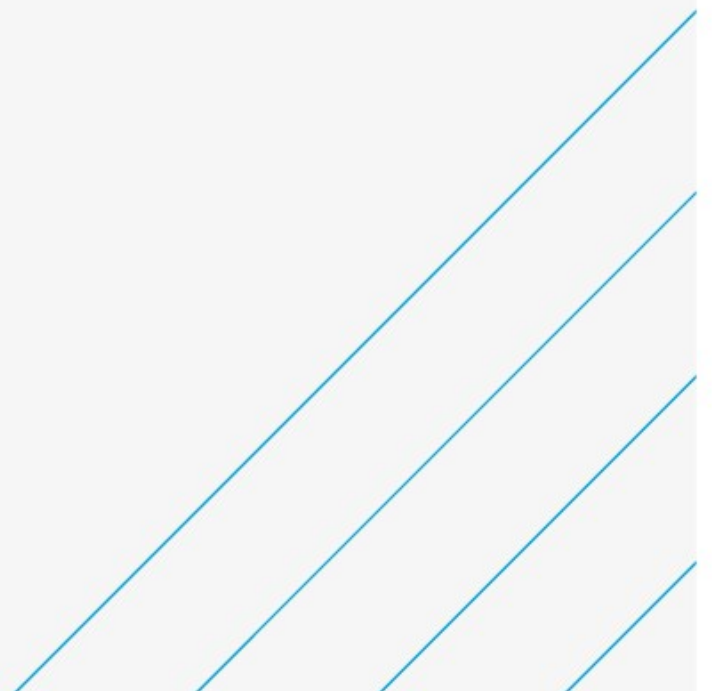


## Coastal Quarter SHD 2

Environmental Impact Assessment Report –  
Volume 2 Main EIAR

Shankill Property Investment Limited

Sept. 22



# Notice

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This document has 435 pages including the cover.

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## Client signoff

Client	Shankill Property Investment Limited
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# 1. Introduction & Methodology

## 1.1. The Proposal

Shankill Property Investments Limited are applying to An Bord Pleanála (ABP) for permission for a Strategic Housing Development consisting of 586 no. residential units in a mix of apartments, duplexes and houses on a ca. 8.81 hectare (ha) site. In addition, a childcare facility, café, retail unit and 1 no. mixed use commercial unit (incorporating a gym and a juice bar) are proposed along with all associated and ancillary development and infrastructural works, hard and soft landscaping, open spaces, boundary treatment works, ancillary car and bicycle parking spaces at surface, undercroft and basement levels. The proposed houses and duplexes range in height from 2 – 3 storeys with the proposed 4 no. apartment blocks ranging in height from 3 – 12 storeys. Block A will accommodate 162 no. Build-to-Rent (BTR) units. It is proposed that 274 no. units will be located within the administrative area of Dún Laoghaire-Rathdown County Council and 312 no. units will be located within the administrative area of Wicklow County Council. The childcare facility, retail, café and commercial unit will all be located in the administrative area of Wicklow County Council.

**Planning permission was granted on part of the subject site for 234 no. residential units, a childcare facility, café and retail unit subject to compliance with the terms of conditions attached to reference ABP-311181-21. The proposed Coastal Quarter development SHD 2 includes development as permitted under ABP-311181-21 together with minor revisions chiefly addressing conditions and new proposals for Blocks A and B which were previously refused. An EIAR was prepared by Atkins (2021) as part of the previous planning application (ABP-311181-21).**

The Harbour Point Masterplan sets the context for the proposed SHD. The subject lands (outlined in red on Dwg. BRA-GHA-SW-XX-DR-A-05001) are part of a larger landholding (outlined in blue) in ownership of the applicant. The overall Harbour Point development site of ca. 19 hectares comprises the former Bray Golf Club lands. Given the size and strategic location of the site, the applicant appointed Glenn Howell Architects (GHA) to prepare a masterplan to guide the development of the entire land holding. The Harbour Point Masterplan is grounded in national, regional and local planning policy and guidelines as well as best practice in urban design. It provides the overarching development framework for the lands and sets out the design principles that will govern this planning application and all future applications on the overall landholding. The masterplan is included as part of this application.

The proposed Coastal Quarter lands are the subject of this Strategic Housing Development (SHD 2) application to ABP and are hereafter also referred to as ‘the Site’, or the ‘proposed development’.

The site is generally bounded to the north by existing public open space at Corke Abbey Valley Park, to the east by the Irish Rail Dublin-Wexford/Rosslare main rail line, to the south by the River Dargle and to the west by undeveloped lands and the existing Ravenswell schools campus.

The Rathmichael Stream is located to the north of the site, and is separated from the site by a hedgerow / treeline. The Site location (Dwg. No. BRA-GHA-SW-XX-DR-A-05001), and proposed layout plan (Dwg. No. BRA-GHA-SW-00-DR-A-05010) are presented in Figure 1-1 and Figure 1-2 respectively. A copy of all planning and engineering drawings submitted in support of this planning application are presented in Appendix 1.1.

The lands on which the development is proposed have been partially zoned by Dún Laoghaire-Rathdown County Council (DLRCC, 2022) as Objective A: ‘*To provide residential development and improve residential amenity while protecting the existing residential amenities*’ zoning and Objective F: ‘*To preserve and provide for open space with ancillary active recreational amenities*’ (DLR County Development Plan 2022-2028 (DLRCC 2022) in the northern section; and by Wicklow County Council (WCC) as Mixed Use with an objective ‘*to provide for mixed use development*’ and New Residential with an objective ‘*to protect, provide and improve residential amenities in a high density format*’ in the southern section of the Site, within their respective County Development Plans (Dún Laoghaire-Rathdown County Development Plan 2022-2028; Wicklow County Development Plan 2016-2022, Draft Wicklow County Development Plan 2022-2028) as well as within the Bray Municipal District Local Area Plan 2018 - 2024 (WCC, 2018). The proposed development has been designed in accordance with the various zoning requirements.

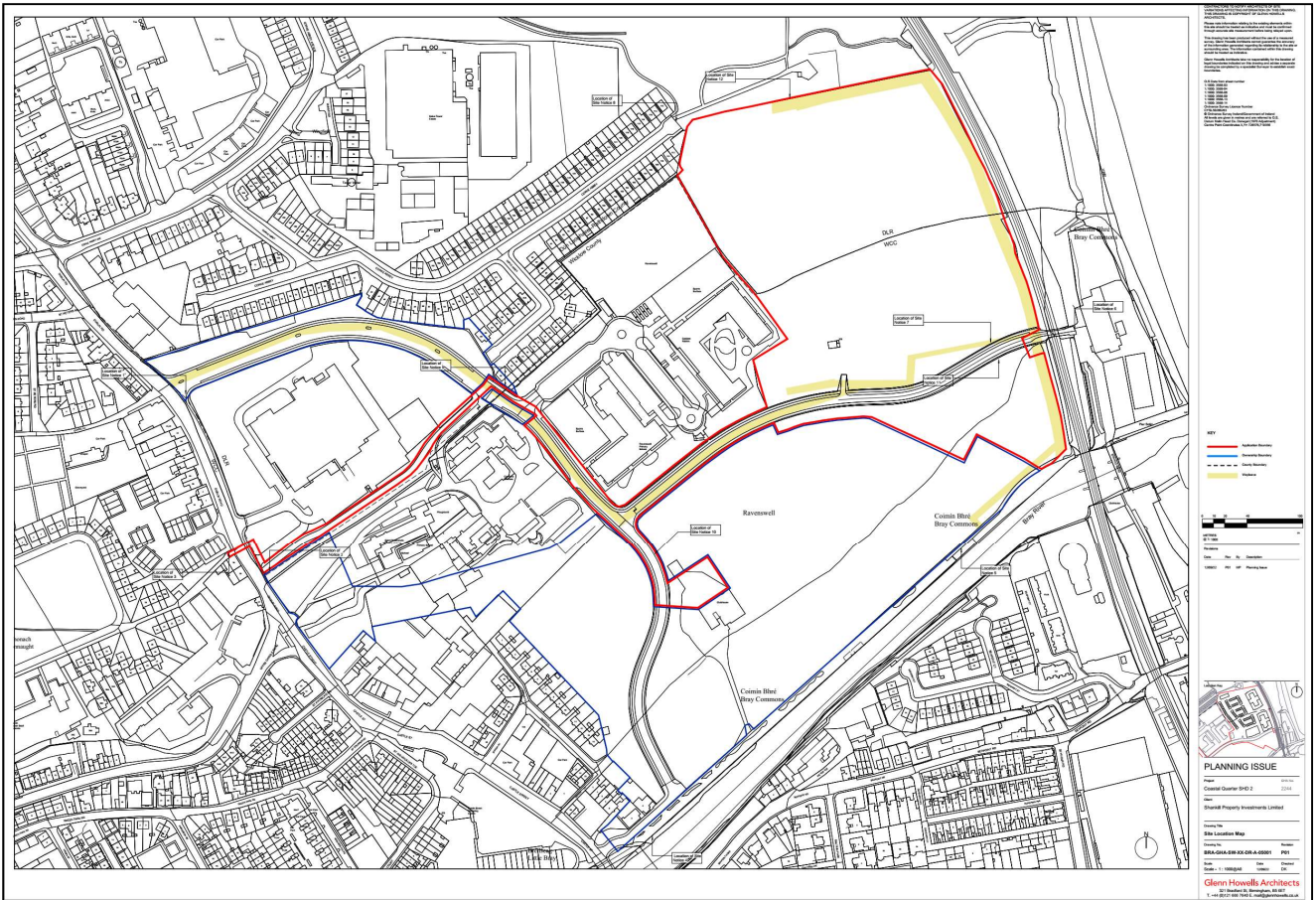


Figure 1-1 - Site Location (showing red-line application / site boundary for the Coastal Quarter) (blue-line denotes overall ownership boundary).



Figure 1-2 – Proposed Site Layout Plan for the Coastal Quarter

## 1.1. Strategic Housing Development Regulations

The Planning and Development (Strategic Housing Development) Regulations (S.I. No. 271/2017) came into effect in July 2017 pursuant to sections 4,5,7,8,9 and 12 of the Planning and Development (Housing and Residential Tenancies) Act 2016 (No. 17 of 2016). These regulations form part of the Planning and Development Regulations 2001 to 2022, as amended. A Strategic Housing Development (SHD) is defined under Section 3 of the Planning and Development (Housing) and Residential Tenancies Act 2016 as follows;

- a. the development of 100 or more houses on land zoned for residential use or for a mixture of residential and other uses;
- b. the development of student accommodation units which, when combined, contain 200 or more bed spaces, on land the zoning of which facilitates the provision of student accommodation or a mixture of student accommodation and other uses thereon;
- c. development that includes developments of the type referred to in paragraph (a) and of the type referred to in paragraph (b), or containing a mix of houses and student accommodation; or,
- d. the alteration of an existing planning permission granted under section 34 (other than under subsection (3A)) where the proposed alteration relates to development specified in paragraph (a), (b), or (c).

*Each of which may include other uses on the land, the zoning of which facilitates such use, but only if—*  
 (i) *the cumulative gross floor area of the houses or student accommodation units, or both, as the case may be, comprises not less than 85 per cent, or such other percentage as may be prescribed, of the gross floor space of the proposed development or the number of houses or proposed bed spaces within student accommodation to which the proposed alteration of a planning permission so granted relates, and*

*(ii) the other uses cumulatively do not exceed—15 square metres gross floor space for each house or 7.5 square metres gross floor space for each bed space in student accommodation, or both, as the case*

may be, in the proposed development or to which the proposed alteration of a planning permission so granted relates, subject to a maximum of 4,500 square metres gross floor space for such other uses in any development’.

Accordingly, this development is the subject of an SHD planning application to ABP, under Planning and Development (Strategic Housing Development) Regulations S.I. No. 271/2017.

## 1.2. Need for the EIAR

The proposed development has been screened against the types of development, various processes and activities listed in Schedule 5 Part 2 of the Planning and Development Regulations as amended 2001-2022, including S.I. No. 296 of 2018 – European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which came into operation on 1<sup>st</sup> September 2018.

In accordance with Section 10(b) an Environmental Impact Assessment Report (EIAR) would be required if the proposed infrastructure consists of the development of more than 500 dwelling units or has an area of more than 20 hectares. The proposed development comprises 586no. residential units, hence exceeds this relevant threshold and thus a mandatory EIAR is required.

This EIAR has been prepared in accordance with Planning and Development Regulations as amended 2001-2022, and with due regard to the following EIAR guidance;

*‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ published in 2022 (EPA, 2022);*

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

*Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU), published by the European Commission.’*

Cognisance has also been taken of the *‘Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment’* published by the Department of Housing, Planning and Local Government (DoHPLG) in August 2018.

Additionally, discipline specific best practice guidance has been consulted by each specialist for each of the relevant topics (Population & Human Health; Biodiversity; Landscape and Visual; Air Quality & Climate; Noise & Vibration; Traffic; Land, Soils & Geology; Water; Cultural Heritage; and, Material Assets) during the preparation of the EIAR.

**For the purposes of this EIAR (Atkins, 2022), the proposed development includes development as permitted under ABP-311181-21 together with minor revisions chiefly addressing conditions and new proposals for Blocks A and B which were previously refused.** Supplementary surveys have been carried out by relevant subject matter experts as required.

## 1.3. Contributors

This EIAR has been prepared by competent experts. The following table clearly sets out a list of the experts who have contributed to this EIAR, showing which parts of the EIAR they have worked on, their qualifications, experience and any other relevant credentials.

Name	Company	Area of Expertise	Relevant Chapter / Input	Relevant Qualifications / Professional Accreditation	Relevant Experience
Deirdre Larkin	Atkins	Geology, Hydrogeology, Hydrology, Human Health Risk Assessment	Chapter 2 - Project Description Chapter 3 - Population and Human Health Chapter 9 - Land, Soils & Geology	BSc. (Hons) Geology (2003) UCC MSc Applied Hydrogeology (2012) University of Newcastle.	18 years



Name	Company	Area of Expertise	Relevant Chapter / Input	Relevant Qualifications Professional Accreditation /	Relevant Experience
			Chapter 10 - Water Chapter 12 - Material Assets Co-ordination of 2022 Tree Survey	IGI PGeo No. 223 EurGeol No 1064	
Kieran Lynch	Atkins	Geology, Waste Management, Human Health Risk Assessment	Chapter 9 - Land, Soils & Geology Chapter 10 - Water	BSc. (Hons) Science 1996 University of Ulster MSc. Biotechnology 1998 University of Ulster LLB Law 2018 Griffith College BL- Barrister of Law Kings Inns 2020. Member of the Chartered Institute of Water and Environmental Management MCIWEM, C.WEM, CSci, C.ENV	25 years
Daniel Mulligan	Glenn Howells Architects Limited	Architecture & Urban Design	Chapter 2 – Project Description	Bachelor of Architecture (B.Arch.) Master's in architecture (B.Arch.) Member of RIBA, ARB	18 years
Helena Gavin	RPS Group Ltd	Planning	Chapter 3 - Population and Human Health with input from Atkins on the Human Health Assessment	BA. (Hons) Economics and Geography (1995) UCD, MSc Town & Country Planning (1997) Queens University Belfast, PG Dip Env Eng (2000) Trinity College Dublin, MIPI	23 years
Michael Higgins	RPS Group Ltd	Planning	Chapter 3 - Population and Human Health with input from Atkins on the Human Health Assessment	BA, MSc Reg & Urb Planning, H Dip Edu, MIPI, CIHT, TPP	15 years

Name	Company	Area of Expertise	Relevant Chapter / Input	Relevant Qualifications / Professional Accreditation	Relevant Experience
Colin Wilson	Atkins	Biodiversity Ecology	Chapter 4 - Biodiversity	B.Sc. (Hons) Environmental Science (Middlesex University 1992)	16 years
Paul O'Donoghue	Atkins	Biodiversity Ecology	Chapter 4 - Biodiversity	BSc (Zoology), MSc (Behavioural Ecology), PhD in avian ecology and genetics. CEnv, Full member of MCIEEM	18 years
Owen O'Keefe	Atkins	Biodiversity Ecology	Chapter 4 - Biodiversity	BSc (Hons) Ecology (UCC, 2015) MCIEEM	6 years
Dr. Tina Aughney	Bat Eco Services	Bat Specialist	Chapter 4 – Biodiversity (Bat Surveys)	B.Sc. Ph.D	21 years
Mark Johnston	Park Hood Chartered Landscape Architects	Landscape and Visual Specialist	Chapter 5 - Landscape & Visual	BA(Hons) Landscape Design (MMU 1995) BLA - Bachelor of Landscape Architecture (MMU 1997) CMLI – Chartered Member Landscape Institute (2001)	24 years
John Morgan	Independent Tree Surveys	Arboricultural Consultant	Chapter 5 – Landscape & Visual (Tree Surveys)	BSc (Hons) Forestry, Tech Cert (Arbor A) M Arbor A	14 years
Nick Polley	3D Design Bureau	3D planning Solutions	Verified View Montages	BSc (Eng) Dip Eng	21 years
Ciara Nolan	AWN	Air Quality and Climate	Chapter 6 - Air Quality and Climate	BSc Energy Systems Engineering UCD (2014) MSc in Applied Environmental Science UCD (2016). Associate Member of the Institute of Air Quality Management and Institute of	5 years

Name	Company	Area of Expertise	Relevant Chapter / Input	Relevant Qualifications Professional Accreditation /	Relevant Experience
				Environmental Sciences.	
Niamh Nolan	AWN	Air Quality and Climate	Chapter 6 - Air Quality and Climate	BSocSc Social Science UCD (2020). Associate Member of the Institute of Air Quality Management and Institute of Environmental Sciences.	2 years
Alistair Maclaurin	AWN	Noise	Chapter 7 – Noise and Vibration	BSc Creative Music and Sound Technology, PgDip Acoustics and Noise Control, Member of the Institute of Acoustics	9 years
Chris Fay	Atkins	Traffic and Transportation	Chapter 8 – Traffic	BEng (2006), PGradDip (2010), MIEI	13 years
Nicholas van den Berg	Atkins	Traffic and Transportation	Chapter 8 – Traffic	BScEng (2013) MIEI	8 years
John Cronin	John Cronin & Associates	Built Heritage & Archaeology	Chapter 11 - Cultural Heritage (Project Manager overseeing compilation of assessment, including liaising with Design Team and National Monuments Service)	B.A. (UCC), 1991, MRUP (UCD) 1993, MUBC (UCD), 1999.	25 years
Tony Cummins	John Cronin & Associates	Archaeology	Chapter 11 – Cultural Heritage (Internal reviewer and editor)	B.A. (UCC) 1992 M.A. (UCC) 1994	25 years
Padraig Dunne	John Cronin & Associates	Archaeology	Chapter 11 - Cultural Heritage (Project Archaeologist responsible for project research and directing site investigations under licence issued by	B.A. (UCC) 2009, M.A. (UCC), 2015	12 years

Name	Company	Area of Expertise	Relevant Chapter / Input	Relevant Qualifications Professional Accreditation	Relevant Experience
			the National Monuments Service)		
Garry Hanratty	Atkins	Storm water / wastewater design, Flood Risk Assessment	Chapter 10 – Water (preparation of Flood Risk Assessment) Chapter 12 – Material Assets (technical input into built services section)	BEng Tech CEng MIEI	20 Years
Niamh O'Malley	IE Consulting	Flood Risk Assessment	Chapter 10 – Water (Fluvial and Tidal Assessment of River Dargle, technical input into Flood Risk Assessment)	BE (Environmental Engineering) CEng MIEI	15 Years
Barry O'Neill	BBSC	Building Services Electrical, Mechanical Engineers	Chapter 12 - Material Assets (Preparation of Telecommunications Impact Assessment, presented in Appendix 12)	Degree in Buildings Services BEng(Hons) 2004, Chartered Engineer MIEI, MCIBSE	31 Years

## 1.4. Environmental Scoping

As part of the assessment process, an environmental scoping exercise was carried out. The purpose of the exercise was to define the scope of the EIAR. It was concluded that the construction and operation of the proposed residential development does not pose a risk with regard to potential radiation impacts. While on a regional scale the EPA (2022) predicts that 'About 1 in 10 homes in this area is likely to have high radon levels' within the northern portion and 'About 1 in 20 homes' in the southern portion are likely to have high radon levels, any risk is considered to be minor and will be addressed via the installation of a radon barrier as per standard building regulation requirements. Potential radiation impacts are not considered further within this EIAR.

