be adopted on site.

> *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.*
>
> *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.*
>
> *Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.*
>
> *Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.**
>
> *Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."*

Other forms of noise control at source relevant to the development works are set out below: -

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are

sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries.

- For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Demountable enclosures can also be used to screen operatives using hand tools/ breakers and will be moved around site as necessary.
- 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.

12.5.1.3 Screening

Typically 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. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver.

Screening may be a useful form of noise control when works are taking place at basement and ground level to screen noise levels at ground floor adjacent buildings.

In addition, careful planning of the site layout should also be considered. The placement of site buildings such as offices and stores and in some instances materials such as aggregate can provide a degree of noise screening if placed between the source and the receiver. The use of localised mobile (mobile hoarding screens and / or acoustic quilts) to items of plant with the potential to generate high levels of noise are an effective noise control measure. These options should be considered when percussive works are taking place in close proximity to the nearest sensitive perimeter buildings.

12.5.1.4 Liaison with the Public

A designated noise liaison should be appointed to site during construction works. All noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, e.g. demolition, breaking, piling, etc., the liaison officer should inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

12.5.1.5 Hours of Work

Construction works will be undertaken within the times below, taken from the Section 6 of the Draft Construction Management Plan: -

- Monday to Friday 07:00 to 19:00hrs
- Saturday 07:00 to 14:00hrs
- Sunday and Public Holidays No noisy work on site.

12.5.2 Operational Phase

12.5.2.1 Additional Traffic on Surrounding 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.

12.5.2.2 Building Services Plant

During the detailed design of the development, the selection and location of mechanical and electrical plant will be undertaken in order to ensure the noise emission limits set out above are not exceeded. Plant items in the proposed development are limited to domestic heating and ventilation equipment and therefore no specific mitigation measures are required.

12.5.2.3 Inward Impact

At detailed design stage, a glazing and vent specifications fulfilling the requirements in Table 12.16 and Table 12.17 will ensure suitable internal noise levels.

12.6 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

This section summarises the likely noise impact associated with the proposed development, taking into account the mitigation measures.

12.6.1 Construction Phase

During the construction phase of the project there will be a short-term noise impact on nearby noise sensitive properties from site activities and the close proximity of adjacent buildings. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration are kept to minimised. For the nearest noise sensitive locations within 20 m of the proposed development, negative, significant and temporary effects are likely.

For the majority of noise sensitive locations at greater distances from the proposed development, negative, moderate and short-term effects are likely.

12.6.2 Operational Phase

12.6.2.1 Additional Traffic on Surrounding Roads

The predicted change noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall effects from noise contribution of increased traffic is considered to be of negative, imperceptible to slight-moderate and long-term effect to nearby noise sensitive locations.

12.6.2.2 Building Services Plant

With the application of mitigation measures for building services noise as described in Section 12.5.2.1, the range of potential noise levels is not expected to add significantly

to the existing noise environment. The resultant noise effect from this source will be of neutral, not significant, long-term impact.

12.7 MONITORING OR REINSTATEMENT

12.7.1 Construction Phase

During the construction phase consideration may be given to noise and vibration monitoring at the nearest sensitive locations, where high level of noise and or vibration are expected.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: "Acoustics – Description, Measurement and Assessment of Environmental Noise" and be located a distance of greater than 3.5m away from any reflective surfaces, e.g. walls, in order to ensure a free-field measurement without any influence from reflected noise sources.

Vibration monitoring should be conducted in accordance with BS 7385-1 (1990) Evaluation and measurement for vibration in buildings — Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings or BS 6841 (1987) Guide to Measurement and Evaluation of Human Exposure to Whole-Body Mechanical Vibration and Repeated Shock. With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2.

12.7.2 Operational Phase

No ongoing monitoring is required during the operational phase of the proposed development.

12.8 CUMULATIVE IMPACT ASSESSMENT

The potential for cumulative impact of the proposed development with any/all relevant other planned or permitted developments as outlined in Chapter 3 (Planning and Development Context) are discussed in Sections 12.9.1 and 12.9.2 below for construction and operational phases.

12.8.1 Construction Phase

If construction of the proposed development were to concur with that of other phases, there is potential for cumulative construction noise impacts. In respect of substantial developments that may result in in-combination effects in respect of material assets are the adjacent residential development GA1 (ABP Reg. Ref.:311018-21) and GA3 (ABP Reg. Ref.:311016-21) are the relevant projects considered in detail.

The GA1 Grant of Permission ABP Reg. Ref.:311018-21 Condition 3 requires that the mitigation measures set out in the EIA must be carried out in full and Condition 4 request the mitigation and mitigation and monitoring measures as they relate to the Baldoyle Bay APA be implemented. Furthermore; Condition 22 states that prior to the commencement of works a Construction Management Plan must be submitted to the planning authority (FCC) that will include measures to avoid noise impacts during construction.

The GA3 Grant of Permission ABP Reg. Ref.:311016-21 Condition 5 states that prior to the commencement of works a finalised Construction and Environmental Management Plan must be submitted to the planning authority (FCC) that will include measures to avoid noise impacts during construction.

As required by planning, each construction site in the cumulative scenario shall implement the mitigation measures presented in Section 12.6.1.1, thus the cumulative impact on noise-sensitive receptors can be controlled.

As noted in Section 12.4.1, significant construction noise levels are only expected when works are being carried out at short distances from a given noise-sensitive location.

The implementation of mitigation measures within each chapter and detailed in Section 12.6; as well as the compliance of adjacent development with their respective planning permissions, significant cumulative noise impacts are not predicted during the construction phase of the proposed development. The residual impact of the proposed development in combination with other planned or permitted developments (as described in Chapter 3) is **short-term-imperceptible-neutral**.

12.8.2 Operational Phase

In respect of cumulative impact, assessment of the impact of additional vehicular traffic on surrounding roads presented in above takes into account both traffic flows due to the proposed development and flows generated by Baldoyle Growth Areas 1 and 3, as set out the Chapter 15 Traffic and Transport.

Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term, negative and imperceptible with regards to noise and vibration.

It is expected that the principal items of building and mechanical services plant will be for heating and ventilation of the buildings. These items and their location will be selected at the detailed design stage to ensure that noise emissions to sensitive receivers both external and within the development itself will be within the relevant criteria set out in Section 12.2.3.2. The effects are considered neutral, not significant and long-term. Thus, there is no potential for cumulative impacts as a result of building and mechanical services plant.

13.0 LANDSCAPE AND VISUAL

13.1 INTRODUCTION

The site of the proposed project, known as Growth Area 2 (GA2), is located in to the north-west of Baldoyle in the south of Fingal County, close to the border with Dublin City Council. The site is north and east of other recent residential development, both built and permitted but not yet built. The site is a brownfield, partially developed site, where works were halted some years ago when elements of the infrastructure were under construction. The Baldoyle-Stapolin Local Area Plan has guided the form of the proposed development and that of adjacent development sites and existing residential areas and infrastructure, and this development will integrate with those areas.

In brief, the proposed development comprises of the construction of 16 no. residential buildings with 1,007 apartments, residential community rooms, and creche with car parking spaces, cycle parking and associated site development, along with landscape and public realm proposals. (For full development description, see Chapter 2 – Description of the Proposed Development)

The landscape and visual assessment of the proposed residential development at Baldoyle is a means of appraising the affect the proposed housing would have on the receiving environment in terms of quality of landscape – both physically and visually. The assessment aims to indicate the layout and design of the proposed development which would present the least overall landscape and visual impact. As part of the assessment, the site and its environs were visited on several occasions between June 2020 and February 2022 for landscape and visual surveys.

In the interests of clarity, it should be noted that this chapter does not address technical effects on sunlight and shadow, which have been assessed separately in Chapter 11 (Microclimate – Sunlight and Daylight).

13.2 METHODOLOGY

The landscape/townscape and visual assessment of the proposed development is a means of appraising the effect the proposed development would have on the receiving environment in terms of the quality of landscape– both physically and visually. Also considered are construction and demolition works, the operational phase, light emissions and the cumulation of effects with other existing and/or approved projects. In an urban context, the term ‘townscape’ is used to refer to the urban landscape.

13.2.1 Terminology

Landscape impacts are defined as changes in the fabric, character and quality of the landscape as a result of the development. This includes direct effects on landscape receptors and greater effects that can alter the wider distinctiveness of the landscape. Landscape receptors are the physical or natural resource that will experience an impact. The sensitivity of a landscape receptor is the vulnerability to change.

The extents of the landscape impacts have been assessed by professional evaluation using the terminology defined as per Table 13.1, 13.3 and 13.4. The terminology is based on the criteria set down in the “*Guidelines for Landscape and Visual Impact*

Assessment" (3rd Edition, by The Landscape Institute / Institute of Environmental Assessment published by E&FN Spon, 2013).

Table 13.1 *The Extent of Landscape Impact (based on ratings from the Draft EPA Guidelines, 2017)*

Extent	Description
Level 1 Imperceptible Effects	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.
Level 2 Not significant	An effect which causes noticeable changes in the character of the landscape but without noticeable consequences. There are no appreciable changes to landscape context, character or features.
Level 3 Slight Effects	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.
Level 4 Moderate Effects	An effect that alters the character of the landscape in a manner that is consistent with existing and emerging trends. There are minor changes over some of the area (up to 30%) or moderate changes in a localised area.
Level 5 Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area (30-50%) or an intensive change over a more limited area
Level 6 Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment. There are notable changes in landscape characteristics over a substantial area (50-70%) or a very intensive change over a more limited area
Level 7 Profound Effects	An effect which obliterates sensitive characteristics. There are notable changes in landscape characteristics over an extensive area (70-100%) or a very intensive change over a more limited area

Visual effects relate solely to changes in available views of the landscape and the effects of those changes on people. They include the direct impact of the development on views, the potential reaction of viewers, their location and number and the impact on visual amenity. The intensity of the visual impacts is assessed by professional evaluation using the terminology defined as per Table 13.2, 13.3 and 13.4.

Table 13.2 *The Extent of Visual Effect (based on ratings from the Draft EPA Guidelines, 2017)*

Extent	Description
Level 1 Imperceptible Effects	There are no noticeable changes to views in the visual landscape.
Level 2 Not significant	An effect which causes noticeable changes in the character of the visual environment but without noticeable consequences. The proposal is adequately screened due to the existing landform, vegetation or constructed features.
Level 3 Slight Effects	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities.

	The affected view forms only a small element in the overall visual composition, or changes the view in a marginal manner.
Level 4 Moderate Effects	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Level 5 Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Level 6 Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the visual environment. The proposal affects the majority of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Level 7 Profound Effects	An effect which obliterates sensitive characteristics. The view is entirely altered, obscured or affected.

Table 13.3 *The Quality of the Landscape and Visual Effect (EPA Draft Guidelines, 2017)*

Extent	Description
Neutral Effect	Neither detracts from nor enhances the landscape of the receiving environment or view
Positive Effect	Improves or enhances the landscape of the receiving environment or a particular view
Negative Effect	Detracts from the quality of the landscape or view

Table 13.4 *The Quality of the Landscape and Visual Effect (EPA Draft Guidelines, 2017)*

Extent	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years

Please note: "Momentary" and "Brief" Effects as defined in the Draft EPA Guidelines (August 2017) are not considered relevant to landscape and visual assessment as effects of such short duration are extremely unlikely to generate appreciable effects.

Table 13.5 *The Probability of the Landscape and Visual Effect (EPA Draft Guidelines, 2017)*

Extent	Description
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.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

The landscape and visual assessment methodology will be utilised in conjunction with a professional evaluation of the proposed development to determine the degree of impact. The extents of landscape and visual effects are assessed by firstly establishing the baseline conditions, per the above charts, by classifying baseline data according to its importance and sensitivity. Secondly, evaluation of the landscape visual effects on the baseline environment using the terminology defined in Table 13.1, 13.2, 13.3 and 13.4.

The term 'study area' as used in this report refers to the site itself and its wider landscape context in the study of the physical landscape and landscape character. This may extend for approximately 1km or more in all directions from the site in order to achieve an understanding of the overall landscape. In terms of the visual assessment, the study of visual amenity may extend outside the study area, from areas where views of the site are available, but the majority of visual impacts for a development of this nature would be most likely within the local context.

13.2.2 Assessment Methodology

The methodology employed in the landscape and visual impact assessment is as follows:

- Desktop survey of detailed maps, aerial photography and other information relevant to the study area, including the Dublin City Development Plan 2016-2022 and the National Planning Framework.
- Site survey and photographic survey to determine the landscape character of the general study area and specific landscape of the site.
- Assessment of the potentially significant impacts of the proposed scheme utilising the plan and elevation drawings of the scheme to determine the main impacting features and the degree to which these elements would be visible in relation to observations made during the field survey. In determining visibility, the views to the proposed development site are considered based on the heights, finishes, design and other visual characteristics of the proposed structures and setting.
- Verified Photomontages have been prepared by a specialist 3-D Visualisations company, ModelWorks, to represent selected views which are typical of the views within the area and are intended to demonstrate the scale of the buildings in the wider landscape. The extent of potential visual impact of the proposed development on the built environment is demonstrated through a selection of representative view locations around the proposed development. The photomontages on which the following assessments is based are provided in Appendix 13.1.

The study methodology reflects the guidance in Guidelines for Landscape and Visual Impact Assessment 3rd Edition, The Landscape Institute / Institute of Environmental Assessment (Routledge, 2013), the Draft Guidelines on The Information to Be Contained In Environmental Impact Statements (EPA, 2017) and Draft Advice Notes For Preparing Environmental Impact Statements (EPA, 2015).

The assessment has operated in a stepwise refinement method with the identification of impacts forming the basis for the design of the proposed scheme. Therefore, the methodology has informed and assisted in the design of the proposed development as opposed to being an assessment of a predetermined development.

The significance of effects can be measured as a function of the magnitude of change (i.e. the degree of change from the baseline) and the sensitivity of the receptor. Table

5 below acts as a guide for the assessor in combining these assessment criteria. It is important to note that the assessor's professional judgement, common sense and experience are also factors in ascribing rational judgements for the significance of effects.

Table 13.6 *Level of Impact resulting from a combination of Sensitivity Rating and Magnitude of Change*

	Magnitude of Change					
Sensitivity		**Very High**	**High**	**Medium**	**Low**	**No appreciable change**
	Very High (IV)	Profound	Very Significant	Significant	Moderate	Slight
	High (III)	Very Significant	Significant	Significant	Moderate	Slight
	Medium (II)	Significant	Significant	Moderate	Slight	Not Significant
	Low (I)	Moderate	Moderate	Slight	Not Significant	Imperceptible
	No sensitivity	Slight	Slight	Not Significant	Imperceptible	Imperceptible

13.2.3 Significance and Sensitivity of the Local Landscape and Visual Amenities

In landscape and visual assessments, one of the key factors is the sensitivity of a landscape to change, where the proposed development will inevitably result in adding a new element to the landscape. The publication *Guidelines for Landscape and Visual Impact Assessment* (2013) defines sensitivity as: *"A term applied to specific receptors, combining judgments of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor."*

Sensitivity refers to the inherent sensitivity to change of the landscape resource, as well as the visual sensitivity in terms of views, visibility, number and nature of viewers and scope to mitigate visual impact.

During the initial research and evaluation, a typology was developed based on the fieldwork and research into the site. These categories will help to identify the sensitivity of the existing receptors, and are defined in the following Table 13.6 and 13.7.

Table 13.7 *Baseline Evaluation – Sensitivity of Landscape Receptors **

Landscape Typology / Receptor	**Category**
Conservation Area and/or Urban Landscape associated with listed or protected buildings, Designated ecological landscapes, Coastal andRiparian Landscapes	IV
Key Public Urban Spaces/ Historic Character Street/ Local Parks/ Tourist Attractions/Routes, Mature trees in the public realm, Local Landmark	III
Local Streets, Residential landscapes, Semi-Mature Trees in public realm	II
Degraded urban townscapes/ streetscapes, Arterial Roads	I
A low-quality landscape, e.g. Industrial landscape, etc.	Not sensitive

** This table has been developed by the author for the proposed development with reference to fieldwork and research, and with reference to Transport Infrastructure Ireland Publication no. PE-ENV-01101, published December 2020: Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Specified Infrastructure Projects - Overarching Technical Document (specifically*

Table 5 Rating of Landscape Significance / Sensitivity - example evaluation criteria for baseline categorisation of landscape / townscape / seascape significance and sensitivity)

Note that existing adverse landscape conditions can reduce sensitivity from the baseline above, such as existing poor-quality landscape elements, degradation or pollution.

Table 13.8 *Baseline Evaluation – Sensitivity of Visual Receptors ***

Receptor	Category
Listed Views/Viewshed in relevant planning documents / policies / county development plan Views from Key Public Urban Spaces and Parks, Good quality / extensive views from listed buildings or spaces, within 50m	IV
Local receptors within 200m of the site (residential properties, nursing homes, residential care units, schools, cemeteries, tourist accommodation, tourist facilities, parks) with direct views of the development Publicly accessible viewpoints identified in the study with high-quality views or within a high-quality visual environment. Views with visual prospects or features on horizon which add to sense of place.	III
Local receptors within 200m of the site with oblique or compromised views of the development, or more than 200m from the site with existing high-quality views, or from a primary pedestrian route. Existing views from elevated viewpoints, within 1 km	II
People travelling through the area.	I
People working in the area.	Not sensitive

*** This table has been developed by the author for the proposed development with reference to fieldwork and research, and with reference to Transport Infrastructure Ireland Publication no. PE-ENV-01101, published December 2020: Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Specified Infrastructure Projects - Overarching Technical Document (specifically Table 6 Rating of Visual Significance/Sensitivity - example evaluation criteria for baseline categorisation of visual significance and sensitivity)*

Note that existing adverse visual conditions can reduce sensitivity from the baseline above, such as existing poor-quality elements in the view, indirect views, existing screening, lack of features or interest, etc.

13.2.4 Difficulties Encountered

There were no specific difficulties encountered in compiling the information and completing this assessment.

13.3 RECEIVING ENVIRONMENT

13.3.1 Site Context / Site Setting

The site is located in the townland of Stapolin, 1 km northwest of the town of Baldoyle and 300m east of Clongriffin DART station, situated in the south-eastern part of Fingal County. The development is part of the proposed Coast Development within the Baldoyle Stapolin area, located on major bus line and adjacent to the Clongriffin Dart Station. The area is zoned RA for new residential developments, as are the sites to the

south and west of this application. To the north is a large area of greenbelt, and east is Baldoyle Bay, which is designated as a Special Area of Conservation (SAC) and Special Protection Area (SPA).

Figure 13.1 *Site in Context (Aerial Photo) – Clongriffin to west, Baldoyle to south, Green Belt to north and bay to east.*

The Fingal Landscape Character Assessment categorizes the site as an Estuary within the landscape character types. This is due to the site proximity to Baldoyle Bay and Estuary (500 m to the east).

The site of the proposed development is part of a larger masterplan area, as described above, much of which has already been developed as residential communities. In the wider context, the areas of Clongriffin and Clarehall to the west have also developed very considerably in the past 10 years so this site can be seen as part of a coordinated development of urban and suburban residential communities with a series of neighbourhood centres, retail units, crèches, parks and associated elements. Similar development of the communities of Portmarnock and environs 1km to the north of the site has also occurred in recent times. It should be noted that some buildings in these areas are unoccupied, partially built or incomplete, both in the immediate vicinity of the site and in the wider area due to economic conditions.

A green belt area has been retained between Baldoyle and Portmarnock, zoned for High Amenity, as described earlier. This area is centred on the Mayne River and includes Mayne Marshlands, a brackish marsh and a considerable area of wetland and grassland of local and regional importance. Baldoyle Estuary also forms part of the landscape context for the site, which is a sensitive coastal landscape with high value under international designations.

This area is centred on the Mayne River and includes Mayne Marshlands, a brackish marsh and a considerable area of wetland and grassland of local and regional importance. Baldoyle Estuary also forms part of the landscape context for the site, which is a sensitive coastal landscape with high value under international designations. As noted elsewhere, the green belt area is to become a large park, Racecourse Park, under plans lodged by Fingal Co. Council to An Bord Pleanála in 2021 (ABP Ref ABP-311315-21), and in accordance with County Development Plan and Local Area Plan objectives.

13.3.2 Site Character

The subject site is approximately 6.1 hectares in area and is mainly composed of a partially cleared development site. The site is on the fringe of a recently developed (over past 10-15 years) residential development area. The site has been colonised by the flora typical of waste ground, primarily grasses, weeds and some small pioneer shrubs such as Buddleia or Willow in places. There are also some mature trees on the site, which are of moderate and low arboricultural value. There are two stands of trees. The first has 13 trees in total, all non-native, 12 of which are Sycamore and one is Alder. A second stand of existing trees within the site area is located at the Stapolin Haggard (a future Class 2 Open Space, permitted under previous planning permission – Reg. Ref. F16A/0412, which also forms part of the proposed development's provision of open space in accordance with the provisions of the Local Area Plan). (See Arborist's Report for full details of existing trees at Appendix 13.2.)

Figure 13.2 *Site in Context (oblique aerial photo looking north) – Clongriffin to west, Baldoyle to south, Green Belt to north and bay to east.*

The Stapolin Haggard to the south and an adjoining area to the north contain some mature trees, generally common native and naturalised trees such as Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Aspen (*Populus tremula*) and scrub understorey (Hawthorn, Elder, Rose, Bramble, etc.). None of the trees would be considered remarkable in visual or sylvicultural terms and they are in fair condition generally.

13.3.3 Planning Context

13.3.3.1 Fingal Co. Development Plan 2017-23

The site is within the Baldoyle Stapolin Local Area Plan area. The overall Coast Development is divided into pre-determined sectors, in compliance with the Baldoyle Stapolin Local Area Plan objectives. This application includes Growth Area 2 – Sectors 6A/6B, 7, 8A, 8B, 8C as shown in the Figure 13.3 below.

Figure 13.3 *Development Sectors which are within this application. Growth Area 2 – 6A/6B, 7, 8A, 8B, 8C*

The Stapolin Haggard area is to be developed as a public park, in accordance with the LAP and planning permission granted to an adjoining landowner, under Reg. Ref. F16A/0412. This park will include a play area, seating, lawn / kickabout spaces, planting, paths, etc. and will protect the existing trees on the site as a wooded space for the new park. It is anticipated that this park and adjoining development will be constructed prior to the proposed development. It should be noted that part of this park (0.85 hectares) forms part of the open space associated with the proposed development, under the provisions of the Baldoyle-Stapolin Local Area Plan.

A green belt area is designated between Baldoyle and Portmarnock, zoned for High Amenity, as described earlier. This area is centred on the Mayne River and includes Mayne Marshlands, a brackish marsh and a considerable area of wetland and grassland of local and regional importance. Baldoyle Estuary also forms part of the landscape context for the site, which is a sensitive coastal landscape with high value under international designations. A large new public park is proposed in the green belt area, Racecourse Park (ABP Ref ABP-311315-21). In 2021, Fingal Co. Council submitted an application to An Bord Pleanála for approval.

The site area is also designated as being on the edge of a 'Highly Sensitive Landscape' area as designated on Map Sheet 14 (Green Infrastructure) of the Fingal Co

Development Plan. Most of the area designated as Highly Sensitive correlates with the areas zoned as High Amenity, with some overlap on the urban edge of Baldoyle and the area designated as part of the Baldoyle-Stapolin LAP.

Figure 13.4 *Extract from Fingal Development Plan 2017-2023 Mapping – showing zoning: High Amenity (dark green), Residential Area (Beige), Existing Residential (Orange-Brown); and Highly Sensitive Landscape (hatching over other zoning)*

13.3.3.2 Baldoyle-Stapolin Local Area Plan

The Baldoyle-Stapolin Local Area Plan was published in May 2013 and has been extended so it remains the guiding plan for the development of this area. There are several aims and objectives within the plan that relate to landscape and green infrastructure. The plan aims for Sustainable Development: "the creation of an urban area with buildings and surrounding areas constructed to high standards of sustainable design, accessible good quality public transport, green spaces and corridors and strong inclusive communities" and High Quality Places for All: "the development of interesting, exciting and stimulating buildings and public spaces, which make the most of natural features and are well connected to surrounding areas. Objective 3 seeks to "Establish a rich tapestry of quality connected open spaces and river corridors across the LAP Lands, which provide for visual amenity and recreational use while addressing the need for nature conservation and flood risk mitigation. Objective 5 looks to "Achieve a high standard of design through development that creates a real sense of place through the juxtaposition and provision of buildings, streets, spaces, features and facilities of high quality design, layout and materials."

Figure 13.5 *Extract from Baldoyle Stapolin Local Area Plan Figure 4A.1 Racecourse Park Masterplan showing the key axes and open spaces that relate to the study area.*

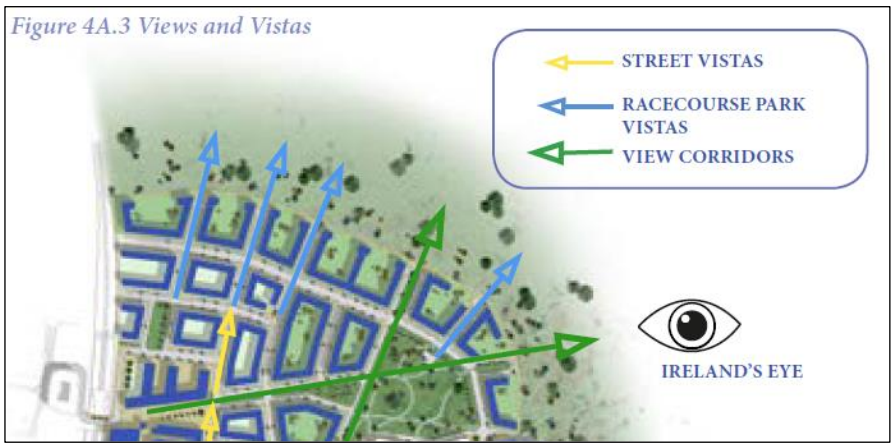


Figure 13.6 *Extract from Baldoyle Stapolin Local Area Plan Figure 4A.3 Views and Vistas showing the important visual corridors and prospects related to the study area.*

13.3.3.3 Urban Development and Building Height Guidelines, December 2018

These Guidelines build on the policy objectives sought by the National Planning Framework for more compact forms of urban development. Further to this, the Guidelines state that "A key objective of the National Planning Framework is, therefore, to see that greatly increased levels of residential development in our urban centres and significant increases in the building heights and overall density of development is not only facilitated but actively sought out and brought forward by our planning processes..." (Para 1.20).

Additionally, the Guidelines confirm that higher buildings can also play a role in placemaking, in that 'they can also assist in reinforcing and contributing to a sense of place within a city or town centre, such as indicating the main centres of activity, important street junctions, public spaces and transport interchanges. In this manner, the increased building height is a key factor in assisting modern placemaking and improving the overall quality of our urban environments."

A set of Specific Planning Policy Requirements (SPPRs) are laid out in the guidelines. These "take precedence over any conflicting, policies and objectives of development

plans, local area plans and strategic development zone planning schemes" which allows for placemaking structures which are taller where appropriate.

With regard to demonstrating that the proposed development is an appropriate addition to the fabric of the area, the Guidelines set out criteria. Following are extracts of particular relevance to landscape and visual assessment:

At the scale of the relevant city/town

- Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/ enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks and protection of key views.
- On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape.

At the scale of district/ neighbourhood/ street

- The proposal responds to its overall natural and built environment and makes a positive contribution to the urban neighbourhood and streetscape
- The proposal is not monolithic and avoids long, uninterrupted walls of building in the form of slab blocks with materials / building fabric well considered.
- The proposal enhances the urban design context for public spaces and key thoroughfares and inland waterway/ marine frontage, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure while being in line with the requirements of “The Planning System and Flood Risk Management – Guidelines for Planning Authorities” (2009).
- The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is situated and integrates in a cohesive manner.
- The proposal positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood.

The residual landscape and visual impacts are considered within both the above scales.

13.3.3.4 Established Building Height

To further put this proposed development into its context and appraise its impact on visual amenity within the surrounding area, it is important to understand how previously granted planning permissions have approached the issue of height in the area.

Permitted developments on adjacent sites (GA1, ABP Reg. Ref.:311018-21 and GA3, ABP Reg. Ref.:311016-21) each have buildings ranging from two (2) to fifteen (15) storeys. Most of the buildings in these developments are more than five storeys in height, with increased heights to create variation and as focal points within the urban framework. Heights also increase towards Racecourse Park and in GA3 the heights along the frontage with Racecourse Park rise from six storeys generally to 10 storeys and with one fifteen-storey focal building, which references a similar focal point close to Clongriffin Train Station in GA1.

Under the SHD process, An Bord Pleanála have permitted increased height and density of development in these areas within the Baldoyle-Stapolin LAP lands, adjacent to the proposed development.

13.3.4 Landscape / Identification of Sensitive Receptors

The sensitive receptors in terms of landscape on or adjacent to the site are as follows:

- Sensitive Landscape Area as defined in County Development Plan
    - Due to the zoning and local area plan proposals for this area, and the existing permissions granted on this site this peripheral area of sensitive landscape has been deemed suitable for development, and therefore the level of sensitivity is reduced.
- Existing tree line on site (within sensitive landscape)
- Stapolin Haggard, including existing trees

Wider considerations of landscape character and context are also considered as landscape receptors.

13.3.5 Views and Visual Environment / Identification of Sensitive Receptors

The site is relatively open from the east, west and north, with views in from surrounding roads, dwellings and amenity areas. The southern boundary is partially open due to recent developments. There are views from Baldoyle and Grange Road but they are somewhat screened by the existing vegetation in the Stapolin Haggard.

In general terms, views of the site from the surrounding areas are of low value, particularly in comparison with the scenic quality of the coastal landscapes and views out to sea, which are very scenic and of high amenity value.

Sensitive views into the site are potentially from the listed views in the development plan from the R106 and the road leading to Portmarnock Golf Club to the east and Howth SAAO some distance to the south-east. Residential areas in Baldoyle to the south may also have views of the site and the new communities of Clongriffin to the east, perhaps including Fr. Collins Park (approx. 1.3 km away). Views from Mayne Road and the residences along that road are also considered in the study.

The quality of views that may occur from more distant vantage points will not be affected by the proposed development due to the existing context and character of the site and are therefore considered to be irrelevant to this study. This is due to the current land use context and site character being of low visual and landscape value and the visual presence of the existing developments in the immediate environs of the proposal.

Views from the site, particularly those of Ireland's Eye and the Hill of Howth are also considered to be important.

Visually sensitive receptors have been identified through review of planning policies and fieldwork and are described in the following paragraphs. See Figure 13.7 for a map showing the receptors, labelled V01-V12.

13.3.5.1 Listed Views and Greenway

The listed views and prospects in the Fingal County Development Plan potentially relevant to the site are from the following areas:

- V03/V04/V05/V11 - The R106 road and Portmarnock Greenway which runs along the coast from Baldoyle to Portmarnock and is approximately 400 m from the subject site at its nearest point (note: views of the site are only available from the area of the R106 south of Mayne Road junction due to landform west of the road);
- The local road that runs from Portmarnock to Portmarnock Golf Club (on the western site of the sand spit enclosing the estuary) – 1.2 km from the site;
- Howth Special Amenity Area – some 5 km from the site.

From a site assessment and review of the development plan, the main elements of high visual quality in these views are the landscapes and seascapes of the coastal zone itself. There are occasional distant views of the Dublin Mountains to the southern horizon from some locations along the road. Views inland are less satisfactory in aesthetic and visual interest terms. The existing buildings in the new development areas of Baldoyle and Clongriffin, as well as existing urban and suburban development, are visible in many views from the R106 and the road to Portmarnock Golf Club. Views from Howth are too distant for the site to be considered a unique element. It is perceived as part of a wider urban landscape and change on this relatively small site would not be noteworthy. Therefore, the view from Howth is not considered sensitive in the context of this assessment and is deemed irrelevant in accordance with the methodology.

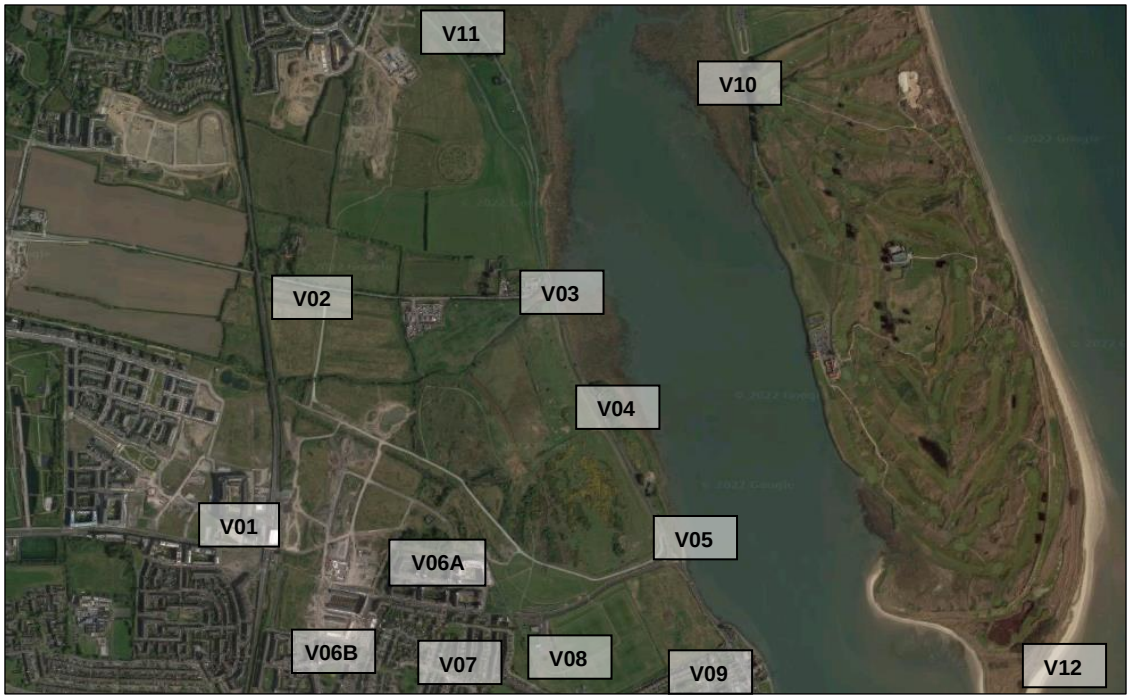


Figure 13.7 *Map of Visually Sensitive Receptors; Note – Photomontages prepared for particularly sensitive including listed views (Fingal Co. Development Plan), views from key public realm locations and public amenity areas - V01, V02, V03, V04, V05, V08, V10, V11 and V12*

13.3.5.2 Views from South of Site (Baldoyle & Environs)

Views from Racecourse Park (V08) are representative of the typical visibility of the site in terms of visibility of the proposed development for both amenity and residential receptors in the areas to the south of the proposed development, along the northern fringes of Baldoyle. In general, the site itself is not visible except from dwellings on Red Arches Drive due to the screening effect of the Red Arches estate. Some of the taller vegetation on the site and in the green belt space beyond may be visible, but due to the generally flat landscape which is falling gently towards the Mayne River in the green belt, generally the sky is large in the viewshed, and the horizon is very low, with Portmarnock and the estuary beyond.

The views from the south of the site are from the established housing estates of:

- V06A - The relatively recent housing estate of Red Arches (occupied c.15-20 years ago) is directly adjacent and to the south of the proposed development. It should be borne in mind that the proposed development is part of the same masterplan lands as these residential developments, which reduces the sensitivity of visual receptors here, as they will have been aware that the site was to be developed and that any views that they currently have of or across the site of the proposed development were likely to be temporary. Views from dwellings facing north from Red Arches Drive will be the most sensitive. Sensitivity of these dwellings is considered low, due to the factors described above.
- V07 / V06B - Stapolin Lawns / Castlerosse and Longfield Road/Myrtle estates are to the south-west - approx. 200-300m to the south of the site. Views are generally blocked by Red Arches estate;
- V09 - Admiral Park – approx. 550m – 750m south-east of the site. Views from rear windows and private amenity space from some dwellings similar to the views from V08, where available.
- V12 – Views from further afield, such as Burrow Road, Sutton, from south of the site, looking north.

Views from these areas, where available, are of a moderate visual value and sensitivity as there are no distinctive or attractive features but there is usually a view of green belt lands beyond the site. The immediate views of the site, where available, are of very low quality, including site hoarding, waste ground, etc. due to the unfinished appearance of the adjoining development. The trees in the Stapolin Haggard area are visible, emerging from the scrub and the treeline on the site is more than 100m from the existing residential buildings on Red Arches Drive, and would be visible but do not form an important part of the views.

13.3.5.3 Views from West of Site

Views from the west of the site are from Clongriffin, in the area around the DART station (min. 230m from the site) and residential areas west of the railway. The view from the DART station is considered representative of views from this area line (V01 on Figure 13.7). The views from residential units are partially limited at ground level due to the DART line being raised and associated structures, infrastructure, embankments and vegetation limit views from ground level. Upper floor apartment windows will have good views to the east at present, as do dwellings on Belltree Avenue, Lake Avenue and Marrsfield Avenue to the northwest. It should be borne in mind that the proposed development has been intended for development since these dwellings were built, which reduces the sensitivity of visual receptors here, as they will have been aware

that the site was to be developed and that any views that they currently have of or across the site of the proposed development were likely to be temporary.

Views from these areas towards the east include the partially developed site area and other undeveloped sites and building sites in the middle ground with the coastal landscape in the background, including Ireland's Eye and the Hill of Howth.

Views from Fr. Collins Park, the primary open space in the district (approx. 1.3 km to the west of the site) would not be affected as there is a line of mature trees on the eastern boundary of that park which restrict views in the direction of the proposed development. Some views are available from the high point in the north of the park but at this distance the subject site forms a very minor element in the view and these views are therefore not considered sensitive in the context of this assessment.

13.3.5.4 Views from North of Site

Views from the north of the site are from Mayne Road, where infrequent breaks in hedgerows occur (V02 on Figure 13.7).

There are several residences along the north side of Mayne Road from the river bridge in the east to the rail bridge west along the road (some 500-650m north-east and north-west of the site). Due to the mature hedgerow along this part of Mayne Road, there are no open views of the site to the south, so these houses are not considered sensitive.

There is also a halting site to the south of Mayne Road and there are open views to the site of the proposed development, some 400m away. The quality of these views is moderate, with the open green belt area in the fore- and middle-ground and the existing housing in Baldoyle and Clongriffin in the background.

Views from the greenbelt lands, i.e. the planned Racecourse Park, should also be considered, from where there are open views of the site.

13.3.5.5 Views from the Site

The most important scenic views from the site are of Baldoyle Estuary and the coastal landscape including Ireland's Eye. The Hill of Howth is visible from some areas of the site but the existing trees and development to the south of the site limit views to the south and south-west from parts of the site. Views of the green belt lands to the north are of medium scenic quality, as this is quite a flat and scrubby landscape.

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

This development comprises of the construction of 1,007 residential apartments in 16 no. 4 to 12 storey buildings comprising 58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units, 6 no. communal residential community rooms, and a ground floor creche with outdoor play space.

Figure 13.8 *Drawing from CCH Architects' Architectural Design Statement showing the proposed layout of the development (with the Stapolin Haggard Class 2 Open Space).*

Associated site development includes 743 no. car parking spaces (605 no. spaces at basement level and 134 no. surface level spaces for visitors), along with the landscape and public realm proposals described herein, public lighting, drainage and ancillary site services and infrastructure development works. 1,754 no. bicycle parking spaces for residents and 500 no. bicycle spaces for visitors are proposed in covered and secure parking facilities at ground level throughout the scheme.

The landscape architectural design proposals include public realm, green spaces, courtyards, tree and shrub planting, etc. and are considered as an integral part of the scheme. The landscape proposals are the result of the stepwise refinement process of environmental impact assessment and are integrated into the scheme as presented and as currently being assessed.

For further detail, please see Chapter 2 (Description of the Proposed Development) and the drawings and reports submitted with the planning application. The activities associated with the proposed development which are relevant to the landscape and visual environment are discussed under construction and operational phases below.

13.4.1 Construction Phase

The construction phase may last up to five years in total (i.e. the duration of the planning permission), so any impacts generated at this stage will be temporary or short term in duration, save for some landscape effects which will be permanent. It should be noted that construction will be phased within the five years for different blocks, so impacts are likely to vary over that time, relative to the location and type of receptor and the specific building under construction. However, as this is uncertain, for the purposes of landscape and visual assessment it is assumed that the entire site will be under construction.

The initial construction operations will include land clearing, earthworks and excavations will be required for construction phase operations to facilitate site clearance, construction of new building, basements, foundations and installation of services. This will include site levelling, construction, and building foundation excavation, this will necessitate the removal of vegetation cover and the excavation of soil and subsoils.

The construction operations will result in changes from its current unoccupied state to that of a construction site, this will include increases in construction traffic, installation of site hoarding, temporary construction plant, use of machinery and cranes, etc. Cranes will be taller than the proposed buildings and therefore more visible in the landscape. There will also be vehicular and crane movement and changes to the configuration of the site, typical of building sites, resulting in visual impacts to local viewpoints.

There are two groups of existing trees within the development site. The first is on the edge of the future Stapolin Haggard Class 2 Open Space and will be retained. The second is a linear group of thirteen mature trees in the centre of the site, close to the boundary with Racecourse Park. These are primarily mature Sycamore, rated B, C and U class; and will be managed as follows:

- Five will be retained in full compliance with the requirements of BS5837 within the Pocket Park, Class 2 Open Space.
- One further tree will be retained subject to detailed site investigation at construction stage.
- Two trees to be removed for safety reasons (U-Class)
- Remaining five trees to be removed due to the development.

13.4.2 Operational Phase

13.4.2.1 Landscape and Visual Characteristics of The Proposed Development

This section sets out the aspects of the design of the proposed development which are most relevant to the landscape and visual assessment, including such parameters as the heights of the buildings, materiality, character, etc.

The proposed residential development is composed of five separate groups of residential blocks, each centred on a courtyard. The courtyards provide semi-private amenity space and facilitate natural light reaching the apartments.

The proposed buildings are generally four to six storeys within the development, rising to seven to twelve storeys on the northern fringe of the site, overlooking the park. The blocks step up in height from the southern and western edges of the site, interfacing with the existing Red Arches development and other planned development of similar height. Along the park edge, there is one building with 12 storeys (in Sector 7), three with 11 storeys (sectors 7, 8A and 8B), one 10-storey (Sector 7), one 9-storey (Sector 8B) and one eight-storey (Sector 8C). The rest of the blocks along this site boundary are four to seven storeys.

Figure 13.9 *Site Layout Plan (CCH Architects) indicating building heights.*

The twelve-storey building is 39.15 m in height. Each floor is c.3.15 m in height and the blocks step down accordingly, to 17.725 m in height for the five-storey and 14.6 m for four-storey blocks.

The elevations of the building are stepped and articulated to break down visual massing even further. In combination with the use of varied materials, the design effect is of punctuated and varied façades.

In relation to design and materiality, the following is taken from CCH Architects' Design Statement:

> *The proposed residential use and apartment types are comparable with those found in neighbouring Clongriffin, as well as those proposed on adjacent sites throughout Baldoyle. This variety of apartments is complemented by a range of public amenities and recreational spaces incorporated into the scheme. With regard to the types of residential units provided, the designs range from studio apartments to 1, 2- and 3-bedroom apartments. There is a variety of full brick and half brick front facades, plaster render finishes and to ensure a variety of streetscapes and character areas.*

The project has been designed to be visually in keeping with the planned and permitted urban character of the area in terms of materiality and scale. There are several buildings of similar height and materiality which have been permitted directly adjacent to the site in Growth Areas 01 and 03 (GA1, ABP Reg. Ref.:311018-21and GA3, ABP Reg. Ref.:311016-21).

Due to the layout of the blocks and competing requirements for open space and communal courtyards, five mature Sycamore trees will be removed due to the proposed development from a treeline on the eastern boundary of the site. One further

tree is intended for retention, subject to site investigation and detailed design but for the purposes of EIAR, it is considered to be removed as it is uncertain that this intention will be feasible. Two further trees will also be removed due to their poor health as recommended by the Arborist. In all, a total of eight trees from the tree line of thirteen trees are assessed as being removed, six of which are due to the proposed development.

13.4.2.2 Considerations in Project Design related to Landscape and Visual Concerns

The landscape and visual assessment has operated in a stepwise refinement method with the identification of impacts informing the basis for the design of the proposed scheme. Therefore, the methodology has informed and assisted in the design of the proposed development as opposed to being an assessment of a predetermined development. The design measures outlined below are the culmination of interim assessments in the EIA process and have been integrated into the design.

Architectural / Site Layout Considerations

The design of the building has been altered during the design process to reduce potential visual effects. Such changes included reducing and rationalising the footprint of the building and stepping of the building at the edges of the site, where it interfaces with the existing residential developments. The additional height along the Racecourse Park boundary is considered to give a strong urban edge, enclosing and overlooking the park, providing passive surveillance and enhancing the security of users and therefore the useability and amenity value of the park.

Considerable attention was paid to massing, daylight and line-of-sight studies in the development of the building design which have avoided or minimised potential issues of overlooking and overshadowing.

Materiality also plays an important role in the visual character of the proposed development. CCH Architects, in the Design Statement note the following: “A contemporary palette of materials is proposed, with complimentary tones of brick and render used as the principal finish of all apartment elevations. This is contrasted with a zinc cladding finish to the circulation cores to help break-up the façade.”

Green roofs are proposed on all blocks, covering c. 85% of the roof space of the development.

Landscape Design Considerations

Landscape proposals are compliant with the policies and principles set out in the Fingal County Development Plan 2017-23 and the Baldoyle Stapolin Local Area Plan in relation to green infrastructure and relevant design principles, as discussed in previous sections. The proposals comply with the Fingal Co. Council development standards for taking in charge of landscape areas where relevant.

For details of landscape proposals, please refer to the landscape drawings and Landscape Architect’s Report accompanying this application.

The proposed buildings will be framed by trees and landscape planting. Public realm areas and open spaces, both public and communal (semi-private courtyards for residents), are heavily planted for shelter, privacy, scale and for aesthetic considerations such as visual massing and breaking up facades. The streets that connect to the adjacent developments and Clongriffin DART station to the west are

also heavily planted and integrated with SuDS (Sustainable Drainage Solutions) considerations. New pedestrian routes link with the parkland and High Amenity Area and Racecourse Park to the north and east. Play areas are also integrated into the landscape areas.

View corridors defined in the LAP are respected and there will be strong visual and physical connections from the streets within the development to Racecourse Park and views towards Ireland's Eye.

The landscape design takes cognisance of the coastal location in both the design and the selection of plants, and thus responds to the context and character of the wider location. This will create a unique sense of place for residents.

Figure 13.10 *Site Layout / Landscape Plan (Murray & Associates).*

Planting proposals incorporate softening and screening strategies to break up and partially hide the proposed buildings. The taller buildings cannot be screened with trees, so the intent is to soften and connect the base of the buildings with the parkland and streetscapes by introducing layered tree and shrub planting which will further punctuate and break up the building facades.

Tree planting also includes compensatory planting which will help to reduce the impacts of removing the trees as described above. Street tree and other shrub planting is planted for structure, scale and aesthetic reasons, as well as to integrate with

drainage proposals, providing bioattenuation functions and reducing the amount of water which will enter the drainage system.

All planting will be native and/or pollinator-friendly to encourage biodiversity adjacent to the Racecourse Park and the designated landscapes. This will provide additional support to conservation objectives in the wider landscape and animation within the site and public realm.

13.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The potential impacts are the impacts that the development could have without consideration of any additional landscape mitigation or amelioration over and above that included in the design proposals for the site. For the sake of clarity these shall be considered under the following headings: Landscape Impacts and Visual Impacts.

These effects have been compiled to identify any areas where the proposed development may be injurious to the scenic and visual character of the area and represent the potential impact rather than the eventual long-term effect. These are effects which do not consider additional mitigation measures over and above the development proposal as presented.

The Environmental Impact Assessment process operates in a stepwise refinement process and many of the potential 'mitigation' strategies have been integrated into the design of the proposed development. The following assessment of potential effects takes into account the proposals as submitted on drawings and documents.

Potential landscape impacts are those that may affect the quality of landscape character, pattern or elements such as trees, watercourses, soil, etc.

Potential visual impacts of the proposed development are assessed by examining specific views to and from the site of the proposed development. Views into the site and from the site can be seen in the accompanying contextual site photos. These plates show key viewpoints from the surrounding area, which will be potentially affected by the proposed development. Verified Photomontages have also been prepared by a specialist 3-D Visualisations company, ModelWorks, to represent selected views which are typical of the views within the area and are intended to demonstrate the scale of the buildings in the wider landscape.

13.5.1 Construction Phase

13.5.1.1 Landscape Impacts

Short-term Landscape Impacts (up to five years[1])

There will be slight negative short-term impacts associated with the construction works of this development. This will be due to the substantial site clearance and building processes required to erect the proposed retail development. The landscape is not currently of value but it will undergo change from that of an area of partially-developed waste ground to a large construction site, with several buildings being constructed.

[1] *The expected timeframe for construction is within five years, as this is the duration of the planning permission. Seven years accords with the Draft EPA Guidelines (August 2017) definition of short term impacts.*

The removal of 5 no. existing mature Sycamore (*Acer pseudoplatanus*) trees due to the development is considered a moderate negative impact in the local landscape, which is designated as a 'Sensitive Landscape' in the county development plan. Trees are relatively scarce in this landscape at present and so this treeline is considered to have some importance. However, with reference to the Tree Survey carried out by John Ward, Arborist (Murray & Associates, 2022) the trees are not native and are not all in good condition. Of the thirteen trees in the treeline, three are in serious decline and recommended for removal. Five will be retained and five removed. This retains the current landscape pattern and structural effect of the treeline.

The potential landscape impacts during construction in the absence of mitigation (by design) are due to the removal of vegetation is ***negative***, ***moderate*** and ***short term.***

13.5.1.2 Visual Impacts

Short-term Visual Impacts (up to five years[2])

Temporary and short-term negative impacts on visual amenity are likely to occur during the construction phase. Impacts are likely to arise due to the following visual characteristics of construction works:

- Temporary buildings such as site offices and welfare units
- Temporary structures and apparatus such as cranes, scaffolding and other temporary structures
- Temporary lighting and signage
- Movement of people and plant on-site, traffic, vehicles entering and leaving the site
- Buildings under construction, partially-completed buildings

Most construction impacts will be localised, but the height of some buildings and the cranes that will be necessary for their construction are likely to be visible over a wider area. Construction is anticipated to take a period of 60 months (5 years), meaning construction phase impacts will be temporary to short-term and negative in terms of quality for local receptors, including residents and recreational users, including from local roads and coastal areas. The magnitude of change in views will vary during that time from low to medium to high for individual receptors, particularly those closest to the building site in Red Arches.

However, the residential receptors in this area will have been aware that the area would be undergoing development and this reduces their sensitivity to change, so the maximum level of visual impact is likely to be ***negative, moderate*** and ***short-term*** in duration.

It appears likely that phasing of construction works will result in the reduction of visual impacts as only parts of the site will appear as a construction site in views at any given time, potentially resulting in the reduction of visual impact for certain receptors at certain times. However, as this cannot be known at the time of assessment, it is not taken into consideration, and the worst-case scenario is assessed.

[2] *The expected timeframe for construction is within five years, as this is the duration of the planning permission. Seven years accords with the Draft EPA Guidelines (August 2017) definition of short term impacts.*

13.5.2 Operational phase

13.5.2.1 Landscape Impacts

Short-term landscape impacts after the construction works (up to seven years)

The operational phase will give rise to a noticeable change in the landscape character. , The main landscape impacts of the proposed development are associated with the change in land use from partially-developed waste ground of low value to a residential community environment with landscaped streets, public open spaces, courtyards and green spaces.

The landscape measures that form part of this development will significantly improve the quality of the landscape character of this area.

This is considered a ***significant, positive***, and ***long-term*** effect on the landscape character, compared with the current low value, poor quality landscape of the site. The proposed development will effect a more complete urban landscape, a more harmonious and diverse landscape, as against the current unfinished brownfield area.

The proposed development will have a significant built edge, up to eleven and twelve storeys along the fringe of the green belt and future parkland, together with a buffer area of tree and native hedgerow planting (see Figures 13.7 and 13.8 and Section 13.4 for description of proposed development). This will create a strong urban edge, which is part of a planned urban framework (Baldoyle Stapolin LAP), forming a defined urban edge to the proposed future park. The juxtaposition of the built edge with the parkland is a deliberate contrast and is considered to be a significant positive impact, as it contributes to the landscape character through creating a definitive edge and interaction with the parkland. The contrast of tall buildings rising out of trees and parkland is a strong aesthetic statement, and a visual composition which is common across many towns and cities in Europe and globally.

The treeline of five retained mature Sycamore trees is integrated into a Class 2 Open Space ('Pocket Park') and additional compensatory trees are proposed to be planted within the space, reinforcing the original line of trees. It should be noted that Sycamore is listed as a 'Medium Impact Invasive Species' on the National Biodiversity Data Centre's Invasive Species lists, so the replacement trees proposed include Oak, Alder, Field Maple and Lime, all of which are considered appropriate to this landscape. This will also be associated with an entrance into the proposed Racecourse Park.

Medium-term landscape impacts (seven to twenty years)

There will be no further landscape impacts during this period due to the proposed development, except to note that the trees and planting will continue to grow and develop. This may result in further ***slight positive*** impact in terms of maturity and sense of place.

Long-term landscape impacts (over twenty years)

The trees and planting will continue to grow and mature over this timescale, and are expected to reach 10-15m in time. This will result in further ***positive*** impact in terms of maturity and sense of place. More than 500 trees are included with this proposed development. In the longer term, the overall impact of the proposed trees to be planted on the site is significant and positive.

13.5.2.2 Visual Impacts

Short-term visual impacts after the construction works (up to seven years)

Listed Views: From the R106 road and Portmarknock Greenway between Baldoyle and Mayne Road (Photomontages V03-V04-V05):

The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east of the road. These primary elements of the listed views will not be affected by the proposed development. The less valuable views inland over the green belt will change due to the juxtaposition of the buildings with the parkland, wetlands and grassland and the contrast arising. The existing green spaces in the foreground and middle ground of the views will not be altered. The magnitude of change is considered to be medium. As the buildings face onto the green belt and future park, they are clearly visible in this flat landscape and the viewer will see the buildings from several vantage points on the road, some 400m away at the nearest point, emerging from the proposed treeline. The Dublin Mountains are faintly visible on the horizon of some views and these could be partially impacted from some of the vantage points along the road, but will not be fully blocked. The buildings will form a new element in the view thereby creating a moderate impact in the post-construction stage. In the short term, the newly-planted trees are unlikely to have a strong visual presence. The quality of impact is considered positive, as the new view will be of an urban landscape emerging above the new trees and a very deliberate building interface along the green belt, which varies in terms of height and materiality.

Listed Views: From the local road that runs from Portmarnock to Portmarnock Golf Club (V10)

Views from this viewpoint (c.1.4km from the site) will be affected by the proposed development. Due to the flat nature of the Estuary landscape, existing buildings in the vicinity of the proposed development are visible as a single cluster from this panoramic vantage point and the new buildings would be larger and more prominent in the background of views of the estuary. The buildings will appear to be on the horizon due to the flat nature of the landscape and some views of the Dublin Mountains on the horizon are partially blocked. However, due to the extent and range of views from this point and the distance from the receptor to the site, the magnitude of change would be perceived as low and the impact would be classified as slight. The quality of impact is considered positive, as the new view will be of an urban landscape emerging above the new trees and a very deliberate building interface along the green belt, which varies in terms of height and materiality.

Listed Views: From Portmarnock (V11)

Views from this viewpoint (c.1.4km from the site) will be affected by the proposed development. The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east and southeast from this vantage point. Secondary views are inland over the existing hinterland of Portmarnock, greenbelt lands and Mayne River. The topography of the area north of Mayne Road is somewhat undulating and this hides existing buildings around Baldoyle and Clongriffin in this view. Views of the Dublin Mountains are visible on the horizon to southwest. Due to the topography of the landscape, existing buildings in the vicinity of the proposed development are not visible from here and the proposed buildings are prominent in the distance. The proposed buildings will appear above the horizon due to the landform. Views of the Dublin Mountains on the horizon are not affected. This is in line with emerging trends in the area and is considered a slight impact. The quality of impact is

considered net negative as the buildings create a new element over the horizon and are not legible as part of the greenbelt edge as in other views.

Views from South of Site (Baldoyle, V06-V09; V12)

Views from Red Arches (V06) will be affected at a moderate level, but this will be a positive impact resulting from the completion of the residential area. At present, the site is unsightly in the foreground of views from these areas and in particular from the higher floor apartments and the construction of the proposed development would help to remove the unfinished appearance, improving the visual environment and removing hoarding thereby allowing the Stapolin Haggard Open Space to be opened up to views from the dwellings. The new streets with tree planting and green space, as well as the good quality architecture of the buildings will result in a generally moderate or significant, positive visual impact. The blocking of some longer distance views over the green belt area is considered a slight negative impact, but is outweighed by the positive effects and the residents in these dwellings will have been aware since they moved in that this site would be developed and these views would be extinguished in the process of delivering on the Local Area Plan.

Views from Racecourse Park (V08) represent the typical visibility of the proposed development for both amenity and residential receptors in the areas to the south of the proposed development, along the northern fringes of Baldoyle. Some of the proposed buildings will be visible above the trees and park elements and the existing developments. This is considered a slight, negative effect where the new buildings are visible against the sky.

The visual impact on the views from Admiral Park (V09), Baldoyle, 550m from the site, will be slightly negative, as the new buildings will be peripherally visible in views from rear windows and private amenity areas and they will be larger than any other recent buildings in the Red Arches estate. The quality of visual impact is considered negative in this context because the existing poor quality site is not visible from these vantage points, only some of the new buildings may be visible over the existing dwellings at Red Arches.

Views from Stapolin Lawns / Castlerosse and Longfield Road/Myrtle estates (V07), Baldoyle are not likely to change in any notable way, due to the screening effect of Red Arches estate. Even where parts of the proposed buildings may be glimpsed, they will be perceived as an extension of the existing built form from these viewpoints. Thus, the visual impact to these dwellings is considered to be 'not significant' or imperceptible.

Views from further afield to the south of Baldoyle and along the coast can also be considered sensitive. Representative of these views is that from Burrow Road, Sutton (V12). The primary elements of the view are estuarine sand flats, the inhabited coastline and flat horizon composed of buildings and trees. Prominent focal points in the views are Baldoyle Church and existing development at Baldoyle and Clongriffin. Views from this area (c.2km from the site) will be affected by the proposed development. Due to the flat topography, the skyline is composed of buildings and trees and the proposed buildings will be visible above these in the distance. This is in line with emerging trends in the area and is considered a slight long term impact.

Views from West of Site

Views from the west of the site are from Clongriffin, in the area around the DART station (min. 230m from the site) and residential areas west and northwest of the

railway, including dwellings on Belltree Avenue, Lake Avenue and Marrsfield Avenue. Existing views of the green belt and coastal landscape would be partially blocked or changed, as the new buildings would be perceived as a new element in the middle ground of the views. This is in line with emerging trends in the area, but would be considered a slight negative impact as the existing poor-quality site is hidden from these vantage points and the new buildings will be visible against the sky.

Views from North of Site (V02)

Views from the halting site on Mayne Road and Mayne Road (where available) over the green belt will change due to the juxtaposition of the buildings with the wetlands and grassland and the contrast arising. Photomontage V02 shows this view from the south of Mayne Road, similar to the view from the halting site. As the buildings face north onto the open spaces and define a new built edge in this flat landscape, the viewer will see the new buildings clearly, from 400 m away, emerging from the proposed treeline on the boundary. Views of Howth Head and the coast to the east and southeast are not affected. The buildings will form a new element in the view thereby creating a moderate negative impact on these views.

Views from the Site

Views from the site will be of the green belt and coastal landscape. New residents can expect to enjoy high quality views from east and north-facing windows and from the open spaces and streetscapes. One of the main streets in the proposed development has been aligned with the view to Ireland's Eye to take advantage of this unique prospect.

Medium- and long-term visual impacts after the construction works (seven to sixty years)

Over time, as the proposed planting measures establish and grow to maturity, negative visual impacts will reduce and positive visual effects will increase.

Listed Views: From the R106 road and Portmarknock Greenway between Baldoyle and Mayne Road (Photomontages V03-V04-V05):

The buildings will form a new element in the view and result in a slight visual impact in the medium to long term when the trees have matured and the buildings appear integrated into the parkland and green belt landscape. The quality of impact is considered positive, as the new view will be of an urban landscape emerging above the new trees and a very deliberate building interface along the green belt, which varies in terms of height and materiality.

Listed Views: From the local road that runs from Portmarnock to Portmarnock Golf Club (V10)

Due to the flat nature of the Estuary landscape, the new buildings will be relatively prominent in the background of views of the estuary, but form a relatively small part of the overall panorama of views from this location. When the trees have matured, the buildings will still appear to be on the horizon due to the flat landscape. Some views of the Dublin Mountains on the horizon are partially blocked. However, due to the extent and range of views from this point and the distance from the receptor to the site, the magnitude of change would be perceived as low and the impact would be classified as slight. The quality of impact is considered positive, as the new view will be of an urban

landscape emerging above the new trees and a very deliberate building interface along the green belt, which varies in terms of height and materiality.

Listed Views: From Portmarnock (V11)

Due to the topography of the existing landscape, existing buildings in the vicinity of the proposed development are not visible from here and the proposed buildings are prominent in the distance. The proposed buildings will appear above the horizon due to the landform. Views of the Dublin Mountains on the horizon are not affected. This is in line with emerging trends in the area and is considered a slight impact. The quality of impact is considered net negative as the buildings create a new element over the horizon and are not legible as part of the greenbelt edge as in other views.

Views from South of Site (Baldoyle, V05-V08)

At present, the site is unsightly in the foreground of views from these areas and in particular from the higher floor apartments. When the proposed trees mature, views from Red Arches (V06) will be significantly positively affected resulting from the completion of the residential area and the heavily planted streets and open spaces.

Slight negative impacts will remain in views from Racecourse Park (V08) and Admiral Park (V09) where some of the taller proposed buildings will be visible above the trees and the existing developments in the intervening landscape.

Views from Stapolin Lawns / Castlerosse and Longfield Road/Myrtle estates (V07), Baldoyle are not likely to change in any notable way, due to the screening effect of Red Arches estate. Thus, the visual impact to these dwellings is considered to be 'not significant' or imperceptible in the longer term.

Views from West of Site

Views from the west of the site are from Clongriffin (V01), in the area around the DART station (min. 230m from the site) and residential areas west and northwest of the railway, including dwellings on Belltree Avenue, Lake Avenue and Marrsfield Avenue. Existing views of the green belt and coastal landscape would be partially blocked or changed, as the new buildings would be perceived as a new element in the middle ground of the views. This is in line with emerging trends in the area, but would be considered a slight negative impact as the existing poor-quality site is hidden from these vantage points and the new buildings will be visible against the sky.

Views from North of Site

Views from the halting site on Mayne Road and Mayne Road (where available) and from the green belt area over the green belt will change due to the juxtaposition of the buildings with the wetlands and grassland and the contrast arising. Photomontage V02 shows this view from the south of Mayne Road, similar to the view from the halting site. As the buildings face north onto the open spaces and define a new built edge in this flat landscape, the viewer will see the new buildings clearly, from 400m away, emerging from the proposed treeline on the boundary. Views of Howth Head and the coast to the east and southeast are not affected. The quality of impact is considered positive, as the new view will be of an urban landscape emerging above the new trees and a very deliberate building interface along the green belt, which varies in terms of height and materiality.

Views from the Site

Views from the site will be of the green belt and coastal landscape. New residents can expect to enjoy high quality views from east and north-facing windows and from the open spaces and streetscapes. One of the main streets in the proposed development has been aligned with the view to Ireland's Eye to take advantage of this unique prospect.

13.5.2.3 Night-time Effects

Proposed street lights and lights within the proposed buildings will be visible in the night-time landscape. This is considered as part of the architectural fabric of the emerging new neighbourhood and will add to the sense of passive surveillance. There will be no loss of privacy or overlooking of (or from) adjacent properties. This is not considered to generate any appreciable or additional impacts over and above those already assessed. When viewed from sensitive landscapes and viewing points from the north and east (including the listed views), the site is considered to have minimal additional impact as the towns of Baldoyle, Clongriffin, Howth, etc. and the city of Dublin are all lit at night, so there is no pristine dark sky which is impacted.

13.6 REMEDIAL AND MITIGATION MEASURES

The following mitigation measures have been considered to assess the avoidance, prevention, reduction, and offsetting of the potential negative effects described in the preceding Section. Mitigation measures can also reinforce the positive impacts of the proposed development. Mitigation measures are proposed and considered only on the lands of the subject site.

13.6.1 Incorporated Design Mitigation

As described earlier, several mitigation strategies which minimise landscape and visual impact or enhance the visual and aesthetic appearance of the proposed development were integrated into the design of the proposed development at an early stage. The architectural layout aims to create an appropriate and varied visual environment within the housing area by proposing variety in scale and massing of buildings and by creating high quality buildings. The roofscape is varied in terms of height and features to add interest to the skyline, particularly at important corners in the layout, and addressing the parkland. Façade colours and materials also vary, resulting in a diverse and human-scale architectural environment.

Landscape proposals include the following mitigation strategies which minimise landscape and visual impact or enhance the visual and aesthetic appearance of the proposed development:

- Screening and softening buildings with tree and shrub planting, helping to integrate them into the landscape. It is not intended that the trees will completely screen the buildings, given the scale of the buildings, but to have the buildings rise from tree canopies, creating an aesthetically interesting and textured, layered visual landscape. It is also acknowledged that trees in coastal landscapes are not likely to reach the same heights as trees in more sheltered conditions, so to this end, species selection and quality of execution are important to achieve the mitigation expected – see Section 13.6.2 below.
- Diverse planting species and selections in accordance with the All-Ireland Pollinator Plan, with an emphasis on native species where possible.

- Specific compensatory tree planting for the trees removed. Semi-mature or similar trees will be planted to reinstate the treeline in the landscape within the new development (specification can be agreed post-planning).
- Enhancements to the tree resource of the area, with upwards of 500no. trees and specimen shrubs proposed in the public realm areas, and a further 250no. such plants in the communal courtyard areas. Many thousands of hedgerow plants, shrubs and perennials are also proposed.
- Access to public green space and routes through the site are enhanced to connect with the Stapolin Haggard Class 2 Open Space and the proposed Racecourse Park. All dwellings are located within 150m of a Class 1 or Class 2 Open Space.

13.6.2 Construction Phase

During the construction phase, site hoarding will be erected to restrict views of the site during construction. Hours of construction activity will also be restricted in accordance with local authority guidance.

The planting works will be undertaken in the planting season after completion of the main civil engineering and building work.

The following measures are required to be integrated into landscape plans and specifications at detailed design stage prior to construction in order to ensure that the proposals as put forward will establish and develop in accordance with the expectations inherent in the proposals and so that mitigation strategies are achieved:

a) At time of planting, the proposed trees will be at least 3.5m in height with all street tree planting a minimum of 5m in height. The trees are expected to reach a mature height of at least 10-12m within 10-20 years.

b) Detailed planting and management proposals will be informed by the All-Ireland Pollinator Plan 2021-25, published by the National Biodiversity Data Centre.

c) With regard to biodiversity, native plants with value for pollinators and other insects will be included in planting design specifications. The Landscape Architect shall consult with the project ecologist with regard to suitable species prior to finalising specifications.

d) Any imported topsoil must be of a high quality, conforming to BS3882 'Multi-Purpose Topsoil' standard. Existing topsoil from site must be stored and handled in accordance with best practice standards to ensure that it is suitable for use and will support tree and plant growth. Soil ameliorants or fertilisers must be organic and used only where necessary to restore soil fertility or to ensure initial establishment.

e) Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

f) In considering landscape mitigation measures, it should be noted that Ash (*Fraxinus excelsior*) is currently restricted due to Ash Dieback Disease and cannot therefore be planted at present. Ash is one of the most common native trees in Irish hedgerows, woodlands and scrub. If the current restrictions on Ash planting are lifted prior to the implementation of the landscape scheme, Ash should be included in the planting plans for the site.

g) Where invasive plants are discovered within the development boundary, measures to eradicate or prevent their further spread will be specified in the landscape works to be agreed with prior to construction with the project ecologist.

h) All trees, shrubs, transplants, hedging material and ground cover planting shall be guaranteed for a period against death, deformation, die-back, or disease other than that caused by malicious damage.

An arboricultural consultant will be engaged to specify all works to trees and to monitor the implementation of same. The following measures are recommended for protection of existing hedgerows and trees to be retained:

a) Trees to be removed should be removed by a qualified tree surgeon to ensure that retained vegetation is not damaged and is protected from inappropriate methods of tree removal.

b) Retained trees and hedgerows should be protected with temporary fencing; which shall be retained in place throughout the contract.

c) On completion, compensatory planting should be planted as per the Landscape Architect's proposals.

d) Consultation with a suitably qualified arborist is advised for the successful and safe retention of existing mature trees.

13.6.3 Operational Phase

As noted earlier, the landscape and visual assessment has operated in a stepwise refinement method with the identification of impacts forming the basis for the design of the proposed scheme. Therefore, the assessment has informed and assisted in the design of the proposed development as opposed to being an assessment of a predetermined development. The site design proposals are the result of this process and have incorporated design mitigation. Please see Section 13.4.2 for a description of these measures inherent in the site design proposals, which include architectural design of the buildings, designed and planned open spaces, planting of street trees, boundary trees and other planting, courtyards and privacy strips, retention of existing trees, etc.

Monitoring of the landscape works and retained trees should continue for a period of at least three years post-completion to ensure that the planting establishes in accordance with the design intent and to ensure that the inherent mitigation requirements are achieved.

13.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

The residual impacts are the impacts that the development is most likely to have on the receiving environment which occur after the proposed mitigation measures have been implemented. For the sake of clarity, these shall be considered under the following headings: Landscape Impacts and Visual Impacts.

These impacts are measured under the following categories:

- Construction Phase
- Operational Phase

As noted in Section 13.6 Mitigation, the majority of material mitigation proposals were integrated into the design proposals and impacts are largely unchanged from potential impacts. The effect of the mitigation measures is primarily in ensuring that the quality

of implementation is such that the proposed trees, shrubs and other elements of mitigation strategies establish and grow as expected and as required to ensure that the mitigation is achieved.

13.7.1 Construction Phase

13.7.1.1 Landscape Impacts

As mitigation measures at construction stage will have minimal effect on mitigating landscape impacts, The residual landscape impacts during construction in the absence of mitigation (by design) are due to the removal of vegetation is ***negative***, ***moderate*** and ***long term.***

13.7.1.2 Visual Impacts

The proposed hoarding and restricted working hours proposed as mitigation measures for the construction stage will result in localised improvements to the visual impact but will not eliminate it. Therefore the residual impact is ***negative, moderate*** and ***short-term*** in duration.

13.7.2 Operational Phase

13.7.2.1 Landscape Impacts

As the mitigation measures proposed were assessed as part of the potential impacts, the predicted landscape impacts will be as per the potential effects – see Section 13.5.1.2, 13.5.1.3 and 13.5.1.4. Over time, trees and planting will continue to grow and develop, resulting in further slight positive impact in terms of maturity and sense of place.

With regard to the *Urban Development and Building Height Guidelines*, December 2018, the following conclusions are relevant to residual landscape impacts in the operational phase.

City/Town Scale

- The proposed development is set in an area of new and recent development centring on public transport hub at Clongriffin. The site layout plan incorporates increased building height and helps to define the character and public realm of this new urban area, with regard to topography, setting of key landmarks and protection of key views, as set out in the Baldoyle Stapolin Local Area Plan and in the context of the adjacent permitted developments.
- The proposed urban form and framework of these buildings will form a landmark in the new landscape of this area, alongside other permitted developments of a similar size.
- The buildings do not impact negatively on key views; the listed views from the R106 road focus on the coastal landscape and the views in the direction of the site are poor in quality currently, across a flat landscape.
- Views towards Ireland's Eye are framed by the proposed development, creating a permanent visual link and enhancing a sense of place.
- The proposed development forms a new element in this landscape and makes a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with strong variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape. The building

heights step upwards from the existing developments on Red Arches Drive from four storeys, and step gradually up to be commensurate with the permitted developments to the northwest and west, at 12 storeys maximum, but varying, as show on Figure 13.7 and Figure 13.8.

District/ Neighbourhood/ Street Scale

- The proposed built form responds to its environment where it presents a strong and deliberate urban edge to the green belt (planned regional park, Racecourse Park).
- The built form also responds to existing buildings by stepping up away from them, as described above.
- The proposed urban design layout makes a positive contribution to the urban neighbourhood and streetscape, with corners accentuated and variation and articulation in both vertical and horizontal planes of the buildings.
- The proposal is not monolithic and avoids long, uninterrupted walls of building and materials / building fabric are well considered and varied.
- The proposal enhances the urban design context for public spaces and key thoroughfares, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure. Passive supervision of the open spaces is also enhanced, resulting in greater amenity value from safer spaces.
- The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is situated and integrates in a cohesive manner.
- The proposal positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood.

Overall, the residual landscape impacts with regard to the criteria in the *Urban Development and Building Height Guidelines* are significantly positive.

13.7.2.2 Visual Impacts

The residual visual impacts are those that will persist following the implementation and establishment of the proposed landscape measures. See the Verified Photomontages (prepared by specialist visualisation company ModelWorks, submitted under separate cover).