Consultation was undertaken with relevant statutory organisations as part of the assessment process, as detailed further in Section 2.7.

## 1.5. Appropriate Assessment

Natura 2000 Sites, which comprise Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), are a network of Sites designated across Europe in order to protect biodiversity within the EU. SACs are designated under the EU Habitats Directive (92/43/EEC), as transcribed into Irish law by the European Communities (Birds & Natural Habitats) Regulations, 2011 [S.I. 477 of 2011], while SPAs are designated under the EU Birds Directive (79/4089/EEC and amendments as consolidated in 2009/47/EC).

Article 6(3) of the EU Habitats Directive states that: 'Any plan or project not directly connected with or necessary to the management of the [Natura 2000] Site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the Site in view of the Site's conservation objectives.' Such an assessment is known as an Appropriate Assessment or a Habitats Directive Assessment. Further guidance on this process is provided by the European Commission (2000) and DEHLG (2009<sup>1</sup>).

<sup>1</sup> Note: DEHLG (2009) guidance was updated in 2010, by replacing the term "Statement for Appropriate Assessment" with "Natura Impact Statement" or "NIS".

A Natura Impact Statement was undertaken as part of this application to consider the potential impacts of the proposed development on the conservation interests of surrounding Natura 2000 Sites (Atkins, 2022). The project does not lie within any European Site. There are 13 no. European Sites within the potential zone of influence (ZoI) of the development project; 9 no. SACs and 4 no. SPAs. The nearest European Site is Bray Head SAC (Site Code: 000714) which is located along the coastline ca. 1.7km south of the Site. There is no direct connectivity from the Site to Bray Head SAC or any other European Site via hedgerows or treelines.

The closest European sites with potential indirect connectivity via the River Dargle and Irish Sea are; Bray Head SAC (000714) (ca. 1.7km) and Rockabill to Dalkey Island SAC (003000) (ca. 4.1km). The NIS considers the following with regards to Bray Head SAC;

*'Potential indirect impacts via the hydrological pathway of the Irish Sea on terrestrial cliff habitats are not considered likely given that only the base of the cliffs are in contact with coastal waters. Also, given the dilution and dispersal that would occur within the Irish Sea this is not considered a viable pathway through which the conservation objectives of the SAC could be affected.'*

*'The proposed development once completed may lead to an increase in public footfall within Bray Head SAC. There are formalised and managed pathways through Bray Head some of which are through heathland habitats and along cliff tops. The objectives and principles of Bray Head Special Amenity Area Order detail extensive measures for the management of increased public access as well as for the maintenance of recreational walkways to be undertaken in combination with the protection of the heath and cliff habitats. Given that the formalised paths through Bray Head are already heavily utilised by the public, and given the paths and heaths are subject to continued management and maintenance measures, it is considered that any increase in footfall that may occur along Bray Head's formalised pathways as a result of the proposed development is not likely to have significant effects on Bray Head's heath and cliff habitats in view of their conservation objectives.'*

Based on the findings of the Natura Impact Statement the following conclusions have been made regarding the Rockabill to Dalkey Island SAC (003000);

*'The NIS has examined the potential impacts of the proposed project on the integrity of the SAC, alone and in combination with other plans and projects, considering the site's structure, function and conservation objectives. Where impacts potentially constituting adverse effects on the site were identified, mitigation measures have been prescribed to avoid or minimise those impacts such that they no longer constitute adverse effects on the integrity of the site.'*

*'Following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests of the SAC and the implementation of the proposed mitigation measures, it has been concluded by the authors of this report that there will be no residual impacts and the proposed project will not have an adverse effect on the integrity of the Rockabill to Dalkey Island SAC or any other European site.'*

## 1.6. Structure of this Report

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

The EIAR is presented in three volumes as follows;

- Volume 1 - Non-Technical Summary;
- Volume 2 - EIAR;
- Volume 3 - EIAR Appendix 1 to Appendix 14.

Within the main body of the EIAR (Volume 2), Chapter 1 sets out the introduction and methodology, while Chapter 2 describes the project and identifies the information required in an EIAR. The environmental topics where there is potential for significant impacts to arise are addressed in Chapters 3 to 12 as follows;

- Chapter 3 Population and Human Health;
- Chapter 4 Biodiversity;
- Chapter 5 Landscape & Visual;

- Chapter 6 Air Quality & Climate;
- Chapter 7 Noise & Vibration
- Chapter 8 Traffic;
- Chapter 9 Land, Soils & Geology;
- Chapter 10 Water;
- Chapter 11 Cultural Heritage; and,
- Chapter 12 Material Assets

Cumulative impacts for all relevant disciplines are addressed in Chapter 13. Interactions between disciplines are addressed in Chapter 14 and the Schedule of Environmental Commitments are presented in Chapter 15.

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

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

Further details of the methodology and discipline specific best practice and guidance are presented in the relevant Chapters included within this report. Drawings are presented in Appendix 1.1

Sources of information mentioned in the text are either i) listed in full in the bibliography (Chapter 16 – References) or ii) are referenced in full in the text.

The full planning application pack, including this EIAR will be available for public viewing from the ABP Office, Wicklow County Council Office, Dún-Laoghaire-Rathdown County Council Office or the SHD Application Website (<https://www.pleanala.ie/en-ie/strategic-housing-development>).

## 1.7. Need for the Project

Shankill Property Investment Ltd are seeking a 5 year planning permission grant for the development of a Strategic Housing Development in Ravenswell, Bray, County Wicklow. The lands on which the development is proposed have been partially zoned by Dún Laoghaire-Rathdown County Council (DLRCC, 2022) as Objective A: *'To provide residential development and improve residential amenity while protecting the existing residential amenities'* zoning and Objective F: *'To preserve and provide for open space with ancillary active recreational amenities'* in the northern section; and by Wicklow Country Council (WCC) as Mixed Use with an objective *'to provide for mixed use development'* and New Residential with an objective *'to protect, provide and improve residential amenities in a high density format'* in the southern section of the Site, within their County Development Plans as well as within the Bray Municipal District Local Area Plan 2018 - 2024 (WCC, 2018).

Should permission be granted for the proposed development, a variety of residential property types will be delivered which will provide for families of all ages and needs. Bray is in a suitable location for families who want to live in a coastal setting within commuting distance of Dublin City and surrounding areas. All of the required educational, healthcare and community services to cater for this wide demographic are located within the immediate vicinity of the proposed development; this coupled with the strong employment and economic prospects in the surrounding area would ensure that the proposed development is an appropriate use of the subject lands zoned Objective A: *To provide residential development and improve residential amenity while protecting the existing residential amenities'*, Objective F: *To preserve and provide for open space with ancillary active recreational amenities'*, Mixed Use with an objective *'to provide for mixed use development'* and New Residential with an objective *'to protect, provide and improve residential amenities in a high density format'*. Furthermore, this type of application (submission via the SHD process) was introduced as part of the Rebuilding

Ireland programme implemented in 2015, primarily to accelerate delivery of larger housing and student accommodation proposals in key areas, such as the coastal town of Bray.

The Wicklow County Development Plan 2016-2022 sets out the following objectives for residential housing (non-exhaustive list);

- *...encourage higher residential densities at suitable locations, particularly close to existing or proposed major public transport corridors and nodes, and in proximity to major centres of activity such as town and neighbourhood centres;*
- *HD2 - New housing development, above all other criteria, shall enhance and improve the residential amenity of any location, shall provide for the highest possible standard of living of occupants and in particular, shall not reduce to an unacceptable degree the level of amenity enjoyed by existing residents in the area; and,*
- *HD13 - Apartments generally will only be permitted within the designated centres in settlements (i.e. designated town, village or neighbourhood centres), on mixed use designated lands (that are suitable for residential uses as part of the mix component) or within 10 minutes walking distance of a train or light rail station.*

The Draft Wicklow County Development Plan 2022-2028 (WCC, 2021) sets out the following objectives for housing (non-exhaustive list);

- *NPO 33 - Prioritise the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location; and,*
- *NPO 35 - Increase residential density in settlements, through a range of measures including reductions in vacancy, re-use of existing buildings, infill development schemes, area or site-based regeneration and increased building heights.*

The Dún Laoghaire-Rathdown County Development Plan 2022-2028 sets out the following objectives in relation to towns, villages and retail development (non-exhaustive list);

- *MFC1: Multifunctional Centres - It is a Policy Objective of the Council to embrace and support the development of the County's Major Town Centres, District Centres and Neighbourhood Centres as multifunctional centres which provide a variety of uses that meet the needs of the community they serve;*
- *MFC2: Accessible and Inclusive Multifunctional Centres - It is a Policy Objective of the Council to promote accessibility to Major Town Centres, District Centres and Neighbourhood Centres by sustainable modes of transportation in order to encourage multi-purpose shopping, business and leisure trips as part of the same journey;*
- *MFC3: Placemaking in our Towns and Villages - It is a Policy Objective of the Council to support proposals for development in towns and villages that provide for a framework for renewal where relevant and ensure the creation of a high quality public realm and sense of place. Proposals should also enhance the unique character of the County's Main streets where relevant.*
- *RET5: Major Town Centres -...In addition to retail, these centres must include community, cultural, civic, leisure, restaurants, bars and cafes, entertainment, employment and residential uses. Development shall be designed so as to enhance the creation of a sense of place.*

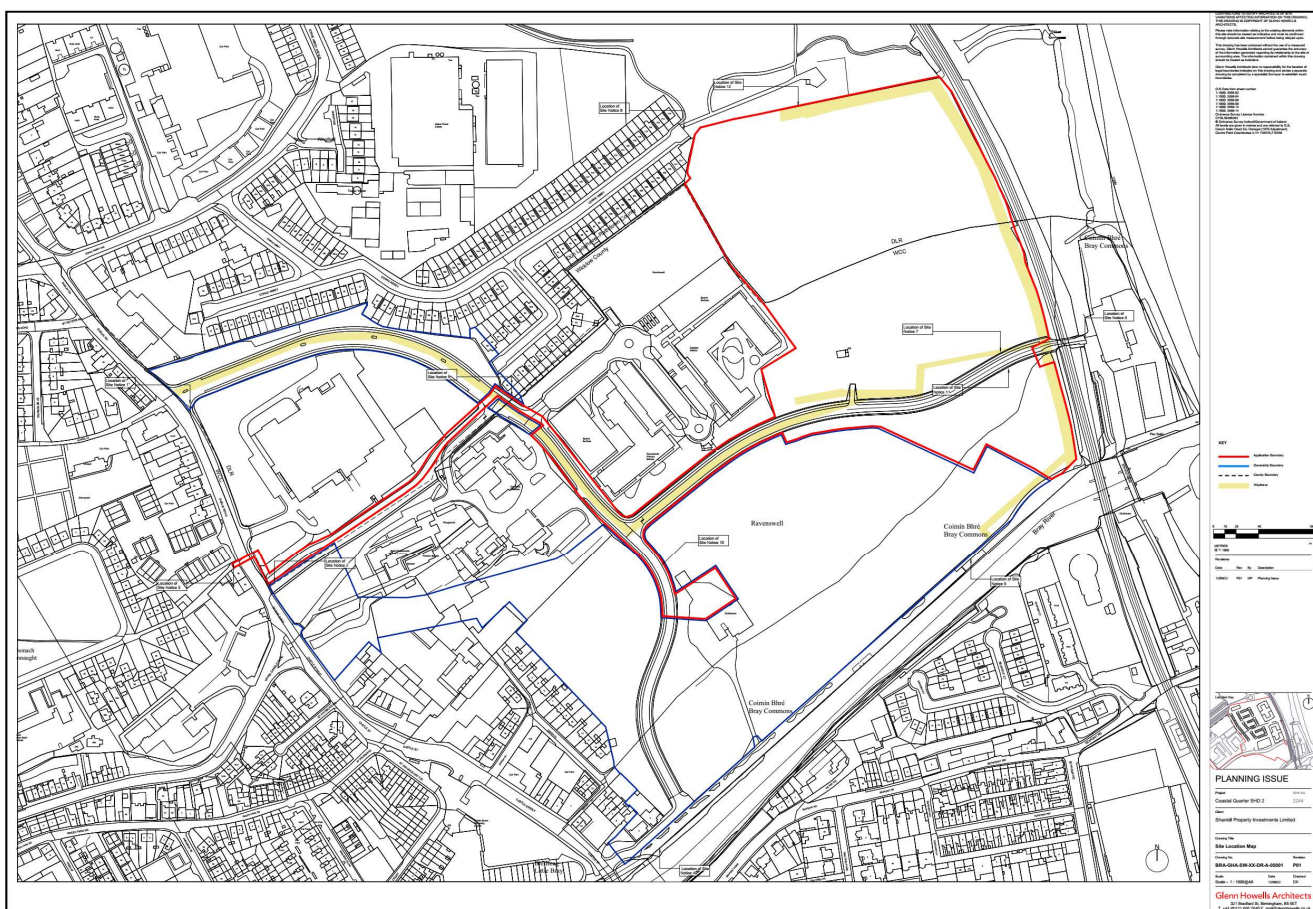
The need for this Project is discussed in greater detail within the planning report submitted as part of this planning application.

## 2. Project Description

### 2.1. Nature and Extent of the proposed development

Phase 1A of the Harbour Point Masterplan consists of the proposed Coastal Quarter development SHD 2 (the subject of this planning application), located on the former Bray Golf Club Lands off Ravenswell Road and the Dublin Road, Bray, County Wicklow and County Dublin (here after referred to as ‘the proposed development’ or ‘the Site’).

The site is generally bounded to the north by existing public open space at Corke Abbey Valley Park, to the east by the Irish Rail Dublin-Wexford/Rosslare main rail line, to the south by the River Dargle and undeveloped lands, and to the west by undeveloped lands and the existing Ravenswell schools campus. The Rathmichael Stream is located to the north of the site, and currently is separated from the site by a hedgerow / treeline. Refer to Figure 2-1 (Drawing presented in full in Appendix 1.1 (BRA-GHA-SW-XX-DR-A-05001)).



**Figure 2-1 - Proposed Coastal Quarter Development Site (Site boundary denoted in red, Harbour Point Masterplan lands boundary denoted in blue)**

The Site is within 2no. county council boundaries, the northern portion of the Site lies within Dún Laoghaire-Rathdown County Council (DLRCC) bounds, while the southern portion of the Site lies within Wicklow County Council (WCC) bounds.

The topography of the Site generally falls from north to south with a localised high ridge running in an east-west direction across the centre of the Site. This ridge is identified as a linear earthwork (DU026-124---- / WI004-005----) and is described by Archaeological Survey of Ireland as a postulation that possibly formed part of the medieval Pale ditch which denotes a county council boundary. However, the results of a number of archaeological investigations of the feature indicates that it is a landscaped feature dating to recent centuries.

An existing underground Irish Water foul storage tank is located in the western portion of the Site, with foul services running along the northern and eastern site boundaries before crossing the River Dargle to the south of



the Site. There are also two gravity foul sewers that run from west to east across the site as detailed further in the Engineering Planning Report (Doc. Ref: 5214419DG0018).

While the Site is private with no formal public access, it is currently used locally as a popular walking and open space amenity.

The proposed Coastal Quarter development comprises 586no. residential units in a mix of apartments, duplexes and houses with a combined gross floor area of 67,814m<sup>2</sup> on an 8.812ha parcel of land within the former Golf Course lands to the north of Bray Town Centre. In addition, a childcare facility (gross floor area of 627m<sup>2</sup>), café (gross floor area of 195m<sup>2</sup>), retail unit (gross floor area of 249m<sup>2</sup>), and 1no. mixed use commercial unit (gross floor area of 512m<sup>2</sup>) are proposed along with all associated and ancillary development and infrastructural works, boundary treatment works, ancillary car and bicycle parking spaces at surface and undercroft levels and all associated ancillary works. The proposed development will also include all associated plant, refuse storage areas, communal open space, public open space, playgrounds, multi-use games area, associated internal roads and drainage arrangements, facilitating utility connections, facilitating linkages with adjoining sites; landscaping, public lighting, construction compounds; and all site development works.

The proposed maximum height of the apartment blocks will be ca. 12no. storeys. The Site of the proposed development is presented in Figure 2-1 (Dwg. No. BRA-GHA-SW-00-DR-A-05010). The proposed houses and duplexes range in height from 2 to 3 storeys (9.811m to 11.024m), with the proposed apartment blocks ranging in height from 3 to 12 storeys with the following heights proposed for each apartment block;

- Block A: 34.020mAOD;
- Block B: 43.500mAOD;
- Block C: 29.000mAOD; and,
- Block D: 25.075mAOD.

The proposed residential units are arranged in a series of character areas that respond to the zoned open space and the existing landscape character of the lands. Views within and from the development are framed by legible links that supervise the space and connect to the existing landscape structure.

The application site is 8.812ha, of which 7.84ha is being developed as the proposed residential development with the remaining 0.972ha (Site extension to the west along the existing road network and footpaths) being utilised to facilitate utility connections to the existing watermain network along Upper Dargle road (refer to the Engineering Planning Report (Doc. Ref: 5214419DG0018) for further details). A developable area of 7.28ha results from the deduction of the ca. 0.56ha zoned open space from the gross site area; and residential densities of 80 units per hectare are achieved through the use of a variety of housing typologies including apartments, duplex, terraced, semi-detached and detached dwellings as shown in Figure 2-2 (and Appendix 1.1).

It is proposed that the types of finish on the buildings will be traditional brick and silicone render with hard wearing engineering stone, metal and concrete. Refer also to the Building Lifecycle Report (Aramark, 2022) which supports this application, for further details on proposed materials.

The proposed works will require the felling of a number of trees throughout the Site, some of which have been recommended for removal following the completion of tree surveys and some of which need to be removed to facilitate construction works. Such trees will be compensated for by extensive planting of trees throughout the proposed development as well as biodiversity corridors throughout the site and a parkland area within the southern portion of the Site. It is proposed that the existing hedgerow along the northern and eastern boundary (within the northern portion of the Site) is retained where possible, and will be protected during construction works by way of a protective fence that will be placed along the route protection zones. Refer to the Landscape Design Strategy (Parkhood, 2022) submitted to support this application.



**Figure 2-2 - Proposed Site Layout (also showing housing mix and typologies)**

The layout proposes 9no. character areas, each responding to specific landscape, topographical and boundary considerations, as summarised below and presented in Figure 2-3.

1. **Underpass Entrance Node** - The Entrance Node marks an important arrival point in to the development for non-car users and provides an opportunity to develop a key piece of well used public realm that ties together the Market Square, the Coastal Gardens and pedestrian/cycle routes to Bray town centre.
2. **Market Square** - The Market Square defines another key entrance and gateway to the development. The design of the area has developed as a mix of hard and soft landscape treatments to create a series of useable spaces.
3. **Nuns Walk** - The 'Nun's Walk' will be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A.
4. **Coastal Gardens** - The Coastal Gardens will create a meandering footpath/cycle link along the eastern boundary that also enables emergency vehicle access to the eastern elevations of Blocks A and B. This pathway has been increased to 3m overall width as required by condition 4F of the current planning approval.
5. **The Orchard** - The Orchard has been developed as the scheme's 'Mobility Hub' and marks a key entrance to the development, designed to bring an aesthetic and usable space to what is currently a below ground waste water pumping station. This significant piece of infrastructure cannot be relocated and therefore the design intent of the scheme is to create a strong frontage on the approach to the development which helps screen the infrastructure and creates a secure location for a mobility hub containing a range of transport options to reduce reliance on private car use.
6. **Green Spine** - The Green Spine provides pedestrian connections through the heart of the scheme to link with Corke Abbey Valley Park and The Nun's Walk. The Spine will benefit from quality paving finishes and extensive SuDs areas to assist attenuation while providing biodiversity interest.
7. **Woodland Settings** - The Woodland Setting area extends across the northern boundary of the site and will help to integrate Block D in to the landscape and with the adjacent existing residential development. This

character area will act as a transition from the proposed development to the surrounding existing residential development and will benefit from access routes to the adjacent Corke Abbey Valley Park.

- 8. **Home Zones** - Home Zones are an urban design led concept for residential developments, where streets are intended for a range of activities and are primarily places for people, not places for vehicles. The aim is to improve the quality of life for residents, and this takes priority over ease of traffic movement. Streets in Home Zones will include seating, shared surfaces, parking spaces and areas of planting as well as indirect traffic routes.
- 9. **Communal Gardens** - Apartment Blocks A, B and C will avail of central courtyard communal open space areas at podium level above the under-croft car parks. These podium gardens will provide amenity space for residents and will include seating and play/exercise features to facilitate active and passive recreation and comply with the relevant requirements of the apartment design guidelines.



**Figure 2-3 - Proposed Key Public Spaces (1 to 9)** (Refer to the Landscape Design Strategy Report (Parkhood) submitted as part of this planning application).

The Site area is 8.812ha, of which 7.84ha is being developed as mentioned previously. Table 2-1 and Table 2-2 presents the breakdown of land zones per area within each county boundary.

**Table 2-1 – Dún Laoghaire-Rathdown County Council Lands - break down of land zoned per area**

Dún Laoghaire-Rathdown County Council	Amount / Area
DLRCC Total Units	274no.
DLRCC Site Area	3.65ha
DLRCC unit/hectare	89 unit/hectare
Zoned open space	0.56ha

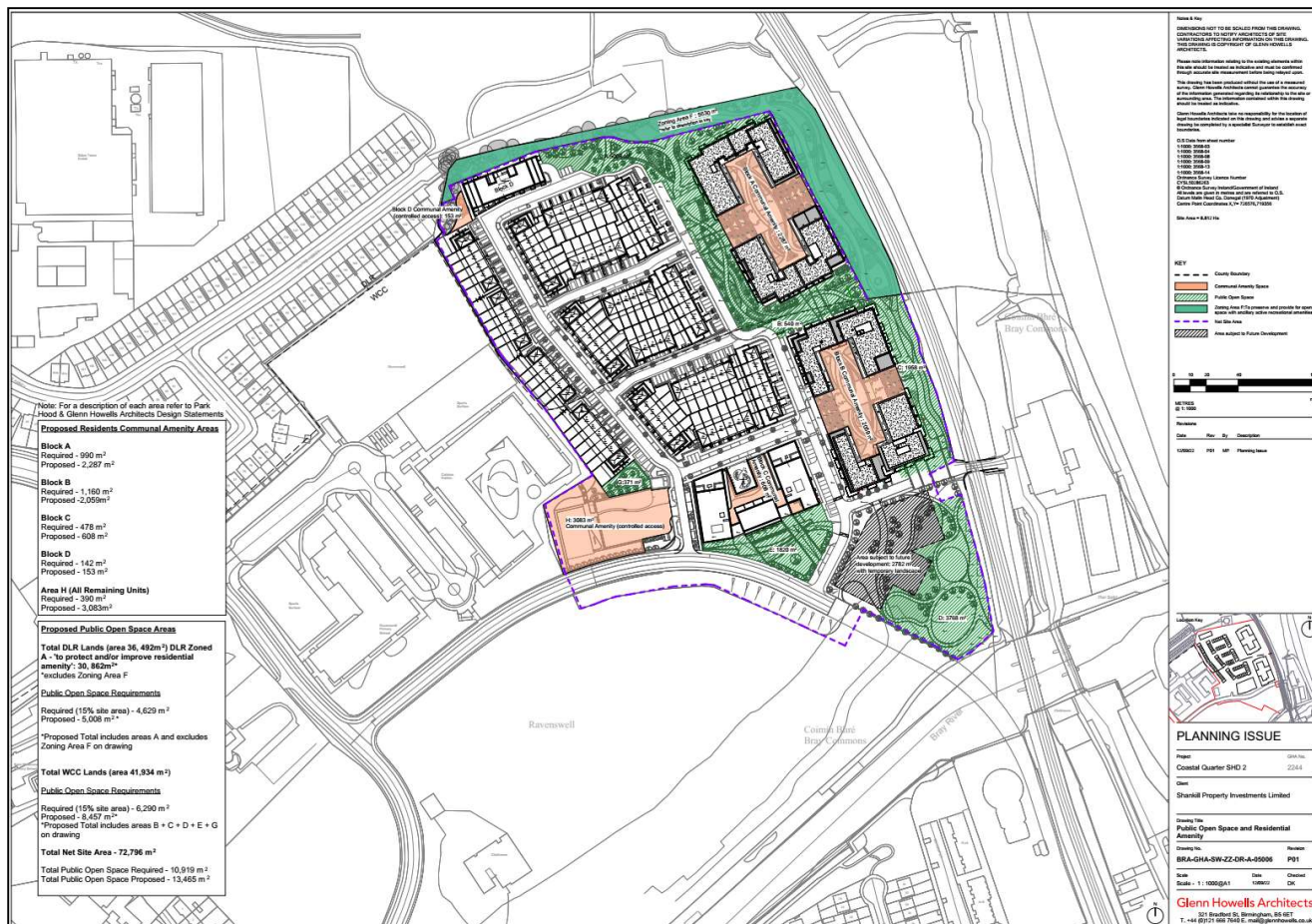
**Table 2-2 - Wicklow County Council Lands - break down of land zoned per area**

Wicklow County Council	Amount / Area
WCC Total Units	312no.
WCC Site Area	4.19ha
WCC unit/hectare	74 unit/hectare
Zoned open space	N/A

While these spaces are organised to provide more local and intimate spaces that aid placemaking in the character areas, each act as a component of a legible sequence of connections to and through the zoned open space to adjacent lands as illustrated in Figure 2-4 (and Appendix 1.1).

The landscape design responds to the presence of the existing coastal gardens linear park located between the Site and the railway line to the east and the Woodland Park to the north of the Site. The layout recognises these areas as the primary cyclist and pedestrian connections to the development Site. In addition to these existing areas, the design provides for the Coastal Gardens, a Green Spine and the Orchard area, with semi-private communal gardens in the podium gardens for apartment blocks, along with a small communal roof terrace on Block C. Further details are provided in Chapter 5 – Landscape and Visual.

The landscape and engineering design of this development incorporates SuDS measures including modular permeable paving, swales, tree pits and underground storage capacity. Trees and other planting have been incorporated within the design so as to create an attractive streetscape.



**Figure 2-4 – External Open and Residential Communal Amenity Areas**

There are houses, own door duplex units and 4no. apartment blocks within the proposed development (Block A, Block B, Block C and Block D). Each house, own door duplex unit and apartment block has different dwelling typologies, as presented in Table 2-3. Table 2-4 provides a further breakdown of the apartment/housing mix and typologies within Dún-Laoghaire-Rathdown County Council. Table 2-5 provides a breakdown of the apartment/housing mix and typologies within Wicklow County Council. The housing mix and typologies are presented Figure 2-2 above (and Appendix 1.1).

**Table 2-3 - Apartment Block and House Typologies**

Block	Unit Type	Number of Apartments
<b>Block A</b>	1 Bed, 2 Person Apartment	79
	2 Bed, 4 Person Apartment	76
	3 Bed, 5 Person Apartment	7
	<b>162</b>	
<b>Block B</b>	1 Bed, 2 Person Apartment	94
	2 Bed, 4 Person Apartment	86
	3 Bed. 5 Person Apartment	10
	<b>190</b>	
<b>Block C</b>	1 Bed, 2 Person Apartment	45
	2 Bed, 4 Person Apartment	3
	2 Bed, 4 Person Apartment	28
	3 Bed, 5 Person Duplex Apartment	4

		<b>80</b>
<b>Block D</b>	1 Bed, 2 Person Apartment	20
	2 Bed, 4 Person Apartment	6
		<b>26</b>
<b>Duplex Apartments</b>	Corner Duplex – 2 Bed, 4 Person (H1)	6
	Corner Duplex – 3 Bed, 5 Person (H1)	6
	Terrace Duplex - 2 Bed, 4 Person (H2)	12
	Terrace Duplex - 3 Bed, 5 Person (H2)	12
	Corner Duplex – 2 Bed, 4 Person (H6)	1
	Corner Duplex – 3 Bed, 5 Person (H6)	1
	Corner Duplex – 2 Bed, 4 Person (H8)	7
	Corner Duplex – 2 Bed, 4 Person (H8)	7
		<b>52</b>
<b>Houses</b>	2 Bed, 4 Person Terrace House (H3)	13
	3 Bed, 5 Person Terrace House (H4)	51
	4 Bed, 8 Person Terrace House (H5)	6
	4 Bed, 8 Person end of terrace house (H7)	6
		<b>76</b>

**Table 2-4 – Apartment / Housing Mix and Typologies within Dún Laoghaire-Rathdown County Council**

Dún Laoghaire-Rathdown County Council	Number of units
<b>Apartment Block A</b>	<b>162</b>
1 Bed, 2 Person Apartment	79
2 Bed, 4 Person Apartment	76
2 Bed, 4 Person Apartment	7
<b>Apartment Block D</b>	<b>26</b>
1 Bed, 2 Person Apartment	20
2 Bed, 4 Person Apartment	6
<b>Own-door Duplex Apartments</b>	<b>34</b>
Corner Duplex (H1)	8
Terrace Duplex (H2)	16
Corner Duplex (H6)	2
Corner Duplex (H8)	8
<b>Houses</b>	<b>52</b>

2 Bed, 4 Person Terrace House (H3)	11
3 Bed, 5 Person Terrace House (H4)	30
4 Bed, 8 Person Terrace House (H5)	6
4 Bed, 8 Person end of terrace house (H7)	5

**Table 2-5 - Apartment / Housing Mix and Typologies within Wicklow County Council**

Wicklow County Council	Number of units
<b>Apartment Block B</b>	<b>190</b>
1 Bed, 2 Person Apartment	94
2 Bed, 4 Person Apartment	86
3 Bed, 5 Person	10
<b>Apartment Block C</b>	<b>80</b>
1 Bed, 2 Person Apartment	45
2 Bed, 3 Person Apartment	3
2 Bed, 4 Person Apartment	28
3 Bed, 5 Person Duplex Apartment	4
<b>Own-door Duplex Apartments</b>	<b>18</b>
Corner Duplex (H1)	4
Terrace Duplex (H2)	8
Corner Duplex (H8)	6
<b>Houses</b>	<b>24</b>
2 Bed, 4 Person Terrace House (H3)	2
3 Bed, 5 Person Terrace House (H4)	21
4 Bed, 8 Person end of terrace house (H7)	1

## 2.2. Preliminary Phasing

It is proposed that the construction of the residential development will be delivered in 3no. Phases (with an overall anticipated construction programme duration of ca. 48 months) as illustrated in Figure 2-5 (and Appendix 1.1). It must be noted however that this phasing plan is preliminary and may be subject to revision at a later stage of the development.

It is anticipated that construction works for all development as permitted under ABP-311181-21 (and in compliance with all relevant planning conditions) will commence during Q4 '22.

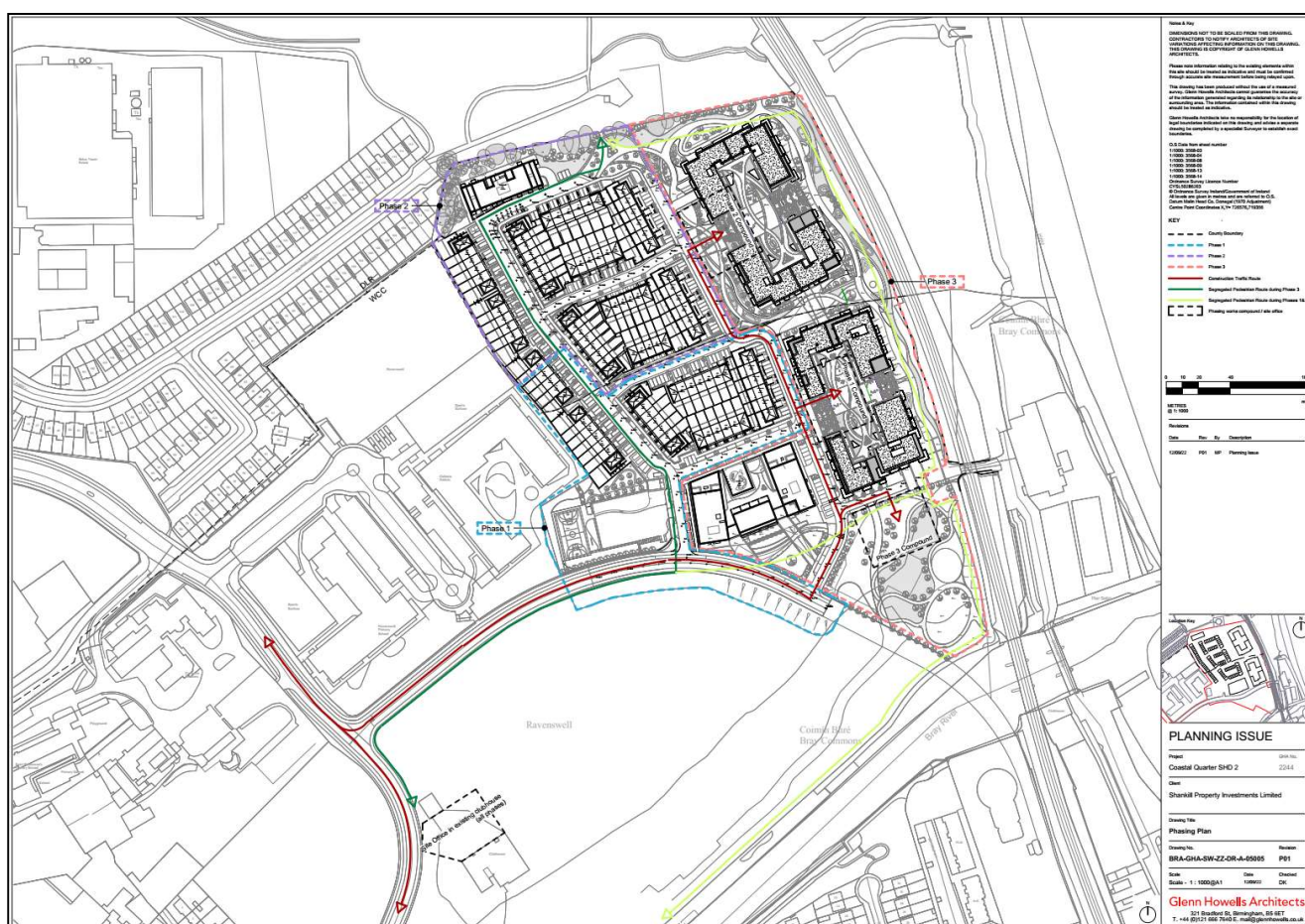
The first development phase, which is expected to be constructed between Q4 '22 and Q3 '24, will be developed in the south western corner of the Site and will be accessed through the existing access road to the school development.

Following the construction of Phase 1, this access route will become operational for the residents of the units developed during this phase and will also be used by construction traffic for the construction of Phase 2 which is located in the north western corner of the Site and is expected to be constructed between Q4 '23 and Q1 '26.

Phase 3 will be developed in the eastern portion of the Site and will be accessed from the existing access route. It is anticipated that this phase will be constructed between Q3 '23 and Q4 '26.

3no. pedestrian / cyclist access points are proposed during the construction phase, as presented in Figure 2-5 below; 2no. points in the south (1no. in south west and 1no. in south east) and 1no. in the north. The proposed construction period will last 48 months.

Access from the north (Corke Abbey Valley Park) to the underpass and Ravenswell Schools complex, and from the underpass to the Ravenswell schools complex will be maintained at all times throughout the construction process. Details are set out in the Construction Management Plan.



**Figure 2-5- Preliminary Construction Phasing of the proposed development**

### 2.3. Construction Aspects

Construction works will take place between 8am and 6pm Mondays to Fridays inclusive, and between 8am and 2pm on Saturdays, with no works taking place on Sundays or Public Holidays (unless agreed via written approval from the planning authority in exceptional circumstances).

The general phasing of the construction stage will be as follows:-



- **Site Mobilisation;** Secure Site, establish Site access and Site compound (including parking, welfare facilities and canteen, Site offices, storage areas and temporary utilities / services), establish internal traffic routes and haul routes, establish all necessary environmental protection measures (tree, water course, well protection etc.), mobilise machinery, equipment and materials;
- **Site Clearance;** Remove existing topsoil and stockpile for reuse onsite or offsite removal (as required), survey and mark out various elements of the construction works as required;
- **Utilities diversions:** Existing rising main and gravity return drains that serve the storm holding tank will be diverted ca.30m southwards to avoid proposed structures;
- **Develop Site Infrastructure;** Install attenuation areas and drainage network, roads and services and key ancillary services;
- **Construction:** Construct 586no. residential units on a phased basis, as per the preliminary phasing plan presented in Figure 2-5. Phase 1 to Phase 3 will be delivered over a maximum period of 48 months;
- **Landscaping:** Landscape each of the residential properties and establish public open space lands; and,
- **Site Demobilisation;** Removal of all machinery, equipment, materials and residual waste from Site, decommissioning of all temporary utilities/ services, removal of all temporary units from the Site compound, removal of Site fencing and signage, and final reinstatement.

Typical machinery used onsite during the construction phase will include mechanical excavators, dumper trucks, bull dozers, piling rigs<sup>2</sup>, concrete delivery trucks, mobile cranes, and mobile elevating work platforms (MEWP).

### 2.3.1. Site Compound/ Site Office

As depicted in Figure 2-5, the Site compound for each of the 3no. phases, and the Site office will be located in various strategic locations across the Site; all of which are away from existing hedgerows and watercourses.

### 2.3.2. Traffic Management

The proposed transport routes of all machinery entering and egressing the Site, for the full duration of the 48 month phased construction period shall be through the proposed entrance off the existing access route west of the main Site. All construction activities will be managed and informed by a Construction Traffic Management Plan (CTMP). The details of the CTMP will be agreed with the roads department of the Local Authority in advance of construction activities commencing on-site.

### 2.3.3. Environmental Management

The construction of the proposed development will be in accordance with the Construction Environmental Management Plan (CEMP) submitted as part of this planning application (which takes account of the Schedule of Environmental Commitments presented within this EIAR). This document will be further developed and added to within the project specific Detailed CEMP which will be prepared by the Contractor in advance of the construction phase and will be fully implemented onsite for the duration of the construction phase of the project. Environmental monitoring will be carried out during the construction phase as detailed in Chapter 15 - Schedule of Environmental Commitments.

### 2.3.4. Waste Management

The construction of the proposed development will be in accordance with the Construction Resource and Waste Management Plan (RWMP) submitted as part of this planning application as presented in Appendix 12.4, prepared in accordance with the relevant following guidance '*Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects*' (EPA, 2022). The Construction RWMP provides a mechanism for monitoring and auditing waste management performance and compliance for the duration of the project. The document also provides a detailed overview of key waste management considerations for the project at this preliminary stage, while also allowing for further enhancement as the project

<sup>2</sup> Based on the results of the geotechnical investigation it is likely that piling will be required.

progresses through to the detailed design and construction stages. This document will be further developed and added to within the project specific Detailed Resource and Waste Management Plan which will be prepared by the Contractor in advance of the construction phase and will be fully implemented onsite for the duration of the construction phase of the project.