Again, as the primary landscape and visual mitigation measures proposed were integrated into the scheme and assessed as part of the potential impacts, the predicted landscape impacts will be as per the potential effects – see Section 13.5.2.2, 13.5.2.3 and 13.5.2.4.

13.7.3 Visual Impacts from Specific Locations

Verified Photomontages have been prepared by a specialist 3-D Visualisations company, ModelWorks, to represent selected views which are typical of the views within the area and are intended to demonstrate the scale of the buildings in the landscape. The extent of potential visual impact of the proposed development on the built environment is demonstrated through nine representative view locations around the proposed development. The photomontages on which the following assessments is based are provided in Appendix 13.1.

Figure 13.11 Photomontage View Locations

View 01 View from Clongriffin Railway Station / West of Site

Existing View:	View representative of views from west of site, across the DART line. Views are partially limited at ground level due to the DART line being raised and associated structures, infrastructure, embankments and vegetation limit views from ground level. Upper floor apartment windows will have good views to the east at present, with views of the sea and coastal landscape, including Howth and Ireland's Eye.
Visual Sensitivity:	Low – Existing adverse factors: Presence of DART line; Baldoyle Stapolin LAP area has been intended for development since these dwellings were built, which reduces the sensitivity of visual receptors here; previously granted development in foreground.
Change to View:	Proposed buildings will be visible over the DART line and will form a visual barrier to some views of the sea and Ireland's Eye. Some areas of sea, coast and Howth Head will remain visible on either side of the development.
Magnitude of Change:	High
Predicted impact - Construction Phase:	Negative, moderate and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.

Predicted impact during Operational Phase:	This is in line with emerging trends in the area and is considered a slight long term negative impact as the existing poor-quality site is hidden from these vantage points and the new buildings will be visible against the sky.

View 02 View from future Racecourse Park / Mayne Road / North of site

Existing View:	View representative of views from north of site, looking south towards site. Views of medium quality with the flat, open green belt area in the fore- and middle-ground and the existing housing in Baldoyle and Clongriffin in the background. Views of Howth Hill on horizon to southeast.
Visual Sensitivity:	Low – Existing adverse factors: focus of views is coast to east, not this view south; Baldoyle and Clongriffin in background; previously granted development adjacent.
Change to View:	Proposed buildings will be visible in the flat landscape, with the taller elements addressing the greenbelt. Howth Hill will remain visible as it currently is.
Magnitude of Change:	Medium (limited portion of panoramic view affected)
Predicted impact - Construction Phase:	Negative, moderate and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Predicted impact during Operational Phase:	This is in line with emerging trends in the area and is considered a moderate long term impact. The quality of impact is considered net positive as the proposed buildings and trees / landscape create a defined edge to the greenbelt lands and future park.

View 03/04/05 Listed Views from the R106 road and Portmarknock Greenway between Baldoyle and Mayne Road

Existing View:	The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east of the road. Secondary views inland over the existing greenbelt lands and Mayne River. There are occasional distant views of the Dublin Mountains to the southern horizon from some locations along the road.
Visual Sensitivity:	Low – Existing adverse factors: distance from proposed development; focus of views is coast to east, not this view west; Baldoyle and Clongriffin in background; previously granted development adjacent.
Change to View:	These primary coastal elements of the listed views will not be affected by the proposed development. The less valuable views inland over the green belt will change due to the juxtaposition of the buildings with the parkland, wetlands and grassland and the contrast

	arising. Views of Dublin Mountains partially limited, but varies along the sequence depending on angle of view.
Magnitude of Change:	Low (limited portion of panoramic sequence of views affected)
Predicted impact - Construction Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Predicted impact during Operational Phase:	This is in line with emerging trends in the area and is considered a slight long term impact. The quality of impact is considered net positive as the proposed buildings and trees / landscape create a defined edge to the greenbelt lands and future park.

View 08 Views from South of the Site (Baldoyle)

Existing View:	Views from Racecourse Park (V08) are representative of the typical visibility of the site of the proposed development for both amenity and residential receptors in the areas to the south of the proposed development, along the northern fringes of Baldoyle. In general, the site itself is not visible due to the screening effect of the other buildings in Red Arches estate. Generally the sky is large in the viewshed, and the horizon is very low.
Visual Sensitivity:	Low – Existing adverse factors: screening effects of Red Arches estate; most important views are of the coast to the east, not this view north; previously granted development adjacent.
Change to View:	The coastal elements of the views will not be affected by the proposed development. The proposed buildings will be visible over roofs of the existing Red Arches estate and to the east of the existing buildings. This has a consolidating effect, aggregating additional, and taller, buildings with the existing in these views.
Magnitude of Change:	Low
Predicted impact - Construction Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Predicted impact during Operational Phase:	This is in line with emerging trends in the area and is considered a slight long term impact. The quality of visual impact is considered negative in this context because the existing poor quality site is not visible from these vantage points, only some of the new buildings may be visible over the existing dwellings at Red Arches.

View 10 Listed View from local road that runs from Portmarnock to Portmarnock Golf Club

Existing View:	The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east south and west from this vantage point. Secondary views inland over the existing greenbelt lands and Mayne River.
Visual Sensitivity:	Low – Existing adverse factors: distance from proposed development; focus of views is coast to east, not this view west/south-west; Baldoyle and Clongriffin in background; previously granted development adjacent.
Change to View:	Views from this viewpoint (c.1.4km from the site) will be affected by the proposed development. Due to the flat nature of the Estuary landscape, existing buildings in the vicinity of the proposed development are visible as a single cluster from this panoramic vantage point and the new buildings would be larger and more prominent in the background of views of the estuary. The buildings will appear to be on the horizon due to the flat nature of the landscape and some views of the Dublin Mountains on the horizon are partially blocked.
Magnitude of Change:	Low (limited portion of panoramic view affected)
Predicted impact - Construction Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Predicted impact during Operational Phase:	This is in line with emerging trends in the area and is considered a slight long term impact. The quality of impact is considered net positive as the buildings create a defined edge to the greenbelt lands and future park and consolidate the current development adjacent.

View 11 Listed Views from the R106 road at Portmarnock

Existing View:	This view is representative of the listed view from Portmarnock. The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east and southeast from this vantage point. Secondary views inland over the existing hinterland of Portmarnock, greenbelt lands and Mayne River. Views of the Dublin Mountains on the horizon to southwest.
Visual Sensitivity:	Low – Existing adverse factors: distance from proposed development; focus of views is coast to east, not this view south; previously granted development adjacent.
Change to View:	Views from this viewpoint (c.1.4km from the site) will be affected by the proposed development. Due to the topography of the landscape, existing buildings in the vicinity of the proposed development are not visible from here and the proposed buildings are prominent in the distance. The taller buildings will appear above the

	horizon due to the landscape. Views of the Dublin Mountains on the horizon are not affected.
Magnitude of Change:	Low (limited portion of panoramic view affected)
Predicted impact - Construction Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Predicted impact during Operational Phase:	This is in line with emerging trends in the area and is considered a slight long term impact. The quality of impact is considered net negative as the buildings create a new element over the horizon and are not legible as part of the greenbelt edge as in other views.

View 12 View from Burrow Road, Sutton

Existing View:	This view is representative of the views from the south along the coast. The primary elements of the view are estuarine sand flats, the inhabited coastline and flat horizon composed of buildings and trees. Prominent focal points in the views are Baldoyle Church and existing development at Baldoyle and Clongriffin.
Visual Sensitivity:	Low – Existing adverse factors: distance from proposed development; focus of views is the coastline and estuary to east; previously granted development adjacent.
Change to View:	Views from this viewpoint (more than 2km from the site) will be affected by the proposed development. Due to the flat topography, the skyline is composed of buildings and trees and the proposed buildings will be visible above these in the distance.
Magnitude of Change:	Low (limited portion of panoramic view affected)
Predicted impact - Construction Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Predicted impact during Operational Phase:	This is in line with emerging trends in the area and is considered a slight long term impact. The quality of impact is considered neutral as the buildings create a new element in a horizon of buildings, but they don't block or change the existing views in any fundamental way.

13.7.4 "Do Nothing" Scenario

The do nothing impact refers to the non-implementation of the proposed development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant.

The current land use of the subject site is not a land use which is likely to persist in the longer term as it is adjacent to existing residential development and serviced land zoned for residential development. The local area plan and the development plan for the area envisage considerable development to create new residential communities.

If the site is left in its current state, as waste ground, it is likely that naturalised planting will continue to self-seed and over a long period of time, scrub woodland could develop. This would be inappropriate in the current context and is likely to be perceived in a negative light by adjacent residents. This scenario is seen as highly unlikely due to the reasons outlined above.

13.8 MONITORING OR REINSTATEMENT

13.8.1 Construction Phase

The establishment of the landscape planting will be managed to ensure that any planting that fails is replaced and that the planting establishes and grows to maturity. These works will be commenced as soon as practical. Initially this will be the re-establishment of grassed areas and later larger plants and trees. This monitoring will continue into the operational phase as detailed in the following section.

13.8.2 Operational Phase

Monitoring of the landscape works and retained trees should continue for a period of at least three years post-completion to ensure that the planting establishes in accordance with the design intent and to ensure that the inherent mitigation requirements are achieved.

Landscape maintenance for the lifetime of the project will consist of grass cutting, weed control, replacement planting, pruning, etc. The company or entity responsible for site management of the scheme will be responsible for the ongoing maintenance of the site after this three-year period is complete. Part of these responsibilities will include monitoring to ensure that failed trees are replaced so the landscape proposals maintain the mitigation effects noted herein.

13.9 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

This section assesses and describes the cumulative impact of the proposed development together with other planned or permitted developments in the area. Please see Chapter 3 (Planning and Development Context) for a full list of planned and permitted developments in the area. The most relevant such developments in terms of the landscape and visual assessment are two adjacent SHD developments which were granted permission in 2021, briefly described as follows:

ABP-310418-21: The Shoreline Partnership

Lands formerly known as the Coast, Baldoyle, referred to as GA01 Lands in the Baldoyle-Stapolin Local Area Plan 2013 (as extended). The permitted development consists of the alteration of previously permitted development, as permitted under FCC Reg. Ref. F16A/0412, ABP Reg. Ref. ABP-248970, as amended, with development proposed for 882 no. residential dwellings (747 apartments, 135 houses) in 15 no. blocks ranging in height from 2 to 15 storeys and including for residential tenant amenity, retail/café/restaurant, pharmacy,

medical centre, crèche, gym, car and bicycle parking and public realm, over a site area of approx. 9.1 ha, of which the development area is 8.89 ha.

ABP-311016-21: The Shoreline Partnership

Lands at Baldoyle/Stapolin, referred to as GA03 Lands in the Baldoyle-Stapolin Local Area Plan 2013 (as extended) and which from part of the wider landholding of lands formerly known as the Coast, Baldoyle, Dublin 13. The proposed development will consist of the development of 1,221 no. residential apartment/duplex dwellings in 11 no. blocks ranging in height from 2 to 15 storeys and including for residential tenant amenity, restaurant/cafe, crèche on a site of 6.89ha.

When taken together with the existing development of The Coast, Red Arches, Myrtle and other development, and the proposed GA2 development under consideration in this EIAR, these developments represent the completion of the Baldoyle-Stapolin Local Area Plan 2013 (as extended).

Permitted developments to the west of the DART line in Clongriffin may also be considered in this context, as they will form part of the same landscape unit in time.

The planned development of Racecourse Park to the north and east of the proposed development at GA2 is also relevant.

GA01 and GA03 developments are to the west and southwest of the proposed development and will effectively negate any visual impacts of GA2 from vantage points to the south, and west (southwest to northwest), because they are located between the vantage points and GA2 in geographic terms. This means that they will screen the proposed development in almost all of those views to such a degree that the proposed development will be inconspicuous or invisible.

The fact that these developments, which were subject to their own EIARs, were permitted would indicate that the height and scale of the buildings was acceptable. GA2 is consistent with, and follows the same principles as, these precincts in terms of urban design and architectural expression, as well as distribution and quality of open spaces and public realm. Taken cumulatively, the area will appear as a homogenous and intensely urban townscape, with significant height and massing, punctuated with open spaces, green areas and trees. The presence of Racecourse Park to the north and east, on the green belt lands will ensure that a significant area of open space is maintained and protected for amenity use, commensurate with the scale of new development. The proposed development of GA2 and the permitted GA3 address the park directly, creating a strong and well-defined edge to the proposed parkland.

13.9.1 Construction Phase

During the construction phase, it is likely that the intensity of several sites working in parallel will lead to an intensification of negative landscape and visual impacts identified in Section 13.5.1. It is noted that the GA01 and GA03 sites have ten-year permissions, so some impacts could extend into the medium term, beyond the envisaged short-term (five year maximum) impacts of the GA2 development.

Landscape impacts due to the development of brownfield sites are relatively minor in nature. In terms of visual impacts, dwellings on the periphery of The Coast development area are likely to endure significant negative visual impact during

construction, although this will not be unexpected for these residents who were aware of this development potential from the outset of their occupation.

13.9.2 Operational Phase

Following construction, the main cumulative landscape impacts are associated with the change in land use from partially-developed waste ground of low value to a residential community environment with landscaped streets, public open spaces, courtyards and green spaces. This is considered a significant positive effect on the landscape character, compared with the current low value, poor quality landscape of the site. The development of these sites will result in a more complete urban landscape, a more harmonious and diverse landscape, as against the current unfinished brownfield area.

The proposed development will have a significant built edge, up to fifteen storeys along the fringe of the green belt and future parkland, together with a buffer area of tree and native hedgerow planting. This will create a strong urban edge, which is part of a planned urban framework (Baldoyle Stapolin LAP), forming a defined urban edge to the proposed future park. The juxtaposition of the built edge with the parkland is a deliberate contrast and is considered to be a significant positive impact, as it contributes to the landscape character through creating a definitive edge and interaction with the parkland.

Visual impact in views from the east is considerable, but mitigated by the articulation of the buildings and tree planting, as well as the management of the green belt as a public park, where the landscape can mature and develop over time to add to the visual setting and reduce visibility of the buildings from the surrounding landscape. Some views to the Dublin Mountains may be reduced or negatively impacted, but these are less valuable than the views along and of the coast which will not be affected by these developments, including the listed views in the County Development Plan along the R106 road to the east of the sites.

All in all, the development of these sites is seen as the building out of the strategies in the Local Area Plan and the planned development of the area, consistent with current and emerging trends. Impacts are generally considered positive.

13.9.3 Visual Impacts from Specific Locations

Additional cumulative effects may arise from the combined effects of this scheme and consented GA1 and GA3 (GA1, ABP Reg. Ref.:311018-21 and GA3, ABP Reg. Ref.:311016-21) projects.

The Verified Photomontages as discussed in Section 13.7.3 and included as Appendix 13.1 included the 3-D Visualisation of the consented GA1 and GA3 in order to fully appraise the potential for cumulative visual impacts from the proposed development. The nine representative view locations around the proposed development are analysed further here:

View 01 View from Clongriffin Railway Station / West of Site

Existing View:	View representative of views from west of site, across the DART line. Views are partially limited at ground level due to the DART line being raised and associated structures, infrastructure, embankments and vegetation limit views from ground level. Upper floor apartment windows will have good views to the east at present,

	with views of the sea and coastal landscape, including Howth and Ireland's Eye.
Visual Sensitivity:	Low – Existing adverse factors: Presence of DART line; Baldoyle Stapolin LAP area has been intended for development since these dwellings were built, which reduces the sensitivity of visual receptors here; previously granted development in foreground.
Cumulative Change to View:	Proposed buildings in GA3 and GA1 will be visible immediately across the DART line and will form a strong visual barrier to some views of the sea and Ireland's Eye. Some areas of sea, coast and Howth Head will remain visible on either side of the development.
Magnitude of Change (Cumulative):	Very High
Cumulative impact - Construction Phase:	Negative, significant and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Cumulative impact during Operational Phase:	The proposed development will be hidden from view by the permitted GA3 development and therefore the cumulative impact is due primarily to GA3. From some nearby vantage points, the proposed development (GA2) will also be visible, but GA3 will be dominant. GA1 will also be visible. The cumulative impact is considered to be moderate, negative, long-term.

View 02 View from future Racecourse Park / Mayne Road / North of site

Existing View:	View representative of views from north of site, looking south towards site. Views of medium quality with the flat, open green belt area in the fore- and middle-ground and the existing housing in Baldoyle and Clongriffin in the background, forming the horizon. Views of Howth Hill on horizon to southeast.
Visual Sensitivity:	Low – Existing adverse factors: focus of views is coast to east, not this view south; Baldoyle and Clongriffin in background; previously granted development adjacent.
Cumulative Change to View:	Proposed buildings will be prominent in the flat landscape, with the taller elements addressing the greenbelt. In the cumulative scenario, the proposals are more coherent in addressing the greenbelt lands, and the permitted GA3 and proposed GA2 development create a consistent edge, with variation and articulation in the architecture. Howth Hill will remain visible as it currently is.
Magnitude of Change (Cumulative):	Medium (portion of panoramic view affected)

Cumulative impact - Construction Phase:	Negative, moderate and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Cumulative impact during Operational Phase:	This is in line with emerging trends in the area and is considered a moderate long-term cumulative impact. The quality of impact is considered net positive as the buildings create a defined edge to the greenbelt lands and future park.

View 03/04/05 Listed Views from the R106 road and Portmarnock Greenway between Baldoyle and Mayne Road

Existing View:	The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east of the road. Secondary views inland over the existing greenbelt lands and Mayne River. There are occasional distant views of the Dublin Mountains to the southern horizon from some locations along the road.
Visual Sensitivity:	Low – Existing adverse factors: distance from proposed development; focus of views is coast to east, not this view west; Baldoyle and Clongriffin in background; previously granted development adjacent.
Cumulative Change to View:	These primary coastal elements of the listed views will not be affected by the cumulative built form. The less valuable views inland over the green belt will change due to the juxtaposition of the buildings with the parkland, wetlands and grassland and the contrast arising. Views of Dublin Mountains are partially limited, but varies along the sequence depending on angle of view.
Magnitude of Change (Cumulative):	Low to Medium (limited portion of panoramic sequence of views affected)
Cumulative impact - Construction Phase:	Negative, moderate and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Cumulative impact during Operational Phase:	This is in line with emerging trends in the area and is considered a moderate long term cumulative impact. The quality of impact is considered net positive as the buildings create a defined edge to the greenbelt lands and future park.

View 08 Views from South of the Site (Baldoyle)

Existing View:	Views from Racecourse Park (V08) are representative of the typical visibility of the site of the proposed development for both amenity and residential receptors in the areas to the south of the proposed development, along the northern fringes of Baldoyle. In general, the site itself is not visible due to the screening effect of the

	other buildings in Red Arches estate. Generally the sky is large in the viewshed, and the horizon is very low.
Visual Sensitivity:	Low – Existing adverse factors: screening effects of Red Arches estate; most important views are of the coast to the east, not this view north; previously granted development adjacent.
Cumulative Change to View:	The coastal elements of the views will not be affected by the proposed developments. The proposed buildings of GA2 will be visible over roofs of the existing Red Arches estate and to the east of the existing buildings. GA1 and GA3 have a marginal effect on this view due to the existing development in the middle ground; only one of the taller buildings is visible in this view. Overall, the cumulative built form has a consolidating effect, aggregating additional, and taller, buildings with the existing in these views.
Magnitude of Change (Cumulative):	Low
Cumulative impact - Construction Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Cumulative impact during Operational Phase:	This is in line with emerging trends in the area and is considered a slight long term cumulative impact. The quality of visual impact is considered negative in this context because the existing poor quality site is not visible from these vantage points, only some of the new buildings may be visible over the existing dwellings at Red Arches.

View 10 Listed View from local road that runs from Portmarnock to Portmarnock Golf Club

Existing View:	The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east south and west from this vantage point. Secondary views inland over the existing greenbelt lands and Mayne River.
Visual Sensitivity:	Low – Existing adverse factors: distance from proposed development; focus of views is coast to east, not this view west/south-west; Baldoyle and Clongriffin in background; previously granted development adjacent.
Cumulative Change to View:	Views from this viewpoint (c.1.4km from the site) will be affected by the proposed development. Due to the flat nature of the Estuary landscape, existing buildings in the vicinity of the proposed development are visible as a single cluster from this panoramic vantage point and the new buildings would be larger and more prominent in the background of views of the estuary. The buildings will

	appear to be on the horizon due to the flat nature of the landscape and some views of the Dublin Mountains on the horizon are partially blocked.
Magnitude of Change (Cumulative):	Low (limited portion of panoramic view affected)
Cumulative impact - Construction Phase:	Negative, moderate and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Cumulative impact during Operational Phase:	This is in line with emerging trends in the area and is considered a moderate long term cumulative impact. The quality of impact is considered net positive as the buildings create a defined edge to the greenbelt lands and future park and consolidate the current development adjacent.

View 11 Listed Views from the R106 road at Portmarknock

Existing View:	This view is representative of the listed view from Portmarnock. The primary elements of this sequence of views are Baldoyle Estuary and the coastal landscape to the east and southeast from this vantage point. Secondary views inland over the existing hinterland of Portmarnock, greenbelt lands and Mayne River. Views of the Dublin Mountains on the horizon to southwest.
Visual Sensitivity:	Low – Existing adverse factors: distance from proposed development; focus of views is coast to east, not this view south; previously granted development adjacent.
Cumulative Change to View:	Views from this viewpoint (c.1.4km from the site) will be affected by the proposed development. Due to the topography of the landscape, existing buildings in the vicinity of the proposed development are not visible from here and the proposed buildings are prominent in the distance. The buildings will appear above the horizon due to the landform. Views of the Dublin Mountains on the horizon are not affected.
Magnitude of Change (Cumulative):	Low (limited portion of panoramic view affected)
Cumulative impact - Construction Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Cumulative impact during Operational Phase:	This is in line with emerging trends in the area and is considered a moderate long term cumulative impact. The quality of impact is considered net negative as the buildings create a new element over the existing landform and are not legible as part of the greenbelt edge as in other views.

	It should be noted in the context of cumulative development that extensive future development is expected in the middle-ground of this viewshed. Part of the Portmarnock South Local Area Plan area is located between the viewpoint and the proposed development, which is likely to result in a new urban neighbourhood in the future which would block or screen most, if not all, of the GA1, GA2 and GA3 developments. In this light, the visual effects due to the proposed development and adjoining permitted developments are likely to be negligible.

View 12 View from Burrow Road, Sutton

Existing View:	This view is representative of the views from the south along the coast. The primary elements of the view are estuarine sand flats, the inhabited coastline and flat horizon composed of buildings and trees. Prominent focal points in the views are Baldoyle Church and existing development at Baldoyle and Clongriffin.
Cumulative Change to View:	Low – Existing adverse factors: distance from proposed development; focus of views is the coastline and estuary to east; previously granted development adjacent.
Magnitude of Change (Cumulative):	Views from this viewpoint (more than 2km from the site) will be affected by the proposed developments. Due to the flat topography, the skyline is composed of buildings and trees and the proposed buildings will be visible above these in the distance. GA1 and GA3 will add some additional punctuations on the skyline, notably a single tall tower in GA1, but the additional effect over GA2 alone is minimal.
Cumulative impact - Construction Phase:	Low (limited portion of panoramic view affected)
Cumulative impact during Operational Phase:	Negative, slight and short-term impacts due to visibility of construction plant, including cranes, and partially constructed buildings.
Cumulative Change to View:	This is in line with emerging trends in the area and is considered a slight long term cumulative impact. The quality of impact is considered neutral as the buildings create a new element in a horizon of buildings, but they don’t block or change the existing views in any fundamental way.

14.0 ARCHAEOLOGY, ARCHITECTURAL AND CULTURAL HERITAGE

14.1 INTRODUCTION

The following chapter assesses the predicted impacts of the proposed development on archaeological, architectural and cultural heritage. The proposed development is located west of the town Baldoyle, in the townland of Stapolin, Co. Dublin (ITM 723552 740934; see Figure 14.1). The project will consist of the provision of a strategic housing development.

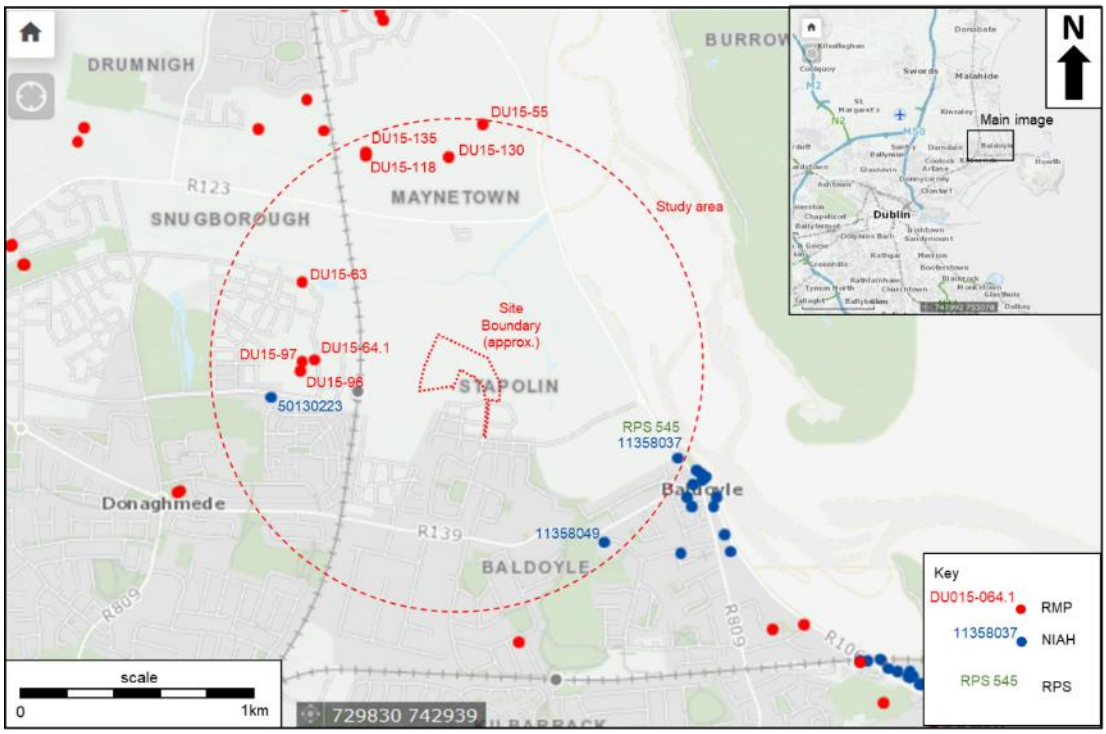


Figure 14.1 *Site location map showing recorded archaeological monuments and architectural heritage structures listed in the NIAH and RPS within c. 1km of the proposed development (source: www.archaeology.ie; www.fingalcoco.maps.arcgis.com).*

14.2 METHODOLOGY

14.2.1 Introduction

To set the proposed development within its wider archaeological, architectural and cultural heritage landscape, and to assess the potential of encountering such features on the site, a paper survey of archaeological, architectural heritage, historical and cartographic sources was undertaken. Stapolin is in the Electoral Division of Coolock, in Civil Parish of Baldoyle, in the Barony of Coolock, in the County of Dublin. The Irish name for Stapolin is Steach Póilín. The townland of Stapolin and the surrounding townlands of Baldoyle, Grange and Mayneland were used as a basis for the study (see Figure 14.2).

14.2.2 Recorded of Monuments and Places

The Record of Monuments and Places (RMP), comprising the results of the Archaeological Survey of Ireland, is a statutory list of all recorded archaeological monuments known to the National Monuments Service. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, the field notes of the Archaeological Survey of Ireland and other relevant publications. Sites recorded on the Record of Monuments and Places all receive statutory protection under the National Monuments Act 1994. The information contained within the RMP is derived from the earlier non-statutory Sites and Monuments Record (SMR); some entries, however, were not transferred to the statutory record as they refer to features that on inspection by the Archaeological Survey were found not to merit inclusion in that record or could not be located with sufficient accuracy to be included. Such sites however remain part of the SMR. The record is a dynamic one and is updated so as to take account of on-going research. The Record of Monuments and Places was consulted in the Archives of the Department of Arts, Heritage and the Gaeltacht .There are no recorded archaeological monuments located within the site boundary. There are eight recorded archaeological monuments within the study area which comprises a distance of c. 1km from the proposed development (see Figure 14.1 and Appendix 14.1).

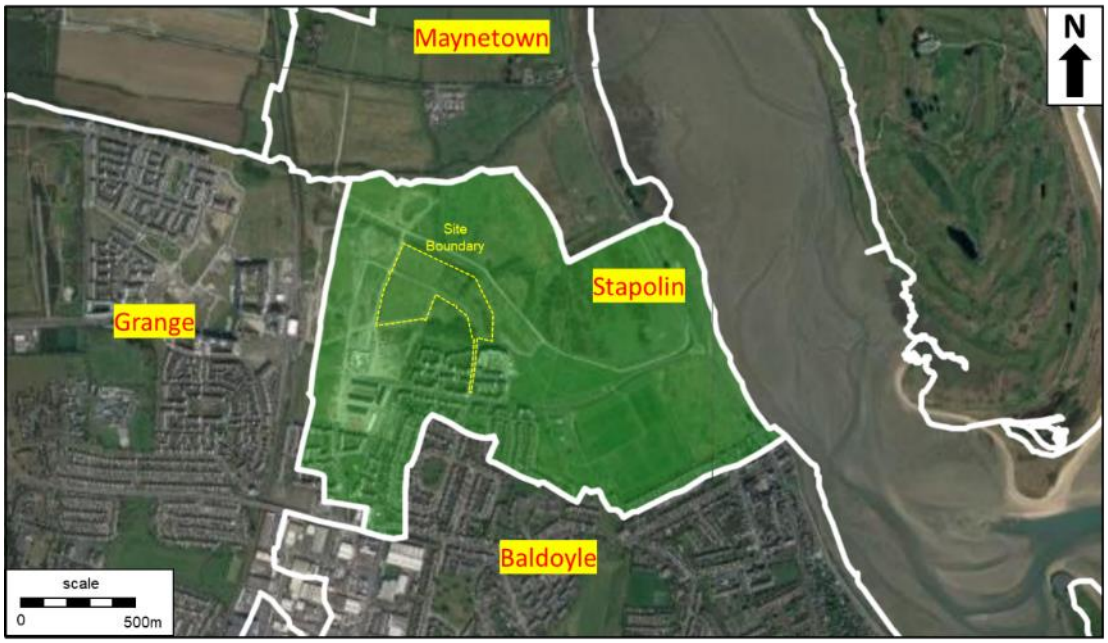


Figure 14.2 *Map showing the townland boundaries in the study area (source: www.downsurvey.tcd.ie).*

14.2.3 Recorded Archaeological Objects

The National Museum of Ireland's topographical files are a national archive of all known archaeological finds from Ireland. They relate primarily to artefacts but also include references to monuments and contain a unique archive of records of previous excavations. The topographical files were not consulted due to Covid 19 restrictions, but a study of the online resource www.heritagemaps.ie was undertaken. Other published catalogues of prehistoric material were also studied: Raftery (1983 - Iron Age antiquities), Eogan (1965; 1993; 1994 - bronze swords, Bronze Age hoards and goldwork), Harbison (1968; 1969a; 1969b - bronze axes, halberds and daggers). A list of recorded finds is given in Appendix 14.2 and shown in Figure 14.3, though it is important to note that archaeological excavations in the area have also revealed

numerous archaeological finds that have not yet been added to the NMI database (see Section 14.2.4 below).

14.2.4 Recorded Archaeological Excavations

The excavation bulletin website (www.excavations.ie) was consulted to identify previous excavations that have been carried out within the study area. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2015. Previous excavations in the study area are shown on Figure 14.4 and listed in Appendix 12.3).

14.2.5 Cartographic Sources

Cartographic sources were used to identify additional potential archaeological and cultural heritage constraints.

- Taken in the years 1656-1658, the Down Survey of Ireland is the first ever detailed land survey on a national scale anywhere in the world. The survey, led by William Petty, sought to measure all the land to be forfeited by the Catholic Irish in order to facilitate its redistribution to Merchant Adventurers and English soldiers (www.downsurvey.tcd.ie). The Down Survey 'Barony of Coolock, in the County of Dublin' is given as Figure 14.5.
- John Rocque (c.1705–62) was a cartographer and engraver of European repute, who could count among his achievement's maps of London, Paris, Berlin and Rome. Rocque's Irish work between 1754 and 1760, included a remarkable series of c.170 manuscript estate maps for the earl of Kildare, and a range of commercially driven projects that resulted in finely-engraved and printed surveys of the cities of Dublin (see Figure 14.6).
- Lewis' topographical dictionary and accompanying map of Ireland is part of works on England, Ireland, Scotland and Wales, which together form Topographical Dictionaries, comprises historical and statistical descriptions of several counties, cities, boroughs, parish and villages within these countries. First published in 1837 in two volumes, with an accompanying atlas, it marked a new and significantly higher standard in such accounts of Ireland Lewis (1837) (see Figure 14.6)
- The Ordnance Survey first edition 6" (1829-41) and second edition 25" (1897-1913) maps were also assessed (see Figures 14.8 - 14.9; www.archaeology.ie).

14.2.6 Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a systematic programme of identification, classification, and evaluation of the architectural heritage of the State. The Minister for Arts, Heritage and the Gaeltacht is currently using the Inventory as the basis for making recommendations for the NIAH. There are three structures included in the NIAH within c. 1km of the proposed development lands (although it should be noted that the town of Baldoyle, located just to the east of the study area, has numerous buildings and structures of architectural heritage value; see Figure 14.1).

14.2.7 Aerial Photography

Modern Ordnance Survey aerial photographic coverage dating from 1999, 2000 and 2005 available on the Ordnance Survey of Ireland (www.osi.ie) were assessed. These were used to locate areas of archaeological potential within the site of the proposed development (see Figure 14.10).

14.2.8 County Development Plan

The Fingal County Development Plan 2017-2023 was also consulted (www.fingalcoco.maps.arcgis.com; see Figure 14.11). The plan includes policy objectives for the protection of the County's archaeological heritage. There is one structure identified in the Record of Protected Structures within the study area (see Figure 14.1).

14.2.9 Historical Research

The baseline historical research utilised sources including Lewis' Topographical Dictionary of Ireland (1837), the Ordnance Survey Letters for County Dublin and the Journal of the Roscommon Archaeological and Historical Society. See Bibliography for full list of references used.

14.2.10 Site Assessment

A systematic site walkover was undertaken to compliment the baseline survey (see Figure 14.12 and Plates 14.1 – 14.10).

14.3 RECEIVING ENVIRONMENT

14.3.1 Archaeological, Architectural and Cultural Background

There are no upstanding prehistoric monuments within the study area which comprises a distance of approximately 1km from the proposed development. However, the recovery of stray archaeological finds indicates that prehistoric people may have occupied or moved through the landscape during this period. Of the c. 160 stone axeheads found in Dublin (as recorded by the Irish Stone Axe Project (ISAP); see Mandal and Cooney 1998), 28 were found in Feltrim, c. 4km to the northwest of the proposed development. Over 21,000 stone axeheads are known from Ireland (Sheridan et al. 1992, 391; Cooney and Mandal 1998, 4). They represent the 'single most numerous artefact type surviving from prehistory in Ireland' (Mandal 1997, 289; Mandal *et al* 2004, 116; Woodman 1978; 1987; Cooney and Grogan 1994), with their production and usage noted as commencing in the early Mesolithic and continuing well into the Bronze Age (Cooney & Mandal 1998, 1; Sheridan *et al*, 1992, 400; Cooney *et al*, 2011, 432; Cooney, 2000, 210). Since 1991 stone axeheads have been the focus of detailed research by the ISAP. Stone axeheads were both a symbol of prestige and an ordinary working tool for people for thousands of years. They served a wide range of functions in early prehistoric Irish society, including use in woodworking, in burial and ceremonial contexts and as symbols of power. Evidence of Bronze Age activity in the area is attested to by the discovery of a bronze ring brooch and buckle in Saintdoolaghs, to the northwest of the proposed development (see Figure 14.3 and Appendix 14.2).

Further evidence of prehistoric activity in the study area is indicated by the presence of the remains of a burnt mound, or fulachta fiadh in the townland of Grange, Donaghmede (RMP Nos. DU15-96 & DU15-97; see Figure 14.1 and Appendix 14.1; see also Excavation No. 2003:485; Figure 14.4 and Appendix 14.3). Burnt mounds, although still somewhat ambiguous, are generally accepted to be ancient cooking places consisting of a water-filled trough into which fire heated stones were placed to heat the water for cooking. The used, and often burnt and fragmented stones were removed and accumulated in a low kidney or horseshoe shaped mound around the

sides of the trough. Burnt mounds are usually located close to a water source (marshy areas, streams or springs).

Ringforts, the characteristic settlement site of the early medieval period. They generally consist of a circular area surrounded by a bank or fosse, or simply by a rampart of stone. In the latter case they are often referred to as cashels from the Irish caisel while those with earthen enclosures are also known by the Irish terms rath or lios. The proposed development is situated in an area of high ringfort density (Stout 1997). Although the emphasis in the literary sources from the period is on pastoral farming, the results of excavations and palynological studies have emphasised the importance of a mixed farming economy during this period (Edwards 2005, 264-275). Although no monuments classified as ringforts occur in the study area, those classified as enclosures, of which there are six in the study area recorded in the Sites and Monuments Record (see Figure 14.1 and Appendix 14.1) and a further one was discovered during archaeological investigations in advance of development at Grange (see Appendix 14.3; Excavation No. 2004:453), are most likely to represent the sub-surface remains of ringforts. This is evidenced by the above-mentioned enclosure excavated in 2004 at Grange (Excavation No. 2004:453), which was interpreted as a levelled-out ringfort.

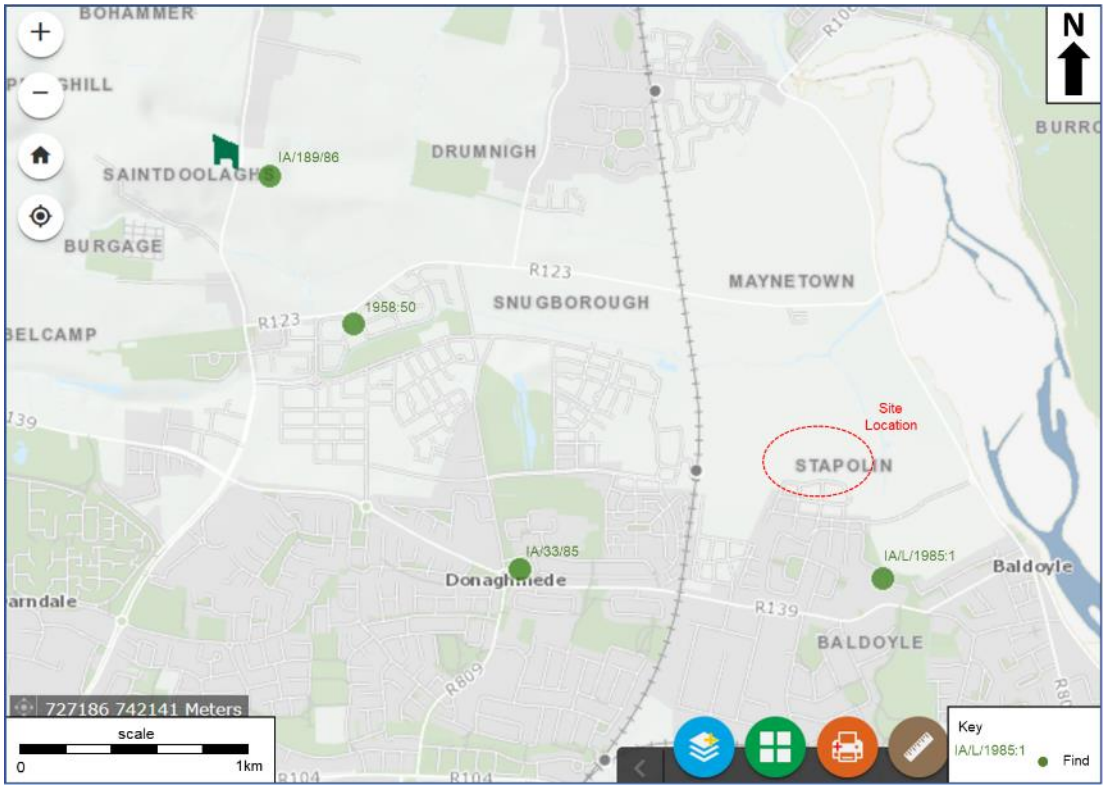


Figure 14.3 *Map showing the recorded archaeological finds in the study area (source: www.excavations.ie).*

The modern area of Fingal in north Co. Dublin derives its name from the term Fine Gall meaning 'the territory of the foreigners'. The 'foreigners' in this case refers to the Vikings who had arrived in Dublin in the late tenth century. Fine Gall was the agricultural hinterland of Dublin and seems by the eleventh century to have referred to an area stretching from Dublin north to Skerries and west to Leixlip. It was from this region that Viking Dublin acquired some of the raw material for manufacturing, goods for international trade, and agricultural produce both for their own consumption and for sale abroad. While Viking settlement did spread out from the Liffey basin in the course

of the eleventh and twelfth centuries, there is no evidence that there was a total displacement of the Irish. Rather, it has been argued that the area called the land of the foreigners was under the immediate control of Dublin, 'where the Irish population had by and large stayed behind and now paid tribute to the Vikings' (Simms & Fagan 1992, 89).

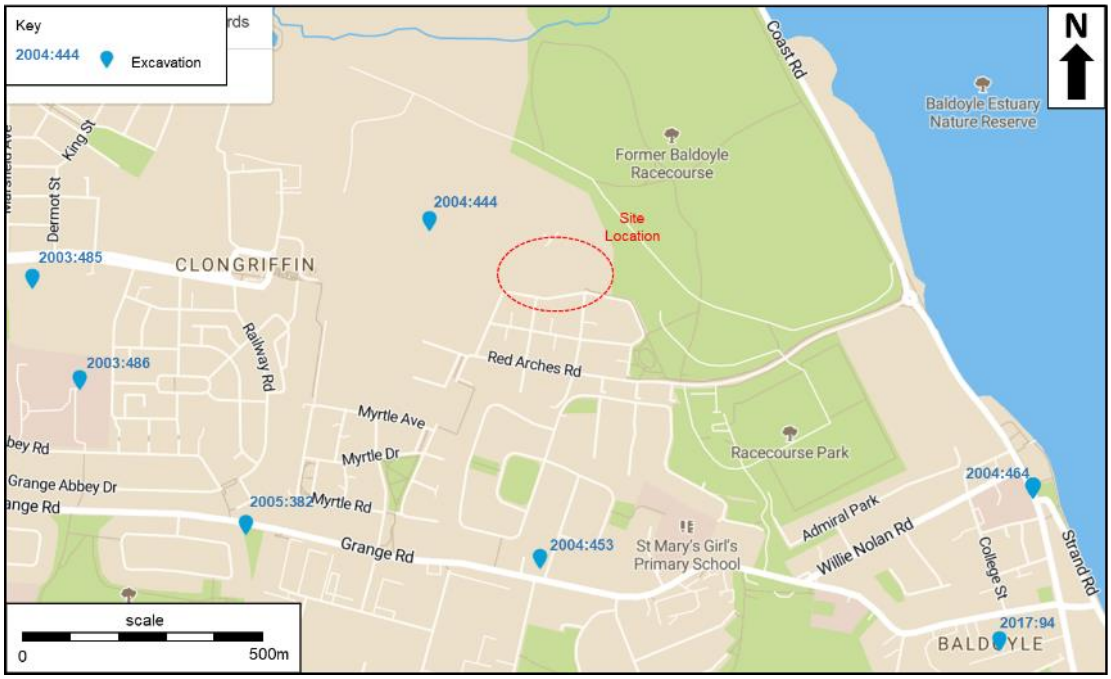


Figure 14.4 *Map showing the recorded archaeological excavations in the study area (source: www.excavations.ie).*

The arrival of the Anglo-Normans in Dublin in c. 1170AD substantially changed the social and political structures of this area. Lying between the de Lacy Lordship of Meath to the north, and the City of Dublin to the southeast, this was an intensely settled area which was to remain tied to the English administration, both politically and economically throughout the remainder of the medieval period and into the early modern period. Large areas of the Dublin hinterland were retained by the crown, but one half of the land in the medieval county of Dublin was granted to archbishops and monasteries and the remainder of the county let to minor lay lords (Simms & Fagan 1992, 91).

The Down Survey of Ireland, undertaken in the years 1656-1658, was the first ever detailed land survey on a national scale anywhere in the world. The survey sought to measure all the land to be forfeited by the Catholic Irish in order to facilitate its redistribution to Merchant Adventurers and English soldiers. Profitable and unprofitable land were distinguished, and there were abbreviated captions for arable, meadow, bog, woodland, mountain and several kinds of pasture, with area figures for each of these categories. Coverage of other subjects was uneven. In the parish maps, dwelling houses with the owners' names are entered in each townland. As noted above, generally speaking, it was a survey of confiscated land. As a result of the re-distribution, approximately 7,500 New Model Army veterans settled in Ireland, in what became known as the Cromwellian Plantation. The Barony of Coolock (Coolocke Parish), within which the proposed development is located, was included in the survey (see Figure 14.5). The Survey indicates that the townland of Stapolin, comprising 262 plantation acres, was in the ownership of Baron Nicholas St Lawrence (a Protestant), both before (1641) and after (1670) the plantation. Baron St Lawrence owned 19 townlands in Dublin, four in Meath and 24 in Tyrone during this time.

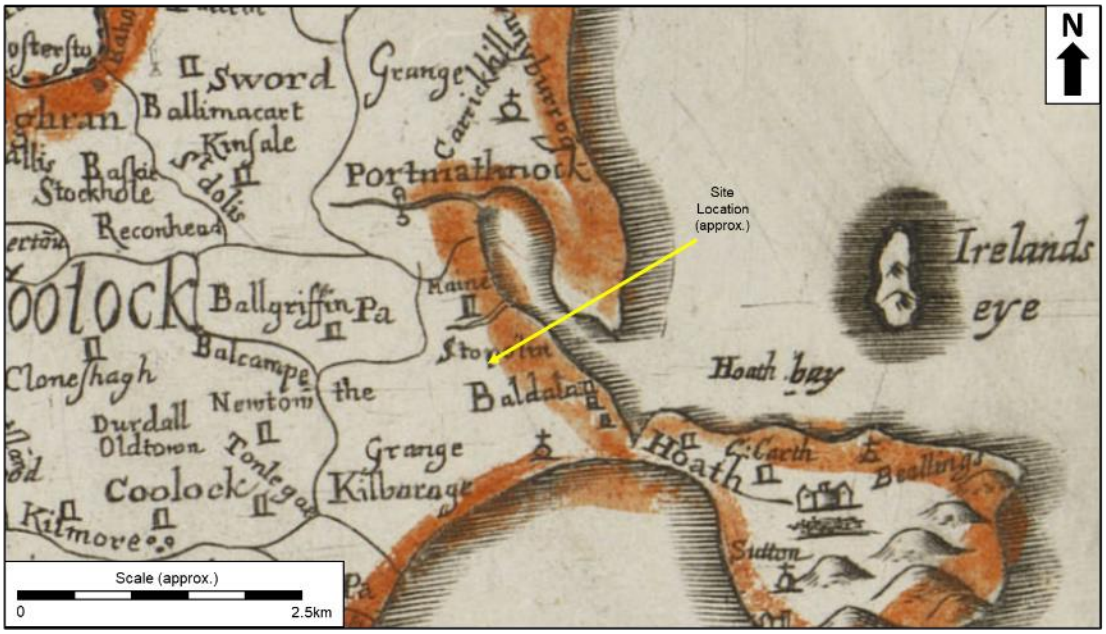


Figure 14.5 *Extract from the Down Survey map (1656-1658) of the Barony of Coolock (source: www.downsurvey.tcd.ie/down-survey-maps.php#c=Dublin).*

John Rocque's Exact survey of Dublin, published in London in 1756, and subsequent survey of the suburbs (1757), provides a vivid snapshot of the city at this period. It shows *'all publick buildings, private dwelling houses, ware houses, stables, courts, yards, &c.'*. Rocque was the son of Huguenot émigrés, who were exiled from France and moved to England in 1709. As well as being a surveyor and mapmaker, he was also an engraver and map-maker of international standing. This map was printed on four sheets and published by subscription, which allows the modern researcher to see the names of persons who purchased it. The map of the Clonshaugh area gives a wonderful snapshot of the environment of the time, with an extensive network of roads and houses, as well as parklands and agricultural land. The site of the proposed development is shown as agricultural land (see Figure 14.6).

Figure 14.6 *Extract from John Rocque's map (1757) of the county of Dublin (source: www.dublinhistoricmaps.ie/maps/1600-1799/index.html).*

Lewis' topographical dictionary and accompanying map of Ireland is part of works on England, Ireland, Scotland and Wales, which together form Topographical Dictionaries, comprises historical and statistical descriptions of several counties, cities, boroughs, parish and villages within these countries. First published in 1837 in two volumes, with an accompanying atlas, it marked a new and significantly higher standard in such accounts of Ireland Lewis (1837). Along with visiting many of the sites in the book, the author sent proof sheets to knowledgeable locals in the area who would be able to add changes that had taken place in the meantime. Some of the entries are short, while others go deeper into history, geography, anecdotes, superstitions, and the life of the people in an area. The dictionary gives a unique picture of Ireland before the Famine. Figure 12.4 gives an extract of Lewis' map of Dublin; the road network of the city spanning northwards and the already developed suburban town of Santry are shown.

Figure 14.7 *Extract from the Lewis's topographical map (1837) of the county of Dublin (source: https://www.swilson.info/lewismaps37.php?coid=9).*

Between 1829 and 1842 Ordnance Survey Ireland completed the first ever large-scale survey of an entire country. Acclaimed for their accuracy, these maps are regarded by cartographers as amongst the finest ever produced. The 1st edition map (c. 1838; see Figure 14.8) shows the land in which the proposed development is sited was set out as managed agricultural land as part of the demesne landscape of the then Stapolin House. The subsequent edition of the Ordnance Survey, (c. 1910; see Figure 14.), shows little change in the landscape in the intervening 70 years or so. It is notable that the layout of the field system, on which the majority of the proposed development will take place, remained largely unchanged in this time.

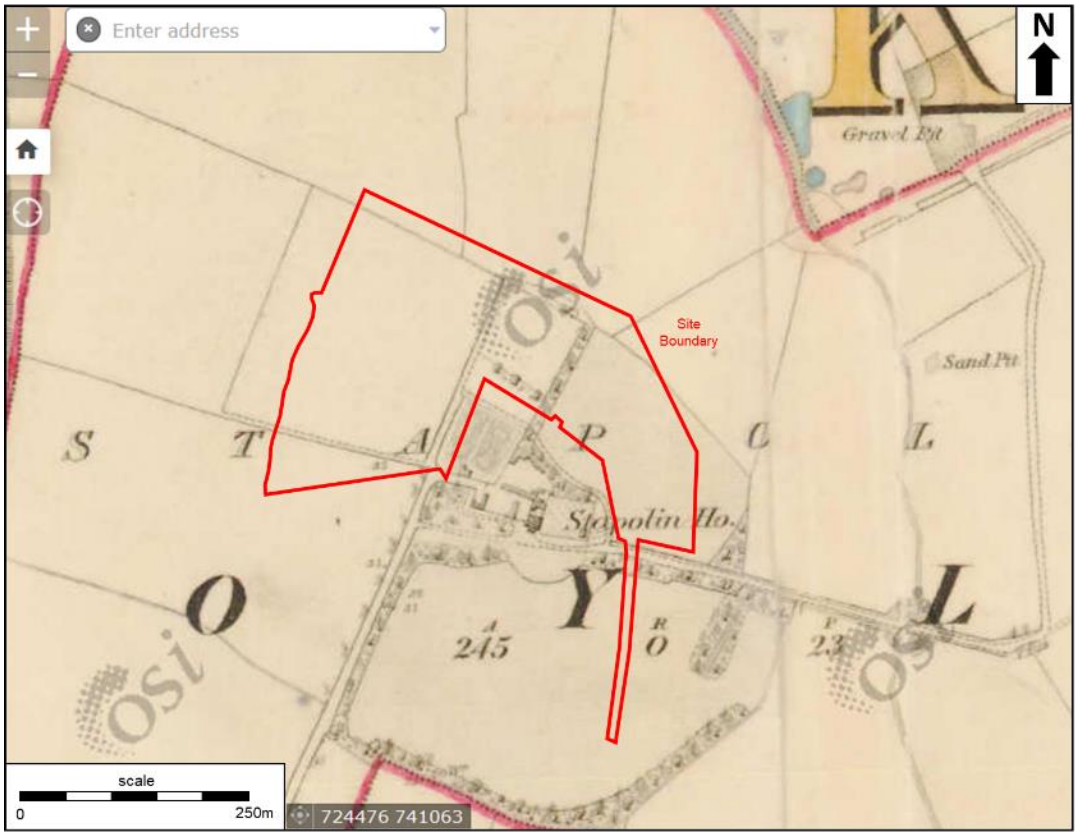


Figure 14.8 *Extract from First edition Ordnance Survey Map (base map source: www.archaeology.ie).*

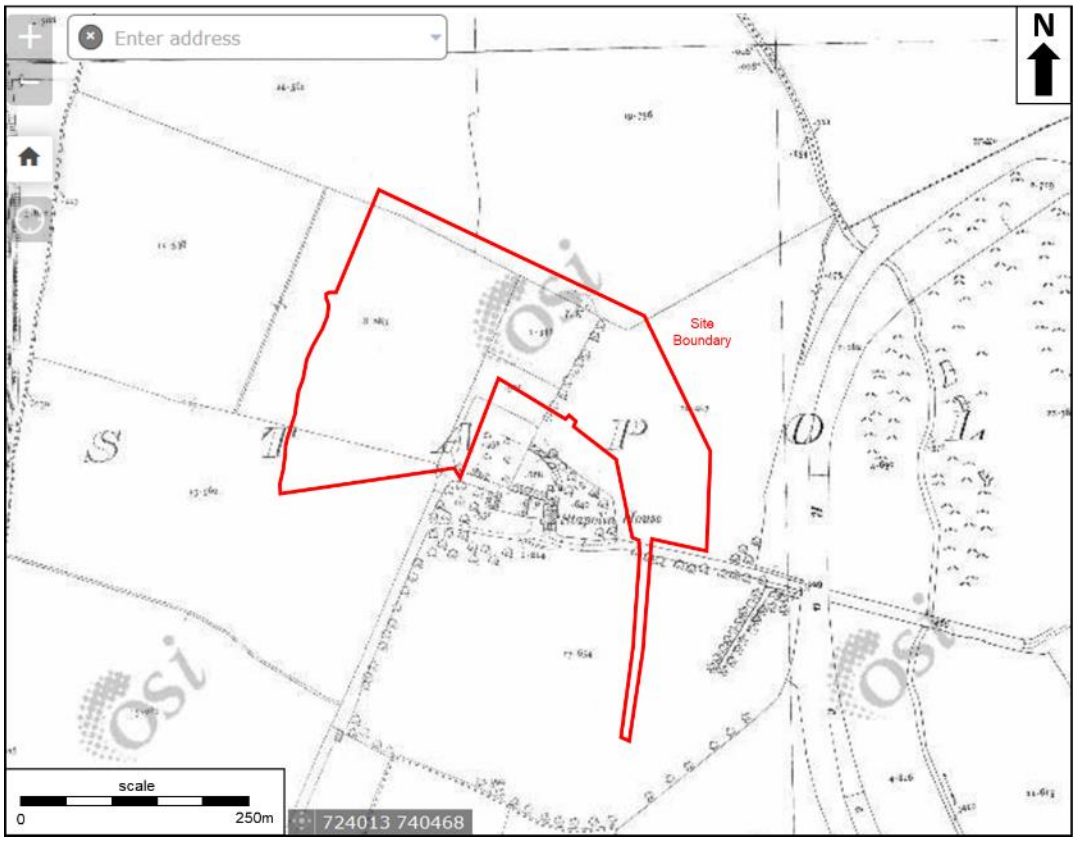
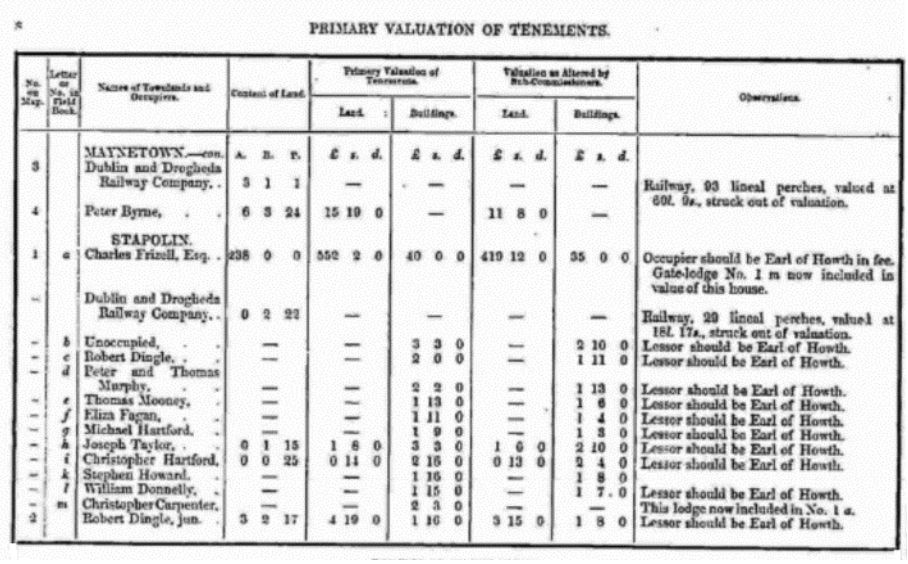


Figure 14.9 *Extract from Second edition Ordnance Survey Map (base map source: www.archaeology.ie).*

There are a number of sites listed in the National Inventory of Architectural Heritage and / or the Register of Protected Structures for County Dublin within the study area (see Figure 14.1 and Appendix 14.1). None of these are located within the proposed development lands. These comprise a thatched cottage (NIAH No. 11358037; also RPS No 545) on Strand Road, Baldoyle, Baldoyle National School (NIAH No. 11358049) and a post box (NIAH 50130223) on Main Street, Clongriffin (see Appendix 14.4; see also Figure 14.1).

The Griffiths Valuation (1847-64) values the townland at £423 40s (see Figure 14.12). In the 1911 census, Stapolin is recorded as having 67 inhabitants.



PRIMARY VALUATION OF TENEMENTS.

No. on Map.	Letter or No. in Field Book.	Names of Tenements and Occupiers.	Content of Land.	Primary Valuation of Tenements. Land.	Primary Valuation of Tenements. Buildings.	Valuation as Altered by Sub-Commissioners. Land.	Valuation as Altered by Sub-Commissioners. Buildings.	Observations.
			a. r. p.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
3		MAYNETOWN.—con. Dublin and Drogheda Railway Company. .	3 1 1	—	—	—	—	Railway, 93 lineal perches, valued at 60l. 9s., struck out of valuation.
4		Peter Byrne, . .	6 3 24	15 19 0	—	11 8 0	—	
		STAPOLIN.						
1	a	Charles Frizell, Esq. .	238 0 0	552 2 0	40 0 0	419 12 0	35 0 0	Occupier should be Earl of Howth in fee. Gate-lodge No. 1 is now included in value of this house.
—		Dublin and Drogheda Railway Company. .	0 2 22	—	—	—	—	Railway, 29 lineal perches, valued at 18l. 17s., struck out of valuation.
—	b	Unoccupied, . .	—	—	3 3 0	—	2 10 0	Lessor should be Earl of Howth.
—	c	Robert Dingle, . .	—	—	2 0 0	—	1 11 0	Lessor should be Earl of Howth.
—	d	Peter and Thomas Murphy, . .	—	—	2 2 0	—	1 13 0	Lessor should be Earl of Howth.
—	e	Thomas Mooney, .	—	—	1 13 0	—	1 6 0	Lessor should be Earl of Howth.
—	f	Eliza Fagan, .	—	—	1 11 0	—	1 4 0	Lessor should be Earl of Howth.
—	g	Michael Hartford, .	—	—	1 9 0	—	1 3 0	Lessor should be Earl of Howth.
—	h	Joseph Taylor, . .	0 1 15	1 8 0	3 3 0	1 6 0	2 10 0	Lessor should be Earl of Howth.
—	i	Christopher Hartford,	0 0 25	0 11 0	2 16 0	0 13 0	2 4 0	Lessor should be Earl of Howth.
—	k	Stephen Howard, .	—	—	1 16 0	—	1 8 0	
—	l	William Donnelly, .	—	—	1 15 0	—	1 7 0	Lessor should be Earl of Howth.
—	m	Christopher Carpenter,	—	—	2 5 0	—	—	This lodge now included in No. 1 a.
2		Robert Dingle, jun. .	5 2 17	4 19 0	1 16 0	3 15 0	1 8 0	Lessor should be Earl of Howth.

Figure 14.10 *Extract from Griffith's Valuation for Stapolin (source: www.griffiths.askaboutireland.ie).*

A review of aerial photographs suggests that whilst much of the former landscape that existed from at least the early 19th century has been altered due to recent development, in particular the insertion of roads, the field layout remains largely intact (see Figure 14.11).

The county development plan for Fingal County Council (2017 – 2023) indicates that the proposed development lands are zoned as Residential Area: to Provide for new residential communities subject to the provision of the necessary social and physical infrastructure. The land immediately the north of the proposed development is zoned as High Amenity: to Protect and enhance high amenity areas (see Figure 14.13).

14.3.2 Site Assessment

A site assessment was undertaken of the site of the proposed development on 5th October 2021 in sunny weather. The land comprised three fields (labelled F1-F3 on Figure 14.13). A modern network of access roads separate the fields. As evidenced by the aerial photography of the site, these works were undertaken between c. 2005 and c. 2012. In the same time period, the land immediately to the south of the proposed development was developed for housing, and there is also clear significant disturbance of the lands immediately to the west (see Figure 14.11). Photographs of the site indicate that although the field layout is as it was from at least the early 19th century (with the exception of the aforementioned roads), there has been significant disturbance (see Figures 14.14 – 14.23; see Figure 14.13 for photograph locations and orientations). It is important to note, that much of this disturbance appears to be infill

rather than excavation, suggesting that the 19th century land surface may be extant below the current ground level.

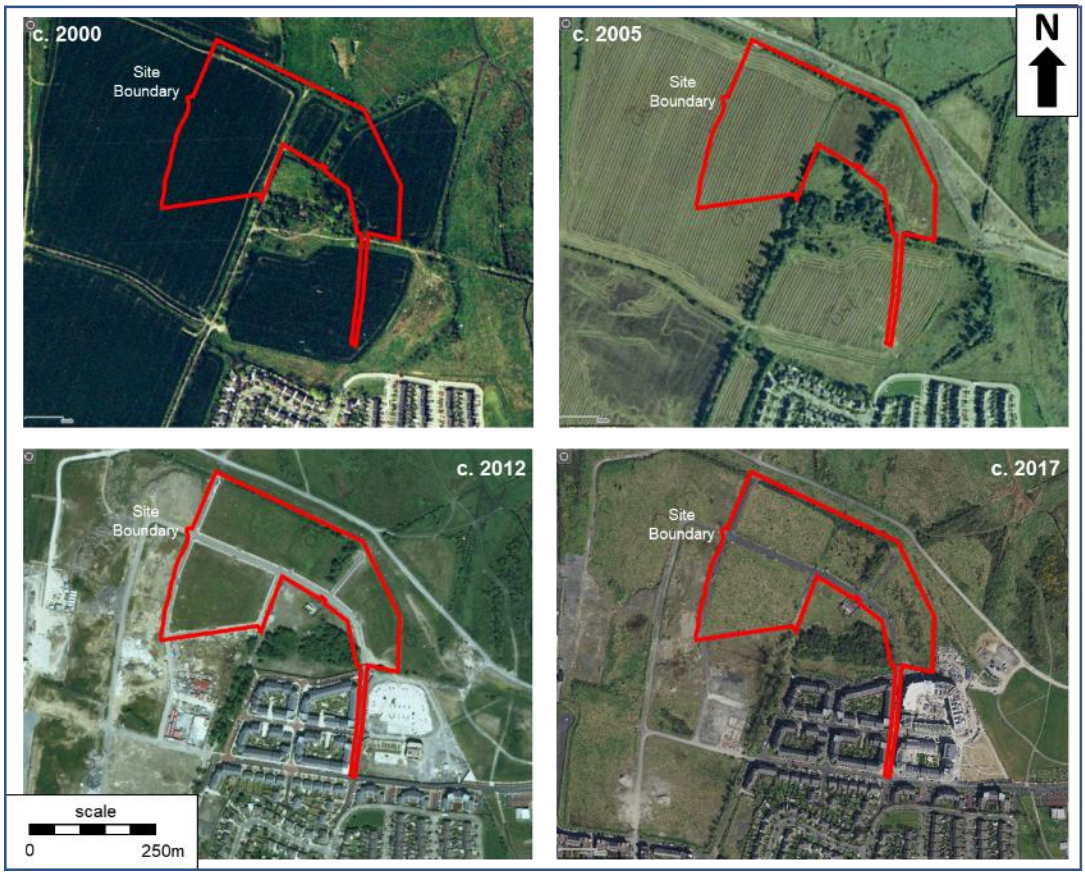


Figure 14.11 *Aerial photographs of the proposed development lands, from c. 2000 to c. 2017 (source: www.osi.ie).*

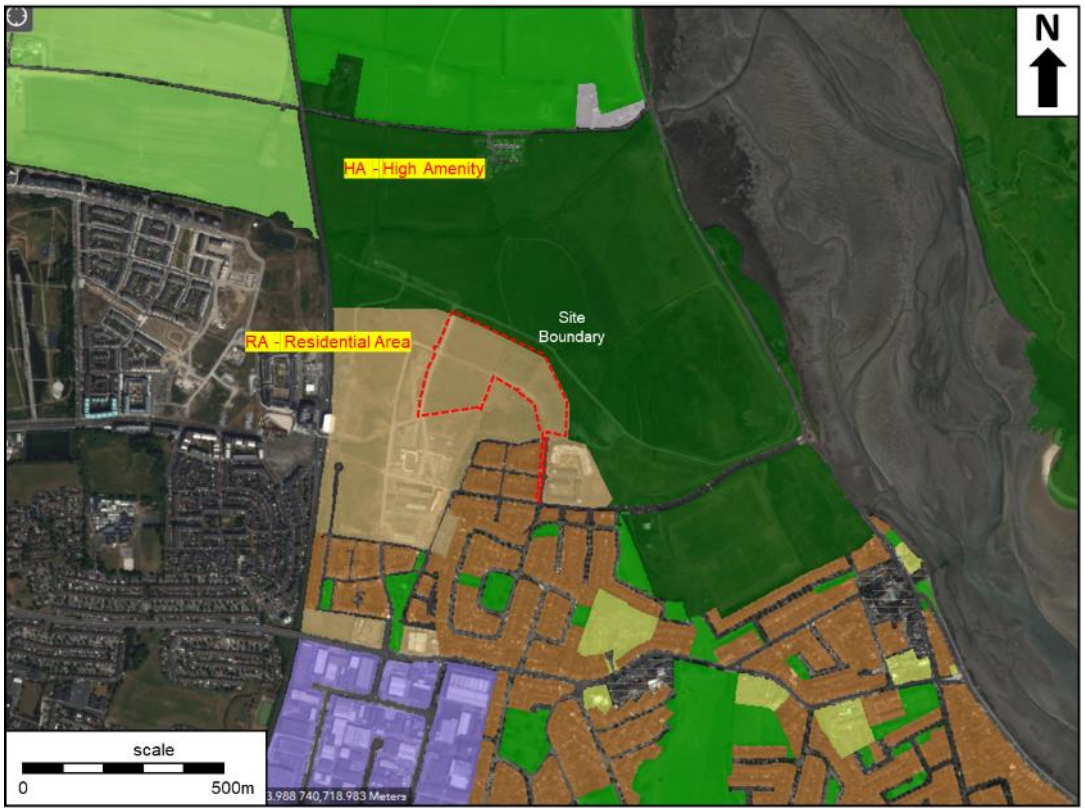


Figure 14.12 *Extract from Fingal County Council Development Plan 2017-2023 (source: www.fingalcoco.maps.arcgis.com).*

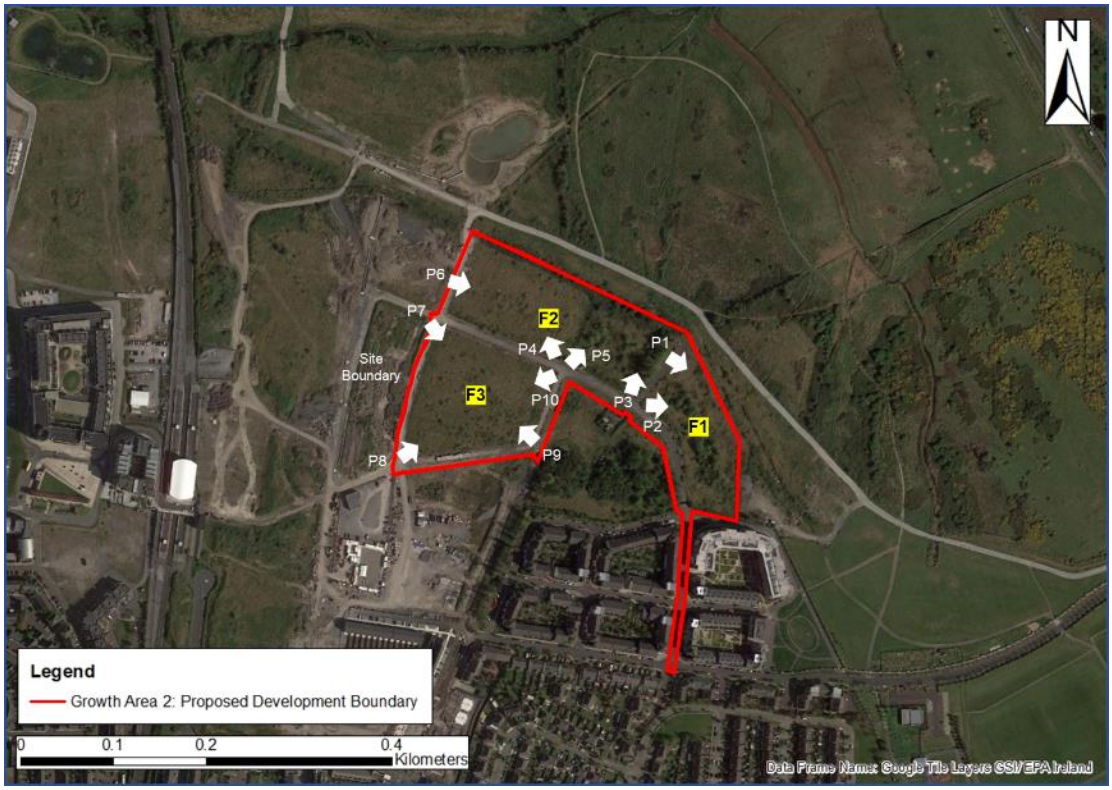


Figure 14.13 *Aerial photograph of the proposed development lands showing the location of fields (F1-F3) and photograph (P1-P10) locations and orientations.*

Plate 14.1 *Photo (P1) of Field 1 (F1) facing southeast*

Plate 14.2 *Photo (P2) of Field 1 (F1) facing east*

Plate 14.3 *Photo (P3) of Field 2 (F2) facing north*

Plate 14.4 *Photo (P4) of Field 2 (F2) facing northwest*

Plate 14.5 *Photo (P5) of Field 2 (F2) facing northeast*

Plate 14.6 *Photo (P6) of Field 2 (F2) facing southeast*

Plate 14.7 *Photo (P7) of Field 3 (F3) facing southeast*

Plate 14.8 *Photo (P8) of Field 3 (F3) facing northeast*

Plate 14.9 *Photo (P9) of Field 3 (F3) facing northwest*

Plate 14.10 *Photo (P10) of Field 3 (F3) facing southwest*

14.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A detailed description of the project is included in Chapter 2. In relation to this assessment, the development will require soil excavation and disturbance.

14.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

14.5.1 Construction Phase

The archaeological, architectural and cultural heritage impact at the site can be summarised as follows:

- There are no recorded archaeological sites or monuments within the proposed development lands, as listed in the Record of Monuments and Places for Co. Dublin.
- There are eight recorded archaeological sites within c. 1km of the proposed development lands. Three of these were discovered during the course of development works and have been excavated. None of these sites will be impacted, either directly or indirectly, by the proposed development works. However, they are indicative of the landscape having been populated since at least the Bronze Age.
- There are no recorded archaeological finds from the site, though stone axes and bronze artefacts found in the area suggests settlement in the Neolithic and Bronze Age.
- Archaeological excavations in the area in advance of development works over the past two decades has also revealed a number of previously unrecorded archaeological sites. The results of the excavation of these sites further indicate prehistoric and medieval settlement and activity in the area.
- There are no architectural heritage structures within the site boundary or the wider study area, recorded in either the National Inventory of Architectural Heritage or the Record of Protected Structures.
- A desk-top survey of the lands proposed for development did not identify any evidence of archaeological features within the development land.
- The survey confirmed that the site of the proposed development has been significantly impacted by previous development. However, the nature of this impact in areas appears to be infill rather than excavation, such that the pre-development landscape may be preserved intact below the current ground level.