## 2.4. Operational Aspects

### 2.4.1. Landscaping

As discussed further in Chapter 5 – Landscape and Visual, the majority of residential properties to the north of the Site are currently screened from the Site by a small woodland area. There is currently no screening in place between the school development and the proposed houses along the western boundary. Tree planting will be provided along this boundary to provide partial screening between the proposed development and the existing school campus. This advanced planting is proposed to take place in the early stages of the construction phase to allow the planting to provide adequate screening prior to the Site becoming fully operational.

### 2.4.2. Volume and Profile of Usage

This development will be used on an all-year round basis with the main users being the residents of the residential units, followed by the users and staff of the proposed crèche, retail unit and 1no. mixed use commercial unit, the multi-use games area, communal open space and playground and pedestrians and cyclists who may utilise the proposed pedestrian / cyclist paths on a regular basis. The proposed impacts of the additional traffic and traffic capacity of the local road network is considered in greater detail in Chapter 8 – Traffic.

### 2.4.3. Waste Management

The operation of the proposed development will be in accordance with the Operational Waste Management Plan (WMP) submitted as part of this planning application.

## 2.5. Description of the Current Setting / Baseline Scenario

The Former Bray Golf Club Lands offer strategically located development opportunities within the Greater Dublin Area circa 20 km south of Dublin City Centre and with excellent transport connections. Bray is an established urban area with a significant population (of ca. 38,000) and catchment which is earmarked for further growth. Schools on the site were opened in 2019 and the remaining Former Golf Course Lands are now encapsulated in the current Harbour Point Masterplan.

The Site is located immediately North of Bray Town Centre. Road access to the nearby M11 is via Dublin Road at the Bray North Motorway exit. The lands have previously been isolated from the harbour area and the Dart Station. A route through the town centre was the only link until the development of the Ravenswell schools campus opened up the area and facilitated access to the road underpass. The Dart station is only a few minutes' walk from the site and bus routes to Dublin are available on the adjoining Dublin Road. The proposal has been developed to facilitate a future Luas / Public Transport corridor through the Site.

The Site is located behind the seafront and harbour adjacent to the southern edge of the Woodbrook Golf Course. The variety of views in and around the lands emphasise the unique quality of the site and its setting. Regionally the town of Bray is almost surrounded by hills and mountains that are in the middle distance to the south and stretch into the horizon to the west. The topography on the site combined with the views and vistas of the surrounding landscape, the sea and Bray Town will provide a rich variety of visual experience at ground level as well as the residents in apartments at higher levels. The topography across the site provides a variety of interesting views as follows (some are glimpses others are panoramic):

- Panoramic sea views as far north as Killiney, and as far south as Bray Head; and,
- Mountain views are available to the west from the higher levels on the site beside the schools.

The development has been arranged so that the smaller scale development (2 storey houses and 3 storey duplexes) are located closest to the existing suburban houses at Corke Abbey Valley Park and the Ravenswell schools campus, while the higher apartment blocks face onto the coast.

It is anticipated that construction works for all development as permitted under ABP-311181-21 (and in compliance with all relevant planning conditions) will commence during Q4 '22. For the purposes of this EIAR the baseline scenario considered relates to the site condition and receiving environment at the time of the preparation of this report.

The baseline scenario including a description of the relevant aspects of the current receiving environment has been considered as part of this EIAR through the collection and collation of baseline data including analytical data where relevant (traffic, air quality, noise levels, soil quality, and surface water and groundwater quality). A detailed description of the current receiving environment is presented in relevant sections for each environmental topic. The predicted changing baseline (i.e. the likely future receiving environment) that could arise as a result of committed development within the vicinity has also been addressed, where relevant, and is presented under the cumulative impacts section for each environmental topic assessed within this EIAR (Chapter 13 – Cumulative Impacts).

## 2.6. Consideration of Reasonable Alternatives

### 2.6.1. Relevant Background Information

The former Bray Golf Club lands represent an area of strategic importance to the town of Bray and the surrounding areas. In June 2010, ABP granted a ten year Planning Permission for a permission on the Former Golf Club Lands and in 2017 a review of this permission was undertaken by NAMA in response to the following key drivers of change at that point in time:

- A new Bray Municipal District Local Area Plan 2018-2024 which came into force in June 2018;
- Changes in residential design standards;
- The extension of the Site area to include the former Industrial Yarns Site, lands that no longer form part of the masterplan for the Coastal and River Quarters; and,
- The progression in the National Transport Strategy towards more sustainable modes of transport that favoured the excellent public transport links and pedestrian/cyclist connectivity offered by the Coastal Quarter and the wider Site and future phases.

A portion of the previously approved 2010 masterplan has already been implemented through the design and construction of two new schools along with their associated playing fields (the schools opened during the 2018/19 academic year). In addition to the schools, and in part to facilitate the schools, a substantial portion of the required infrastructure works to serve the entire masterplan lands have been completed.

The 2010 permission was a retail led development and the 2017 masterplan took on board the changed economic climate and moved away from being a predominantly retail led scheme to a residential led masterplan with ca. 4,000 residents and in excess of 2,000 homes whilst supporting the extension of Bray's existing town centre with in excess of an additional 20,000m<sup>2</sup> of retail, commercial and leisure space.

### 2.6.2. Consideration of Reasonable Alternatives

The Coastal Quarter area has consistently been a predominantly residential area in the various masterplans that have been prepared. What has changed in the design of the proposed development is the unit mix and design layouts to meet updated design standards. The current Coastal Quarter design introduces houses as part of the residential mix for the first time. A number of the key design iterations which were considered during the current design process, and how the overall design evolved taking account of site-specific design, engineering and environmental constraints, is described below.

#### 2.6.2.1. Option 1 (2021)

- Early options placed a series of apartment mansion blocks along the coast in order to establish acceptable levels of density for a site on the edge of Bray town centre.
- These apartment buildings are distanced from the eastern boundary to account for the various services along this boundary.

- A larger apartment building lined the southern boundary of the Coastal Quarter, its alignment guided by existing services at that location.
- A series of houses were set out across the remainder of the site with their orientation guided by the county boundary line that runs west to east across the Quarter.
- The apartment buildings to the eastern boundary of the site provide shelter to the housing at this exposed coastal location.
- The layout for Option 1 is presented in Figure 2-6.
- The key reasons Option 1 was not selected as the final design layout for the proposed development are summarised as follows:
  - This layout resulted in long narrow streets which was not desirable from DMURS perspective. The 4no. individual apartment blocks to the east were inefficient from a parking perspective, and the overall parking ratios were not feasible.
  - With ongoing input to the design team from the building lifecycle assessment including Mechanical and Electrical services, it became clear that apartment blocks of 200no. units are more efficient from a heating and circulation perspective.
  - Ongoing design input from the preliminary wind analysis undertaken suggested that the long and linear nature of the streets proposed in this layout would have a funnelling effect with respect to wind impacts.
  - The concept of achieving a market square was not fully realised with this layout. Terraced housing was shown as a single block backing onto the existing school which was deemed to be rather monotonous from an architectural perspective. When the contiguous elevation of western terraces was developed further, it became apparent there was not enough variety of character of house types along the street.
  - During the process of developing this option, a design constraint in the form of an exclusion zone was identified around the existing onsite Irish Water odour control unit. This resulted in the road alignment needing to be curved around the unit.
  - This option did not include a green corridor along the western portion of the site and so did not provide any connectivity between the site and green spaces further north in the vicinity of Corke Abbey Valley Park, Woodbrook and Shankill. Hence the current ecological / biodiversity connectivity between these two areas based on the existing site setting would be impacted by this layout.
  - Finally, it was desired that each apartment block would have its own communal podium, which was not the case with this layout option.
  - In summary, while this option would not result in significant adverse environmental impacts, it was not considered to be an optimal design from an environmental perspective, specifically with respect to traffic, sustainability, biodiversity and landscape and visual considerations.



Figure 2-6 - Alternative Layout – Option 1

### 2.6.2.2. Option 2 (2021)

- The apartment buildings to the east are now grouped together and define the eastern ends of blocks.
- In order to accommodate parking the communal spaces for apartments were raised up onto podiums with parking below.
- A clear vista out to sea along the County Boundary Line is provided between the apartment buildings facing east.
- In earlier options roads were long and straight and not DMURS compliant.
- An exclusion zone around the existing underground Irish Water foul storage tank and the associated odour control unit was introduced.
- The services along the southern boundary of the site were diverted to allow for the change in shape of Block C and the creation of a public space close to the existing underpass under the railway line.
- A series of apartment buildings were placed along the northern boundary to overlook the existing park at that location.
- The layout for Option 2 is presented in Figure 2-7.
- The key reasons Option 2 was not selected as the final design layout for the proposed development are summarised as follows:
  - The market square in this layout had a traffic route bisecting it resulting in traffic being directed through the square, which is not ideal from either a DMURS or public safety perspective.
  - The design constraint in the form of an exclusion zone identified around the existing onsite Irish Water odour control unit persisted within this option and resulted in the road alignment needing to be curved around the unit.
  - This option included 2no. L shaped blocks in the north eastern portion of the site with the approaching access roads resulting cul de sacs which is not desirable from a DMURS perspective. In addition none of these streets had connectivity for potential fire / emergency access.
  - This option would have funnelled significant traffic through the home zone streets. The concept of achieving home zone streets was also not feasible due to the length of the terraced houses in this option.
  - This option resulted in 3no. small apartment blocks being positioned along Corke Abbey Valley Park to the north of the site. However, on review of the zoning boundary in the context of the detailed building review this design was not considered to be feasible.
  - This option resulted in properties being positioned across the county boundary. Guidance from utility providers indicated that properties should not straddle the county boundary due to billing and address constraints. In addition this scenario could potentially result in legal / conveyancing issues.
  - Based on the preliminary results of the archaeological assessment for the proposed development, the cultural heritage importance of commemorating / recognising the county boundary within the design was identified. The landscape plan for this option tried to incorporate this request as a first iteration. In terms of open space there was an uneven distribution, and open spaces were positioned in more peripheral spaces.



**Figure 2-7 - Alternative Layout – Option 2**

2.6.2.3. Option 3 (2021)

- Block D was consolidated to make it more efficient and to avoid infringing the complex geometry of the zoning line at the northern end of the quarter.
- The apartment buildings to the south east of the site are pulled further away from the site boundary to facilitate a route for the fire brigade along building elevations. The creation of public open space along the eastern boundary of Block B also contributed to the Wicklow County Council requirement for a two hectare quantum of open space for all parts of the overall Harbour Point Masterplan lands within Wicklow.
- Two community streets (home zones) were introduced into the scheme.
- In order to minimise traffic through the proposed Market Square the principle route into the Coastal Quarter became the road between Block C and the existing underground Irish Water foul storage tank. As this was the first road that would be encountered by traffic approaching the scheme the design emphasised this as the principle entry point.
- A large quantum of public open space was also required in DLRCC lands within the quarter, this open space could not use the Zone F lands. A large green space was introduced between block A and the adjacent housing.
- Block A and B became rectangular blocks with apartments on three sides and triplex apartments on their western elevation. Large podiums allowed for significant quantum's of car parking to be located off the streets.
- The layout for Option 3 is presented in Figure 2-8.
- The key reasons Option 3 was not selected as the final design layout for the proposed development are summarised as follows:
  - The triplex apartments in Block A and B were overshadowed by the surrounding apartments, which was informed by the preliminary sunlight and daylight analysis. The first terrace of houses to the west was still considered to be too elongated and lacking in character. Also houses were still located to the north

and west of Block C which were being overshadowed, again based on the results of the sunlight and daylight analysis.

- In order to enclose and define the market square, there was a requirement to create a hard edge meaning Block C needed to be reshaped and positioned. At this stage of the iterative design process, discussions with Irish Water in relation to relocating a wayleave impacting Block C had progressed. This allowed more flexibility around the footprint of the Block C and the creation of the market square. This allowed Block C to be redesigned into a more regular urban block.
- With this option, traffic was still directed through the market square which is obviously not ideal from a DMURS and public safety perspective.
- The design constraint in the form of an exclusion zone identified around the existing odour control unit persisted within this option and resulted in the road alignment needing to be curved around the unit.
- This option preserves the most amount of trees along the northern boundary of the site and allowed more preservation of the county boundary; hence there were more environmental benefits associated with this option than the two previous options.
- While this option would not result in significant adverse environmental impacts, it was not considered to be an optimal design from an environmental perspective, specifically with respect to traffic and landscape and visual considerations.



**Figure 2-8 – Alternative Layout – Option 3**

#### 2.6.2.4. 2021 Planning Application

The following design amendments were incorporated into the final layout for the 2021 planning application, following consultation with ABP at pre-application stage:

- The façade of Block C which addresses the Market Square was modified so that the individual entrances to housing units were replaced with retail outlets facing onto this key public space. The provision of more active frontages would create a stronger urban edge at this key nodal point within the Coastal Quarter and the wider Masterplan;



- Block D was reduced in height by one floor and was moved slightly further away from the boundary. In addition all balconies on the west faced were relocated so that no balconies look directly towards the western boundary. A larger set back was also provided on the top floor to further reduce the scale of the building so that the three floors of the new apartment building were now closer in scale to the nearby two storey houses with their pitched roofs;
- The 'Orchard' concept was created to make creative use of the space sterilised by the existing underground Irish Water foul storage tank at this location. This item of critical infrastructure restricted the uses that can be placed over the tank and one of the few uses allowed was car parking and landscaping. The landscape space was enclosed by a stone wall that picked up on the stone wall theme used on approach roads to the Coastal Quarter;
- The site planning placed the taller and denser buildings along the coastal edge of the site and away from the existing school to the west and the housing to the north west. The taller buildings along the sea frontage provide shelter from the cooler sea winds and at a location where larger scale buildings could be placed against the scale of the harbour and the expanse of the sea;
- The primary external material for buildings was render which was consistent with the existing urban character of Bray. A high preforming render system would be used with a maintenance regime carried out by the management company on a regular basis. At ground level on all houses and apartment buildings a harder wearing stone type system was taken to a datum level with render used above this datum. Deep cills and copings at roof level would provide good protection to walls at these locations by throwing water falling on horizontal surfaces away from the rendered facades; and,
- Full public access through the site is provided to enhance connectivity between Corke Abbey Valley Park to the north, the rail underpass to the east, the River Dargle footpath to the south and the existing access roads to the west. The boundary to the east along the full length of the railtracks would require a solid 2.4m high wall as a requirement of CIE. The visual impact of this wall from the public routes along the eastern side of the site would be reduced by lifting the ground level towards the apartment buildings along this edge of the site and by continuous planting along this boundary wall.

### 2.6.2.5. Current (2022) Planning Application

Under the previous application, a portion of this development (consisting of 76 no. Houses, 52 no. Duplex units and 106 no. Apartments with café, retail unit and childcare facility contained within apartment buildings C & D) received planning permission, (ABP-311181) in December 2021.

Blocks A and B were not granted planning permission.

**The current application / proposed development includes development as permitted under ABP-311181-21 together with minor revisions chiefly addressing conditions and new proposals for Blocks A and B which were previously refused.** The design iterations which formed the basis of the redesigned proposal for the eastern area of the site (previously containing Blocks A and B) are summarised as follows.

#### 2.6.2.5.1. Design iterations

A number of different approaches were tested for the area to the East of the site, which previously contained Blocks A and B. Three clear approaches emerged.

The first approach consisted of a series of narrow finger blocks, perpendicular to the coastline. The second approach was a 'Zig-Zag' option of two blocks (A and B) in a zig-zag arrangement, while the third approach was a variation on the courtyard typology.

#### Finger Block Option

- This option consisted of four narrow finger blocks, perpendicular to the coastline. Parking and service areas were contained within two blocks at ground level with podium above. The finger blocks were raised above podium level and equally spaced from North to South along the Eastern boundary of the site.
- This approach resulted in a more open grain in this part of the site, providing better visual connections across the site from West to East and vice versa.
- The openness of the blocks also allowed the landscaping to connect across the podium from the coastal gardens to the green spine to the West.
- The finger blocks were very efficient in layout, as well as providing a good number of dual aspect apartments, which maximised sea views.

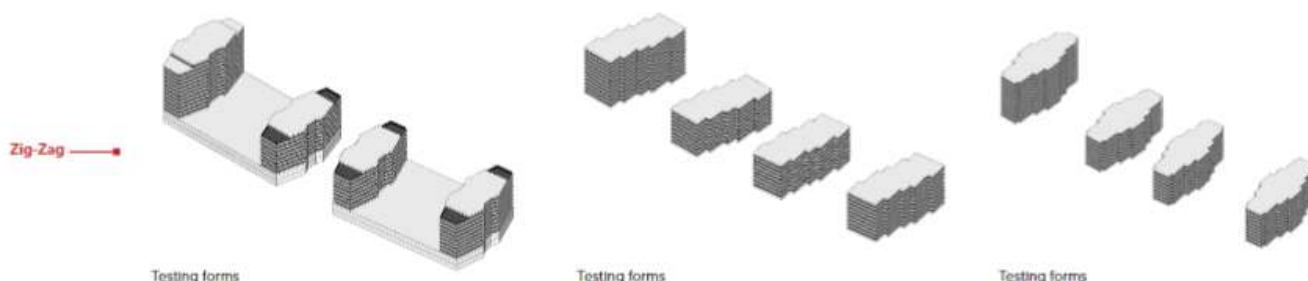
- Each of the finger blocks had a number of set back levels as the buildings increased in height. They were taller to the East, as they faced the sea, reducing in height to the West, in order to have a better relationship to the smaller houses and duplex units.
- The buildings also increased in height from ground + eight storeys at the northern end of the site, to a ground + 16 storey tower at the southern end, which formed a focal point for the site.
- The key reasons this option was not selected as the final design for the proposed development are summarised as follows:
  - Although the reduced footprint of the finger blocks provided a more open feel to this part of the site, the reduced floor area resulted in the need for significantly taller buildings.
  - It was also felt that this approach had a negative impact on the character and sense of enclosure intended for the public spaces to the West of these buildings.
  - This approach relied on a consistent approach to the design and detailing across all four blocks and this did not adequately address some of the stated concerns about the previous application.
  - It was felt that the second approach under consideration would have a better relationship with the parts of the development that had previously been granted planning permission and would tie in better with the overall masterplan.



**Figure 2-9 – 2022 Design Iteration – Finger Block Option**

### Zig-Zag Option

- This consisted of two blocks (A and B) in a zig-zag arrangement.
- While this option maximised views of the sea from the apartments, it had the effect of severing the permitted elements of the scheme from the sea by effectively creating a wall between these elements and the sea.
- The 'zig-zag' pattern was also difficult to reconcile with the orthogonal layout in the consented elements of the Coastal Quarter scheme and with the general established urban form of Bray analysed in the Masterplan

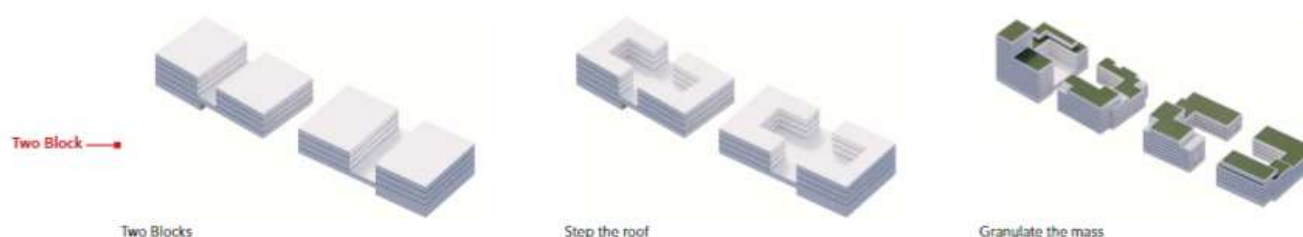


**Figure 2-10 – 2022 Design Iteration – Zig-Zag Option**

### Current Proposal - Two Block option

- It was felt that there was merit in lower courtyard buildings that offered an edge to the coastal gardens and some enclosure to the green spine to the west. This option sought to directly address the issues with the previous application.

- In this option the buildings have been expressed as 4 distinct blocks, paired to share a ground floor and podium level.
- Like in the finger blocks, the landscaping is continued across the podium level, to link the coastal gardens on the east with the green spine to the west, creating a better sense of openness and connectivity.
- The buildings are not linked above ground floor level, which improves the visual connections across the site.
- The distance between each of the buildings and also across the public space at the county boundary, has been increased and each of these openings aligns with the home zone streets to the West, which helps to create a better sense of connectivity and integrates the proposal within the overall masterplan.
- The two Southern most buildings have been set back a further distance from the train line and under pass, to provide a more generous dimension to the coastal gardens in this location and a better sense of place to the public space at the underpass, which is an important point of connection between the development and the continuing link to the seafront further South.
- The buildings have a number of set back levels on the upper floors, that moderate the blocks and relate them to the heights of neighbouring buildings. To the North of the site the buildings steps down to three storeys above ground floor, to address the height of the three story duplex buildings opposite. The buildings step in height from West to East, where they are taller on the side facing the coastal gardens and the sea.
- The stepped roofline is also continued from North to South, where set backs and changes in levels are used to create a variation in the roofline which is visible in the more historic buildings and streetscapes along the seafront in Bray.
- In order to avoid monotony or a sense of monolithic form, the four buildings are given distinct architectural character. Different in their form and massing, each building is also distinct in terms of colour, fenestration and detail, with high quality balconies proposed throughout.
- The buildings are to be constructed in brick, with details such as cills and copings designed to be robust, taking care over how these more exposed sea facing buildings, will weather and stand the test of time.



**Figure 2-11 – 2022 Design Iteration – Two Block Option**



**Figure 2-12 – 2022 Design Iteration – Two Block Option**

- The key reasons this option was selected as the basis for the final design for the proposed development are summarised as follows:
  - In general, the appropriate scale and massing, as well as the more granular form of the proposed buildings, is sympathetic and fits within the character of the coastal fringe zone and the overall masterplan.
  - This option successfully addresses the concerns with the two buildings that were refused planning permission in the previous application. Namely;
    1. It **responds more appropriately to the built environment** and makes a positive contribution to the neighbourhood and streetscape, most notably in relation to the public spaces that surround the buildings and in the connectivity across the site.
    2. It **addresses the monolithic profile of the previously refused buildings**, by creating four distinct blocks, unique in form and massing and provides variety in the treatment of elevations through colour, fenestration and detail.
    3. The **lack of variation in height between and within the blocks in the previous application is addressed** as outlined above, through the use of set back levels and variation across the roofline.

The moderation of height relative to the previously granted development, provides a better relationship with the scale of these neighbouring streets and public spaces.

4. The **proposed buildings have been spaced more generously** when viewed from the coast, creating a greater sense of openness and connection to the coastal gardens.
5. The specific concern around the quality of balconies proposed in the previous application, has been addressed through the **use of high quality, distinctive balconies**, which are oversized and positioned to take advantage of the coastal location.
6. The specific concern about materials, has been addressed through the **proposed use of brick, to provide variety in colour and texture, as well as robust detailing**, which will ensure that these larger, more exposed buildings, will weather and age well.

## 2.7. Consultation

As part of the EIAR assessment process, consultation was undertaken with statutory organisations at various stages of the pre-planning process for both the original application, and the current application. All environmental consultees (except where noted) were consulted by letter or email in June 2020 (during the Environmental Scoping phase of EIAR) regarding any environmental or planning interests that they may have in relation to the Coastal Quarter development. A full list of consultees consulted (2020-2022) including date and method of correspondence is presented in Appendix 2.1.

In addition, as part of the consultation process individual meetings were arranged with a number of key stakeholders to effectively discuss the key potential issues of the project in accordance with Section 5(2) of the Planning and Development (Housing and Residential Tenancies Act 2016), as detailed further below.

A summary of all relevant feedback in relation to the proposed development is presented below. A copy of all pre-application consultation correspondence received from statutory organisations as part of the EIAR process is presented in Appendix 2.2.

All relevant comments from the various consultees have been fully addressed as required within this EIAR and the accompanying Natura Impact Statement.

The responses to the comments received from ABP, DLRCC and WCC outlined below are in respect to the pre-application consultation ref ABP-308291-20 on part of the subject site for the permitted development for 234 no. residential units, a childcare facility, café and retail unit ref ABP-311181-21. These responses in respect of this new planning application remain relevant and have been fully addressed as part of this planning submission comprising of 586 no. residential units in a mix of apartments, duplexes and houses within the same site boundary. The responses to comments received from ABP and Irish Water in respect of pre-application consultation for the current SHD 2 application have also been fully addressed as part of this planning submission.

### 2.7.1. An Bord Pleanála (ABP)

A synopsis of the ABP notice of pre-application consultation opinion as part of the original application dated February 2021 is presented as follows (refer to Appendix 2.2 for a full record of ABPs comments);

*'An Bord Pleanála considers that the following issues need to be addressed in the documents submitted that could result in them constituting a reasonable basis for an application for strategic housing development.'*

- **Design and Layout:**

*'Further consideration / amendment or justification of the design and layout of Block 1C to provide a strong urban edge for the development, in particular the ground floor uses on the southern elevation which front onto the 'Market Square' and future potential Luas Line.'*

*'Further consideration / amendment or justification of the scale and bulk of Block 1D having regard to the residential amenities of the adjoining properties and the visual amenities of Woodbrook Glen and the open space zoning objective of lands located to the north of the site.'*

*'Further consideration / amendment or justification of the proposed surface level car parking at 'The Orchard' along the southern site boundary, having regard to the proximity to existing and proposed public transport infrastructure and the potential negative impact of surface level car parking on the public realm.'*

- **Water Services:**

*'Further consideration of the relocation of Irish Water infrastructure located underneath 'The Orchard' in the south west portion of the site having regard to its potential negative impact on the development potential of the site and the public realm. In the event that the infrastructure is not to be relocated then a justification should be submitted at application stage that seeks to address, inter alia, the potential negative impact on the development potential of the site and the public realm at this location.'*

*'Further consideration / amendment or justification of the design of the storm water management proposals, including the location of attenuation tanks, having regard to existing underground infrastructure within the site and to all available flood maps / information regarding the potential for pluvial, fluvial and coastal / tidal flood risk within the site. A site-specific Flood Risk Assessment should be submitted. Further consideration of the concerns raised in the report of Dún Laoghaire-Rathdown County Councils Drainage Planning Section dated 12th October 2020 and concerns raised under the Drainage section of Wicklow County Councils written opinion dated 28th October 2020.'*

*'Further consideration / amendments of the documents as they relate to foul water drainage proposals to service the development. The documents should provide details of necessary upgrade works required to facilitate the development to include, inter alia: plans and particulars, having regard to the wastewater network constraints raised by Irish Water in their report dated 22nd October 2020.'*

- **Transportation:** *'Further consideration of the documents as they related to access and emergency access to the site. Clarity is to be provided concerning who is to deliver the proposed road network; the status of any planning and other consents required to deliver the infrastructure; the timelines involved in the delivery of the required infrastructure in the context of the proposed strategic housing development. Further consideration of the concerns raised in the report of Dún Laoghaire-Rathdown County Councils Transportation Planning Section dated 13th October 2020 and concerns raised in the report of Wicklow County Councils Roads Section dated 15th October 2020.'*
- **The following specific information should be submitted with any application for permission;**
- *'A report that addresses and provides a clear design rationale for the proposed height, density, design and character of residential units and details of the materials and finishes of the proposed development. Particular regard should be had to the requirement to provide high quality, robust and sustainable finishes and details which seek to create a distinctive character for the development, having regard to the coastal and highly visible location of the site.'*
- *A report that addresses and provides a justification for the proposed housing mix*
- *A building life cycle report in accordance with section 6.3 of the Sustainable Urban Housing: Design Standards for New Apartments (2018).*
- *A site layout plan indicating what areas, if any, are to be taken in charge by the planning authority, and the phased delivery of such public open spaces.*
- *A phasing plan for the proposed development which includes the phasing arrangements for the delivery of the public open spaces and Part V provision.*
- *Childcare demand analysis, including but not restricted to the justification for size of the proposed crèche, having regard to the existing childcare facility in the vicinity of the site, the likely demand and use for childcare places and the accommodation of additional requirement resulting from the proposed development.*
- *A landscape and permeability plan of the proposed open spaces within the site clearly delineating public, semi-private and private spaces, areas to be gated and proposed boundary treatments, in particular the eastern boundary at the interface with the railway line.*
- *Submission of a Traffic and Transport Assessment, including a quality audit of the junctions and road network between the proposed entrance and Castle Street / Dublin Road. The audit should include details of the capacity of the surrounding road network and the impact of the proposed development, details of available sightlines, pedestrian and cycle facilities and recommendations for potential improvements to the public road, if required.*

- *Submission of an Archaeological Impact Assessment.*
- *Where the applicant considers that the proposed strategic housing development would materially contravene the relevant development plan or ABP-308291-20 Pre-Application Consultation Opinion Page 5 of 6 local area plan, other than in relation to the zoning of the land, a statement indicating the plan objective (s) concerned and why permission should, nonetheless, be granted for the proposed development, having regard to a consideration specified in section 37(2)(b) of the Planning and Development Act 2000. Notices published pursuant to Section 8(1)(a) of the Act of 2016 and Article 292 (1) of the Regulations of 2017, shall refer to any such statement in the prescribed format. The notice and statement should clearly indicate which Planning Authority statutory plan it is proposed to materially contravene.*
- **Notification of application to the following authorities;**
- *Department of Education and Skills;*
- *Irish Water;*
- *Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media;*
- *The Heritage Council;*
- *An Taisce;*
- *The Commission for Railway Regulation;*
- *Iarnrod Eireann;*
- *Transport Infrastructure Ireland;*
- *Wicklow County Childcare Committee; and,*
- *Dún Laoghaire-Rathdown Childcare Committee.*

A Section 5 Pre-Application Consultation Meeting was held on 15<sup>th</sup> December 2020 and the Record of Meeting ABP-308291-20 was reviewed as part of this EIAR and is included in full in Appendix 2.2. The following items were discussed at this meeting (refer to Appendix 2.2. for details);

- Settlement Strategy – core strategy, phasing, objective SLO3 of the Wicklow County Development Plan;
- Development Strategy – height, density, scale and massing, materiality, permeability;
- Open Space;
- Childcare Provision / Social Infrastructure;
- Water Services – flooding and drainage;
- Transportation and Car Parking;
- Environmental Considerations; and,
- Any Other Matters.

Additionally the Inspector’s Report on Recommended Opinion ABP-308291-20 dated 1<sup>st</sup> February 2021 which notes the objectives of all relevant local authorities, the National Planning Framework (2018) and Section 28 Ministerial Guidelines which the proposed development must adhere to was also reviewed, as presented in full in Appendix 2.2.

#### 2.7.1.1. **Current (2022) Application**

A synopsis of the ABP notice of pre-application consultation opinion as part of the SHD2 application dated June 2022 is presented as follows (refer to Appendix 2.2 for a full record of ABPs comments);

*'An Bord Pleanála considers that the following issues need to be addressed in the documents submitted that could result in them constituting a reasonable basis for an application for strategic housing development.'*

- **Development Strategy.**

*'Further clarity / consideration / justification of the documents as they relate to what precisely is being proposed as part of any future proposed development, what the redline boundary encompasses. Regard being had to portion of the site permitted under SHD – 311181 and how any future proposal links with the approved portion of that permission. The further consideration of these issues may require an amendment to the documents and/or design proposals submitted.'*

*'Further consideration with respect to design rationale for the proposed height, density, design and character of residential units and details of the materials and finishes of the proposed development. Particular regard should be had to the previous reason for refusal on foot of SHD 311181-21 and justification of the proposal in terms of urban design such as height, scale, massing in the context of the site's location and architectural design treatment and interface with Bray seafront and the requirement to provide high quality, robust and sustainable finishes and details which seek to create a distinctive character for the development, having regard to visual amenity given the coastal and highly visible location of the site and its interface with Bray seafront.'*

- **Intensity of Development:**

*Further consideration and / or justification of the documents as they relate to the height, scale, massing, plot ratio, tenure mix and tenure type and overall intensity of development given the provisions of the DLRDCDP 2022 – 2028 and the Bray MD LAP 2018.*

- **The following specific information should be submitted with any application for permission;**

- *'A detailed statement of consistency and planning rationale, clearly outlining how in the prospective applicant's opinion, the proposal is consistent with the zoning objectives of the DLRDCDP 2022 – 2028 and the Bray MD LAP 2018.*
- *A detailed statement, which should provide adequate identification of all such elements and justification as applicable, where the proposed development materially contravenes the DLRD County Development Plan 2022 - 2028 and Bray MD LAP 2018 other than in relation to the zoning of the land, indicating why permission should, nonetheless, be granted, having regard to a consideration specified in section 37(2)(b) of the Act of 2000.*
- *A visual impact assessment of the proposed development that addresses, inter alia, the height, scale and massing of the proposal in the context of the nature of the receiving environment. Long range views / photomontages of the proposed development from the surrounding area, in particular from the east.*
- *An assessment on how the proposed scheme ties in with the expansion of the overall Bray seafront area in particular in light of recent split decision on foot of SHD 311181-21. It is important that the proposed scheme should be highly visually and functionally connected to the portion of the scheme permitted under the recent SHD 311181-21. There needs to be strong permeability within the scheme and into adjoining lands.*
- *A Housing Quality Assessment that provides details in respect of the proposed apartments set out as a schedule of accommodation, with the calculations and tables required to demonstrate compliance with the various requirements of the 2020 Guidelines on Design Standards for New Apartments. It is important that the proposal meets and preferably exceeds the minimum standards in terms of dual aspect and proportion of apartments which exceed the floor area by 10%. In the interests of clarity clear delineation / colour coding of floor plans indicating which of the apartments are considered by the applicant as dual / single aspect, single aspect north facing and which apartments exceeds the floor area by 10%.*
- *A Traffic and Transportation Impact Assessment.*
- *Details of a Green Infrastructure Plan, Landscaping Plan, Arboriculture Drawings, and Engineering Plans that take account of one another.*
- *A report that addresses issues of residential amenity, specifically with regards to potential overlooking, overshadowing and overbearing. The report shall include full and complete drawings including levels and cross-sections showing the relationship between the proposed development and any adjacent existing or permitted development.*
- *A Daylight and Shadow Impact Assessment of the proposed development, specifically with regard to impact upon adequate daylight and sunlight for individual units, public open space, courtyards, communal areas, private amenity spaces and balconies. Impact to any neighbouring properties.*



- *A full response to matters raised within the PA's CE Opinion's (both Wicklow County Council and Dun Laoghaire Rathdown County Council) and addendum reports submitted to ABP.*
- *Detailed landscape drawings that illustrate hard and soft landscaping, useable communal open space, meaningful public open space, quality audit and way finding. The public open space shall be usable space, accessible and overlooked to provide a degree of natural supervision. Details of play equipment, street furniture including public lighting and boundary treatments should be submitted.*
- *A report on surface water drainage, surface water management strategy and flood risk which deals specifically with quality of surface water discharge.*
- *An AA screening report which considers potential impacts on the Qualifying Interests of any Natura 2000 site.*
- *An up to date Ecological Impact Assessment, inclusive of a Bird and Bat Survey.*
- *Where an EIAR is not being submitted the applicant should submit all necessary information referred to in article 299B(1)(b)(ii)(II) and article 299B(1)(c) of the Planning and Development Regulations 2001-2018 for the purposes of EIAR screening.*
- *A Microclimate Impact Assessment.*
- *A site layout plan indicating what areas, if any, are to be taken in charge by the planning authority'*
- *Site Specific Construction and Demolition Waste Management Plan.*
- *A life cycle report shall be submitted in accordance with section 6.13 of the Sustainable Urban housing: Design Standards for New Apartments (2020). The report should have regard to the long-term management and maintenance of the proposed development. The applicant should consider the proposed materials and finishes to the scheme including specific detailing of finishes, the treatment of balconies in the apartment buildings, landscaped areas, child friendly spaces, pathways, and all boundary treatments. Particular regard should be had to the requirement to provide high quality and sustainable finishes and details which seek to create a distinctive character for the development.'*
- *'Details of public lighting.'*
- Notification of application to the following authorities;
  - Irish Water (IW)
  - The Commission for Railway Regulation
  - Iarnród Eireann
  - Transport Infrastructure Ireland (TII)
  - National Transport Authority (NTA)
  - Dun Laoghaire Rathdown County Council Childcare Committee.
  - Wicklow County Childcare Committee.
  - The Minister for Culture, Heritage and the Gaeltacht,
  - The Heritage Council
  - An Taisce — the National Trust for Ireland
  - Fáilte Ireland

A Section 5 Pre-Application Consultation Meeting was held on 6<sup>th</sup> May 2022 and the Record of Meeting ABP-312257-21 was reviewed as part of this EIAR and is included in full in Appendix 2.2. The following items were discussed at this meeting (refer to Appendix 2.2. for details);

- Compliance with statutory Development Plan policies and Bray Municipal District LAP 2018. (Height, massing and SLO3)
- Previous Split Decision under 311181 (omits two apartment Blocks A and B) and justification that the reason for refusal has been overcome.
- Residential Amenity (proposed and existing)
  - Sunlight and Daylight and Overshadowing
  - Overlooking to the northwest
  - Open Space and public realm
- Transportation, permeability, connectivity and pedestrian flow.

- Any Other Matters

Additionally the Inspector's Report on Recommended Opinion ABP-308291-20 dated 9th May 2022 which notes the objectives of all relevant local authorities, the National Planning Framework (2018) and Section 28 Ministerial Guidelines which the proposed development must adhere to was also reviewed, as presented in full in Appendix 2.2.

## 2.7.2. Dún Laoghaire-Rathdown County Council (DLRCC)

A synopsis of the relevant conclusions set out in the written opinion received from DLRCC (DLRCC Ref. PAC/SHD/161/20) is presented as follows (refer to Appendix 2.2 for a full record of DLRCCs comments);

- The applicant is required to undertake the following in advance of planning submission to the Bord:
  - Consult with Drainage Planning and agree the attenuation storage provision and allowable site runoff.
  - Submit the complete Site Investigation Report and results including Infiltration test and plan showing trial pits/soakaway test locations.
  - Demonstrate that the proposed green roof extents are in accordance with the Council's Green Roof Policy i.e. that a minimum coverage requirement of 60% is achieved and provide details of the maintenance access.
  - Provide detailed plans of the proposed attenuation storage system and long sections of the surface water drainage system.
  - Agree run-off coefficients (if proposed) and methodology of calculation of interception and treatment volume storage requirements.
  - Provide details of the options being proposed for interception and treatment.
  - Provide a penstock in the flow control device chamber and ensure the flow control device provided does not have a bypass door.
  - The Site Specific Flood Risk Assessment should refer to the OPW Old Connaught & Wilford Fluvial Flood Extents map. Details of the proposed northern boundary treatment should extend to include the predicted flood extents.
  - The applicant is requested to comment on the proposed surface water drainage system in the event of blockage or partial blockage, commenting on any surcharging or flood risk that may be identified.
  - Parking provision for all proposed residential dwelling units shall be in accordance of the current DLRCC County Development Plan.
  - Transportation planning consider that a parking ratio of 1 space per apartment/duplex unit is acceptable.
  - Parking provision for commercial areas/café has not been outlined.
  - EV charging points shall be provided at a rate of 1no. fully functional charging point per ten residential units.
  - A portion of proposed disabled car parking shall be provided at surface level at a rate of 4% of total provision.
  - Drive ways for the proposed dwellings shall be no more than 3.5m in width.
  - 1159no. cycle parking spaces shall be provided as part of the development.
  - Cycle parking quantity for the proposed dwelling houses shall be in accordance with the DLRCC standards for cycle parking.
  - A portion of visitor cycle parking should be located above ground to encourage their use.
  - Stacked cycle parking shall be avoided, the preferred type is the Sheffield Stand.