Therefore, should previously unrecorded sub-surface archaeological remains survive below the current ground level, then the proposed development will result in their removal. The potential impact on sub-surface archaeological remains that may survive in the absence of mitigation would have will ***direct, negative*** and ***profound*** impacts on these sub-surface features.

14.5.2 Operational Phase

There are no potential impacts on archaeological, architectural and cultural heritage expected as a result of the operational phase of the proposed development.

14.6 REMEDIAL AND MITIGATION MEASURES

14.6.1 Construction Phase

As the proposed development lands were previously in agricultural use, there is the possibility of sub-surface archaeological features surviving within the site boundary. In order to mitigate against the potential impacts of the proposed development on such features, should they exist, the following mitigation measures will be undertaken.

Given the level of disturbance of the land, it is likely that a geophysical survey would be of value in identifying potential sub-surface features.

Therefore, a programme of archaeological testing will be undertaken across the greenfield areas of the proposed development lands prior to the commencement of construction works, under license to the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

Should any features of archaeological potential be identified, then they will be assessed, and following consultation with the National Monuments Service, should it not be possible to preserve these in-situ, then they will be excavated in full (preservation by record) under license to the National Monuments Service.

Please note that the recommendations given here are subject to the approval of the National Monuments Service, Department of the Culture, Heritage and the Gaeltacht.

14.6.2 Operational Phase

No mitigation measures are required for archaeological, architectural and cultural heritage during the operational phase of the proposed development.

14.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

14.7.1 Construction Phase

The implementation of the mitigation measures set out in Section 14.6.1 above will ensure that there will be a ***neutral*** and ***imperceptible***, and ***long term*** of the proposed development on the archaeological, architectural and cultural heritage.

14.7.2 Operational Phase

There will be ***neutral*** and ***imperceptible***, and ***long term*** of the proposed development on the archaeological, architectural and cultural heritage.

14.8 MONITORING OR REINSTATEMENT

As stated in section 14.6.1 during prior to construction, a programme of archaeological testing will be undertaken across the greenfield areas of the proposed development lands prior to the commencement of construction works, under license to the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

There are no requirements for ongoing monitoring or reinstatement requirements.

14.9 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

The cumulative impact (as far as practically possible) of the proposed development with any/all relevant existing or permitted developments as set out in Chapter 3, of the EIAR Addendum unless otherwise stated. The likelihood of cumulative effects are discussed in Sections 14.9.1 and 14.9.2 below for construction and operational phases.

14.9.1 Construction Phase

An assessment of the potential for cumulative impacts on archaeological, architectural and cultural heritage was undertaken by assessing planning applications in the vicinity of the proposed development. The review of the existing projects within the vicinity of the site and the projects set out in Chapter 3, of this EIAR Addendum Report has been undertaken.

In respect of substantial developments that may result in in-combination effects in respect of material assets are the adjacent residential development GA1 (ABP Reg. Ref.:311018-21) and GA3 (ABP Reg. Ref.:311016-21) are the relevant projects considered in detail.

The EIAR for the GA1 Grant of Permission ABP Reg. Ref.:311018-21 included mitigation measures in respect of archaeology including monitoring of monitoring of topsoil-stripping within the entire GA1 site will be undertaken as an archaeological exercise, to determine whether there are any archaeological features or deposits present. Given the way that subsurface features and sites present in this landscape, this strategy will ensure a comprehensive archaeological mitigation measure. The EIAR for GA1 (Brady Shipman, Martin, 2021) predicted after the implementation of mitigation measures that there would be no residual impacts in respect of archaeological, architectural and cultural heritage.

The GA3 Grant of Permission ABP Reg. Ref.:311016-21 Condition 22 states that "*The developer shall facilitate the preservation, recording and protection of archaeological materials or features that may exist within the site….*" The EIAR for GA3 (Brady Shipman, Martin, 2021) predicted after the implementation of mitigation measures that there would be no residual impacts in respect of archaeological, architectural and cultural heritage.

The implementation of mitigation measures within each chapter and detailed in Section 14.5.1; as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential. if previously unidentified archaeological features are uncovered during construction works. The ability to excavate these sites through the construction phase will provide data to the archaeological community from the potential subsurface sites. The potential to gain knowledge outweighs the negative impact. The residual impact of the proposed development in combination with other planned or permitted developments (as described in Chapter 3) is ***long-term, imperceptible, neutral***.

14.9.2 Operational Phase

There are no potential impacts on archaeological, architectural and cultural heritage expected as a result of the operational phase of the proposed development. Therefore, there are no cumulative impacts expected with other existing and permitted developments.

15.0 TRAFFIC AND TRANSPORTATION

15.1 INTRODUCTION

15.1.1 Background

The Material Assets: Transportation Chapter of the EIAR to support a Planning Application for Baldoyle GA2. The Baldoyle GA2 development corresponds to Growth Area 2 in the Baldoyle Stapolin Local Area Plan and is the fifth phase of a six-phase development which began in the early 2000s. Phases 1 and 2 are complete, phases 3 and 4 have commenced construction.

GA2 is a Strategic Housing Development for the construction of 1,007 residential apartments (consisting of 58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units), communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a site located in the townland of Stapolin, Baldoyle, Dublin 13.

It is noted that the proposed 1,007 units for the GA2 development is higher that the future land use assumptions noted in the South Fingal Transport Study (2019). However, due to the high-quality public transport (existing and proposed) and cycling infrastructure in the area, Baldoyle is an excellent location for higher density developments. Baldoyle is also in close proximity to the city centre and growing employment areas so will be capable of sustaining higher density developments in the future.

The proposed development site is located in Stapolin townland, Baldoyle North, Dublin 13 as shown in Figure 15.1 below.

Figure 15.1 *Location of Proposed Development*

15.1.2 Consultation and Scoping Study

Preplanning meetings were held with Fingal County Council (FCC) including the Roads and Traffic department on the 2nd of September and the 16th of December 2020 to discuss the study area and agree the traffic junctions under consideration for this EIAR Traffic and Transportation Chapter. Following an analysis of the surrounding area, it was agreed that the study area would include the following three junctions in the vicinity of the development;

- Junction 1- Hole In The Wall / Grange Road / R139 roundabout;
- Junction 2- Grange Road / Grange Rise / Longfield Road;
- Junction 3- Coast Road / Red Arches Road roundabout;

These junctions were selected as they are considered the junctions most likely to be affected by traffic associated with the proposed development. As a result, these three junctions will form the study area for the EIAR Traffic and Transportation Chapter. The locations of the three junctions are illustrated in Figure 15.2 below. Due to Covid-19 restrictions, traffic in the surrounding area is considerably less than normal. Therefore, it was agreed with FCC that historical traffic counts (pre-covid) were acceptable for analysing the junctions.

15.2 METHODOLOGY

15.2.1 Objectives

This report provides an assessment of the potential traffic impacts associated with the proposed development. In this regard, the assessment aims to:

- Identify the existing environment in terms of traffic and transportation;
- Quantify the likely vehicle traffic flows to and from the development from and to the surrounding road network;

- Identify and quantify the likely traffic impacts on the surrounding road network resulting from the development; and
- Identify suitable measures to mitigate traffic and transportation impacts, if any, associated directly with the development.

The assessment is based on the findings of site visits, traffic observations, on-site traffic counts, architectural plans, and consultations with the Design Team.

15.2.2 Methodology

The methodology adopted for this report is summarised as follows:

- Reference was made to site layout drawings issued by the project architect and other proposed plans for the site;
- An inspection of the local road network was undertaken during am and pm peak traffic periods;
- Proposed access arrangements for the development onto the surrounding road network were considered;
- The traffic survey location and survey times were selected so as to best reflect the likely traffic generation from the subject development, particularly at proposed site access/egress points;
- Existing traffic volumes on the surrounding road network were analysed;

In preparing this assessment, reference has been made to the following documents:

- TII Traffic and Transport Assessment Guidelines;
- TII PE-PAG-02017 - Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections.
- Design Manual for Urban Roads and Streets (DMURS);
- Fingal Development Plan 2017 – 2023; and
- Baldoyle Stapolin Local Area Plan

15.2.3 Forecasting methods and difficulties encountered

To determine current traffic behaviour in the vicinity of the subject site, a vehicle turning movement survey was obtained at all three junctions under consideration. Due to the current Covid-19 restrictions, traffic in the surrounding area is considerably less than normal. Therefore, it was agreed with FCC that historical traffic counts (pre-covid) were acceptable for analysing the junctions. The historical traffic surveys at all junctions were factored up to 2021 figures to ensure consistency across all junctions. Traffic flows were factored up in accordance with Table 5.3.2 of Transport Infrastructure Ireland publication, Project Appraisal Guidelines. The medium growth rate factors were used.

The Trip Rate Information Computer System (TRICS) database was interrogated to derive the potential development trip generation rates. TRICS is the UK and Ireland's national system for trip generation analysis. It contains over 7,150 directional transport surveys at over 110 types of development in both the UK and Ireland. Transport surveys from the Greater London area were excluded from the database used as this tends to skew results because of London's greater reliance on public transport. A review was also conducted of neighbouring developments which have been granted planning permission or currently seeking planning permission in the vicinity of the proposed GA2 development. Trip rates were gathered for these developments also.

A traffic capacity assessment of all three junctions was undertaken utilising the surveyed results and TRL's PICADY (Priority Intersection Capacity and Delay), OSCADY (Optimised Signal Capacity and Delay) and ARCADY (Assessment of Roundabout Capacity and Delay) traffic modelling software.

15.3 RECEIVING ENVIRONMENT

15.3.1 Site Location

The proposed development site is located in Stapolin townland, Baldoyle North, Dublin 13 as shown in Figure 15.2 below.

Figure 15.2 *Development Location – Stapolin Lands, Baldoyle North, Dublin 13*

The subject site is located to the west of Coast Road and to the north of Grange Road. Access to the site will be gained via Red Arches Road to the South and Longfield Road to the East respectively. The planning documentation and architect's plans provide a more detailed description of the proposed development and the positioning of the buildings relative to the site boundary and access roads/links. The site currently includes several internal through roads not accessible by the public used for construction traffic only.

15.3.2 Local Road Network

The local road network in the vicinity of the subject site is illustrated graphically in Figure 15.2 above. The existing Grange Road and Coast Road, which run along the south and east of the site respectively form the two access points to the Baldoyle Stapolin LAP lands. Figures 15.3 to 15.7 below illustrate the three existing junctions to be analysed adjacent to the development.

The signalised crossroads junction of Grange Road/Grange Rise/Longfield Road located at the southern end of the development lands provides a high level of service for all road users including cars, buses, HGV's, cyclists, and pedestrians together with the visual and mobility impaired. A photograph of the junction of Grange Road/Grange Rise/Longfield Road is shown below in Figure 15.3.

Figure 15.3 *Junction of Grange Road/Grange Rise/Longfield Road (source Google Maps)*

Longfield Road has a road pavement width of 17.0 metres in the vicinity of the junction including provision for an outbound bus lane which will have signal priority at the junction once a bus service is operational within the site. Footpath and cycle facilities are also provided along its length. Figure 15.4 below shows a photograph of Longfield Road on the approach to the signalised junction on Grange Road.

Figure 15.4 *Longfield Road (source Google Maps)*

Grange Road is a wide bi-directional two-lane distributor road providing a strategic link to the M50 to the west and to Coast Road to the east. Grange Rise serves Baldoyle Industrial Estate and Abbey Business Park and is a bi-directional two-lane local access road with a width of 9.3 metres.

Access to the site from the east is gained via Red Arches Road and the roundabout junction of Coast Road/Red Arches Road. The roundabout has been operational since 2006 and provides a high level of service for all road users including cars, buses, HGV's, cyclists, and pedestrians together with the visual and mobility impaired. Figure 15.5 below shows a photograph of the roundabout junction of Coast Road/Red Arches Road.

Figure 15.5 *Roundabout Junction of Coast Road/Red Arches Road (source Google Maps)*

Red Arches Road provides a direct link between the Baldoyle Stapolin site and Coast Road/Baldoyle to the east. The road has a pavement width of 7.5 metres with off road cycle lanes and footpaths along its length. Figure 15.6 below shows a photograph of Red Arches Road.

Figure 15.6 *Red Arches Road (source Google Maps)*

The signalised roundabout junction of Hole in The Wall/R139/Grange Road located to the south west of the Baldoyle Stapolin LAP lands provides a high level of service for all road users including cars, buses, HGV's, cyclists, and pedestrians together with the visual and mobility impaired. Figure 15.7 below shows a photograph of the junction of Hole in The Wall/R139/Grange Road.

Grange Road and R139 are wide bi-directional two-lane distributor roads providing a strategic link to the M50 to the south west and to Coast Road to the east. R139 has a carriageway width of approximately 15.0 m.

A pedestrian footpath runs along all arms of the roundabout as well as a high quality off-road cycle lane that runs around the roundabout.

Figure 15.7 *Roundabout Junction of Hole in The Wall/ R139/ Grange Road (source Google Maps)*

The subject site, as well as surrounding phases of development, is well serviced internally by a road network which has been designed based on a clear hierarchy of street functions as follows:-

- Main Streets: These roads are 7.5/6.0 metres wide with additional space for indented parallel parking. These roads have been designed to cater for large volumes of traffic flows traffic flows through the development, providing the highest level of connectivity, whilst still catering for other road users. Bus services will run along these routes.

- Secondary Streets: These roads are narrower than the main streets at 6.0/5.5 metres in width with additional space for indented parallel parking. These roads have been designed to provide access to the key areas around the site without generally connecting through the site.

- Narrow Streets: These one way roads are typically 4.0 metres wide with a lower level of additional road space for parking. These roads have been designed for local access only with the lowest level of connectivity. They will be pedestrian / cyclist dominated areas with shared road surfaces. They have been designed to cater for a low level of vehicular activity; however emergency vehicles can still be accommodated.

15.3.3 Public Transport

15.3.3.1 Existing Public Transport

The proposed development is well situated next to high-quality existing public transport services. The main Dublin-Belfast railway line bounds the site to the west. The line caters for DART services to and from Malahide to the north and Greystones, Bray and all Dublin stations to the south as well as a limited number of Northern Commuter services to and from Drogheda and Dundalk. At peak times, services run approx. once every 15 minutes linking the site with Dublin city centre. Clongriffin DART station, opened to the public in April 2010 is located approximately 500m from the GA2 development site.

In addition, the following Dublin Bus Routes currently service the study area:

- 102 - Dublin Airport to Sutton station via Coast Road & Baldoyle
- 15- Clongriffin to Ballyclllen Road

Phase 1 of the new BusConnects network launched on 27th June with the introduction of H-Spine (H1, H2, H3, H9) and Route 6 (all operated by Dublin Bus). The following BusConnects Routes currently service the study area:

- H1- Baldoyle to City Centre
- H2- Malahide to City Centre

Bus stops are located along Grange Road on both upstream sides of the signal-controlled junction with Grange Rise/Longfield Road and regular bus services operate along the Malahide Quality Bus Corridor, Coast Road and other roads in the vicinity of the site as shown below in Figure 15.8.

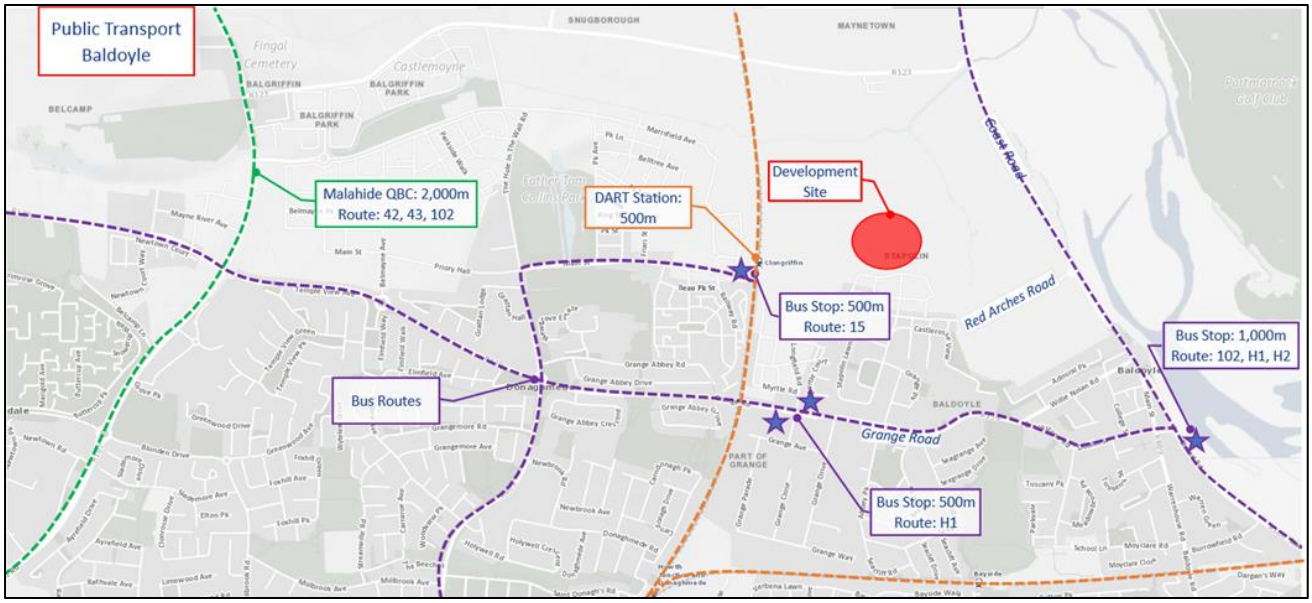


Figure 15.8 *Public Transport Baldoyle*

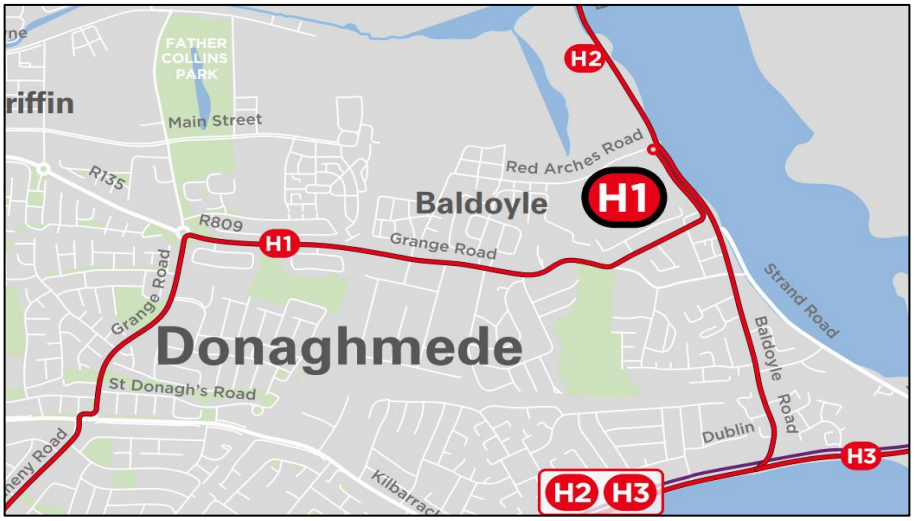


Figure 15.9 *Phase 1 of the new BusConnects network as per www.busconnects.ie*

15.3.3.2 Proposed Transport Proposals

Bus Connects proposes 16 No. Core Bus Corridors extending radially from Dublin City Centre to the surrounding suburbs. Bus Connects also proposes to introduce numerous new bus routes in close proximity to the development. Figure 15.9 taken from the latest Bus Connects proposal illustrates proposed new routes in the vicinity of the proposed development. The proposed Clongriffin to City Centre Core Bus Corridor (CBC) shown in Figure 15.10 is planned to originate at Clongriffin DART Station. This CBC scheme will deliver a public transport service with higher speeds and quality of service than traditional bus services. Such enhancements will be achieved by improved road infrastructure, the provision of appropriate vehicles, rapid and frequent operations.

Figure 15.10 *Proposed Bus Connects Routes beside Baldoyle as per www.busconnects.ie*

15.3.4 Existing Pedestrian and Cycle Facilities

The proposed development is very well catered for in terms of facilities for pedestrians and cyclists. Both the Coast Road Roundabout and Grange Road signalised junction are provided with pedestrian and cyclist facilities which link footpaths and cycle lanes on the external road network with similar facilities within the Baldoyle Stapolin LAP lands.

Longfield Road and Red Arches Road are provided with separate dedicated off road cycle lanes which tie-in seamlessly with cycle facilities at both junctions. Figure 15.11 shows photographs of off road cycle lanes on Longfield Road and Red Arches Road.

Longfield Road *Red Arches Road*

Figure 15.11 *Off Road Cycle Lanes (source Google Maps)*

Within the Baldoyle Stapolin LAP lands, the road layout design and traffic management measures ensure low vehicle speeds are maintained on development roads providing a safe environment for cyclists to travel. High quality pedestrian footpaths, of minimum width 1.8 metres, are provided on both sides of all development roads and result in good pedestrian linkages to all parts of the development and to existing external footpaths on the surrounding road network.

The site layout has been designed to ensure swift easy access for residents and workers to new on-site public transport nodes such as the train station and bus stop facilities. In the vicinity of the Baldoyle Stapolin LAP lands access points, cycle facilities are in place on many roads on the surrounding road network as shown in NTA Greater Dublin Area Cycle Network Plan (Figure 15.12 below).

Figure 15.12 *Off Road Cycle Lanes as per the Greater Dublin Area Cycle Network Plan*

As discussed above, in line with the Baldoyle-Stapolin LAP Objective TM 4, the development is ideally placed to facilitate enhanced patronage and efficient utilisation of public transport and promote walking and cycling.

15.3.5 Road Safety

All development traffic will enter and exit the Baldoyle Stapolin LAP lands via the existing access junctions on Red Arches Road and Longfield Road.

The Road Safety Authority (RSA) database of road collision information was interrogated to establish if the surrounding road network in the vicinity of the proposed development access points holds records relating to historical collision occurrence (Figure 15.13 below).

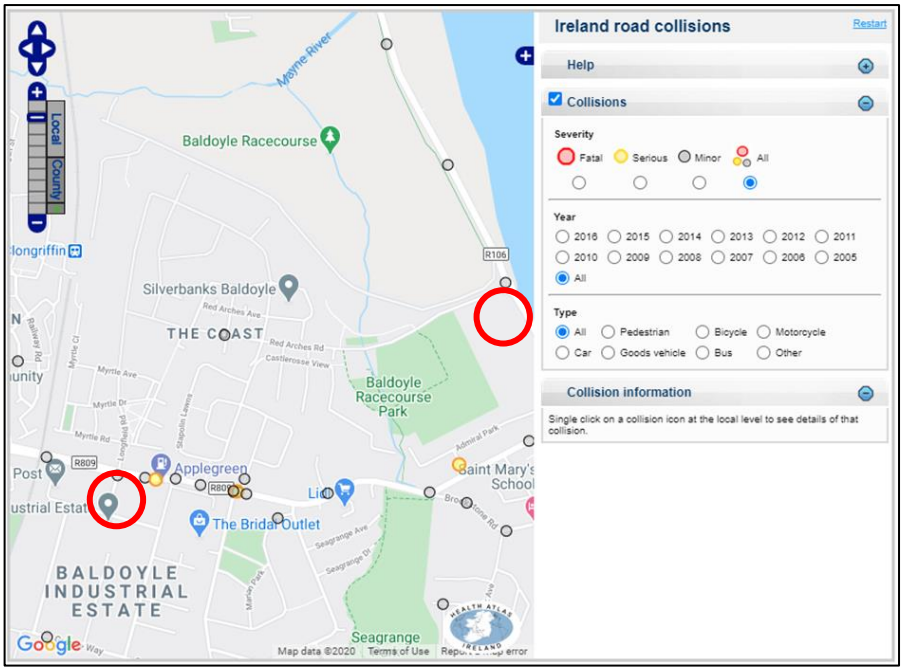


Figure 15.13 *RSA record of collisions*

The exercise revealed that there was one minor collision recorded at the eastern junction on the Coast Road and one minor collision at the southern junction on Grange Road between 2005 and 2016. A number of minor collisions and two serious collisions were also recorded along Grange Road. The circumstances of these collisions are varied and there is no pattern of collisions at this junction.

It is not considered that the proposed development would result in any traffic safety implications.

15.3.6 Existing Traffic Flow: Base Year

15.3.6.1 Traffic Survey

To determine current traffic behaviour in the vicinity of the subject site, a vehicle turning movement survey was obtained at all three junctions under consideration (See Figure 2). Due to the current Covid-19 restrictions, traffic in the surrounding area is considerably less than normal. Therefore, historical traffic counts were obtained for each junction;

- Junction 1- Hole In The Wall / Grange Road / R139 roundabout (2019)
- Junction 2- Grange Road / Grange Rise / Longfield Road (2019)
- Junction 3- Coast Road / Red Arches Road roundabout (2018)

The vehicle turning movement survey for Junction 1 was undertaken on Wednesday, January 31st, 2018, on Tuesday, May 21st, 2019 for Junction 2 and on Wednesday, January 31st, 2018 for Junction 3. The counts captured all turning movements at these junctions. The traffic survey at each junction was factored up to 2021 figures to ensure consistency across all junctions. The counts were carried out over a 12-hour period (07:00 to 19:00) to cover both the morning and evening peak periods.

The morning peak hour was identified as 08:00-09:00 for all three junctions. The evening peak hour was identified as 18:00-19:00 at Junction 1, 15:00-16:00 at Junction 2 and 13:00-14:00 at Junction 3. The peak hours identified concur with visual

observations made on site. Data was collected in 15-minute intervals and the following count classifications were employed:

- Cars;
- Light Goods Vehicles (LGV);
- Motorcycles (M/C);
- Oversize Goods Vehicles 1 (OGV 1);
- Oversize Goods Vehicles 2 (OGV 2);
- Public Service Vehicles (PSV); and
- Pedal Cycles (P/C).

A full transcription of the turning movement survey is included in Appendix 15.1.

The evening peak hour was observed to be more intense than the morning peak hour. However, in order to carry out a robust traffic analysis of the surrounding road network, the traffic modelling exercise following herein will be based on traffic flows recorded for both the weekday AM and PM peak hours.

A summary of the factored up 2021 vehicle turning movement surveys for the morning and evening peak hour periods is shown in Figures 15.14 and 15.15 below.

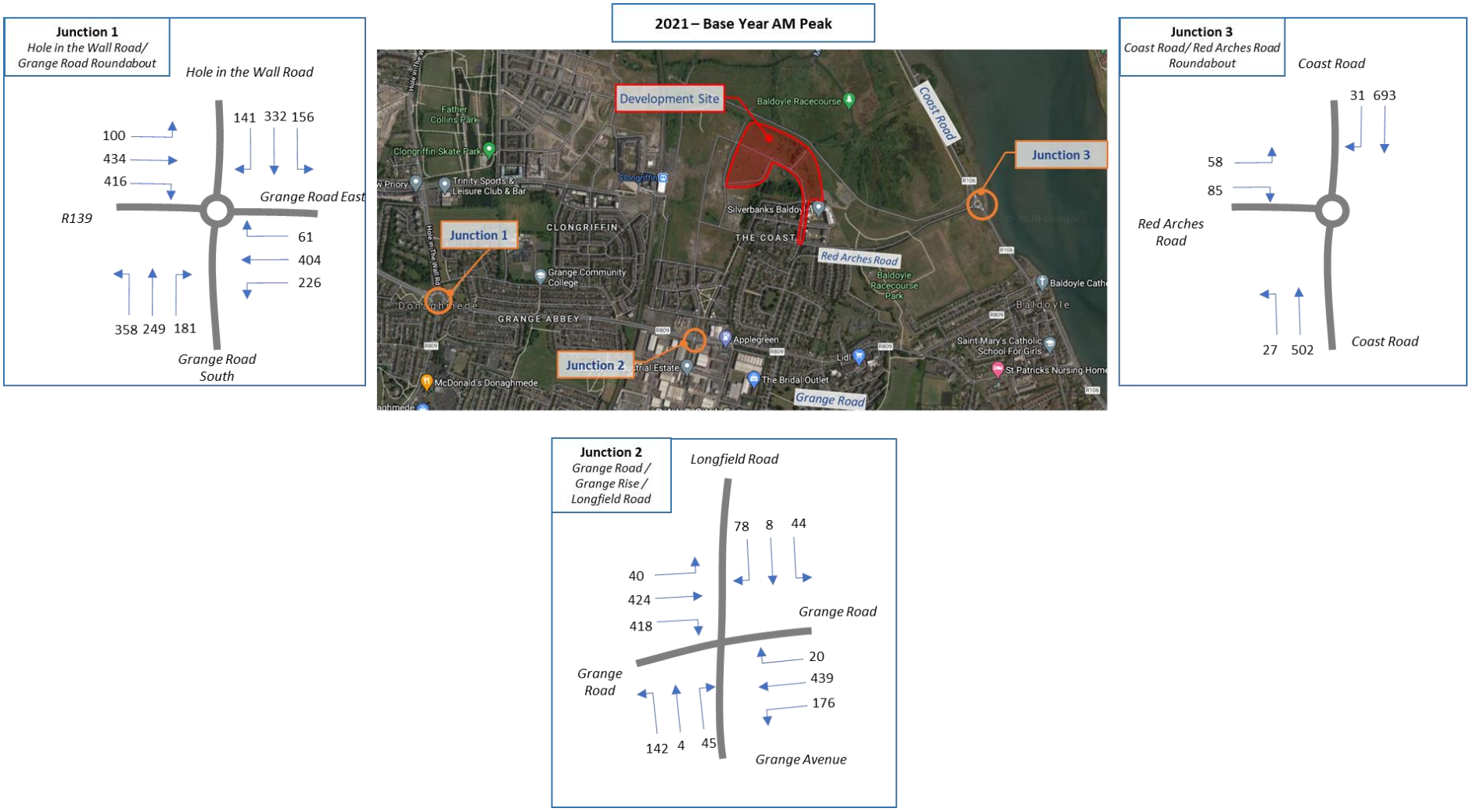


Figure 15.14 *Traffic Flow 2021 Base Year AM Peak*

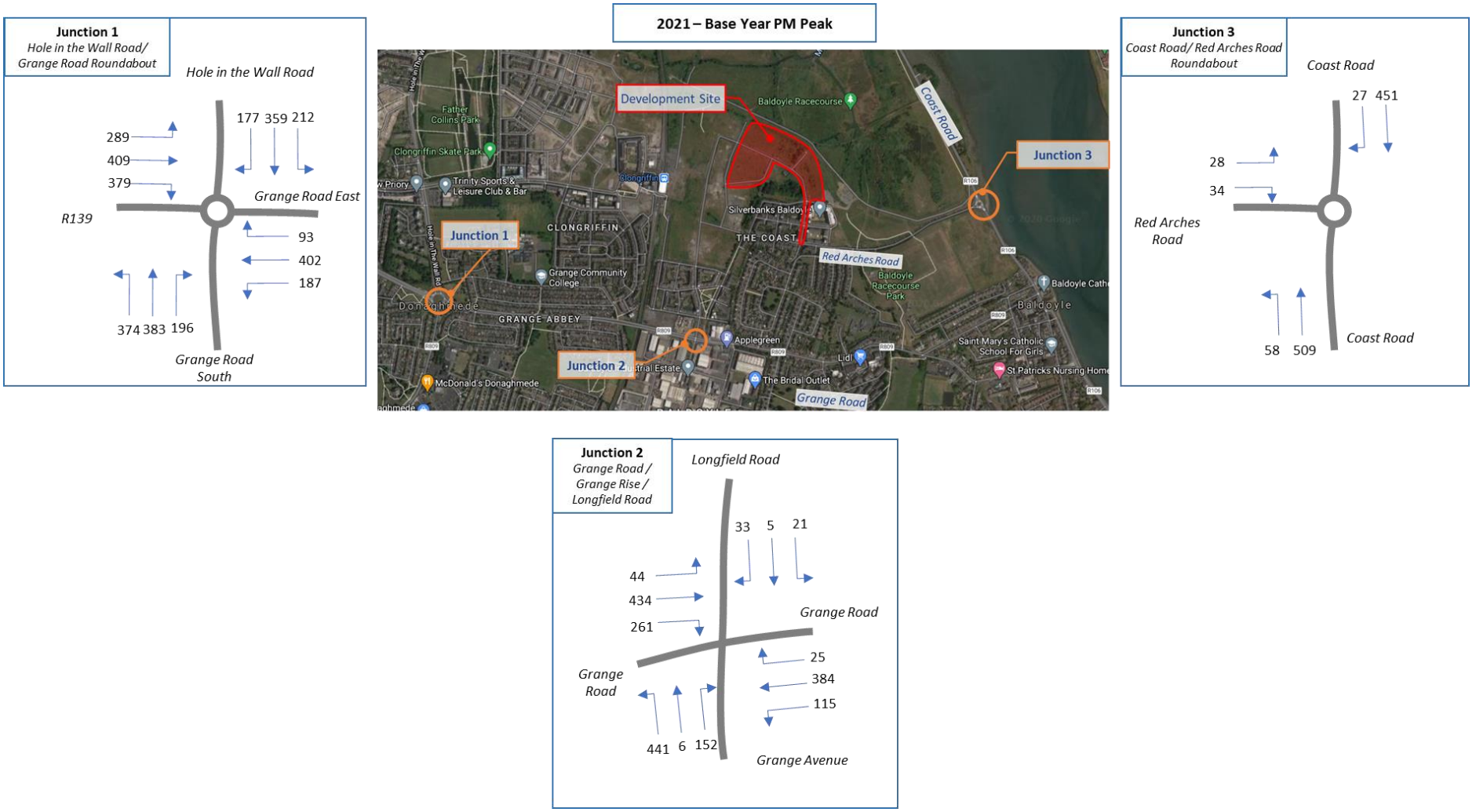


Figure 15.15 *Traffic Flow 2021 Base Year PM Peak*

15.3.6.2 Junction Capacity Assessment for Base Year 2021

A traffic capacity assessment of all three junctions was undertaken utilising the surveyed results shown in Figures 15.14 and 15.15 and TRL's PICADY (Priority Intersection Capacity and Delay), OSCADY (Optimised Signal Capacity and Delay) and ARCADY (Assessment of Roundabout Capacity and Delay) traffic modelling software. A summary of the results of this analysis for the morning and evening peak hours is shown in Tables 15.1 to 15.3 following. Each junction was modelled using it's own PM Peak time.

- Junction 1- Hole In The Wall / Grange Road / R139 roundabout (2019)
- Junction 2- Grange Road / Grange Rise / Longfield Road (2019)
- Junction 3- Coast Road / Red Arches Road roundabout (2018)

Table 15.1 *Junction 1- Hole In The Wall / Grange Road / R139 roundabout 2021 Morning and Evening Peak Hour*

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Grange Road (East)	0.54	0.54	1	1	6	6
Grange Road (South)	0.66	0.82	2	5	9	17
R139	0.77	0.95	4	14	13	44
Hole in The Wall	0.53	0.61	1	2	6	8

Table 15.2 *Junction 2- Grange Road / Grange Rise / Longfield Road 2021 Morning and Evening Peak Hour*

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Grange Road (East)	0.98	0.86	27	15	97	54
Grange Avenue	0.38	0.83	5	18	38	58
Grange Road (West)	0.96	0.78	31	21	72	51
Longfield Road	0.66	0.26	5	2	80	51

Table 15.3 *Junction 3- Coast Road / Red Arches Road roundabout 2021 Morning and Evening Peak Hour*

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Coast Road (North)	0.59	0.38	1.6	0.7	7	5
Red Arches Road	0.37	0.39	0.6	0.7	4	4
Coast Road (South)	0.13	0.06	0.2	0.1	4	4

A sample traffic modelling output file is included in this report in Appendix 15.2.

The normal design threshold for the ratio of flow to capacity (RFC) is 0.9 for a roundabout. Table 15.3 demonstrates that Junction 3 currently operates within the normal design threshold during the morning and evening peak hour considered. However, Table 15.1 demonstrates that Junction 1 exceeds the normal design threshold during the evening peak hour but operates within the theoretical capacity of 1.0.

The normal design threshold for the ratio of flow to capacity (RFC) is 0.9 for a signalised junction. Table 15.2 demonstrates that Junction 2- Grange Road / Grange Rise / Longfield Road the junction exceeds the normal design threshold during the morning peak hour. However, it should be noted that the junction operates within its theoretical capacity of 1.0. This analysis concurs with observations made on site.

15.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

15.4.1 Overview

The Baldoyle GA2 proposed development includes:

- 1,007 residential apartments
  - 58 no. studio units,
  - 247 no. 1 bedroom units,
  - 94 no. 2 bedroom 3 person units,
  - 563 no. 2 bedroom 4 person units,
  - 45 no. 3 bedroom units;
- Crèche 818sq;
- Open greenfield areas;
- 2,254 cycle parking spaces;
- 605 basement carpark spaces and 138 surface parking spaces;

It is noted that the proposed 1,007 units for the GA2 development is higher that the future land use assumptions noted in the South Fingal Transport Study (2019). However due to the high-quality public transport (existing and proposed) and cycling

infrastructure in the area, Baldoyle is an excellent location for higher density developments.