- Junction counts were undertaken at a number of junctions in the vicinity of the site in 2019. 5 of these counts will be utilised for the traffic assessment of this development. Further proposed future counts are referenced in order to allow assessment of the Covid19 impacts on traffic between the 2019 and 2020 counts.
- Any future submission should clearly demonstrate any impact of extra traffic on the Wilford interchange and the Dublin Road.
- It is understood that the existing vehicular access to Castle Street from Ravenswell Road is to be re-allocated to pedestrian/cyclist use only.
- Pedestrian/cycle links are welcome however, the proposed 'future connections' do not provide adequate connectivity in their current form.
- It is also a Specific Local Objective to upgrade and enhance the linear park at Woodbrook Glen. This is listed within section 9 of the current DLRCC Development Plan.
- All internal pedestrian and cycle links should be minimum of 3m in width.
- There are concerns that the presence of straight sections may encourage increased vehicle speeds. Further details needed to demonstrate measures to reduce vehicle speed.
- A detailed Quality Audit should be submitted which shall include a Road Safety Audit, Access Audit, Cycle Audit, and a walking Audit.
- Access arrangements and vehicle movements required for refuse collection, emergency vehicles and deliveries within the proposed development should be submitted.
- A Travel Plan shall be submitted and should detail measures which will reduce reliance on the private car as a means of transport to and from the proposed development.
- It is noted that no areas are shown to be proposed Taking in Charge within the DLRC controlled portion of the site.
- A detailed construction management plan should be submitted, which demonstrates measures to mitigate against negative impacts on the surrounding transport network during construction.

### 2.7.3. Wicklow County Council (WCC) Transportation, Water & Emergency Services (TWES) Department

In letter correspondence dated 15<sup>th</sup> October 2020, WCC TWES department noted the following relevant observations (refer to Appendix 2.2 for a full record of DLRCCs comments);

- The termination details of road MC50 at the railway underpass need to be submitted and agreed.
- The existing pedestrian link to the rail underpass via Ravenswell road should be retained and upgraded to ensure that there are high quality connections in the area.
- The termination of the cycle paths at all of the vehicular entrance/access points to the proposed development should be designed in accordance with the National Cycle Manual.
- No information provided on public transport facilities, consider the provision of bus stops along the main development access road.
- Road marking and signage should be submitted for all modes of transport.
- Road construction details should be submitted as part of any application.
- Sightlines/visibility envelopes information drawings should be included in any application.

- It is noted that road alignment is designed in accordance with DMURS; however, some of the link streets appear to be excessively straight which may lead to vehicles traveling at higher undesirable speeds. Details should be submitted on how to keep speeds down.
- Junction MC10 and MCX0 is approximately 50m closer to the river when compared to the proposed junction improvements proposed for the delivery of the River Dargle Alternative Transport Bridge Project. Further discussion required between Applicant and the design team for the bridge to ensure that both projects will not be adversely impacted.
- It is likely that improvement to existing road infrastructure outside the red line boundary will be required (the R761 Dublin Road). Analysis of existing junctions is needed, and any improvement identified and agreed with local authorities before final submission is made to An Bord Pleanala.
- A review of the safe operation of the internal road network is required.
- Need to demonstrate that access to the basement car park for Block 1B can be negotiated safely.
- The applicant should be aware of the requirements on the Bray Transports Study and the measures required to fully develop the golf club lands. The applicant should consider and comment on each of the following measures:
  - Golf club lands development roads;
  - Pedestrian and cycle links from the golf club to Bray Town Centre;
  - Dublin Road bus priority;
  - Public transport, pedestrian and cycle bridge from the golf club lands to Bray DART station for future use by LUAS;
  - Development of interchange at Bray DART Station; and
  - Commitment to the phased introduction of bus and enhanced rail services in line with increased demand.
- A full Transport Assessment (TA) will need to be provided for this development and submitted as part of any final application.
- A scoping study should be carried out and the extent of the assessment should be agreed with the local authorities.
- When modelling for the TA, should look at including the traffic generated in Phase 2 analysis.
- The applicant should be aware that it is the Council's intention to close the Ravenswell Road to vehicular traffic and that reliance on this as a vehicular access point for the residential areas in the medium to long term is questionable. An assessment should be undertaken.
- A sensitivity analysis should be undertaken to demonstrate that the road network still works in the event that long term working from home increase does not fully materialise as outlines in section 8.3.
- A stage 1 and or 2 Road Safety Audit should be carried out and included in any application. Any issues that are found and accepted by the design should be incorporated into the design.
- Further Public Lighting details shall be provided if this development is granted permission:
  - Details of the lights proposed to be taken in charge by each local authority shall be clearly identified and are supplied from separate independent supplies.
  - Circuit layout, column type and the like shall be submitted and agreed with each local authority.
  - Please confirm or otherwise that the lights will be taken in charge by the local authorities.

- No detailed drainage information was provided as part of the stage 2 application, such details should be provided in any application to An Bord Pleanála.
- WCC is about to commence the Part 8 process in November 2020 for the Bray Public Alternative Transport Bridge and associated link roads, the application should have regard to this project and were possible incorporate into their application.
- Need to review the extents of the Taking in Charge map. It would appear that the footpaths and any cycle provision have been excluded.
- If the applicant proposes to change the alignment of the LUAS it should be done in such a manner as not to affect the viability and use of the proposed public transport bridge.
- It is recommended that the comments and observations are considered by the applicant prior to submission of any application to An Bord Pleanála.

#### 2.7.4. Geological Survey Ireland (GSI)

In letter correspondence dated 17<sup>th</sup> August 2020, the GSI noted that the Site is located within vicinity of a Geological Heritage Site; Killiney Bay and noted various other geological features which should be considered during the EIA process as follows:-

- **Geoheritage** *‘Our records show that there is a CGS in the vicinity of the proposed development. Killiney Bay, Co Dublin. (Central ITM: 326272, 222516). Under IGH theme ‘IGH 7 Quaternary’. Link to site report at DLR007. A 5 kilometres long coastal section exposes a succession of several units of glacial till. A particularly impressive exposure into deep till with many sedimentological characteristics exposed. With the current plan, there are no envisaged impacts on the integrity of current CGSs by the proposed development...’;*
- **Geohazards** *‘We recommend that geohazards and particularly flooding be taken into consideration, especially when developing areas where these risks are prevalent, and we encourage the use of our data when doing so;*
- **Natural Resources (Minerals/Aggregates)** *‘Geological Survey Ireland highlights the consideration of mineral and aggregate resources and potential resources as a material asset which should be explicitly recognised within the environmental impact assessment process.’;*
- **Marine and Coastal Unit** *‘The Marine and Coastal Unit also manage coastal monitoring programmes providing data on coastal erosion and sea level rise including the Climate, Heritage and Environments of Reefs, Islands and Headlands (CHERISH) and the Coastal Vulnerability Index (CVI) mapping projects. We would therefore recommend use of our Marine and Coastal Unit datasets available on our website and Map Viewer.’; and,*
- **Other Comments** *‘Should development go ahead, all other factors considered, Geological Survey Ireland would much appreciate a copy of reports detailing any site investigations carried out. Should any significant bedrock cuttings be created, we would ask that they will be designed to remain visible as rock exposure rather than covered with soil and vegetated, in accordance with safety guidelines and engineering constraints. In areas where natural exposures are few, or deeply weathered, this measure would permit on-going improvement of geological knowledge of the subsurface and could be included as additional sites of the geoheritage dataset, if appropriate. Alternatively, we ask that a digital photographic record of significant new excavations could be provided. Potential visits from Geological Survey Ireland to personally document exposures could also be arranged.’*

The above comments from GSI have been addressed where relevant to the Site within Chapter 9 – Land, Soils and Geology.

#### 2.7.5. Transport Infrastructure Ireland

In letter correspondence received on 12<sup>th</sup> August 2020, Transport Infrastructure Ireland (TII) made the following comments / recommendations: -

- *'In summary, there is a requirement at local policy level as well as regional and national policy to ensure that the strategic function of the M/N11 and M50 is safeguarded. Demonstration of the agreed requirements and adherence to the provisions included in the Bray and Environs Transport Study (2019) will be required in any subsequent development proposal;*
- *'Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to locations of existing and future national road schemes in the vicinity;*
- *TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads) in the proximity of the proposed development; M/N11 and M50, national roads and associated junctions;*
- *The developer should assess visual impacts from existing national roads;*
- *The developer should have regard to any Environmental Impact Statement and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should in particular have regard to any potential cumulative impacts;*
- *The developer, in preparing EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works);*
- *The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2006);*
- *The EIAR should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority (see Guidelines for the Treatment of Noise and Vibration in National Road Schemes (1st Rev., National Roads Authority, 2004));*
- *It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road network and junctions of lower category roads with national roads;*
- *'TII'S Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA;*
- *Transport analysis should also consider;*
  - *A mobility management plan should accompany the transport assessment,*
  - *Modal share targets should be outlined and how any PT modal share is accommodated,*
  - *Measures proposed to reduce car dependency should be outlined,*
  - *Detailed phasing proposals of development with associated transport infrastructure provision is required,*
  - *Consider and address cumulative impacts of other development and impacts on limited national road capacity,*
  - *The traffic and transport assessment should consider all road users,*
  - *Mitigation measures should be aligned with phasing of road infrastructure improvements and required public transport interventions; all clearly outlined,*
  - *Implementation of required transport measures outlined in the NTA Bray and Environs Transport Study (2019),*

*The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required,*

*In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network,*

*In relation to haul route identification, the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Separate structure approvals/permits and other licences may be required in connection with the proposed haul route and all structures on the haul route should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal load proposed.*

*In relation to the operation and maintenance of the light rail network, it is vital that any works adjacent or interfacing with Luas infrastructure shall have regard to TII's "Code of engineering practice for works on, near, or adjacent the Luas light rail system" available at <https://www.luas.ie/work-safety-permits.html>. The assessment should include schedule of compliance with the design and mitigation measures in the Code of Practice for both the construction and operation phases of the development.'*

The above comments from Transport Infrastructure Ireland have been addressed where relevant to the Site within Chapter 8 – Traffic.

### 2.7.6. Department of Culture, Heritage and the Gaeltacht

In letter correspondence dated 31<sup>st</sup> August 2020, the Department noted that the Site 'is located within the confines of a Recorded Monument which is identified as WI004-005 linear earthwork and DU026-124 linear earthwork.' The Department recommended the engagement of the services of a suitably qualified archaeologist to conduct an Archaeological Impact Assessment of the lands where the development is to take place. It was noted that the Archaeological Impact Assessment should include the results of an archaeological geophysical survey and the results of subsequent test excavations at the location. The Department also noted that the archaeological report should be included in any Environmental Impact Assessment Report (EIAR) that is submitted as part of the Strategic Housing Development (SHD) process. Summary comments are presented as follows:-

- *'The development site straddles the jurisdictional areas of two counties. The proposed Phase 1 development area, named the 'Coastal Quarter', is located within the confines of a Recorded Monument which is identified as WI004-005 linear earthwork and DU026-124 linear earthwork. The earthwork located along the current line of the county boundary between Dublin and Wicklow has been identified as possible remains of the Pale Ditch and described as follows in the Archaeological Survey of Ireland records: "A continuous curving section of flat-topped bank (L 150m; Wth at top 1.60m; Wth at base 10m; H.0.80m) which runs on a NNE-WSW axis. It follows the line of the county boundary and is in flat coastal terrain with view onto the Sugarloaf Mountain to the S. Some mature Sycamores grow along the side. Possibly part of the Pale Ditch. (pers. comm. Rob Goodbody; SMR file DU026-124- ---). Archaeological test trenching was carried out on a section of this ditch in 2002 (Excavation Licence 02E1717), the results suggested that it had been levelled in the area tested during the construction of the golf course (Gowan 2004, 533). Archaeological monitoring, carried out as part of the Shanganagh and Bray main drainage scheme in 2005 (Excavation Licence 02E1717 ext.), uncovered a low much-degraded bank (Wth 5.5m; H c. 0.3m) and a ditch (Wth 2.5m; D 0.6m) alongside it to the S (Moriarty 2005, 417).*
- *In addition to the extant remains of the possible Pale Ditch, the greenfield development site is located in a coastal location and north of the Dargle River in an area with potential for archaeological remains to survive. The discovery of a number of Romano-British burials in the area now occupied by Esplanade Terrace in the shoreline area of Bray town (RMP WI004-004 burial) demonstrates the potential for similar archaeological features to survive in the area. The development site is located south-east of Recorded Monuments DU026-068 church & graveyard (Cork Abbey) and DU026-069 holy well. Recorded Monuments WI004-001001 cross-slab, WI004-001006 castle – towerhouse, WI004-002 martello tower and DU026-070 martello tower are also located closeby.*
- *Previous archaeological investigations carried out in the area have produced varied results indicating that some sections of the surviving earthwork (WI004-005 linear earthwork and DU026-124 linear earthwork) may be 18th/19th century in date while other investigations of the earthwork have produced archaeological evidence to indicate modifications to and possible association with the earlier medieval Pale Ditch. Further archaeological investigative work, initially in the nonintrusive form of geophysical survey and topographical survey, will be required to develop an informed archaeological strategy and to ensure the comprehensive assessment of the potential impact of the proposed development on the archaeological heritage.*

- *The developer is advised to engage an archaeologist to carry out a detailed archaeological impact assessment and to prepare a comprehensive report to be submitted with any future planning application. The assessment will involve documentary and cartographic research, an analysis of all previous archaeological assessments carried out in the area, fieldwork, topographical survey and geophysical survey to identify any anomalies that may indicate the survival of archaeological features within the development area and examination of any available plans for development. Pending the results of the survey work, targeted archaeological testing within the proposed development site (licensed under the National Monuments Acts 1930-1994) may be considered necessary.*
- *An assessment of the potential visual impact of the proposed development on the extant earthwork (WI004-005 linear earthwork and DU026-124 linear earthwork) and any associated features should also be included. Visual material including section drawings, elevation drawings, annotated photographs and photomontage as appropriate to illustrate any conclusions made should be included in the report. Following completion of the above surveys and any targeted archaeological testing, the archaeologist shall prepare a written report, including an archaeological impact statement, to form an integral part of any future planning application. Where archaeological material/features are shown to be present, preservation in situ, preservation by record (archaeological excavation) or monitoring may be required. The establishment of a 'buffer area' surrounding and including any identified archaeological features, in which no development or groundworks would be considered, might be recommended pending the results of the archaeological assessment. Mitigatory measures to ensure the preservation in-situ and/or recording of archaeological material/features should be suggested in the archaeological assessment report and the Department of Culture, Heritage & the Gaeltacht will advise further with regard to any archaeological requirements following receipt of the assessment.*
- **Framework and Principles for the Protection of the Archaeological Heritage** *The developer should have regard to the archaeological policy of the Department of Culture, Heritage & the Gaeltacht as outlined in our policy document entitled "Framework and Principles for the Protection of the Archaeological Heritage", (1999).*
- *With regard to the preservation in-situ of archaeological remains, it is stated in our policy document that "there should always be a presumption in favour of avoiding developmental impacts on the archaeological heritage. Preservation in-situ must always be the preferred option to be considered rather than preservation by record in order to allow development to proceed, and preservation in situ must also be presumed to be the preferred option."*
- *It should also be noted that "if preservation by record is to be applied the developer must accept responsibility for the costs of archaeological excavation to the extent necessitated by the development. Such costs include those arising from the preparation of a report on the excavation."*
- **Wicklow County Development Plan 2016-2022** *The developer should be aware of the archaeological objectives included in the current County Wicklow Development Plan:*
  - *BH1 - No development in the vicinity of a feature included in the Record of Monuments & Places (RMP) will be permitted which seriously detracts from the setting of the feature or which is seriously injurious to its cultural or educational value.*
  - *BH2 - Any development that may, due to its size, location or nature, have implications for archaeological heritage shall be subject to an archaeological assessment. When dealing with proposals for development that would impact upon archaeological sites and/or features, there will be presumption in favour of the 'preservation in situ' of archaeological remains and settings, in accordance with Government policy. Where permission for such proposals is granted, the Planning Authority will require the developer to have the site works supervised by a competent archaeologist.*
- **Dún-Laoghaire-Rathdown Development Plan 2016-2022** *The developer should be aware of the archaeological objectives included in the current Dún Laoghaire-Rathdown County Development Plan:*
  - *AH1 – It is Council policy to protect archaeological sites, National Monuments (and their settings), which have been identified in the Record of Monuments and Places (RMP) and, where feasible, appropriate and applicable to promote access to and signposting of such sites and monuments.*



- AH2 – *It is Council policy to seek the preservation in-situ (or where this is not possible or appropriate, as a minimum, preservation by record) of all archaeological monuments included in the Record of Monuments and Places, and or previously unknown sites, features and objects of archaeological interest that become revealed through development activity. In respect of decision making on development proposals affecting sites listed in the RMP, the Council will have regard to the advice and/or recommendations of the Department of Arts, Heritage and the Gaeltacht.*

The above comments from the Department of Culture, Heritage and the Gaeltacht have been addressed where relevant to the Site within Chapter 11 – Cultural Heritage.

### 2.7.7. Department of Tourism, Culture, Arts, Gaeltacht, Sport, Media

In letter correspondence, dated 15<sup>th</sup> March 2021, the department noted the following observations, as summarised below (refer to Appendix 2.2 for a full record of the departments comments);

- *‘...ecological surveys of the development site should be carried out including the route of any access roads, pipelines or cables etc. to survey the habitats and species present.*
- *Where ex-situ impacts are possible (such as recreational disturbance impacts) survey work may be required outside of the development site.*
- *Surveys should be carried out by suitably qualified persons at an appropriate time of the year depending on the species being surveyed for. The EIAR should include the results of the surveys, and detail the survey methodology and timing of such surveys. It is expected by this Department that best practice survey methodology will be adhered to. The EIAR should cover the whole project, including construction, operation and, if applicable, restoration or decommissioning phases. Alternatives examined should also be included in the EIAR.*
- *The Department welcomes that the EIAR will consider both the construction and operational phases of this development and will also take into consideration the potential for cumulative impacts with other projects / developments which have been granted planning permission within the surrounding area and within the town of Bray.*
- *The River Dargle and its environs in this area may be used by otter (*Lutra lutra*), a species which is protected under the Wildlife Act, 1976, as amended and listed on Annexes II and IV of the Habitats Directive (92/43/EEC) and impacts on this species must be assessed.*
- *The EIAR should also address the issue of invasive alien plant and animal species, such as Japanese knotweed, and detail the methods required to ensure they are not accidentally introduced or spread during construction.*
- *Hedgerows and treelines form important wildlife corridors and provide areas for birds to nest in. In addition badger setts may be present. If suitable trees are present, bats may roost there and they also use hedgerows as flight routes. It is important that the connectivity of routes for the movement these species are not compromised should any hedgerows or treelines have to be removed. Adverse impacts from the removal of hedgerows and treelines could result in the natural range for bat species being reduced.*
- *Any losses of habitat associated with this proposed development such as woodland, scrub, hedgerows and other habitats should be mitigated for. In order to ensure there is no net loss of biodiversity, like for like mitigation and compensation measures are required. Hedgerows and trees should not be removed during the nesting season (i.e. March 1st to August 31st).*
- *This area is considered to be in the higher range of suitability for bat species. Bat species are strictly protected under the Wildlife Act, 1976, as amended as well as under Annex IV of the Habitats Directive. Bat roosts may be present in trees within the site. The Department considers that a bat survey should be carried out by a suitably qualified ecologist at appropriate times of the year. Any roosts identified, are protected under the provisions of Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015. Damage to such roosts can only occur if a derogation licence under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015 is obtained. Applications for derogation*

licences can be made in writing, including survey results and proposed mitigation measures, to the Wildlife Licensing Unit, National Parks and Wildlife Service of this Department. It has been found that artificial lighting is particularly harmful if used along river corridors, near woodland edges and near hedgerows, and therefore lighting along the River Dargle and any woodland areas should be avoided.