15.4.2 Construction Phase

Assuming planning permission is granted for the development in the beginning of 2022 and allowing for a 3-4 year construction period, it is estimated that the proposed development will be fully operational by the year 2026.

Before the development commences, a full and detailed construction management plan should be submitted to and agreed in writing with the Planning Authority, which shall include, inter alia, a construction programme for the works, hours of operation, a traffic management plan, noise and dust mitigation measures, including details of a truck wheel wash at the site entrance, and details of construction lighting. A Construction Manager will be appointed to liaise directly with the various sections of Fingal County Council.

The construction management plan will take into account construction vehicle routing and timing to mitigate any issues with vehicles on the surrounding road network.

All construction traffic will access/egress the site via a new construction route north of the site coming off Mayne Road. The route is for construction traffic only and does not interfere with the general public within the greater Baldoyle development. All site parking will be catered for within the site boundaries.

It is estimated that during the site clearance/excavation phase vehicular traffic to and from the site will be at its peak. During the peak construction period it is estimated that there will be 12 HGVs per hour arriving and leaving (ie. 24 HGV movements) during these works. assuming a 2 year timeframe for all the bulk excavations. Additionally, it is expected that an additional 50 light vehicles arrivals and 5 departures will occur during the AM peak. Overall, the estimated peak construction traffic will be significantly lower than the operational peak outlined in Section 15.5. It should be noted that the majority of construction traffic generated during the Construction Phase tends to be outside of peak hours. As traffic will be lower during the Construction Phase than during the Operational Phase, junction modelling and assessment will not be required for the Construction Phase.

All construction activities will be governed by a construction Traffic Management Plan (TMP) the details of which will be agreed with FCC's Roads Department prior to the commencement of the Construction Phase.

15.4.3 Operational Phase

15.4.3.1 Access Arrangements

Once operational it is proposed to utilise the two existing access points to the development from Red Arches Road onto Coast Road and from Longfield Road onto Grange Road. Pedestrian and cyclists' movements are fully catered for within the proposed development. Internal footpaths and walkways will be provided which link the proposed development to Red Arches Road and Longfield Road.

Within the development site, the road layout design and traffic management measures ensure low vehicle speeds are maintained on development roads providing a safe environment for cyclists to travel. High quality pedestrian footpaths of minimum width 1.8 metres are provided on both sides of all development roads which provide good

pedestrian linkage with all parts of the development and to existing external footpaths on the surrounding road network.

15.4.3.2 Parking Provision

Preplanning meetings were held with Fingal County Council including the Roads and Traffic department on the 2nd of September and the 16th of December 2020 to discuss the proposed Baldoyle GA2 development. FCC advised that the car parking and cycle parking requirements of the Development Plan were to apply to the proposed development.

Although the requirements of Fingal County Council with regard to car parking is acknowledged, it is proposed that a sustainable approach to parking will be incorporated into the development. The parking strategy utilised is derived from "Sustainable Urban Housing: Design Standards for New Apartments", which places a strong emphasis on bicycle parking. As per the standards, cycling is a:

"flexible, efficient and attractive transport option for urban living and these guidelines require that this transport mode is fully integrated into the design and operation of all new apartment development schemes."

The Baldoyle GA2 development is well situated next to high-quality off-road cycling infrastructure including the Baldoyle to Portmarnock Green Way and the S2S Greenway. There is an opportunity to maximise the benefit deriving from appropriate cycle parking provision.

The proposed development is also well situated next to high-quality existing public transport services, as well as planned future public transport upgrades. Additionally, the development is in an "Intermediate Urban Location" as per the standards and therefore the quantum of car parking can be reduced:

"In suburban/urban locations served by public transport or close to town centres or employment areas and particularly for housing schemes with more than 45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard."

In line with the Baldoyle-Stapolin LAP Objective TM 2, the development seeks to put a strong emphasis on sustainable forms of transport. Due to the close proximity of the proposed development to existing and future high frequency and high capacity public transport services, as well as high-quality off-road cycling infrastructure, the parking strategy for the proposed development is based upon the principles of "Sustainable Urban Housing: Design Standards for New Apartments" in order to further promote sustainable transport modes thus minimising the need for car usage and associated car parking.

As per the apartment standards, it is proposed that car parking will be reduced due to the exceptional public transport and cycle facilities in the area. Table 15.4 below summarises the car parking and cycle parking proposed to be provided within the development. The majority of car parking will be provided in the basement areas. The basement car parking provision of 605 spaces equates to 0.6 car parking spaces per residential unit, with 124 additional visitor car parking spaces available on the surface. Bicycle parking provision amounts to a total of 1,754 surface residential cycle parking spaces (1 space per room) and 500 surface visitor cycle parking spaces (one space per two units).

A creche set-down area has also been provided and 14 no. additional car parking spaces are allocated adjacent to the creche area at ground level to facilitate staff parking, short duration parking and childcare facility pickup / drop off.

Table 15.4 *Car Parking and Bicycle Parking*

	Land Use	Parking Provided	Ratio
Car Parking	Residential Units	605 Basement Car Parking Spaces	*0.6 spaces per residential unit*
		124 Surface/Visitor Car Parking Spaces	*1 space per 8 residential units*
	Creche Facility	14 Surface Short-term/Drop-off Car Parking Spaces	*1 space per 58m²*
Cycle Parking	Residential Units	1,754 Surface Residential Cycle Parking Spaces	*1 bicycle space per residential bedroom*
		500 Surface Visitor Cycle Parking Spaces	*1 bicycle space per 2 residential units*

The proposed car parking strategy at 0.6 basement car parking spaces per apartment will discourage reliance on the private car, resulting in a less negative effect on traffic in the surrounding area and is in line with a number of recent An Bord Pleanala decisions for similar developments. This strategy agrees with the projection that car ownership levels will not increase in the Baldoyle Area (and throughout the city) due to the increased investment in public transport infrastructure such as Bus Connects and MetroLink.

15.4.3.3 Car Parking Management

In line with the Baldoyle-Stapolin LAP Objective TM28, it is understood that car parking management and control often forms the most practical and effective method of encouraging modal shift. Access to the underground residential car parking will be regulated by means of barrier controlled systems. The majority of on street visitor car parking will be taken in charge by the Local Authority. However, a number of parking spaces including the creche parking will remain under the control of the management company.

Additionally, the management company will set aside a number of car parking spaces and allocate them to a private car sharing company which will enable residents to avail of car sharing services. The benefits of such car sharing services include; the reduction of the number of cars on the road, the freeing up of land traditionally used for private parking spaces and the increase in use of public transport, walking and cycling as the need for car ownership is reduced.

15.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

15.5.1 Construction Phase

All construction activities will be governed by a construction Traffic Management Plan (TMP) the details of which will be agreed with FCC's Roads Department prior to the commencement of the Construction Phase. The principal objective of the TMP is to ensure that the impacts of all building activities generated during the Construction Phase upon both the public (off-site) and internal (on site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders' requirements. All site parking will be catered for within the site boundaries.

During the construction works there will be additional HGV movements to/from the Site. Traffic will be generated by the disposal of surplus subsoil from the Site, deliveries of construction materials and equipment and of course private vehicles owned and driven by construction workers and staff. It is assumed c. 120,000m^3 of excavated material will be removed from site (these works should have the maximum HGV movements during the construction period). As a result it is estimated that a peak of 12 HGVs per hour arriving and leaving (ie 24 HGV movements) will occur during these works. Additionally, it is expected that an additional 50 light vehicles arrivals and 5 departures will occur during the AM peak. Overall, the estimated peak construction traffic will be significantly lower than the operational peak outlined in Section 15.5.

It should be noted that construction traffic generated during the Construction Phase tends to be varied throughout the day and generally outside of peak hours. (Staff and deliveries arrive before 07:30 and usually depart after 18:30). The traffic generated by the construction phase will not be higher than the peak hour predicted volumes for the Operational Phase. Any specific recommendations/requirements with regard to construction traffic management made by FCC will be adhered to during this phase.

All construction traffic will access/egress the site via a new construction route north of the site coming off Mayne Road. The route is for construction traffic only and does not interfere with the general public within the greater Baldoyle development.

15.5.2 Operational Phase: Proposed Development Impact

15.5.2.1 Development Trip Generation and Modal Split

Introduction

The Trip Rate Information Computer System (TRICS) database was interrogated to derive the potential development trip generation rates. Utilising data supplied by the TRICS database, Table 15.6 below details the estimated trip generation for the proposed residential development and creche during the morning and evening peak hours being considered for this study. The TRICS morning and evening peak hours were 08:00 to 09:00 and 17:00 to 18:00 respectively. The full TRICS output files are contained in Appendix 15.3.

When estimating trip generation for a residential development using TRICS the trip rate for car drivers generally accounts for a 65% modal split of total trips. However, in order to produce a more accurate assessment of the traffic impart, an investigation into the likely modal split was undertaken.

2016 Census Modal Choice

Census 2016 Small Area Population Statistics were analysed in order to determine existing travel to work, school and college trends of the surrounding apartment developments in the Baldoyle area. For the purposes of this analysis, 5 No. locations, which are characterised as being predominately apartment complexes were utilised. These locations mirror closely the proposed Baldoyle GA2 apartment development and are illustrated in Figure 15.16 below, marked in purple. Small Area populations in the area which comprised mainly semi-detached housing units or residential/industrial areas were excluded from this analysis.

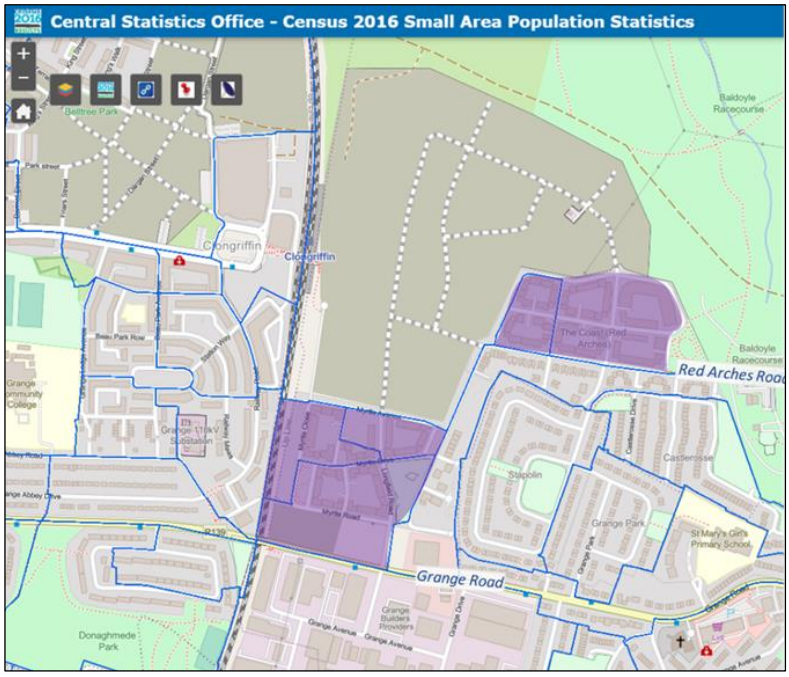


Figure 15.16 *Census 2016 Data Locations (Central Statistics Office)*

Table 15.5 outlines the modal split for households traveling to work, school or college of the surrounding apartment residential developments. The analysis indicates that a modal split of 31.4% for car drivers is observed in the area, far lower than the 65% modal split found in TRICS.

Table 15.5 *Mode choice summary*

Mode Choice	No. of Households	%
Car driver	274	31.4%
Car passenger	103	11.8%
On foot	117	13.4%
Bicycle	56	6.4%
Bus	57	6.5%
Train / DART	211	24.2%
Other	45	5.2%

	873	**100%**

PTAL – Public Transport Accessibility Level

As mentioned above, when estimating trip generation for a residential development using TRICS, the trip rate for cars accounts for a 65% modal split. This is in line with the national average modal split as well as the modal split of a location with a Public Transport Accessibility Level (PTAL) of 1 (South Fingal Transport Study 2012: Section 5). As the Baldoyle GA2 development has a PTAL of 4 (South Fingal Transport Study 2012: Section 5), a modal split of 41% for car drivers is generally applicable. A Public Transport Accessibility Level (PTAL) is defined as a numerical value which determines the quality of access to public transport from a particular location. The value is based on the proximity to a service, the frequency of the service, and the nature of the service. Baldoyle GA2 has a PTAL of 4 due to the proximity of the DART and Bus.

Conclusion

It can be concluded from the analysis that the car trips generated by the development will result in a modal split of c.30% to 40%. As a result, the trip rates derived by TRICS should be attenuated. This trip attenuation will more accurately reflect the trip generation of the Baldoyle GA2 development due to its proximity to Clongriffin DART station and Dublin bus routes. It is also in line with the regional and national strategies to promote and encourage sustainable transport. Furthermore, it is highly likely that this modal split will actually be lower due to the proposed sustainable parking strategy which will encourage less of a reliance on private cars and a greater focus on sustainable transport such as cycling.

Utilising data supplied by the TRICS database including trip attenuation principles, Table 15.6 following details the estimated trip generation for the proposed development and Creche during the morning and evening peak hours being considered for this study. For the purpose of this analysis, a modal split of 35% for the private car was used to reflect the likely outcome for the proposed development.

Additionally, the trips generated by the creche facility will most likely come from within the Baldoyle/Stapolin residential area and form part of the GA2 residential trips (ie. people using the creche will live within the GA2 development or the adjacent Baldoyle GA1/GA3 developments, rather than the wider Donaghmede/ Clongriffin area). Therefore, these trips will also be attenuated.

Table 15.6 *TRICS Trip Generation Residential Housing Development and Creche*

	Time	**Factor**	**TRICS Arrival Rate**	**TRICS Departure Rate**	**Hourly Trips** ***(65% modal split)***		**Attenuated Hourly Trips** ***(35% modal split)***	
					Trips In	**Trips Out**	**Trips In**	**Trips Out**
Residential Units	Morning Peak Hour	1,007 units	0.060 *(per unit)*	0.196 *(per unit)*	60	198	**32**	**107**
	Evening Peak Hour		0.173 *(per unit)*	0.087 *(per unit)*	174	88	**94**	**47**

Creche	Morning Peak Hour	820m^2	3.396 *(per 100m^2)*	2.806 *(per 100m^2)*	28	23	**15**	**12**
	Evening Peak Hour		2.412 *(per 100m^2)*	2.904 *(per 100m^2)*	20	24	**11**	**13**
TOTAL	Morning Peak Hour	-	-	-	-	-	**47**	**119**
	Evening Peak Hour		-	-	-	-	**105**	**60**

15.5.2.2 Trip Distribution

It was assumed for the purposes of this study that the future development traffic will likely be weighted more towards the Red Arches Road onto the Coast Road rather than the alternative Grange Road junction This is due to the proximity of the development to Coast Road and likely quicker journey times/less congestion via the Coast Road. By the year of opening 2026, it is anticipated that 60% of vehicles will enter and exit the subject site via the Coast Road Junction and 40% of vehicles will enter and exit the subject site via the Grange Road Junction. This will be the case during the morning and evening peak hours.

The future development traffic distribution at the surrounding junctions themselves will mirror existing traffic patterns i.e. development generated flows will be split through the junctions proportionally to existing flows. Once development traffic reaches the Red Arches Road/Coast Road junction; 40% of vehicles will travel north towards Portmarnock and 60% will travel south towards Baldoyle village, this split is evident for both the morning and evening peak hours. Equally, 40% of vehicles arriving back at the Red Arches Road/Coast Road junction will come from the north and 60% will come from the south. Once development traffic reaches the Longfield Road/Grange Road junction; 60% of vehicles will travel west towards the Donaghmede roundabout, 33% will travel east towards Baldoyle village and 7% will travel south towards Baldoyle Industrial Estate, this is also evident for both the morning and evening peak hours. Equally, when vehicles arrive back at the Longfield Road/Grange Road junction, they will follow the same proportions.

See Figures 15.17 and 15.18 below for a graphical representation of the trip distribution in and out of the development. The trip distribution will be the same for the morning and evening peak.

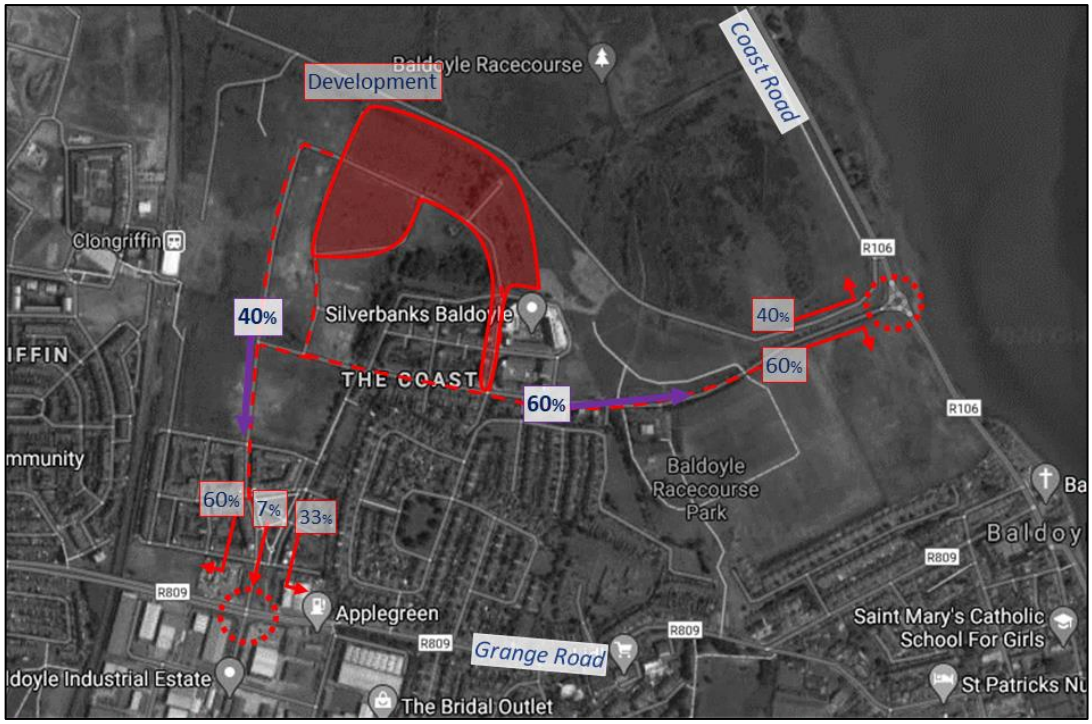


Figure 15.17 *Trip Distribution Percentages Leaving (AM peak and PM peak)*

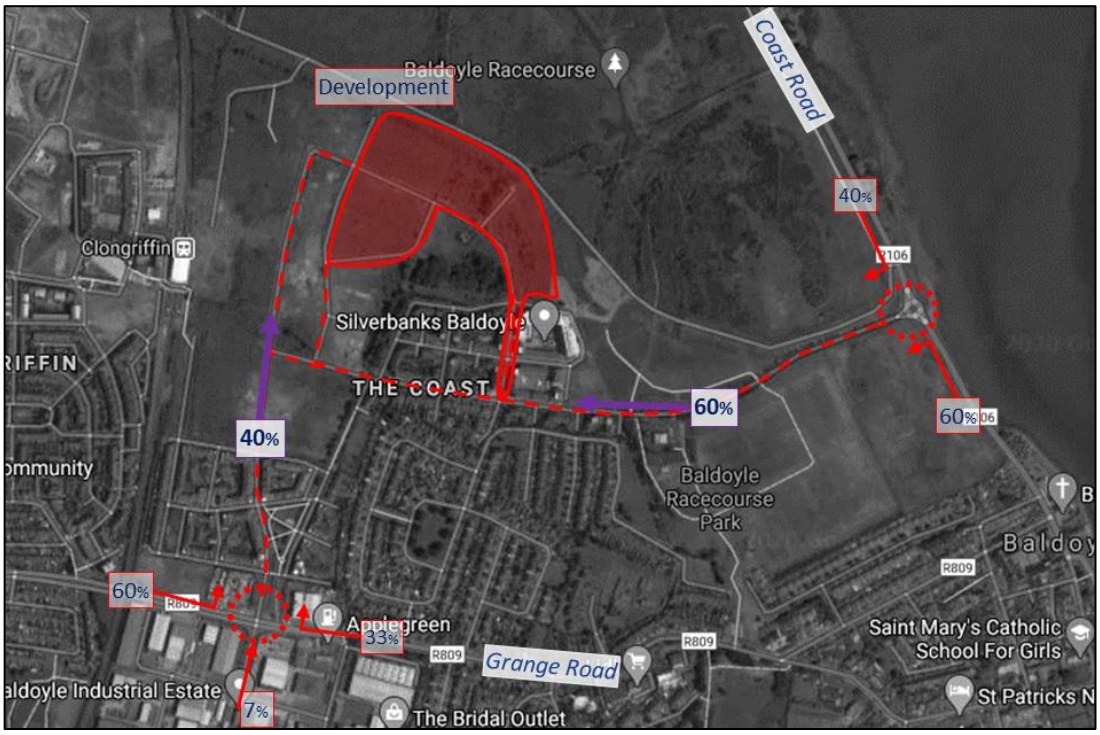


Figure 15.18 *Trip Distribution Percentages Arriving (AM peak and PM peak)*

15.5.2.3 Neighbouring Developments

Introduction

A review was conducted of neighbouring developments which have been granted planning permission or currently seeking planning permission in the vicinity of the

proposed GA2 development. The exercise is to identify any nearby developments with the potential to significantly increase vehicular traffic flows on the surrounding road network.

Neighbouring Committed Developments

Two locations where identified which have been granted planning permission and have started construction or nearing a construction start.

- A 16-classroom primary school with 22 no. car parking spaces and vehicular access to/from Myrtle Road connecting to Longfield Road. (Planning Ref: F19A/0461).
- A residential development as part of Baldoyle Stapolin Growth Area 1 (GA1), consisting of 99 houses which are currently under construction. The development formed part of a previously permitted planning application (Planning Ref F16A/0412 and APB PL06f.248970), which also included the rest of the GA1 site. The remainder of the GA1 site will be subject to another planning application.

For the purposes of this analysis, it has been assumed that the two developments above will be fully constructed and operational by the GA2 year of opening c. 2026 and therefore will be included in the "Without" development scenarios.

Neighbouring Future Developments

Two neighbouring developments where identified which are currently seeking planning permission and have submitted applications. The developments form part of the Baldoyle Stapolin Growth Areas 1 and 3.

- The GA1 development will consist of 882 new residential dwellings, residential tenant amenities, village centre and creche. (ABP ref TA06F.310418).
- The GA3 development will consist of 1,221 new residential dwellings, residential tenant amenities, creche, café/restaurant and public realm. (ABP ref TA06F.311016).
- A Hotel and Retirement Home on Red Arches Road, directly off Junction 3-Coast Road / Red Arches Road roundabout, consisting of a 150 no. bedroom hotel and a 150 no. bedroom retirement and respite care home. (Planning Ref F14A/0109 and ABP Ref. PL 06F.243832).

It is not known if the GA1, GA3 and the hotel/retirement home developments will be completed by the year of opening or even granted permission. However, in order to produce a conservative assessment, these neighbouring developments will be added to the traffic modelling scenarios. The combination of all three Growth Areas will act as a **"Stress Test"** Scenario and will be modelled in the year of opening 2026 and design year 2041.

Trip Generation

The trip generation of the neighbouring committed and future developments have been sourced from the traffic and transport statements submitted as part of the relevant planning applications referenced above.

Table 15.7 following details the trip generation of committed developments and Table 15.8 details the trip generation of potential future developments.

Table 15.7 *TRICS Trip Generation Committed Developments*

	Time	Factor	Hourly Trips	
			Trips In	**Trips Out**
Residential Units	Morning Peak Hour	-	68	68
	Evening Peak Hour		-	-
GA1 (99 Units Under Construction)	Morning Peak Hour	-	18	37
	Evening Peak Hour		28	19
TOTAL	Morning Peak Hour	-	**86**	**105**
	Evening Peak Hour		**28**	**19**

Table 15.8 *TRICS Trip Generation Future Developments*

	Time	Factor	Hourly Trips	
			Trips In	**Trips Out**
Hotel and Retirement Home	Morning Peak Hour	-	41	40
	Evening Peak Hour		50	51
GA1	Morning Peak Hour	-	127	224
	Evening Peak Hour		192	155
GA3	Morning Peak Hour	-	72	213
	Evening Peak Hour		142	102
TOTAL	Morning Peak Hour	-	**199**	**437**
	Evening Peak Hour		**334**	**257**
TOTAL (including GA2)	Morning Peak Hour	-	**244**	**554**
	Evening Peak Hour		**440**	**316**
TOTAL (including all committed developments)	Morning Peak Hour	-	**414**	**701**
	Evening Peak Hour		**517**	**387**

15.5.2.4 Trip Assessment Years

Assuming planning permission is granted for the development in the beginning of 2022 and allowing for a 3-4 year construction period, it is estimated that the proposed development will be fully operational by the year 2026.

Traffic analysis associated with this study will focus on the following future development operational scenarios:

- Residential Development Year of Opening – 2026
- 15 Year Design Horizon – 2041

The projected 2026 and 2041 design year traffic flows were calculated by factoring up the 2018/2019 recorded traffic flows in accordance with Table 5.3.2 of Transport Infrastructure Ireland publication, Project Appraisal Guidelines. The medium growth rate factors have been utilised.

Figures 15.19 and 15.20 illustrate the 2023 Year of Opening for the "without" development, "with" development (the proposed GA2) and "stress test" (combination of all three Growth Areas) scenarios. Figures 15.21 and 15.22 illustrate the 2041 Design Year Horizon for the "without" development, "with" development and "stress test" scenarios.

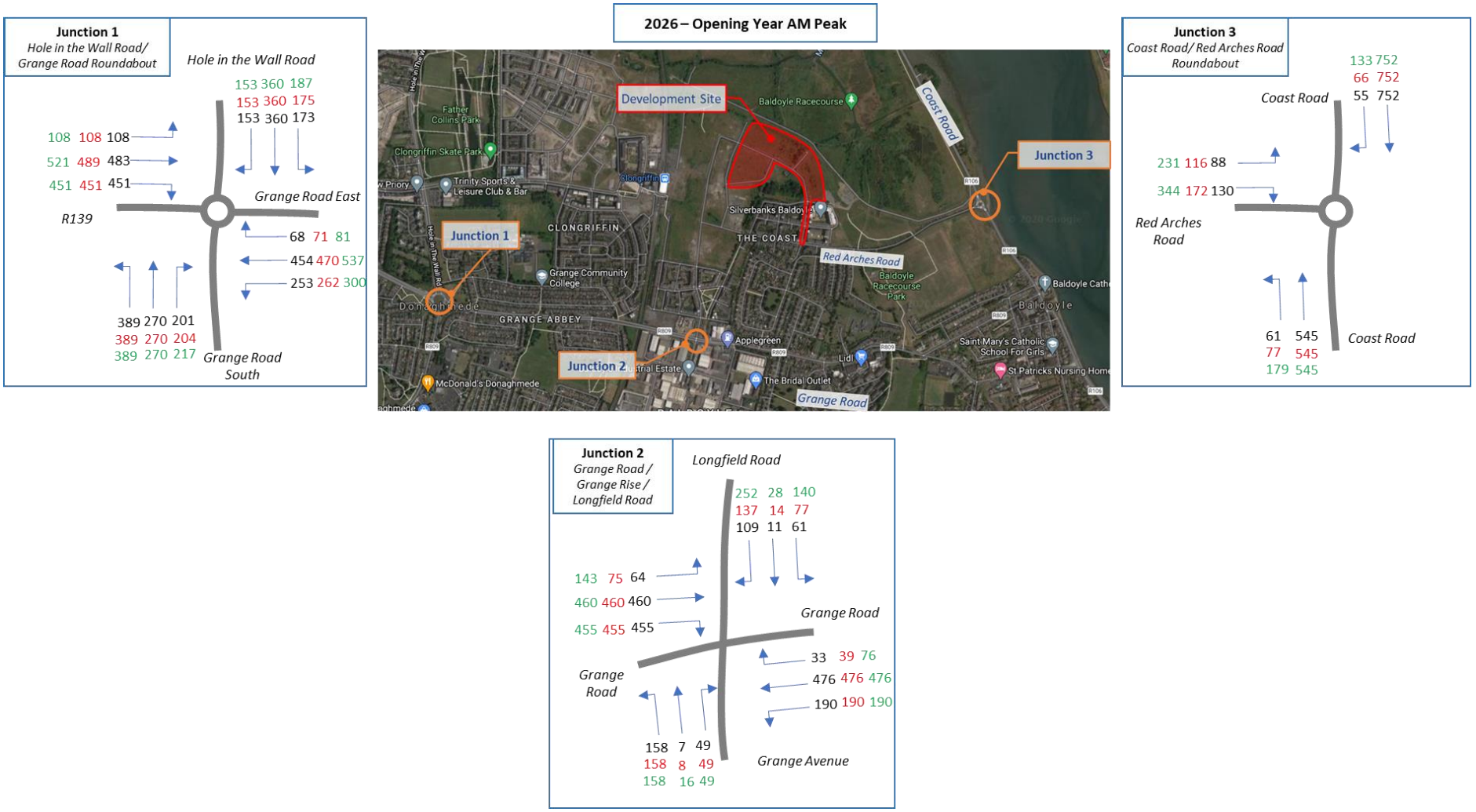


Figure 15.19 *Traffic Flow 2026 Opening Year AM Peak*

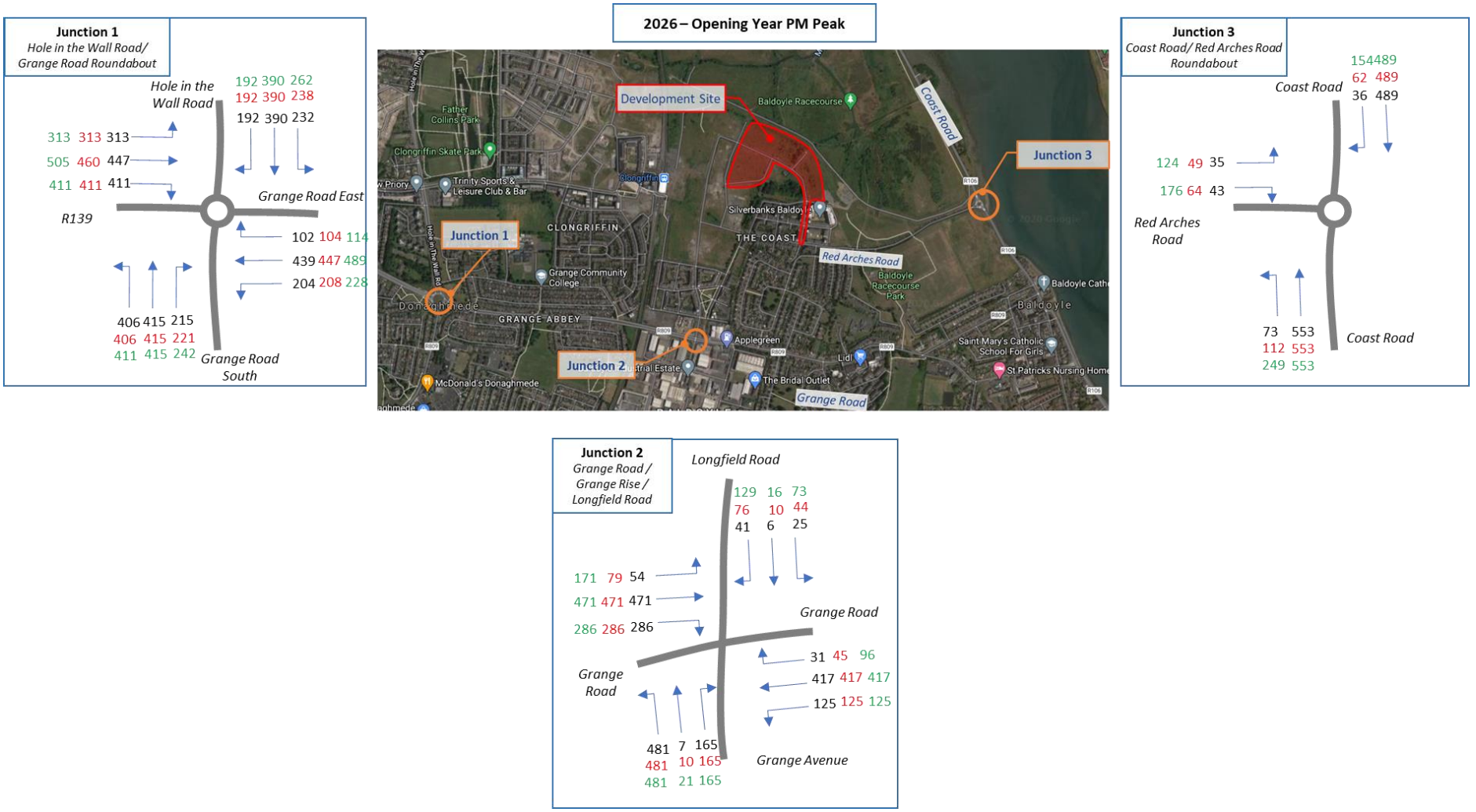


Figure 15.20 *Traffic Flow 2026 Opening Year PM Peak*

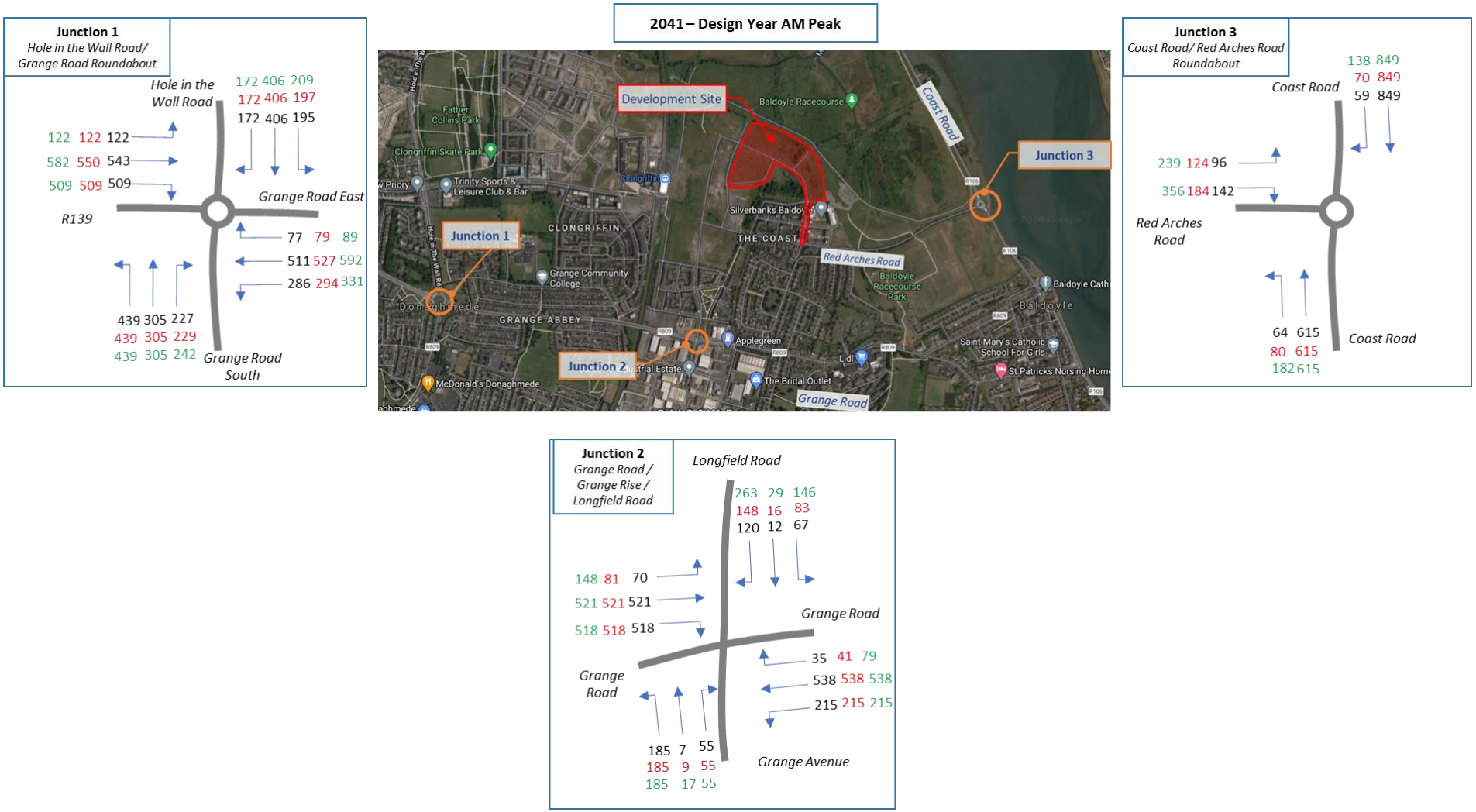


Figure 15.21 *Traffic Flow 2041 Opening Year AM Peak*

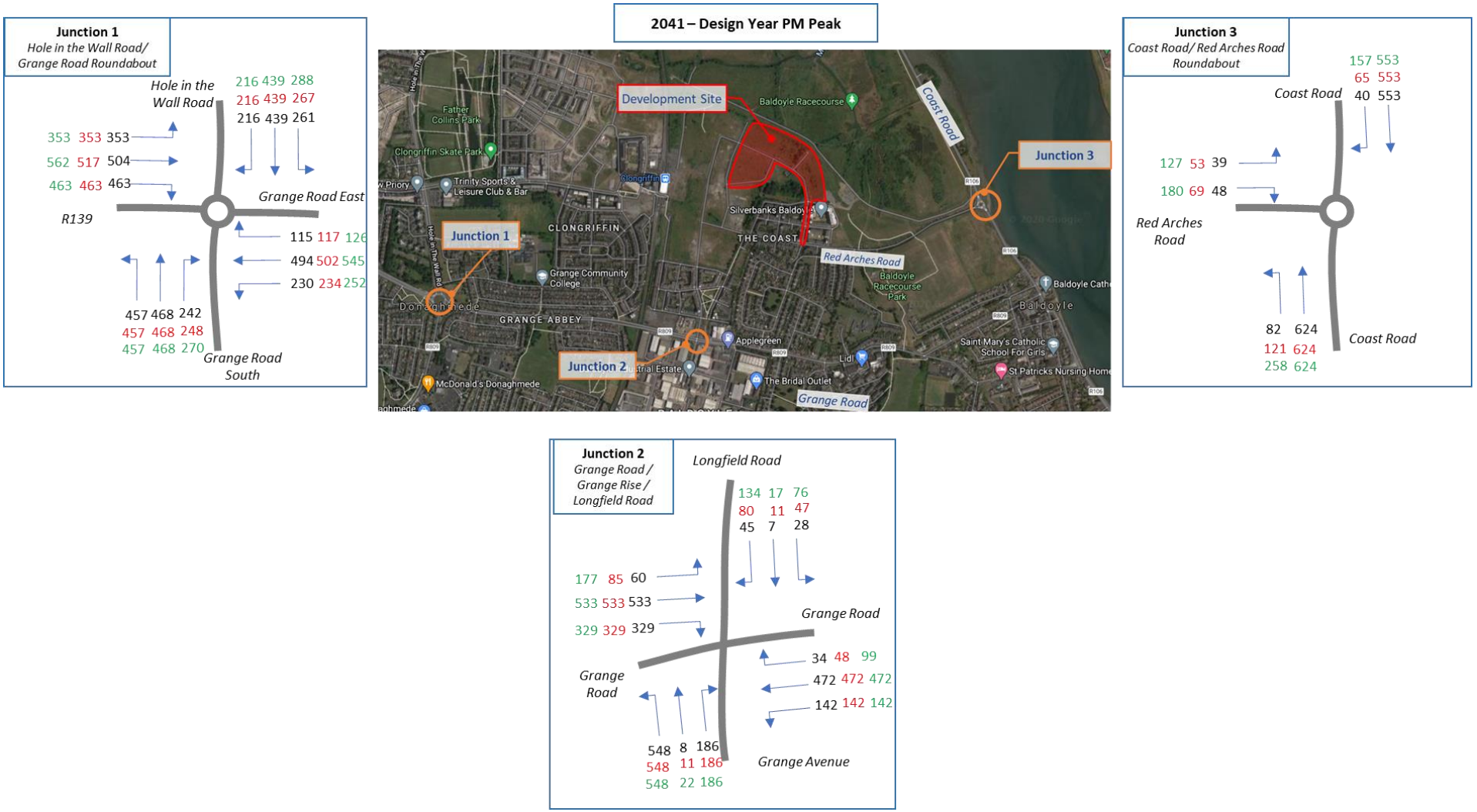


Figure 15.22 *Traffic Flow 2041 Opening Year PM Peak*

15.5.2.5 Traffic Impact 2026 Opening Year

To assess the future traffic impact of the proposed development, capacity assessments were undertaken using TRL's PICADY, OSCADY and ARCADY software on the following junctions;

- Junction 1- Hole In The Wall / Grange Road / R139 roundabout
- Junction 2- Grange Road / Grange Rise / Longfield Road
- Junction 3- Coast Road / Red Arches Road roundabout

The junctions were modelled for the 2026 year of Opening and 2041 the 15 Year Design Horizon for the morning and evening peak hour periods using the flow diagrams shown in **Figures 15.19 to 15.22** in the previous section. Each junction was modelling using their own PM Peak time.