- Ground and surface water quality should be protected during the construction and operation of the proposed development and if applicable the applicant should ensure that adequate sewage treatment facilities are or will be in place prior to any development. The applicant should also ensure that adequate water supplies are present prior to development.
- IFI guidelines in relation to riparian buffer zones contained in the recently updated publication “Planning for watercourses in the urban environment” should be followed. Reference should be made to the National Biodiversity Action Plan 2017-2021 and any relevant Local Authority Biodiversity Plan, as well as the All Ireland Pollinator Plan 2015- 2020. Landscaping plans must accord with the “Pollinator Friendly Planting Code Professional planting recommendations” of the All-Ireland Pollinator Plan 2015-2020.’
- A move away from maintaining the greenfield runoff rate and use of attenuation tanks as ‘go to’ SUDS measures and towards the use of natural measures (bio retention, infiltration trenches, swales, ponds, basins and rain gardens) is encouraged. Such measures also benefit biodiversity. For larger scale developments such as this, the inclusion of details of the SUDS measures considered in principle and detailed reasons why natural measures were not considered is suggested.
- The proposed development site lies close to a number of Natura 2000 sites. In any Appropriate Assessment screening or full Appropriate Assessment carried out the following should be considered;
  - Description of the project;
  - Conservation Objectives;
  - Impact Assessment;
  - Mitigation measures; and,
  - Monitoring;’

The above comments from the Department of Tourism, Culture, Arts, Gaeltacht, Sport, Media have been addressed where relevant to the Site within Chapter 4 – Biodiversity.

## 2.7.8. Irish Water

In letter correspondence from Irish Water, dated 20<sup>th</sup> November 2019, Irish Water made the following observations in relation to the original application:-

- ‘Where the applicant proposes to connect to a public water/wastewater network operated by Irish Water, the applicant must sign a connection agreement with Irish Water prior to the commencement of the development and adhere to the standards and conditions set out in that agreement.
- In the Interest of Public Health and Environmental Sustainability, Irish Water Infrastructure capacity requirements and proposed connections to the Water and Waste Water Infrastructure will be subject to the constraints of the Irish Water Capital Investment Programme.
- All development shall be carried out compliance with Irish Water Standards codes and practices.
- Connection is provided if it is carried out in accordance with the conditions set in the Pre-connection Enquiry Report by Irish Water.
- It may be necessary to connect to the public water mains at Upper Dargle Road not at the location indicated on the proposed watermains layout, sheet 2.’

### 2.7.8.1. Current (2022) Application

As part of the pre-planning meeting with ABP on the 6<sup>th</sup> of May 2022, a submission was received from Irish water with the following observations: -

- *Irish Water therefore requests the applicant re-engage with Irish Water to obtain a Confirmation of Feasibility for all 564 no. residential units proposed. It is further noted that the previous Pre connection Enquiry response identified the following capacity issues in the area.*
- To connect this development to Irish Water’s water network significant upgrades are required, these include but are not limited to the replacement of approx. 450m of existing 6inch watermain to 200mm ID main. In addition to this approx. 190m of new 200mm ID main is required to connect the existing network to the development. Uisce Éireann Irish Water Given the nature of these works, Irish Water would request the applicant engage with Irish Water, prior to the submission of a full SHD planning application to agree these upgrade works.
- *The proposed wastewater connection is feasible for 524 no. residential units subject to upgrades, namely;*
  - The connection is feasible subject to the completion of the Old Connaught LNRP. Your site layout and connection point does not align with the proposed LNRP route and existing infrastructure; these issues will need to be address between the applicant and the Irish Water Asset Delivery Project Manager. The applicant was advised to contact Irish Water to discuss further.
  - While the above assessment identifies issues surrounding the proposed connections, this information should be used for guidance purposes only. As noted above, given the previous Pre-Connection Enquiry did consider the full extent of the subject SHD planning application, a new Pre-Connection Enquire will be required to confirm feasibility.
  - Should the applicant wish to proceed with the subject 564 no. unit development, a new Pre-Connection Enquiry, obtained from Irish Water is required, prior to the submission of the Final SHD application.

Atkins have re-engaged with Irish Water as part of this proposed planning application and have fully addressed the requirements as required by Irish Water during the pre-planning meeting with ABP.

Irish Water has issued a new Confirmation of Feasibility (COF) on the 2<sup>nd</sup> of September 2022 confirming that the connection for up to 590 no. units is feasible. A Statement of Design Acceptance (SoDA) was also received from Irish water on 31<sup>st</sup> of August confirming that based on the design submitted to them. Irish Water has no objection to the proposals. Both the COF and SoDA are included as part of this planning application in the Engineering Planning Report.

## 2.7.9. Department of Housing, Planning and Local Government

In email correspondence on 28<sup>th</sup> July 2020, it was noted that ‘*under Section 30 of the Planning and Development Act 2000, as amended, the Minister, and by extension this Department, is specifically precluded from exercising any power or control in relation to any particular case with which a planning authority or An Bord Pleanála is or may be concerned*’. Refer to Appendix 2.2.

## 2.7.10. Other Stakeholders

The following stakeholders confirmed receipt of confirmation with no additional responses received. It was therefore assumed that there were no relevant comments or observations in relation to the Coastal Quarter development:

- EPA – confirmation of receipt received via. email dated 23<sup>rd</sup> July 2020;
- Bus Eireann – confirmation of receipt received via. email dated 23<sup>rd</sup> July 2020;
- Office of the Minister for Agriculture, Food and the Marine – confirmation of receipt via. letter dated 28<sup>th</sup> July 2020; and,
- BirdWatch Ireland – confirmation of receipt received via. email dated 23<sup>rd</sup> July 2020.

## 2.8. Meetings

As part of the consultation process individual meetings were arranged with a number of key stakeholders to effectively discuss the key issues of the project in accordance with Section 5(2) of the Planning and Development (Housing and Residential Tenancies Act 2016). Pre-planning discussions were undertaken with Wicklow County Council on the 22<sup>nd</sup> July 2020 and with Dún Laoghaire County Council on the 13<sup>th</sup> August 2020.

Pre-application consultation was held with ABP Representatives, Dún Laoghaire-Rathdown County Council and Wicklow County Council for the original application on 15<sup>th</sup> December 2020, with ABP issuing their opinion in February 2021.

Pre-application consultation was held with ABP Representatives, Dún Laoghaire-Rathdown County Council and Wicklow County Council for the current application on 9<sup>th</sup> May 2022, with ABP issuing their opinion in May 2022. All relevant recommendations from both ABP and Local Authority pre-application consultation meetings have been addressed within this EIAR and the accompanying Natura Impact Statement.

As advised during the ABP meeting, contact was made with Irish Water between the Pre-Application Stage and Application stage to confirm the details of the proposed development and the proposed design.

## 2.9. Consideration of Cumulative Effects with other Projects

Potential cumulative impacts, defined as ‘*the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects*’ (EPA, 2022) have been considered for each environmental topic within this EIAR. A summary of all committed / proposed development in the immediate environs of the proposed development, which have been approved by Dún Laoghaire-Rathdown County Council, Wicklow County Council or ABP within the last 7 years, have been reviewed as part of the preparation of this EIAR. The majority of these developments have already been constructed or are of small scale in nature (i.e. extension works, or property retention works) or are considered to be a reasonable distance from the Site and so do not warrant further consideration as part of this assessment.

Relevant committed development is summarised below under three broad categories; residential development, development within adjacent business parks, and community and utility development. In addition relevant projects are also considered i.e. the Harbour Point Masterplan Development, Bray Sustainable Transport Bridge and any other projects which could potentially have a cumulative impact (as described in detail in specific chapters including, but not limited to Chapter 8 – Traffic and Chapter 12 – Material Assets). Each environmental topic, where relevant, includes a cumulative impact assessment of the proposed development with other committed developments in the immediate area. Therefore, each of the following developments, which are not part of the existing environment, has been reviewed in terms of potential cumulative environmental impacts that may arise with the proposed construction and operation of this development. The results of the cumulative impact assessment for each environmental topic are presented in Chapter 13 – Cumulative Impacts. In addition, specific plans and projects have been considered where relevant during the preliminary design stage and the preparation of this EIAR, within individual environmental topics, as detailed further within the specific EIAR Chapters.

### 2.9.1. Harbour Point Masterplan Development

The overall Harbour Point Masterplan is a mixed use development and is consistent with the policies and objectives of the Wicklow County Development Plan, Dún-Laoghaire Rathdown Development Plan, Bray Municipal District Local Area Plan, Best Practice Urban Design Manual (2009) and the principles of sustainable development. These plans require residential and mixed use development to form an extension of the existing town centre. While the overall scale and mix of development is subject to future planning applications, it is envisaged that it will include a mix of residential units, commercial and retail units, childcare facilities, a hotel and retirement accommodation, a transport bridge over the River Dargle, open spaces and parks and landscaping along with all associated site ancillary works. The development will provide for further improvements in public transport and connections with Dublin City and the surrounding areas as well as increased employment and welfare facilities for the population of Bray town. The Masterplan design has been informed by the existing site context including the historical evolution of Bray, coastal setting and Bray streetscape.

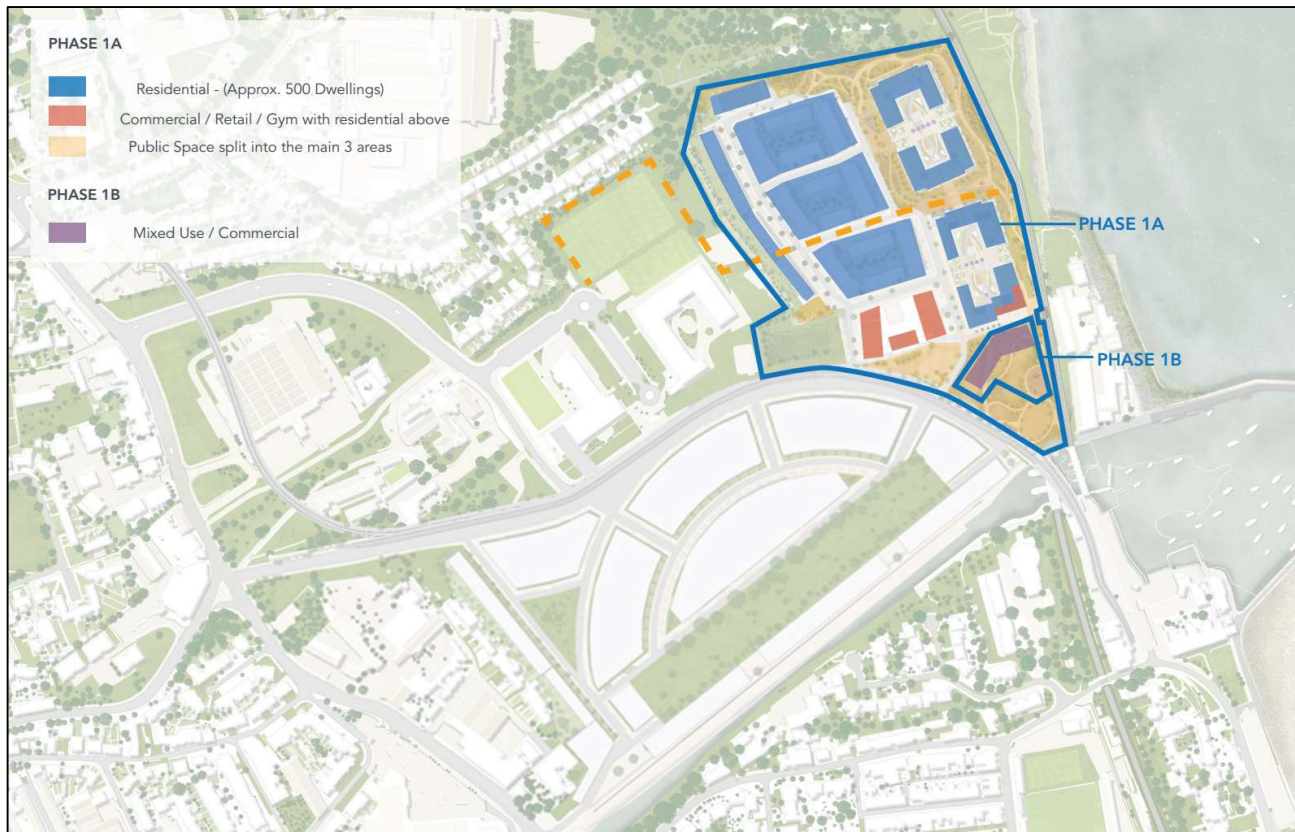
The overall proposed Masterplan Development comprises phased residential, retail and commercial development at a key development site within Bray town, via. the following 4no. core phases (presented in no particular order):

- Coastal Quarter Phase 1A – the subject of this particular planning application. A detailed description is provided in Section 2.1.;
- Coastal Quarter Phase 1B – this phase will consist of the development of a mixed use building (referred to as a Special Building);
- River Quarter Phase 2A – this development will comprise ca. 500no. residential units, commercial units (5,000 sqm), hotel / retirement buildings, a transport bridge over the River Dargle with associated transport

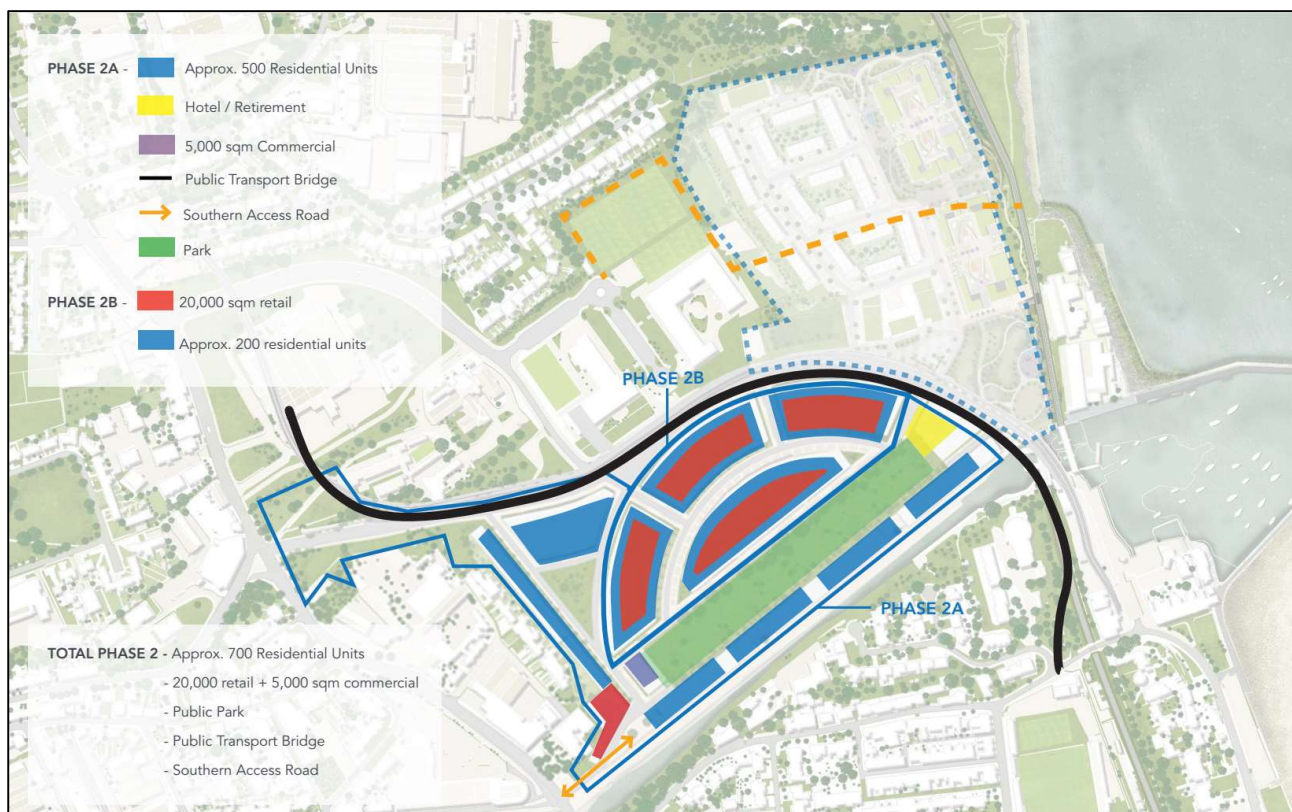
route, an access route in the south western corner of the site and a public park area as well as all associated site works; and,

- River Quarter Phase 2B – this development will consist of the development of retail units (20,000 sqm) as well as ca. 200no. residential units, landscaping and all associated site works.

Refer to Figure 2-13 and Figure 2-14 for preliminary masterplan design layouts.

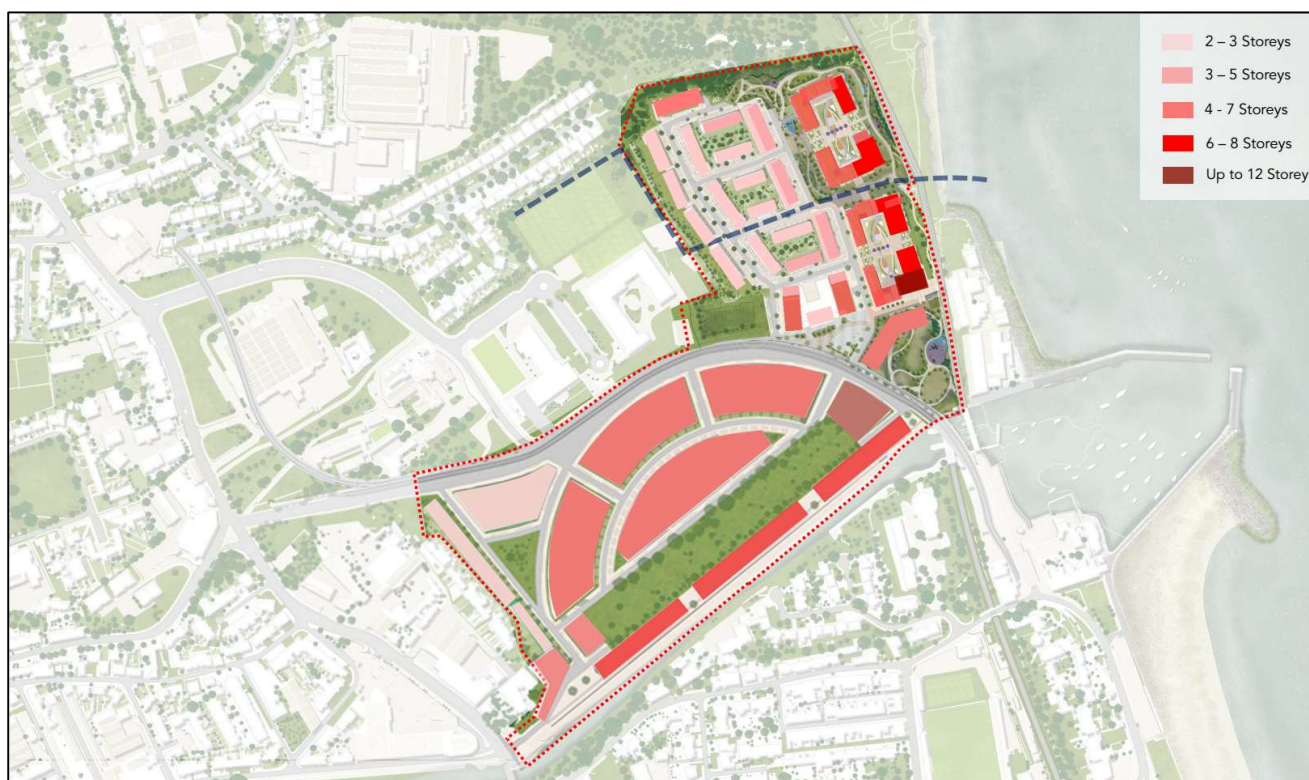


**Figure 2-13 – Harbour Point Masterplan Development Preliminary Design Layout - Coastal Quarter Phase 1A and Phase 1B**



**Figure 2-14 - Harbour Point Masterplan Development Preliminary Design Layout - River Quarter Phase 2A and Phase 2B**

Proposed building heights throughout the entire Masterplan lands will range from 2-3 storeys to 3-12 storeys as indicated in Figure 2-14.