To demonstrate the direct traffic impact associated with the proposed development, the traffic modelling exercise was carried out for the "without" development, "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. A sample traffic modelling output file is included in this report in **Appendix 15.2**.

A summary of the results of the analysis for the 2026 year of opening the "without" development, "**with**" development and "**stress test**" scenarios., morning and evening peak hours is shown in **Tables 15.9** to **15.11** following.

Table 15.9 *Junction 1- Hole In The Wall / Grange Road / R139 roundabout 2026 Opening Year Morning and Evening Peak Hour*

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Grange Road (East)	0.63 0.65 0.75	0.61 0.62 0.67	2 2 3	2 2 2	8 8 11	7 8 9
Grange Road (South)	0.74 0.75 0.79	0.92 0.93 0.97	3 3 4	10 11 16	12 12 15	34 37 53
R139	0.86 0.87 0.91	1.06 1.08 1.13	6 7 9	49 57 83	21 22 28	127 144 200
Hole in The Wall	0.61 0.62 0.64	0.68 0.69 0.72	2 2 2	2 2 3	8 8 9	9 10 11

The normal design threshold for the ratio of flow to capacity (RFC) is 0.85 for a roundabout junction. **Table 15.9** demonstrates that Junction 1- Hole in The Wall / Grange Road / R139 exceeds the normal design threshold during the morning and evening peak hour considered for the R139 and Grange Road (South) arms. The R139 arm during the PM peak period will also exceed the normal theoretical capacity of 1.0 with queuing and delays evident. However, this is the case for both the "Without",

"**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios.

It is clear from the comparative analysis presented above in terms of Max RFC, Max Queue size and Average Delay, that the proposed development will have an imperceptible impact on the Junction. The few vehicle trips generated by the development during the peak hours will be well diluted when distributed by the time it reaches the Hole In the Wall roundabout and hence will have a minimal traffic impact.

Table 15.10 *Junction 2- Grange Road / Grange Rise / Longfield Road 2026 Opening Year Morning and Evening Peak Hour*

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Grange Road (East)	0.95 0.97 1.03	0.88 0.88 0.88	29 32 47	20 20 21	83 93 138	65 65 65
Grange Avenue	0.61 0.62 0.74	0.84 0.84 0.88	9 9 10	25 25 28	59 61 75	71 73 85
Grange Road (West)	0.97 0.97 1.02	0.80 0.84 0.94	42 44 58	27 29 37	81 84 113	58 61 78
Longfield Road	0.88 0.90 1.02	0.31 0.57 0.95	12 14 31	3 6 14	136 130 153	66 77 47

The normal design threshold for the ratio of flow to capacity (RFC) is 0.90 for a signalised junction. **Table 15.10** demonstrates that Junction 2- Grange Road / Grange Rise / Longfield Road will exceed the normal design threshold during the morning peak hour considered. This is the case for both the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. It is clear from the comparative analysis presented above in terms of Max RFC, Max Queue size and Average Delay, that the proposed development will have an imperceptible impact on the Junction. While the "**with**" development and "**stress test**" scenarios do have a noticeable effect on the Longfield Road arm, it is to be expected, as at this stage, once a junction is at or nearing capacity any slight increase, whether it is background traffic growth or new trip generation, will have a noticeable increase in queues/delays.

Table 15.11 *Junction 3- Coast Road / Red Arches Road roundabout 2026 Opening Year Morning and Evening Peak Hour*

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Coast Road (North)	0.67 0.70 0.82	0.42 0.44 0.55	2.0 2.5 5	0.8 0.8 1.3	9 10 18	5 6 7
Red Arches Road	0.43 0.44 0.52	0.43 0.46 0.59	1 1 1.1	0.8 0.9 1.5	4 5 6	4 5 6
Coast Road (South)	0.21 0.27 0.54	0.07 0.10 0.28	0.3 0.4 1.3	0.1 0.1 0.4	4 5 7	4 4 5

The normal design threshold for the ratio of flow to capacity (RFC) is 0.85 for a roundabout junction. **Tables 15.11** demonstrates that Junction 3- Coast Road / Red Arches Road will operate within the normal design threshold during the morning and evening peak hour considered. This is the case for both the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. The analysis indicates that the development will have an imperceptible impact on the Junction.

15.5.2.6 Traffic Impact 2041 Design Year

A summary of the results of the analysis for the 2041 design year opening "without" development, "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios, morning and evening peak hours is shown in **Tables 15.12** to **15.14** following.

Table 15.12 *Junction 1- Hole In The Wall / Grange Road / R139 roundabout*

2041 Opening Year Morning and Evening Peak Hour

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Grange Road (East)	0.75 0.77 0.87	0.71 0.72 0.77	3 4 7	3 3 4	12 13 22	10 11 13
Grange Road (South)	0.87 0.88 0.93	1.08 1.09 1.14	7 7 11	60 66 92	24 24 39	153 161 229
R139	0.99 1.01 1.05	1.22 1.23 1.27	24 30 45	144 155 197	69 70 114	430 461 575
Hole in The Wall	0.74 0.74 0.76	0.77 0.77 0.80	3 3 3	4 4 4	13 13 14	13 13 15

The normal design threshold for the ratio of flow to capacity (RFC) is 0.85 for a roundabout junction. **Table 15.12** demonstrates that Junction 1- Hole in The Wall / Grange Road / R139 exceeds the normal design threshold during the morning and evening peak hour considered for the R139 and Grange Road (South) arms. The R139 and Grange Road (South) arms will also exceed the normal theoretical capacity of 1.0 with queuing and delays evident. However, this is the case for both the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios.

It is clear from the comparative analysis presented above in terms of Max RFC, Max Queue size and Average Delay, that the proposed development will have an imperceptible impact on the Junction. The few vehicle trips generated by the development during the peak hours will be well diluted when distributed by the time it reaches the Hole In the Wall roundabout and hence will have a minimal traffic impact.

Table 15.13 *Junction 2- Grange Road / Grange Rise / Longfield Road*

2041 Opening Year Morning and Evening Peak Hour

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Grange Road (East)	1.05 1.06 1.14	0.95 0.96 0.96	53 47 84	27 29 29	150 161 308	88 90 90
Grange Avenue	0.73 0.76 0.85	0.96 0.96 0.96	11 12 13	35 34 42	69 74 88	102 102 102
Grange Road (West)	1.03 1.06 1.15	0.87 0.91 1.01	59 66 96	35 38 58	105 120 208	72 78 121
Longfield Road	0.98 1.00 1.15	0.36 0.64 0.93	16 20 45	4 7 15	176 174 290	72 88 141

The normal design threshold for the ratio of flow to capacity (RFC) is 0.90 for a signalised junction. **Table 15.13** demonstrates that Junction 2- Grange Road / Grange Rise / Longfield Road will exceed the normal design threshold during the morning and evening peak hour considered. This is the case for both the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. It is clear from the comparative analysis presented above in terms of Max RFC, Max Queue size and Average Delay, that the proposed development will have an imperceptible impact on the Junction. While the "**with**" development and "**stress test**" scenarios do have a noticeable effect on the Longfield Road arm, it is to be expected, as at this stage, once a junction is at or nearing capacity any slight increase, whether it is background traffic growth or new trip generation, will have a noticeable increase in queues/delays.

Table 15.14 *Junction 3- Coast Road / Red Arches Road*

2041 Opening Year Morning and Evening Peak Hour

	Max. RFC		Max. Queue (PCU)		Average Delay (Seconds)	
Approach Arm	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Coast Road (North)	0.76 0.77 0.92	0.47 0.49 0.61	3 4 10	1 1 2	13 14 37	5 6 8
Red Arches Road	0.48 0.47 0.58	0.49 0.51 0.65	1 1 2	1 1 2	5 5 6	5 5 7
Coast Road (South)	0.23 0.24 0.58	0.09 0.11 0.30	0.3 0.5 2	0 1 1	5 5 9	4 4 5

The normal design threshold for the ratio of flow to capacity (RFC) is 0.90 for a roundabout junction. **Tables 15.14** demonstrates that Junction 3- Coast Road / Red Arches Road will operate within the normal design threshold during the morning and evening peak hour considered. This is the case for both the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. The analysis indicates that the development will have an imperceptible impact on the Junction.

A sample traffic modelling output file is included in this report in **Appendix 15.2**.

15.5.2.7 Conclusion

As demonstrated above, Junction 3- Coast Road / Red Arches Road has a high level of residual capacity both in the 2026 and the 2041 future years. This will have the effect of attracting development trips away from the signalised Junction 2- Grange Road / Grange Rise / Longfield Road and therefore also Junction 1 – Hole in the Wall Road / Grange Road / R139 roundabout during peak hours as the road network flows 'balance out'.

In heavily trafficked urban environments, it is common for signalised junctions to exceed capacity with a degree of saturation well in excess of 1.0. As echoed within the South Fingal Transport Study, providing more road space to cater for private vehicles will undermine the area strategy which is to create a modal shift from car use to public transport.

Therefore, any queuing and delay experienced by drivers at the signal-controlled Junction 2 may be considered a demand management measure which serves to promote the modal shift towards public transport. The national aspiration is not to provide additional road space within towns and cities for future traffic growth in order to deter car use and promote public transport. Lastly, it is evident from the analysis that the development will have an imperceptible/minimal impact on all three junctions.

15.6 REMEDIAL AND MITIGATION MEASURES

With the objective of mitigating the potential impact of the proposed Baldoyle GA2 development during its Construction and Operational Stage, the following proposals have been identified and subsequently form an integral part of the subject development proposals.

15.6.1 Construction Phase

Managing construction traffic is an ongoing collaborative process. The application documentation includes a Construction Environmental Management Plan (CEMP) prepared by AWN Consulting; the measures set out therein will be adhered to by the construction contractor.

In advance of work starting on site the works Contractor will prepare an updated and revised construction environmental management plan and construction traffic management plan to be submitted to FCC for approval. The construction stage management plan will act as a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. The document will include lessons learned from previous developments the contractor has worked on. The following mitigation measures have been identified which will form part of a plan:

- Good construction management practices will be employed such as fencing the site off from the public and neighbouring sites, adequate external/internal signage, secure internal site offices, dedicated construction access points all to ensure the safety construction staff and the public.
- Appropriate levels of staff parking and compounding will be provided to ensure no potential overflow or haphazard parking in the area. The Site will be able to accommodate employee and visitor parking throughout.
- Set construction traffic routes to and from the site will be agreed with FCC prior to the commencement of constructions activities onsite. The time of day permittable for such routes will also be agreed upon and outside of the morning/evening peak hours.
- Construction traffic will access/egress the site via the construction route coming from Mayne Road. The route is for construction traffic only and does not interfere with the general public within the greater Baldoyle development.
- Wheel wash facilities will be provided on site to ensure that construction debris will not have an impact on the quality of roads in the Baldoyle area.

15.6.2 Operational Phase

A number of measures have been and will be implemented prior to the subject scheme opening which include:

Development Plan Objectives: The Fingal Development Plan 2017-2023 and Baldoyle-Stapolin LAP 2013-2019 propose a number of junction and road infrastructure upgrades which will greatly increase traffic capacity in the area. The upgrades include an extension of Red Arches Road and bridge over the Clongriffin DART railway line, the Hole in the Wall realignment upgrade nearing completion and the realignment of the Malahide road from Belcamp Lane to north of Chapel Road including a new grade separated junction with the R139. All junction upgrades will

improve traffic movements in the area, improve road safety, and provide a safer environment for pedestrians and cyclists, encouraging sustainable transport.

Parking: Car parking and bicycle parking within the development will take a sustainable approach to parking. The parking strategy utilised is derived from "Sustainable Urban Housing: Design Standards for New Apartments", which places a strong emphasis on bicycle parking, thus reducing the need for private single occupancy vehicles.

Residential Travel Plan (RTP): An RTP included with the application documents is to be rolled out with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor. A Residential Travel Plan, also known as a Mobility Management Plan, is a long-term management strategy which identifies a package of measures to encourage residents and visitors to use sustainable forms of transport such as walking, cycling and public transport and to reduce dependency on private car single-occupancy use. By providing for the transportation needs of people and goods in an ordered and planned manner the environmental, economic and social impacts of travel may be greatly reduced.

The successful implementation of the Residential Travel Plan provides the development with a number of advantages, which include: improved environmental performance; improved health and well-being for those residents using active transport modes and the reduced demand for car parking spaces. Available initiatives to reduce the environmental impact of commuter journeys include; car pooling schemes and the promotion of sustainable transport such as walking, cycling and public transport.

15.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

15.7.1 Construction Phase

There will be minor impacts on the safety and operation of the road network as a result of the construction phase of the Baldoyle GA2 development. Having consideration for the mitigation measures outlined above, likely impacts during the construction phase will be negligible. All construction related traffic will be outside the morning and evening peak hours and will not have a significant impact on the operation of the adjoining junctions.

The overall residual impact during the construction phase of the proposed development on traffic and transportation, after the implementation of mitigations measures outlined in Section 15.6.1 above will be ***short term, not significant and neutral***.

15.7.2 Operational Phase

The traffic analysis and operational assessment of the proposed residential development at the three junctions revealed that at present Junction 1- Hole in The Wall / Grange Road / R139 roundabout and Junction 2- Grange Road / Grange Rise / Longfield Road just begin to exceed their normal design threshold in 2021 but operate within their theoretical capacity of 1.0. Junction 3- Coast Road / Red Arches Road roundabout operates below the normal design threshold during the morning and evening peak hour considered.

In the year of opening (2026) and design year (2041), three different assessment scenarios were looked at; the "Without", "**with**" development (the proposed GA2) and

"**stress test**" (combination of all three Growth Areas) scenarios. It was assumed that all future development traffic will mirror existing travel flows when exiting the development.

In the year of opening (2026), Junction 3- Coast Road / Red Arches Road roundabout will continue to operate below the normal design threshold during the morning and evening peak hours. However, Junction 1- Hole in The Wall / Grange Road / R139 roundabout during the morning and evening peak hours and Junction 2- Grange Road / Grange Rise / Longfield Road during the morning and evening peak hour will operate above the normal design threshold. It must be noted that this will be the case for both the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. However, the analyses indicate that the development will have an imperceptible impact on the Junctions.

In the design year (2041), Junction 3- Coast Road / Red Arches Road roundabout will continue to operate within the normal design threshold during AM and PM peak hour. This is the case for the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. Junction 1- Hole in The Wall / Grange Road / R139 roundabout and Junction 2- Grange Road / Grange Rise / Longfield Road will continue to exceed the normal design threshold for the AM and PM peak hours. This is the case for the "Without", "**with**" development (the proposed GA2) and "**stress test**" (combination of all three Growth Areas) scenarios. However, the analyses indicate that the development will have an imperceptible impact on the Junctions.

The analysis and operational assessment of the key junctions in the vicinity of the study area confirms that the Grange Road signalised junction will operate at or close to capacity. The Coast Road roundabout will operate within capacity. This will have the effect of attracting development trips away from the signalised junction as the road network flows 'balance out'. This is also considered acceptable as providing more road space to cater for private vehicles will undermine the area strategy which is to create a modal shift from car use to public transport.

The proposed development is well positioned within the Baldoyle Stapolin LAP lands to avail of excellent links to Clongriffin DART station and Dublin Bus routes as well as neighbouring phases of development and the two key junctions onto the external road network at Coast Road Roundabout and Grange Road signalised junction.

The parking strategy utilised is derived from "Sustainable Urban Housing: Design Standards for New Apartments". As per the standards, it is proposed that car parking will be reduced due to the exceptional public transport and cycle facilities in the area. The proposed car parking strategy at 0.6 basement car parking spaces per apartment will discourage reliance on the private car, resulting in a less negative effect on traffic in the surrounding area.

This study concludes that from a traffic and road safety perspective, the proposed residential development as described herein, does not pose any significant residual impacts.

The overall residual impact during the operational phase of the proposed development on traffic and transportation, after the implementation of mitigations measures outlined in Section 15.6.2 above will be ***long-term, not significant and neutral***.

15.8 MONITORING OR REINSTATEMENT

15.8.1 Construction Phase

During the Construction Phase a number of monitoring exercises will be utilised in Baldoyle GA2 development and going forward. The specific exercises implemented come from the range of measures detailed in the final construction management plan to be agreed with the planning authority;

- compliance with construction vehicle routing practices;
- compliance with construction vehicle parking practices;
- internal and external road conditions; and
- timing of construction activities.

15.8.2 Operational Phase

During the operational stage it is anticipated that the residual impacts from both the proposed development and background traffic growth will be mitigated with the improvements of the public transport network (DART and BusConnects) and cycling infrastructure throughout Dublin. Therefore, no significant monitoring has been proposed. However, the Residential Travel Plan has set out ways to monitor progress.

The RTP included with the application documents sets out a strategy which identifies a package of measures to encourage residents and visitors to use sustainable forms of transport and to reduce dependency on private car single-occupancy use. Whilst it is difficult to continuously monitor the progress, the setting of targets and promotion of the plan will be vital. Modal split targets need to be attainable and most importantly correspond with the development's goals i.e. supporting and enhancing the lives the residents involved. As well as reviewing objectives and initiatives regularly, it is equally important to measure results. This ensures that the targets are realistic and are being met and most importantly they correspond with the development's goals.

Mobility management measures are relatively new to Ireland and are therefore not widely understood. In the absence of extensive Irish based performance data associated with such measures, expectations for their implementation and performance are often idealistic. Mobility management measures for residential developments are difficult to arrange and monitor. The proposals set out in the Residential Travel Plan however give a framework for adopting mobility management principles.

A Residential Travel Plan is not a one-off event, more so it is an on-going iterative process. The collection of commuter data, and on-going monitoring and reviewing of the initiatives set out within the plan will form a far greater part of the Residential Travel Plan itself.

Preliminary targets should be reviewed and adjusted as required. Failing to meet initial targets should not be seen as failure, as the initial 12 to 18 months of the plan should be viewed as a calibration exercise for target setting.

15.9 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

15.9.1 Construction Phase

As outlined in section 15.7.1, there will be minor impacts on the safety or operation of the road network as a result of the construction phase of the Baldoyle GA2 development. Having consideration for the mitigation measures outlined above, any impacts during the construction phase will be negligible.

The cumulative impact during the construction phase of the proposed development in combination with other existing or permitted development on traffic and transportation, after the implementation of mitigations measures outlined in Section 15.6.2 above will be ***short-term, not significant and neutral***.

15.9.2 Operational Phase

The cumulative impact of the proposed development is demonstrated by the assessment carried out for the design year 2041 as summarised is Section 15.7.2. The analysis and operational assessment of the key junctions in the vicinity of the study area confirms that the Grange Road signalised junction will operate at or close to capacity. The Coast Road roundabout will operate within capacity. This is considered acceptable as providing more road space to cater for private vehicles will undermine the area strategy which is to create a modal shift from car use to public transport.

The 2041 design year traffic flows which were calculated by factoring up the recorded traffic flows in accordance with TII's Project Appraisal Guidelines. The traffic growth factors applied to the traffic count will account for the full impact of population growth and employment distribution expected in the Baldoyle area.

It is noted that the junction analysis for the entire development is a robust and conservative analysis. The Entire Development 2041 analysis assumes that little additional transport interventions have been applied to the road network in the Fingal area and presents a "worst-case" situation where the full impact of population growth and employment distribution is assigned to the existing road network. Several committed road schemes and junction upgrades in the Fingal area are to be implemented in the coming years.

The analysis does not consider that by 2041 further sustainable transport improvements in the Fingal area such as improved DART services, Bus Connects, cycle schemes and additional government initiatives will all have a positive effect on the modal split, reducing the impact on surrounding junctions.

The cumulative impact during the operational phase of the proposed development in combination with other existing or permitted development on traffic and transportation, after the implementation of mitigations measures outlined in Section 15.6.2 above will be ***long-term, not significant and neutral***.

16.0 WASTE MANAGEMENT

16.1 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 (Bsc ENV AssocCIWM) of AWN Consulting. Chonaill Bradley is a Principal Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia. He is an Associate Member of the Institute of Waste Management (CIWM). Chonaill has over seven years' experience in the environmental consultancy sector and specialises in waste management.

A site-specific Construction and Demolition Waste Management Plan (C&D WMP) 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 16.1. The C&D WMP 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 16.2 of this Chapter.

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.

16.2 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 provided in Appendix 16.1 and the OWMP provided in Appendix 16.2.

This Chapter is based on the proposed development, as described in Chapter 2 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including demolition, site preparation and excavation);

- Operational phase; and
- Decommissioning 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 16.6

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 6 of this EIAR (Land, Soils, Geology and Hydrogeology).

16.2.1 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 16.1).

Figure 16.1 *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* and the EPA's *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects'*. 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.

16.2.2 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 of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

16.2.3 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 Roscommon 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.

16.3 RECEIVING ENVIRONMENT

In terms of waste management, the receiving environment is largely defined by FCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the EMR Waste Management Plan 2015 – 2021, 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 Fingal Development Plan 2017 – 2023 also sets policies and objectives for the FCC area, which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, FCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR 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.

16.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of A Strategic Housing Development for the construction of 1,007 residential apartments (consisting of 58 no. studio units, 247 no. 1 bedroom units, 94 no. 2 bedroom 3 person units, 563 no. 2 bedroom 4 person units, and 45 no. 3 bedroom units), communal residential community rooms, and a ground floor creche in 16 no. buildings with heights varying from 4 to 12 storeys, basement and surface level car parking, secure bicycle parking, landscaping, water supply connection at Red Arches Road, and all ancillary site development works on a site located in the townland of Stapolin, Baldoyle, Dublin 13.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 6 (Land, Soils, Geology and Hydrogeology), which also discusses the environmental quality of any soils to be excavated to facilitate construction of the proposed Project.

A full description of the proposed development can be found in Chapter 2 (Description of the Proposed Development). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

16.4.1 Demolition Phase

There will be no demolition required as part of this development.

16.4.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be soil, stones, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed basements. The development engineers have estimated that 135,000m^3 of material will need to be excavated to do so. It is currently envisaged that 6,000m^3 will be able to be retained and reused onsite for landscaping purposes the remaining material, will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

If the material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under 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 WMP (Appendix 16.1).

Ground Investigations Ireland (GII) carried out an environmental site investigation directly to the east of the proposed development site between October 2019 and February 2020 (BSM, 2021). The scope of works included trial pitting, borehole drilling, subsoil sampling, interpretation of chemical data and reporting. Site investigation works also entailed Geotechnical & Environmental Laboratory testing (12 No in total for environmental testing).

During the 2019 and 2020 site investigations, samples were recovered from the on-site trial pit and borehole locations and sent for analysis. In order to assess materials, which may be excavated and removed from Site, in terms of waste classification, a selection of samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as hazardous or non-hazardous referred to as the 'RILTA Suite'. The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen. The total pollutant content analysis also provides analytical data which can be used to assess the quality of the

subsoils underlying the Site and allow an assessment of their suitability for a range of proposed uses against generic assessment criteria.

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.

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 16.1). 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 16.1.

Table 16.1 *Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	2133.0	10	213.3	80	1706.4	10	213.3
Timber	1809.8	40	723.9	55	995.4	5	90.5
Plasterboard	646.4	30	193.9	60	387.8	10	64.6
Metals	517.1	5	25.9	90	465.4	5	25.9
Concrete	387.8	30	116.3	65	252.1	5	19.4
Other	969.5	20	193.9	60	581.7	20	193.9
Total	**6463.6**		**1467.2**		**4388.8**		**607.6**

16.4.3 Operational Phase

As noted in Section 16.1, an OWMP has been prepared for the proposed development and is included in Appendix 16.2. 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, organic waste and mixed non-recyclable waste; 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 Project for the main waste types, based on the AWN waste generation model (WGM), is presented in Table 16.2, and is based on the uses and areas as advised by the Project Architects. Further unit breakdowns can be found in Appendix 16.2.

Table 16.2 *Estimated off-site Reuse, Recycle and Disposal Rates for Construction Waste*

Waste type	Waste Volume (m^3/week)	
	Residential Units (Combined)	Commercial Units (Combined)
Organic Waste	15.49	0.08
DMR	109.79	2.76
Glass	3.00	0.01
MNR	57.73	1.51
Total	186.01	4.35

The residents and 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). All WSAs can be viewed on the plans submitted under separate cover with the application.

The OWMP seeks to ensure that the proposed Project contributes to the targets outlined in the *EMR Waste Management Plan 2015 – 2021* and the FCC waste bye-laws.

16.4.4 Decommissioning Phase

The Proposed Development may be decommissioned at some stage in the future. At that time, a demolition or refurbishment plan will be formulated for the decommissioning phase of the Proposed Development to ensure no waste nuisance occurs at nearby sensitive receptors.

16.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential waste effects associated with the proposed development.

16.5.1 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 and regional environment is likely to be ***short-term, significant*** and ***negative***.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be ***Long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the Development Site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed Development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 6. It is anticipated that c. 135,000 m^3 of excavated material will need to be removed off-site, however it is envisaged that c. 6,000 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***.

16.5.2 Operational Phase

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

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling 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 **indirect, *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 **indirect, *long-term, significant*** and ***negative***.

16.5.3 Decommissioning Phase

The greatest potential impact on waste during the decommissioning phase of the Proposed Development would be if the building waste to be demolished or refurbished.

The decommissioning of the proposed development will generate a range of non-hazardous and hazardous waste materials during site demolition / refurbishment. 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 and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with the European Union, 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 **indirect, *long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region and within Ireland. 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 **indirect, *short-term, significant*** and ***negative***.

16.5.4 Do Nothing Scenario

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.

16.6 REMEDIAL AND 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.

16.6.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development :

As previously stated, a project specific 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), *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects'* and is included as Appendix 16.1. 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 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 16.1) in agreement with FCC, or submit an addendum to the C&D WMP to FCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will be required to fully implement the C&D WMP throughout the duration of the proposed excavation and construction phases.

A quantity of topsoil and sub soil will need to be excavated to facilitate the proposed development. The Project Engineers have estimated that 129,000m^3 of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
    - Concrete rubble (including ceramics, tiles and bricks);
    - Plasterboard;
    - Metals;
    - Glass; and
    - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- 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 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.

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.

16.6.2 Operational Phase

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in a designated, easily accessible areas of the site.

- 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.

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 including Vertical Farm organic waste;
    - Dry Mixed Recyclables;
    - Mixed Non-Recyclable Waste;
    - Glass;
    - Waste Oil;
    - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
    - Batteries (non-hazardous and hazardous);
    - Light bulbs; and
    - Cleaning chemicals (paints, adhesives, resins, detergents, etc.).
- 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 Project is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the FCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved

16.6.2.1

The following mitigation measures will be implemented during the decommissioning of the proposed development:

- Prior to commencement, the appointed Contractor(s) will be required to prepare a Demolition or Refurbishment Waste Management Plan (DR WMP) in agreement with FCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will be required to fully implement the DR WMP throughout the duration of the decommissioning.

In addition, the following mitigation measures will be implemented:

- 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.
- 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 / refurbishment 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.

16.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

16.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 16.6.1 and adherence to the C&D WMP (Appendix 16.1) during the construction phase will ensure that the predicted effect on the environment will be ***short-term*, *imperceptible* and *neutral*.**

16.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 16.6.2 and adherence to the OWMP (Appendix 16.1) 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 impact of the operational phase on the environment will be ***long-term, imperceptible and neutral.***

16.7.3 Decommissioning Phase

A carefully planned approach to waste management as set out in Section 16.6.3 and adherence to a DR WMP during the demolition / refurbishment phase will ensure that the predicted effect on the environment will be ***short-term*, *imperceptible* and *neutral*.**

16.7.4 Conclusion

Assuming the full and proper implementation of the mitigation measures set out herein and, in the C&D WMP (Appendix 16.1), no likely significant negative effects are predicted to occur as a result of the construction or operational of the proposed development.

16.8 RESIDUAL IMPACTS

The implementation of the mitigation measures outlined in Section 16.6 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.

16.9 CUMULATIVE IMPACT ASSESSMENT

The following considers the cumulative impacts of the proposed development and proposed and permitted and operating facilities in the surrounding area in relation to Material Assets – Waste Management. This considers the proposed development and other surrounding proposed and permitted developments considered in Chapter 3 and 4.

16.9.1 Construction Phase

Multiple permissions remain in place (see Chapter 3 Planning and Alternatives for list) for commercial and some residential developments within the vicinity of the proposed development. 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 and Lienster 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, and the indicative future masterplan development, 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***.

16.9.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area, and the indicative future masterplan development, will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

16.10 REFERENCES

1. Waste Management Act 1996 (No. 10 of 1996) as amended.
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
6. Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
7. Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
8. Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).
9. Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (November 2021)
10. FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
11. Fingal (FCC) Fingal County Council Development Plan 2017 – 2023. (2017)
12. FCC (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2019).
13. BS 5906:2005 Waste Management in Buildings – Code of Practice
14. Planning and Development Act 2000 (No. 30 of 2000) as amended
15. Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)
16. 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.
17. EPA, *European Waste Catalogue and Hazardous Waste List* (2002)
18. EPA, National Waste Database Reports 1998 – 2018.
19. US EPA, *Characterisation of Building Uses* (1998);
20. EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015)

17.0 MATERIAL ASSETS

17.1 INTRODUCTION

This chapter prepared evaluates the potential impacts, from the proposed development on Material Assets as defined in the EPA Guidelines '*Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2017), Advice Notes *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015), and *European Commission Guidance on Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (2017).

17.2 METHODOLOGY

The Directive 2011/92/EU defined Material Assets as '*resources that are valued and that are intrinsic to specific places; they may be of either human or natural origin'* this included architectural and archaeological heritage. The Directive 2014/52/EU included architectural and archaeological heritage as components of cultural heritage; this EIA report has also done so within in Chapter 12 Archaeological, Architectural and Cultural Heritage.

The EPA Guidelines (2017) state that material assets are taken to mean "*built services and infrastructure, roads and traffic and waste management"*. The EPA Advice Notes (2015) also gives examples of material assets including assimilative capacity of air and water; ownership and access; and tourism and recreational infrastructure. The European Commission Guidance (2017) refers to several examples of material assets including buildings, other structures, mineral resources and water resources.

In this EIA Report, the impacts on some of the material assets described in the above guidance have already been considered in the following chapters and therefore these aspects will not be addressed in specific detail within this chapter.

- Chapter 5, Population and Human Health
- Chapter 6, Land, Soils, Geology & Hydrogeology
- Chapter 7, Hydrology
- Chapter 9, Air Quality & Climate
- Chapter 11, Noise and Vibration)
- Chapter 14, Cultural Heritage
- Chapter 15, Traffic & Transportation
- Chapter 16, Waste Management

This chapter assesses ownership and access, built services and infrastructure, which have not already been addressed elsewhere in this EIA Report. The subsequent sections address built services and infrastructure. The potential impacts on built services and infrastructure, if any, are assessed in under the following subheadings:

- Land Use, Property, and Access
- Power and Electrical Supply
- Surface water infrastructure
- Foul drainage infrastructure
- Water supply

- Telecommunications

The associated built services and infrastructure in the vicinity of the site are summarised in the following sections.

17.3 RECEIVING ENVIRONMENT AND CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

17.3.1 Land Use

The site forms part of a larger block of residential zoned land in the townland of Stapolin, Baldoyle, Dublin 13. The site forms part of a substantial area of undeveloped residential zoned land within Baldoyle-Stapolin. The site is presently rough ground with some development work having been carried out (access roads, drainage, etc) and some areas covered with hard core.

The subject site is identified as Growth Area 2 (GA2) occupying the northeast sector of the undeveloped lands. Growth Area 1 (GA1) is to the southwest and Growth Area 3 (GA3) is to the west. Lands to the north and east are zoned HA High Amenity with an objective to protect and enhance high amenity areas. Vehicular access to the site is currently restricted by locked gates but it is otherwise available at Coast Road and Grange Road.

The proposed development site is zoned as '*RA – Residential Area'* in the Development Plan, for which the zoning objective is to "*Provide for new residential communities subject to the provision of the necessary social and physical infrastructure*". The context of the site is described further in Chapter 2 (Description of Development) and Chapter 3 (Planning and Development Context).

17.3.2 Power and Electrical Supply

During construction, contractors will require power for onsite accommodation, and construction equipment/plant. A construction compound and temporary power supply will be established in consultation with the utility suppler. The power requirements for the construction phase will be relatively minor.

Once in operation, electricity will be provided to the site via the national grid tying in with existing infrastructure in neighbouring areas. New electricity and telecommunications services infrastructure will be put in place to serve the various buildings. This will be carried out in accordance with the requirements of the various service providers, working around the existing live gas infrastructure on the Site.

The proposed development will not require any gas connections. Therefore, the works will be carried out carefully around the existing on-Site live gas main.

17.3.3 Surface Water Infrastructure

Planning permission F16A/0412 requires that a storm water wetland is provided in the open space amenity lands to the north of the proposed development as a regional control as recommended in the SuDS Strategy Briefing Document, Baldoyle Stapolin LAP. All storm water from the proposed development will pass through the wetland for attenuation and treatment prior to discharge to Baldoyle Estuary. The wetlands comply with the Storm Water Wetland Briefing Paper, GDSDS.

It is proposed to connect surface water runoff from the proposed development to a new surface water sewer network within the Baldoyle Stapolin LAP lands. Currently, surface water sewers are present in the roads running through the proposed development, but these have had little use since they were installed in the mid 2000s. In addition, the sewers were laid at a depth that will not allow discharge by gravity above the existing North Fringe Sewer to a wetland within the open space to the north as required by the LAP. Consequently, to comply with the LAP, finished ground levels will have to be raised by up to 1.5m and a new surface water network for the proposed development will have to be installed.

This new network will discharge to a new permitted network to be installed by The Shoreline Partnership for Growth Area 3 (ABP ref. 311016-21). This discharges to a new outfall pipe which traverses over the North Fringe Sewer and discharges into a new permitted wetland in the open space area. The wetland discharges to the Mayne River and ultimately to Baldoyle Estuary through a series of flap valves.

Sustainable drainage systems (SuDS) measures will be incorporated into the stormwater drainage network to improve the quality of stormwater leaving the site. SuDS are drainage systems that are environmentally beneficial, causing minimal or no long-term detrimental damage.

These measures will include green roofs, rainwater harvesting, permeable paving, integrated tree pits and bio-retention areas. Petrol interceptors will also be provided in car parking areas. The constructed wetland will feature shallow ponds and marshy areas with a high density of aquatic vegetation. It will detain flows for an extended period, allowing suspended solids to settle out and facilitating treatment of contaminants, before discharging via a weir into the Mayne River floodplain.

Further details on the proposed design of the surface water drainage is within the Water Services Report (JB Barry, 2022) and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

17.3.4 Foul Drainage Infrastructure

Welfare facilities will be provided for the contractors via portable sanitary facilities within the construction compound site during the construction works. It is an anticipated that initially, waste collected by tanker and disposed of appropriately, and that temporary connections to the existing services will be established to provide service and utilities subject to relevant applications and approvals.

It is proposed to connect the foul sewerage from the development to the existing foul sewer network in the Baldoyle Stapolin LAP lands. The network discharges to an existing pumping station in Stapolin Haggard from where it is pumped to the North Fringe Sewer. The pumping station has not been taken in charge. This pumping station will be upgraded as required by Irish Water in conjunction with the developer of Growth Areas 1 and 3 in accordance with the conditions of the Memorandum of Agreement dated 24th July 2003 between Helsingor Limited (the registered owner per Folio 3241 and Folio 132779F County Dublin in the Land Registry) and Penshanko Limited that applies to the application site.

All foul effluent generated at the proposed development site during the operational phase shall be collected in a new foul drainage network for the proposed development designed in accordance with Irish Water Code of Practice for Wastewater Infrastructure.

There is no trade effluent associated with this development.

A Pre-Connection Enquiry (PCE) was submitted to Irish Water on 20th July 2020 on the basis of the foul water flows for the proposed development site. A Confirmation of Feasibility was issued by Irish Water on the 28th of January 2021 and a copy is included in Appendix 1 to the Water Services Report (JB Barry, 2022). A Design Acceptance submission was submitted to Irish Water on 16th August 2021. A Confirmation of Design Acceptance was issued by Irish Water on 18th November 2021 and copy of this is also included in Appendix 1 to the Water Services Report (JB Barry, 2022).

Further details on the proposed design of the foul water drainage is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on accompanying drawing 20211-JBB-00-XX-DR-C-01003 included with the planning documentation.

17.3.5 Water Supply

It is proposed to connect the proposed Baldoyle GA2 development to the existing watermain network in the Baldoyle Stapolin LAP lands which is fed by the adjacent North Fringe Watermain. Watermains are currently present in the roads running through the proposed development, but these have had little use since they were installed in the mid 2000's. As there is a doubt about their integrity, it is proposed that they are grubbed up, removed and replaced with an entirely new network. It is a requirement of Irish Water that the new network is connected to the 300mm watermain in Red Arches Road c. 170m from the boundary of the subject development.

The proposed water supply network will be designed and installed to the requirements and specifications set out in the Irish Water Code of Practice for Water. Measures are proposed to minimise water use during the operational phase, including low consumption sanitary fittings, leak detection systems and rainwater harvesting.

A Pre-Connection Enquiry (PCE) was submitted to Irish Water on 20th July 2020 on the basis of the water supply requirements for the proposed development site. A Confirmation of Feasibility was issued by Irish Water on the 28th of January 2021 and a copy is included in Appendix 1 to the Water Services Report (JB Barry, 2022). A Design Acceptance submission was submitted to Irish Water on 16th August 2021. A Confirmation of Design Acceptance was issued by Irish Water on 18th November 2021 and copy of this is also included in Appendix 1 to the Water Services Report (JB Barry, 2022).

Further details on the proposed design of the water supply is within the Water Services Report (JB Barry, 2022) included with the planning documentation and on the accompanying drawing 20211-JBB-00-XX-DR-C-01002.

17.3.6 Telecommunications

There are telecommunication lines in existence for telephone and broadband services in the area. There are existing underground carrier ducts adjacent to the site that will be utilised for the development.

17.4 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

17.4.1 Land Use, Property, and Access

During the construction phase there are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or the existing drainage ditches associated with demolition, excavations and construction. In order to manage these short-term impacts the *Outline Construction Environmental Management Plan (CEMP)* prepared by AWN Consulting will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. The specific mitigation measures to address potential environmental impacts, are presented in each individual EIAR chapter.

The potential impact associated with land use and property for the construction phase will be ***localised***, ***negative, not significant*** and ***short term***.

During the operational phase the proposed development is not anticipated to generated significant air (including odour), noise or water emissions during normal operating conditions; these have been discussed further in the respective EIAR chapters, Chapter 7 (Hydrology), Chapter 9 (Air Quality & Climate) and Chapter 11 (Noise and Vibration) Chapters.

The proposed development represents a loss of agricultural land however in the overall context of Ireland's available agricultural land the loss is negligible. Due to the zoning of these lands, the overall potential impact associated with land use and property for the operational phase will be a localised ***neutral, slight,*** and ***long term***.

17.4.2 Power and Electrical Supply

Any excavations within the vicinity of existing electrical services will be carried out in consultation with EBS Networks to ensure there is no impact on existing users. The electrical connection should have no disruptions to the national grid during connection works. The potential impact associated with power and electrical supply for the construction phase will be a ***neutral, imperceptible*** and ***short term.***

All utilities work shall be carried out in accordance with the relevant requirements of the respective service providers. These works will be carried out in a manner that is safe, and which minimises interruptions of service which might affect local residents and businesses, and adjacent development.

During the operational phase, maintenance of utilities infrastructure on the Site will be carried out in accordance with the relevant requirements of the various utilities providers / authorities. operation. As such, no significant impacts on services or utilities themselves are predicted to occur as a result of the operational phase.

As detailed in Chapter 2 (Description of the Proposed Development) details the sustainable energy measures which have been considered and incorporated into the design of the proposed development. There is a potential impact on material assets during the operational phase of the proposed development is ***neutral, slight*** and ***long term.***

17.4.3 Surface Water Infrastructure

During the construction phase, there is potential for an increase in run-off due to the introduction of impermeable surfaces and the compaction of soils. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading which could potentially impact local drainage. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses.

With appropriate and standard mitigation in place, as outlined in the CEMP, the potential impact on surface water for the construction phase is ***neutral, imperceptible,*** and ***short term.***

The proposed new storm water drainage arrangements will be designed and carried out in accordance with:

- The Greater Dublin Strategic Drainage Study Volume 2
- The Greater Dublin Regional Code of Practice for Drainage Works
- BS EN – 752:2008, Drains & Sewer Systems Outside Buildings
- The requirements and specifications of Fingal County Council (FCC)
- Part H (Building Drainage) of the Building Regulations

SuDS measures will be incorporated into the stormwater drainage network to improve the quality of stormwater leaving the Site. These will include green roofs, rainwater harvesting, permeable paving, integrated tree pits and bio-retention areas. Petrol interceptors will also be provided in car parking areas. The design is in accordance with the criteria of FCC's SuDS / Green Infrastructure checklist.

The new network will connect to a constructed wetland and associated upstream surface water network. The potential impact associated with surface water for the operational phase is ***neutral, imperceptible, and long term.***

17.4.4 Foul Drainage Infrastructure

Welfare facilities will be provided for the construction workers on site during the construction works and wastewater will be of domestic origin only. The works contractor will be required to apply to Irish Water for connection to discharge any contaminated surface water which collects in excavations, if it is required. The works contractor will be obliged to comply with any conditions of the discharge license to control discharge quality and rate of flow. The potential impact on foul drainage for the construction phase is ***negative, imperceptible,*** and ***short term.***

During the operational phase the wastewater discharged from the site will ultimately discharge to the Ringsend wastewater treatment plant. Irish water have confirmed through the PCE (see Section 17.3.4) that there is available capacity in the network. The potential impact on foul drainage for the operational phase is ***neutral, imperceptible,*** and ***long term.***

17.4.5 Water Supply

Irish water have confirmed through the PCE (see Section 17.3.5) that there is available capacity in the network. Irish Water is the National Authority for water management and should there have been an inadequate supply this would have been confirmed to the developer during consultation.

The proposed development has considered the sustainable use of water within its design. Measures are proposed to minimise water use during the operational phase, including low consumption sanitary fittings, leak detection systems and rainwater harvesting. The potential impact on potable water infrastructure for the operational phase is ***neutral, imperceptible,*** and ***long term.***

17.4.6 Telecommunications

The locations of existing services (underground and overhead, where applicable) will be confirmed prior to the commencement of on-Site works. The potential impact on telecommunications infrastructure for the construction phase is ***neutral, imperceptible,*** and ***short term.***

New telecommunications and broadband infrastructure will be put in place at the Site, tying in with existing infrastructure in neighbouring areas. The connection into the wider telecommunications network will be undertaken by a statutory telecommunications operator. The potential impact on telecommunications infrastructure for the operational phase is ***neutral, imperceptible,*** and ***long term.***

17.5 REMEDIAL AND MITIGATION MEASURES

17.5.1 Construction Phase

No significant impacts are predicted to occur as a result of the construction or operation of the proposed development. However, in order to minimise impacts insofar as practicable, the following mitigation measures shall be implemented during the construction phase:

- The exact locations of all existing on-Site services (underground and overhead, where applicable) will be confirmed, e.g., using slit trenches at key areas, prior to the commencement of on-Site works.
- In planning and executing the proposed works, due reference shall be had to the Gas Networks Ireland (GNI) Guidelines for Designers and Builders – Industrial and Commercial (Non-Domestic) Sites (2018) and the Health & Safety Authority (HSA) Code of Practice for Avoiding Danger from Underground Services (2016).
- All possible precautions shall be taken to avoid unplanned disruptions to any services / utilities during the proposed works.
- Consultation with all relevant service providers shall be undertaken in advance of works, ensuring all works are carried out to the relevant standards and in a safe manner. Close liaison will be required with GNI in relation to works in proximity to the existing on-Site gas infrastructure.
- There will be an interface established between the Contractor and the relevant utilities service providers / authorities during the construction phase of the proposed development. This interface will be managed to ensure a smooth construction schedule with no / minimal disruption to the local residential and business community.
- All new infrastructure will be installed in accordance with the applicable standards, guidelines and codes of practice.
- All mitigation measures in relation to Site access / egress and construction traffic management set out in Chapter 15 of this EIAR (Traffic & Transportation) and in the finalised Construction Traffic Management Plan to be finalised by the Contractor in agreement with FCC, as stipulated in the Outline Construction

Management Plan (submitted under separate cover as part of the planning application) shall be fully implemented by the Site contractors.

- Prior to the operational phase of the proposed development, utilities infrastructure connections will be tested by a suitably qualified person using an appropriate methodology, approved by the relevant service provide, and under the supervision of FCC. The proposed development water supply will be tested to the satisfaction of FCC and Irish Water prior to the connection to the public potable water.
- The successful contractor will ensure that the drainage and water supply networks are kept clear and free from materials which could cause diminished capacity or blockages. Routine visual inspections shall be carried out to this end.

17.5.2 Operational Phase

No significant impacts are predicted to occur as a result of the construction or operation of the proposed development. However, in order to minimise impacts insofar as practicable, any necessary maintenance or upgrades of on-Site utilities infrastructure during the operational phase of the proposed development, will be carried out in accordance with the specifications of the relevant service providers and facilitated by the estate manager.

17.6 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

17.6.1 Construction Phase

The works contractor will be obliged to put best practice measures in place and work in accordance with the CEMP. The implementation of mitigation measures within each chapter and detailed in Section 17.5.1 will ensure that the residual impacts on the material assets during the construction phase will be ***neutral, imperceptible*** and ***short-term***.

17.6.2 Operational Phase

The implementation of mitigation measures within each chapter and detailed in Section 17.5.2 will ensure that the residual impacts on the material assets during the operational phase will be ***neutral, imperceptible*** and ***long-term***.

17.7 MONITORING AND/OR REINSTATEMENT

No additional monitoring or reinstatement is required.

17.8 CUMULATIVE IMPACTS

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments (as described in Chapter 3) are discussed below.

17.8.1 Construction Phase

The proposed development entails minimal use of material assets during construction therefore there is limited opportunity for the causation of cumulative impacts during the construction phase of the proposed development in combination with other planned or permitted developments (as described in Chapter 3).

Coordination and consultation will be had between the Construction contractor and ESB and Irish Water and other relevant service providers within the locality to facility the proposed development (Section 17.5.1). The proposed development will be in accordance with the requirements of statutory providers for electrical infrastructure, surface water, foul drainage and water infrastructure.

The works contractors for other planned or permitted developments (as described in Chapter 3) will be obliged to put best practice measures to ensure that there are no unplanned interruptions to service from the existing telecommunications network, watermain, sewer and electrical grid, any planned interruptions will be agreed in advance with the utilities suppliers.

In respect of substantial developments that may result in in-combination effects in respect of material assets are the adjacent residential development GA1 (ABP Reg. Ref.:311018-21) and GA3 (ABP Reg. Ref.:311016-21) are the only relevant projects considered in detail.

The GA1 Grant of Permission ABP Reg. Ref.:311018-21 Condition 3 requires that the mitigation measures set out in the EIA must be carried out in full and Condition 4 request the mitigation and mitigation and monitoring measures as they relate to the Baldoyle Bay APA be implemented. Furthermore; Condition 22 states that prior to the commencement of works a Construction Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The GA3 Grant of Permission ABP Reg. Ref.:311016-21 Condition 5 states that prior to the commencement of works a finalised Construction and Environmental Management Plan must be submitted to the planning authority (FCC) to avoid pollution through surface water runoff or airborne dust, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures.

The implementation of mitigation measures within each chapter and detailed in Section 17.5.1; as well as the compliance of adjacent development with their respective planning permissions, will ensure that the predicted impacts on the material assets during the construction phase for the proposed development will be ***neutral, imperceptible*** and ***short-term***. Thus, significant in combination effects with other planned or permitted developments (as described in Chapter 3) is unlikely.

17.8.2 Operational

Once operational, the proposed project will result in minimal impact on surface water, foul drainage and water infrastructure. During the operational phase the proposed project will not generate significant air (including odour), noise or water emissions during normal operating conditions therefore the potential for cumulative with other permitted development is low; these have been discussed further in the respective EIAR chapters, Chapter 7 (Hydrology), Chapter 9 (Air Quality & Climate) and Chapter 10 (Noise and Vibration).

Irish Water is the National Authority for water management and should there have been an inadequate supply this would have been confirmed to the developer during consultation.

Based on the above, it is predicted that the cumulative impact of the proposed development with other permitted, planned and existing developments is considered to be ***long-term*** and ***not significant*** during the operational phase.

18.0 INTERACTIONS – INTERRELATIONS BETWEEN THE ASPECTS

18.1 INTRODUCTION

This chapter of the EIA Report in accordance with the guidance, the potential interactions and inter-relationships between the environmental factors discussed in the preceding chapters. This covers both the construction and operational phase of the proposed development.

Directive 2011/92/EU, as amended by Directive 2014/52/EU, and section 171A of the Planning and Development Act, as amended, both provide that an EIA shall identify, describe and assess in an appropriate manner, in the light of each individual case, the interaction between the following factors:

a) human beings, fauna and flora 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 and landscape;
d) material assets, cultural heritage and the landscape.

This chapter has been produced following the requirements of the EIA Directive and *Planning and Development Act 2000,* as amended. The contents of the chapter have been prepared following *European Commission 'Guidance on Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report'* (2017) and the draft *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017).

The interactions and inter-relationships between the environmental factors have been considered under the subheadings as set out in the EIA Report.

The majority of the EIA Report chapters have already included and described assessments of potential interactions between a number of environmental factors. The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the EPA 2017 Guidance as outlined in Chapter 1 (Introduction). This section of the assessment presents a summary and assessment of the identified interactions.

18.2 POPULATION AND HUMAN HEALTH AND ITS INTERACTION WITH:

18.2.1 Land, Soils and Hydrogeology:

Construction Phase

The proposed development will change the existing brownfield lands to a residential developed site in accordance with the intended development of these lands. The proposed development will not impact on domestic wells or any groundwater protection areas.

Taking into account the design and mitigation measures set out in Chapter 6 of this EIA Report, there is no potential for negative interaction between Population and Human Health, and Land, Soils and Hydrogeology during the construction phase. The interaction is considered to be ***neutral***, and ***short term***.

Operational Phase

The construction phase development has the potential to impact on the ground water and soil quality due accidental leaks or spills during the operational phase from the site, which have the potential to interact negatively on human health in the long term if not adequately mitigated.

Taking into account the design and mitigation measures set out in Chapter 6 of this EIA Report, there is no potential for negative interaction between Population and Human Health, and Land, Soils and Hydrogeology during the operational phase. The interaction is considered to be ***neutral***, and ***long term***.

18.2.2 Hydrology:

Construction Phase

The construction phase of the proposed development has the potential to impact on the surface water quality due to increased sediment runoff from the site, which have the potential to interact negatively on human health in the long term if not adequately mitigated.

The proposed construction phase mitigation set out in Chapter 7 has considered this the proposed development will not result in significant negative impact on surface water quality in the local area.

Taking into account the design and mitigation measures set out in Chapter 7 of this EIA Report, there is no potential for negative interaction between Population and Human Health, and Hydrology during the construction phase. The interaction is considered to be ***neutral***, and ***short term***.

Operational Phase

The operational development has the potential to impact on stormwater and foul wastewater systems, as well as to impact on the hydrological regime due to increased hardstanding and alternations in site drainage, which have the potential to interact negatively on human health if not adequately mitigated.

The proposed development represents an increase in hardstanding that could have the potential to alter the hydrological regimen and result in downstream flooding. Stormwater generated on site will be discharged at suitable rates through the use of sustainable urban drainage systems which will reduce the risk of flooding and management of water quality as a result of the development. The proposed drainage design measures (see JB Barry Engineering Report) and flood risk assessment (See JBA Consulting Flood Risk Assessment) undertaken demonstrate that the proposed development will not result in offsite flooding or impact on surface water flows in the local area.

The foul sewer will ultimately discharge to the wastewater treatment plant at Ringsend via an existing pumping station in Stapolin Haggard from where it is pumped to the North Fringe Sewer.

Taking into account the design and mitigation measures set out in Chapter 7 of this EIA Report, there is no potential for negative interaction between Population and Human Health, and Hydrology during the operational phase. The interaction is considered to be ***neutral***, and ***long term***.

18.2.3 Biodiversity:

Construction Phase

There are no potentially significant interactions identified between Population and Human Health, and Biodiversity during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Population and Human Health, and Biodiversity during the operational phase.

18.2.4 Air Quality and Climate:

Construction Phase

The construction phase of the proposed development has the potential to impact on air quality and climate and human health if not adequately mitigated. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues.

Taking into account the design and mitigation measures set out in Chapter 9 of this EIA Report, there is no potential for negative interaction between Population and Human Health, and Air Quality and Climate during the construction phase. The interaction is considered to be ***neutral***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between Population and Human Health, and Air Quality and Climate during the operational phase.

18.2.5 Noise and Vibration:

Construction Phase

The demolition, land clearance, excavation and construction give rise to the potential for the maximum permissible daytime noise level to be exceeded at distances up to 30 metres from the subject lands. This indicates that additional mitigation measures may be required to prevent likely significant impacts at the residential properties to the south and south-west. Provided that the relevant mitigation measures are employed during the construction phase, it is anticipated that impacts will be short-term, negative and slight.

Taking into account the design and mitigation measures set out in Chapter 12 of this EIA Report, there is potential for negative interaction between Population and Human Health, and Noise and Vibration during the construction phase. The interaction is considered to be ***negative,*** *and* ***short term***.

Operational Phase

There are no potentially significant interactions identified between Population and Human Health, and Noise and Vibration during the operational phase.

18.2.6 Landscape and Visual Impacts:

Construction Phase

The change from an undeveloped brownfield site to a construction site will impact negatively on Population and Human Health. There is limited mitigation to reduce this therefore the interaction is considered to be ***negative,*** *and* ***short term***.

Operational Phase

The existing site currently offers no landscape value. The proposed development will significantly and positively directly increase the landscape value of the subject site and will also provide indirect positive landscape impacts to the neighbouring lands and the people who use them.

The landscape and visual impact associated with human beings focuses on the effects to dwellings and school. The proposed development generates visual effects and the effects and associated amelioration of these effects is discussed in the impact section of the Chapter 13.

Taking into account the design and mitigation measures set out in Chapter 13 of this EIA Report, there is potential for negative interaction between Population and Human Health, and Landscape and Visual Impacts during the construction phase. The interaction is considered to be ***positive,*** *and* ***long term***

18.2.7 Archaeological, Architectural and Cultural Heritage:

Construction Phase

There are no potentially significant interactions identified between Population and Human Health, and Archaeological, Architectural and Cultural Heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Population and Human Health, and Archaeological, Architectural and Cultural Heritage during the operational phase.

18.2.8 Material Assets, including Transport and Waste:

Construction Phase

The proposed development will have an demand on material assets such as surface water drainage, water supply, wastewater drainage, power supply and road infrastructure. Chapters 16 and 17 (Waste Management and Material Assets) have reviewed the capacities of the available infrastructure to accommodate the proposed development and the implementation of the mitigation measure proposed in these chapters will ensure there are no residual negative impacts on the local population.

Taking into account the design and mitigation measures set out in Chapters 15, 16 and 17 of this EIA Report, there is no potential for negative interaction between Population and Human Health, and Material Assets during the construction phase. The interaction is considered to be ***neutral,*** *and* ***short term***.

Operational Phase

The proposed development will have an demand on material assets such as surface water drainage, water supply, wastewater drainage, power supply and road infrastructure. Chapters 16 and 17 (Waste Management and Material Assets) have reviewed the capacities of the available infrastructure to accommodate the proposed development and the implementation of the mitigation measure proposed in these chapters will ensure there are no residual negative impacts on the local population.

Taking into account the design and mitigation measures set out in Chapters 15, 16 and 17 of this EIA Report, there is no potential for negative interaction between Population and Human Health, and Material Assets during the operational phase. The interaction is considered to be ***neutral,*** *and* ***long term***.

18.3 LAND, SOILS AND HYDROGEOLOGY AND ITS INTERACTION WITH:

18.3.1 Hydrology:

Construction Phase

The construction phase of the proposed development has the potential to result in increased sediment runoff which has the potential to interact negatively on surface water quality in the Mayne River and Baldoyle Bay.

The proposed construction phase mitigation set out in Chapter 6 and 7 has considered this the proposed development will not result in significant negative impact on surface water quality in the local area.

Taking into account the design and mitigation measures set out in Chapter 6 and 7 of this EIA Report, there is a residual negative interaction between Land, Soil, and Hydrology during the construction phase. The interaction is considered to be ***neutral***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Hydrology during the operational phase.

18.3.2 Biodiversity:

Construction Phase

In the absence of mitigation measures to control the construction phase there is potential for silt laden material or pollution to enter the watercourse and impact on local biodiversity and European sites immediately downstream from the works. Furthermore, dust emissions from exposed earthworks have the potential to settle on plants causing impacts to local ecology.

Taking into account the design and mitigation measures set out in Chapter 6, and 9 of this EIA Report, there remains a residual negative interaction between Land, Soil, and Biodiversity during the construction phase. The interaction is considered to be ***negative***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Biodiversity during the operational phase.

18.3.3 Air Quality and Climate:

Construction Phase

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. The interaction is considered to be ***negative***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Air Quality and Climate during the operational phase.

18.3.4 Noise and Vibration:

Construction Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Noise and Vibration during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Noise and Vibration during the operational phase.

18.3.5 Landscape and Visual Impacts:

Construction Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Air Quality and Climate during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Air Quality and Climate during the operational phase.

18.3.6 Archaeological, Architectural and Cultural Heritage:

Construction Phase

Archaeological assessment for the proposed development has not identified features of archaeological interest on the site. If previously unidentified archaeological features are uncovered during construction works. The ability to excavate these sites through the construction phase will provide data to the archaeological community from the potential subsurface sites. The potential to gain knowledge outweighs the negative impact.

The mitigation measures detailed Chapter 12 (Archaeological, Architectural and Cultural Heritage), including a comprehensive programme of archaeological excavation, will ensure that the effect is ***positive*** and ***long term***.

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Archaeological, Architectural and Cultural Heritage during the operational phase.

18.3.7 Material Assets, including Transport and Waste:

Construction Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Material Assets during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Land, Soils and Hydrogeology, and Material Assets during the operational phase.

18.4 HYDROLOGY AND ITS INTERACTION WITH:

18.4.1 Biodiversity:

Construction Phase

In the absence of mitigation, surface water run-off during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may damage downstream water quality and habitats.

Taking into account the design and mitigation measures set out in Chapter 7, and 8 of this EIA Report, there remains a residual negative interaction between Hydrology, and Biodiversity during the construction phase. The interaction is considered to be ***negative***, and ***short term***.

Operational Phase

The use of SuDS during operations will mean that the development will result in neutral water impacts in the operational phase with regard to runoff rates and flooding risk. The use of SuDS and attenuation will mean that the development will result in neutral water impacts in the operational phase with regard to runoff rates and flooding risk. Furthermore, with the implementation of mitigation (design) measures there will be no measurable impact on the receiving water quality as a result of the development.

Taking into account the design and mitigation measures set out in Chapter 7 of this EIA Report, there remains a residual negative interaction between Hydrology, and Biodiversity during the operational phase. The interaction is considered to be ***nuteral***, and ***long term***.

18.4.2 Air Quality and Climate:

Construction Phase

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 that may deposit in surface waters. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and hydrology. The interaction is considered to be ***negative***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between Hydrology, and Noise and Vibration during the operational phase.

18.4.3 Noise and Vibration:

Construction Phase

There are no potentially significant interactions identified between Hydrology, and Noise and Vibration during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Hydrology, and Noise and Vibration during the operational phase.

18.4.4 Landscape and Visual Impacts:

Construction Phase

There are no potentially significant interactions identified between Hydrology, and Archaeological, Architectural and Cultural Heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Hydrology, and Archaeological, Architectural and Cultural Heritage during the construction phase.

18.4.5 Archaeological, Architectural and Cultural Heritage:

Construction Phase

There are no potentially significant interactions identified between Hydrology, and Archaeological, Architectural and Cultural Heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Hydrology, and Archaeological, Architectural and Cultural Heritage during the operational phase.

18.4.6 Material Assets, including Transport and Waste:

Construction Phase

There are no potentially significant interactions identified between Hydrology, and Material Assets during the construction phase.

Operational Phase

As a part of the SuDS features, it is anticipated that small amounts of hydrocarbon sludge waste and debris may be generated in the hydrocarbon interceptors which will treat the surface water run-off. This waste stream will be managed in accordance with the relevant legislation identified in Chapter 16 such that the effect of the waste generation will be long-term, and neutral.

There are no potentially significant interactions identified between Hydrology, and Material Assets during the operational phase.

18.5 BIODIVERSITY AND ITS INTERACTION WITH:

18.5.1 Air Quality and Climate:

Construction Phase

There is the potential for interactions between air quality and biodiversity as the Baldoyle Bay Special Area of Conservation (SAC) and Proposed Natural Heritage Area (pNHA) (site code 000199), along with the Baldoyle Bay Special Protection Area (SPA) (site code 004016) are to the direct east of the proposed development. Dust emissions from construction works have the potential to impact vegetation in the SAC, pNHA and SPA. Once the mitigation measures outlined within Section 9.6 and Appendix 9.3 are implemented dust related impacts are predicted to be short-term and imperceptible. Traffic emissions also have the potential to impact vegetation as a result of NOx emissions. Air dispersion modelling of traffic emissions was conducted, and it was found that the traffic associated with the proposed development will lead to an imperceptible increase in NOx concentrations within the pNHA, SAC and SPA.

Taking into account the design and mitigation measures set out in Chapter 9 of this EIA Report, there remains a residual negative interaction between Air Quality and Climate, and Biodiversity during the construction phase. The interaction is considered to be ***negative***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between Air Quality and Climate, and Biodiversity during the operational phase

18.5.2 Noise and Vibration:

Construction Phase

The nearby Special Area of Conservation is used by wintering birds. There is a potential risk of noise and vibration disturbance to birds during the construction phase. Mitigation measures include limiting working hours and timing the daily construction activities and keeping the most noisy activities around the midday period where bird

activity is at a minimum. It is anticipated potential effects will not be significant above local geographic scale.

Taking into account the design and mitigation measures set out in Chapter 9 of this EIA Report, there is a residual negative interaction between Noise and Vibration, and Biodiversity during the construction phase. The interaction is considered to be ***negative***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between Noise and Vibration, and Biodiversity during the operational phase

18.5.3 Landscape and Visual Impacts:

Construction Phase

No biodiversity of conservation value was noted the treeline that exists on site. There are no potentially significant interactions identified between Landscape and Visual Impacts, and Biodiversity during the construction phase

Operational Phase

The operational phase will alter the existing brownfield lands habitat to a built environment, that there will not be any long-term impact on overall biodiversity.

The long-term effects of the proposed development will have a positive effect on the tree cover associated with the development. Consultation with the ecologist through the assessment and design process resulted in the inclusion of native plant species to maintain wildlife corridors and create areas of habitat. Further consultation with the Ecological Consultant will take place at implementation and monitoring stages.

The implementation of a high quality landscaping scheme will have a ***positive*** and ***long term*** interaction with biodiversity.

18.5.4 Archaeological, Architectural and Cultural Heritage:

Construction Phase

There are no potentially significant interactions identified between Biodiversity, and Archaeological, Architectural and Cultural Heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Biodiversity, and Archaeological, Architectural and Cultural Heritage during the operational phase.

18.5.5 Material Assets, including Transport and Waste:

Construction Phase

There are no potentially significant interactions identified between Biodiversity, and Material Assets during the operational phase.

Operational Phase

There are no potentially significant interactions identified between Biodiversity, and Material Assets during the operational phase.

18.6 AIR QUALITY AND CLIMATE AND ITS INTERACTION WITH:

18.6.1 Noise and Vibration:

Construction Phase

There are no potentially significant interactions identified between Air Quality and Climate and Noise and Vibration during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Air Quality and Climate and Noise and Vibration during the operational phase.

18.6.2 Landscape and Visual Impacts:

Construction Phase

There are no potentially significant interactions identified between Air Quality and Climate and Landscape and Visual during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Air Quality and Climate and Landscape and Visual during the operational phase.

18.6.3 Archaeological, Architectural and Cultural Heritage:

Construction Phase

There are no potentially significant interactions identified between Archaeological, Architectural and Cultural Heritage, and Landscape and Visual Heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Archaeological, Architectural and Cultural Heritage, and Landscape and Visual Heritage during the operational phase.

18.6.4 Material Assets, including Transport and Waste:

Construction Phase

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 (Chapter 9) by reviewing the change in annual average daily traffic on roads close to the site. The interaction is considered to be imperceptible ***neutral***, and ***short term***.

Operational Phase

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 interaction of the proposed development on air quality are assessed (Chapter 9) by reviewing the change in annual average daily traffic on roads close to the site. The interaction is considered to be imperceptible ***negative***, and ***long term***.

18.7 NOISE AND VIBRATION AND ITS INTERACTION WITH:

18.7.1 Landscape and Visual Impacts:

Construction Phase

There are no potentially significant interactions identified between Noise and Vibration, and Landscape and Visual during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Noise and Vibration, and Landscape and Visual during the operational phase.

18.7.2 Archaeological, Architectural and Cultural Heritage:

Construction Phase

There are no potentially significant interactions identified between Noise and Vibration, and Archaeological, Architectural and Cultural Heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Noise and Vibration, and Archaeological, Architectural and Cultural Heritage during the operational phase.

18.7.3 Material Assets, including Transport and Waste:

Construction Phase

There are interactions between the noise and vibration assessment and traffic assessment. With increased traffic movements, the noise levels in the surrounding area increase.

The interaction of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be imperceptible to slight-moderate due to the changes in traffic flows associated with the proposed development. The interaction is considered to be imperceptible ***neutral***, and ***short term***.

Operational Phase

There are interactions between the noise and vibration assessment and traffic assessment. With increased traffic movements, the noise levels in the surrounding area increase.

The interaction of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be imperceptible to slight-moderate due to the changes in traffic flows associated with the proposed development. The interaction is considered to be imperceptible ***negative***, and ***long term***.

18.8 LANDSCAPE AND VISUAL IMPACTS AND ITS INTERACTION WITH:

18.8.1 Archaeological, Architectural and Cultural Heritage:

Construction Phase

There are no potentially significant interactions identified between Landscape and Visual Impacts, and Archaeological, Architectural and Cultural Heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Landscape and Visual Impacts, and Archaeological, Architectural and Cultural Heritage during the operational phase.

18.8.2 Material Assets, including Transport and Waste:

Construction Phase

There are no potentially significant interactions identified between Landscape and Visual Impacts, and Material Assets during the construction phase.

Operational Phase

There are no potentially significant interactions identified between Landscape and Visual Impacts, and Material Assets during the operational phase.

18.9 ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE AND ITS INTERACTION WITH:

18.9.1 Material Assets, including Transport and Waste:

Construction Phase

There are no potentially significant interactions identified between Material Assets, and Archaeological, Architectural and Cultural Heritage during the operational phase.

Operational Phase

There are no potentially significant interactions identified between Material Assets, and Archaeological, Architectural and Cultural Heritage during the operational phase.

18.10 SUMMARY

In summary, the interactions between the environmental factors and impacts discussed in this EIAR have been assessed and the majority of interactions are neutral.

The reasoning behind the conclusion that certain interactions are considered to have a positive, neutral or negative effect is outlined in this Chapter. A summary of the potential interactions is presented in Table 18.1 below.

The proposed development will create significant residential capacity which will have a positive benefit to the local area which the development is located.

18.11 TABLE OF INTERACTIONS

Table 18.1 *Summary of interrelationships Between the Aspects*

	Population & Human Health		Land, Soils and Hydrogeology		Hydrology		Biodiversity		Air Quality and Climate		Noise and Vibration		Landscape and Visual Impact		Archaeological, Architectural and Cultural Heritage		Material Assets, including Transport and Waste	
	Con.	**Op.**	**Con.**	**Op.**	**Con.**	**Op.**	**Con.**	**Op.**	**Con.**	**Op.**	**Con.**	**Op.**	**Con.**	**Op.**	**Con.**	**Op.**	**Con.**	**Op.**
Population & Human Health			O	O	O	O	×	×	O	×	O	×	-	+	×	×	O	O
Land, Soils and Hydrogeology					O	×	-	×	-	×	×	×	×	×	O	X	X	X
Hydrology							-	O	-	×	×	×	×	×	×	×	X	X
Biodiversity									-	×	-	×	×	+	×	×	×	×
Air Quality and Climate											×	×	×	×	×	×	O	-
Noise and Vibration													×	×	×	×	O	-
Landscape and Visual Impact															×	×	×	×
Archaeological, Architectural and Cultural Heritage																	×	×
Material Assets, including Transport and Waste																		

Con.	Construction Phase
Op.	Operational Phase
×	No Interaction

+	Positive Interaction
o	Neutral Interaction
-	Negative Interaction