**Figure 2-15 - Harbour Point Masterplan Development Preliminary Design Layout - Proposed Building Heights**

The Harbour Point Masterplan is presented in full within the ‘*Harbour Point, Bray – Masterplan Document*’ (Glenn Howells Architects, 2022) submitted as part of this planning application.

## 2.9.2. Bray Sustainable Transport Bridge

Wicklow County Council (WCC) is undertaking Part 8 approval procedures to carry out the design and construction of the Bray Sustainable Transport Bridge (Ref. PRR 21/869). Part 8 planning has been granted and is currently under judicial review. The proposed development comprises the following (refer to the AA Screening Report (Arup, 2021) submitted as part of the planning application);

*‘...two parcels of land, north and south of the River Dargle. The former golf club lands form part of the northern application site and comprise a semi-greenfield site. There is also a pedestrian and cycle track running south of this greenfield site, adjacent to the north river bank wall. The proposed northern section of the link road will cross both these areas. A network of below ground services runs approximately parallel to the river bank wall in the location of the existing pedestrian and cycle track. The River Dargle is approximately 57m wide at the location of the proposed bridge crossing. The river is tidal in this region and outlets into Bray Harbour to the east. Bray Pumping Station is located to the south of the proposed bridge. Immediately to the west of this is a constrained corridor along which the southern part of the road link is proposed. The main Dublin-Bray railway line forms the eastern boundary of the proposed southern portion of the link road. The existing rail bridge is located directly downstream (east) of the proposed bridge, with an existing road bridge running parallel immediately east of it. The existing road bridge links Bray Harbour to Bray town. The proposed bridge and road link will facilitate public transportation and pedestrian/cycle movement over the River Dargle and link with the existing road network. The proposed bridge will be a bowstring arch bridge which crosses the river with a single span of 63m’.*

## 2.9.3. Residential Developments

Proposed residential developments within the vicinity of the Site generally comprise the construction of various types of residential developments or amendments to previously granted permission; the scope for each relevant committed development is briefly summarised below. The location of each of these developments are shown in Figure 2-16 below.

- **Silverbow Limited, The former Heiton Buckley site on Castle Street; St. Anthony’s Dwyer Park and No. 20 Dwyer Park (ABP Planning Ref: 313442 – Awaiting decision: due 17/08/2022)** – permission to demolish existing commercial buildings and residential buildings as well as sections of the boundary walls, and the construction of a mixed use residential and commercial development comprising 2no. apartment blocks, accommodating 139no. apartments, creche and mixed use unit along with all associated site works.
- **Shankill Property Investment Limited, Seapoint Road, Ravenswell, Bray, Co. Wicklow (Planning Ref: 22188 – Awaiting decision: RFI issued 20/04/2022)** - demolition of 4 light industrial/commercial buildings including their extensions, change of use from light industrial/commercial to residential use, and the construction of a total of 54 no. apartment units across 2 no. blocks comprising: Block A consisting of 4 storeys with setback 5th storey (5 storeys overall), all over undercroft parking and providing 14 no 1 bed units and 17 no. 2 bed units, with a 220sqm communal terrace located above the 4th storey; and Block B consisting of 3 storeys with a setback 4th storey(4 storey overall), all over undercroft parking providing 9 no. 1 bed units and 14 no. 2 bed units. The development will also include: private open spaces in the form of balconies and terraces; 193 sqm public open space and associated play areas and landscape works; roof mounted solar photovoltaic panels; 36 no. undercroft car parking spaces and 1 no. disabled parking space at surface; 85 no. resident bicycle spaces and 28 no. visitor bicycle spaces; upgraded vehicular access from Seapoint Road and all ancillary utilities, plant and bin stores, boundary treatments and associated site development works.
- **Duo Build Ltd, The Old Printworks, St. Laurence’s Terrace and Adelaide Villas, Bray, Co. Wicklow (Planning Ref: 191189 – Granted April 2020)** – permission to demolish existing industrial buildings, structures and boundary walls along St. Laurence’s Terrace and Adelaide Villas and adjoining property, the construction of a three storey apartment building, comprising of 18 no. residential units (4no. one bedroom apartments, 13 no. 2 bedroom apartments and 1 no. 3 bed apartment), new boundary walls, bin store and 18 no. car parking spaces, 6 bicycle parking spaces, vehicular entrance at St. Laurence’s Terrace and associated site works.

- **Deirdre Gurney, The Printworks, Adelaide Villas, Bray, Co. Wicklow (Planning Ref: 181364 – Granted March 2019)** – 1 no. 2 bedroom fully serviced apartment on the third floor level including extension / alterations to the existing common staircase/ apartment building together with all associated site works and carparking space;
- **Deirdre Gurney, The Printworks, Adelaide Villas, Bray, Co. Wicklow (Planning Ref: 171429 – Granted March 2019)** – 3 no. 2 bedroom fully serviced apartments on the second floor levels including extension/alterations to the existing common staircases/apartment buildings together with all associated site works and carparking spaces.
- **Kildare & Wicklow Education & Training Board, Bray Institute of Further Education, Novara Avenue, Bray, Co. Wicklow (Planning Ref: 20255 – Granted June 2020)** – Detached single storey temporary demountable building containing toilet facilities, erection of a single storey temporary demountable building extension containing kitchen store and changing facilities, associated site works and ancillary related works.
- **Woodbrook Campus Limited, The Aske House, Dublin Road, Bray, Co Dublin (Site address also known as The Aske, Old Bray Road, Shankill, Co Dublin) (Planning Ref: D17A/0065 – Granted July 2020** - Permission for the development of a Specialist Hospital for 56 no. in-patients out-patient care and teaching unit, including works to Protected Structures.
- **Aeval Unlimited Company, SHD Planning, Townland of Corke Little, Woodbrook, Shankill, Co. Dublin (Planning Ref: ABP30584419 – Granted February 2020)** - Permission for a Strategic Housing Development comprising 685no. residential units and 1no. childcare facility in buildings ranging from 2 to 8-storeys. The breakdown of residential accommodation includes detached, semi-detached, terraced and end of terrace houses as well as 3 storey houses, apartments and duplexes.
- **Avonvard Ltd, Nursing Home, Vevay Rd & Boghall Rd, (Former Dell site), Bray, Co. Wicklow (Planning Ref: 181181 – Granted April 2019)** - A four storey nursing home building, accommodating 205 no. bedrooms, ancillary resident and staff facilities, and a plant area at roof level, which includes plant, storage and car and cycle spaces. The proposals include internal courtyards and terrace areas, and adjacent landscaped amenity space. A four-storey office building, including a ground floor café and plant area at roof level. Internal access roads, and parking comprising 107 no. surface car parking spaces, 38 no. basement car parking spaces, 5 no. motorcycle spaces and 141 no. cycle spaces.
- **Cosgrave Property Group, Fassaroe & Monastery, Bray, Co. Wicklow, (Planning Ref: 16999 – Granted June 2017)** - mixed use development comprising of 658no. residential units (comprised of 390 no. apartments and 268no. houses), a neighbourhood centre, comprising of a convenience food store, 6 no. retail / commercial units and a cafe, security kiosk, 3 no. 3 storey office blocks, a two storey creche, a district park, residential public open space, realignment of part of existing road and provision of new road.
- **ES Shan Limited, SHD, south of Abingdon, Shanganagh Road, Shankill, Dublin 18, (Planning Ref: ABP30841820 – Granted February 2021)** - Permission for a Build To Rent Strategic Housing Development comprising 193no. apartments within 4no. blocks ranging in height from 5 to 8 storeys. The apartment mix will comprise: 193no. units as follows: 12no. studios; 110no. 1 bed; 1no. 2 bed (3 persons); 70no. 2 bed (4 persons). All apartments will be provided with associated private balconies/terraces facing north/ south/ east/ west. The development will include a pavilion, open spaces, tree houses, meeting rooms and flexible workspace, BBQ facilities, resident's gym, and residential amenities areas.
- **Hines Cherrywood Dev Fund ICAV, SHD, the townlands of Cherrywood, Dublin 18, (Planning Ref: DZ17A/0862 – Granted May 2018)** - The proposed development relates to a mixed-use town centre development on plots TC1, TC2 and TC4 in accordance with the Cherrywood SDZ Planning Scheme 2014 (As Amended). The proposed development will comprise a total of 15 blocks including: 1,269no. residential units, Retail Gross, High Intensity Employment (HIE) uses, Non Retail uses, Community uses and all associated roads, streets and public spaces, services infrastructure and all associated site and development works. The 15 blocks are located above 2-3 levels of basement/ below podium car parking and service areas which create revised/ new site levels across the site.



- **Wicklow County Council, Station Road, Florence Road, Adelaide Road, Quinsborough Road, Bray, Co. Wicklow, (Planning Ref:181386 – Granted Match 2019)** - The permission relates to the regeneration of the existing forecourt at Bray DART station to create a transport interchange while providing a landmark civic space. The proposed development will include the extent of the Bray Transport Interchange which consists of the general forecourt area in front of Bray Station and incorporates sections of Quinsborough Road, Adelaide Road and Florence Road.
- **Nypro Limited, Corke Abbey, Bray, Co Dublin, (Planning Ref: D19A/0887 – Granted December 2020)** - Permission for the construction of a new infill building (770 sq.m. floor area) linking Building 1 and Building 2 and all associated works. The roof profile of the proposed infill building matches the existing roof profile of Building 1.

#### 2.9.4. Business Park Developments

Proposed relevant committed development within the Harbour Industrial Estate is briefly summarised as follows:

- **PEMCO Ltd, 8 & 9 Harbour Industrial Estate, Bray Harbour, Bray, Co. Wicklow (Planning Ref: 16367 – Granted May 2016)** – permission extension of appropriate period for the demolition of existing light industrial/warehousing building (existing floor area c.1096m sq & height c.6.85m) and replacement of same with a new light industrial warehousing building (proposed floor area c.1473m sq. (1042m.sq. at ground floor & 431m.sq at first floor/mezzanine level) & height c.9m) all on site of circa. 1258.sq/0.31Ac.

#### 2.9.5. Community and Utility Developments

Proposed relevant committed development in the vicinity of the proposed development is briefly summarised as follows:

- **Board of Directors of St. Gerard`s School, St. Gerard's School,Thornhill Road, Bray, Co Dublin (Planning Ref: D17A/1104 – Granted March 2018)** - Permission is sought for the development of a new two-storey 672 sqm wing to the existing Junior School, a new two-storey 1948 sqm wing to the existing Senior School and associated site works.
- **Barnaby Investments Ltd, Boghall Road & Southern Cross Road, Bray, Co. Wicklow (Planning Ref: 18822 – Granted September 2018)** - single storey petrol filling station comprising a forecourt convenience (465 sqm gross floor area) shop with off licence, 2 no. café / restaurant concession areas with seating area, public toilets and ancillary staff and store areas. The associated facilities within the site include 6 no. fuel pumps with canopy over, external seating area, external children's play area, car wash facility, air / water services and associated car parking and bicycle parking.
- **Irish Water, Old Connaught / Woodbrook Water Supply scheme at Ballyman Road, Ballyman, Co. Dublin (Planning Ref: D18A/0606 – Granted April 2019)** –The development will consist of: A 10 year permission to facilitate construction of water supply infrastructure in two phases. The Phase 1 infrastructure to be constructed comprises the following: 10,000m<sup>3</sup> covered low level reservoir approximately 2560sqm with height above ground up to 4.5m approximately without handrailing on the roof (up to 5.7m approximately with handrailing); 2,500m<sup>3</sup> covered high level reservoir approximately 660sqm. Phase 2 of the development will be required when water supply demand reaches the capacity of the Phase 1 infrastructure, requiring additional storage to ensure at least 24 hours at average day demand. The Phase 2 infrastructure to be constructed comprises of the same assets listed above. Both phases are proposed within a site of approximately 6.3 hectares.

The remainder of committed development within the vicinity of the Site relate to proposed single dwelling properties, extensions to existing properties, or the provision of signage and boundary fencing, and are generally of small scale. Therefore, based on the location, nature and scale of the proposed development, the remainder of committed development within the vicinity of the Site have not been considered further with regards to potential cumulative environmental impacts.



**Figure 2-16 – Locations of Relevant Committed Development in the vicinity of the proposed Site**

In addition, a number of local infrastructural works are scheduled for commencement during September on or adjacent to the site by others. These works are as described below:

- Irish Rail works – set down / compound area for Irish Rail which is undertaking upgrade works to the rail bridge over the underpass from the application site to Harbour Road. The temporary compound which is required for an approx. two week period from 23.09.22 required minor grading of the area and placement of a hardcore base to position a crane and materials on.
- Irish Water Works - these works are part of a wider Local Area Reinforcement Project by Irish Water and local diversion works. These works involve the laying of a new foul sewer and the diversion of an existing sewer in the existing road leading to the underpass (at the southern side of the site). Irish Water has advised that it intends to commence these works in mid – September and the works will last for approx. 6 weeks.

### 2.9.6. Risk of Major Accidents and/or Disasters

As previously stated, a Construction Environmental Management Plan (CEMP) has been submitted as part of this planning application. This document will be added to by the Contractor and will list all environmental mitigation measures that will be implemented by all site personnel during the construction of this development, including the appointment of an Environmental Manager during the construction phase.

The Environmental Manager will be responsible for the preparation of an Environmental Incident Emergency Response Plan which should be made available to all relevant site staff. Typically, emergency procedures would include contact details of key personnel in local authorities and statutory authorities including the National Parks and Wildlife Services (NPWS), Inland Fisheries Ireland (IFI), DLRCC, WCC and the Environmental Protection Agency (EPA). Emergency preparedness and response procedures (including the provision of suitable oil spill kits and absorbent material) should be clearly set out within the Detailed CEMP in the highly unlikely event of an environmental pollution incident onsite. There is no Lower or Upper Tier Seveso Site, within 15km of the Site. Therefore no further consideration of the SEVESO Directive (DIRECTIVE 2012/18/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC) is warranted for the proposed development.

## 3. Population and Human Health

### 3.1. Introduction

This chapter describes the Population and Human Health setting in the general area of the proposed Coastal Quarter residential development at Harbour Point, Bray, Co. Dublin and Co. Wicklow. The assessment addresses the potential impact of the construction and operation of the proposed development on these factors, together with any mitigation measures that may be required to eliminate or reduce potential impacts. A more complete description of the proposed development is presented in Chapter 2 – Project Description.

Population and human health comprise an important element of the ‘environment’, and any potential impacts which may result from the construction and operation of the proposed development must therefore be comprehensively addressed. There are three key considerations in this regard:

- To ensure that human beings experience no significant unacceptable diminution in an aspect, or aspects of ‘quality of life’ via. potential impacts to population, employment and economic activity, land-use, community and recreation.
- To improve the general health and wellbeing of the proposed residents through encouraging activities such as walking and cycling by means of inclusion of pedestrian and cyclist facilities and open green spaces.
- To ensure that there are no human health impacts via. potential environmental pathways including soil, water, air and noise.

The population and human health topic is broad ranging and addresses the existence, activities and wellbeing of people as groups or populations. While most developments will affect other people, this chapter concentrates on those topics which are manifested in the environment, such as new land uses, more buildings or greater emissions. The principal concern is that human beings within the area experience no significant unacceptable diminution in aspects of quality of life because of the proposal. Potential impacts can arise from natural heritage, air and noise emissions, soils and water, visual and traffic, all of which are addressed in the relevant chapters of the Environmental Impact Assessment Report (EIAR). Topics assessed in this chapter which are not covered in other chapters of the EIAR include a detailed review of current land use, settlement pattern, demography, economic activity and social infrastructure.

### 3.2. Methodology

This chapter provides an assessment of the potential impacts of the construction and operation of the proposed development (also referred to as ‘the Site’) on the broader human environment under two considerations:

- Population and Associated Factors; and,
- Human Health.

Mitigation measures are proposed where appropriate in order to address any likely impacts associated with the construction and operation of the proposed residential development. This Population and Human Health Assessment has been undertaken in accordance with relevant Environmental Protection Agency’s (EPA) Guidance.

- *Guidelines on the information to be contained in Environmental Impact Assessment Reports*, Environmental Protection Agency (EPA), 2022 highlights the amendments to Article 3(1) of amended European Union (EU) Environmental Impact Assessment (EIA) Directive which states that:

*“The environmental impact assessment shall identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of a project on the following factors: a) population and human health; [...].”*

- Moreover, Annex IV, paragraph 5(d) requires an EIAR to contain:

*“A description of the likely significant effects of the project on the environment resulting from, inter alia, “the risks to human health”*

- When outlining the scope of environmental factors covered by the EIA Directive within *Guidance on the Preparation of the Environmental Impact Assessment Report* (European Commission, 2017), “population and human health” is defined as follows:

*“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 human health assessment will also consider unplanned events (in addition to construction and operational activities). Examples of such unplanned events include the following; spill from traffic accidents, floods or landslides affecting the Site, fire, collapse or equipment failure on the Site. For the purposes of this report human health has been assessed using two separate approaches, as follows;

- Preparation of a Health Impact Assessment (HIA); and,
- Preparation of a Human Health Risk assessment via. Source-Pathway-Receptor (S-P-R) model.

To establish the existing receiving environment / baseline, a site walkover was undertaken in 2022 and a thorough desk-based study of the Site was undertaken, and the following publications and data sources were consulted in the preparation of this Chapter:

- Bray Municipal District Local Area Plan 2018-2024;
- Central Statistics Office (CSO) data website (2016 data and 2022 preliminary results) [www.cso.ie](http://www.cso.ie);
- Department of Education data website [www.education.ie/en/find-a-school](http://www.education.ie/en/find-a-school);
- Dún Laoghaire-Rathdown County Development Plan 2016 – 2022;
- Dún Laoghaire-Rathdown County Development Plan 2022 – 2028;
- Eastern and Midlands Regional Assembly Regional Spatial and Economic Strategy 2019 -2031;
- Economic and Social Research Institute (ESRI) Quarterly Economic Commentary Summer 2022;
- Google Earth;
- Google Map;
- Health Service Executive data website [www.hse.ie](http://www.hse.ie);
- Planning Applications Online Search at websites <https://www.dlrccoco.ie/en/planning-applications/planning-applications-online-search> and <http://www.eplanning.ie/WicklowCC/searchtypes>;
- Pobal Mapping @ [maps.pobal.ie](http://maps.pobal.ie);
- Project Ireland 2040 - National Planning Framework;
- Regional Spatial and Economic Strategy for the Eastern and Midland Region 2019 – 2031; and
- Wicklow County Development Plan 2016-2022;
- Draft Wicklow County Development Plan 2022– 2028 and proposed amendments.

All data sources were consulted the week ending 19<sup>th</sup> August 2022 except where otherwise stated.

### 3.2.1. Difficulties Encountered

No particular difficulties were encountered in the preparation of this EIAR chapter.

### 3.2.2. Assessment Criteria

In undertaking the assessment of the impact of the proposed development on Population and Human Health, community and the local socio-economic environment, both positive and negative impacts are considered. The following terms used in this assessment are defined as per the EPA *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022) as seen in Table 3-1.

**Table 3-1 - Description of Effects**

Description of Effects	
<p><b>Quality of Effects</b></p> <p>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral</p>	<p><b>Positive Effects</b></p> <p>A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities)</p> <p><b>Neutral Effects</b></p> <p>No effect or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.</p> <p><b>Negative/adverse Effects</b></p> <p>A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).</p>
<p><b>Describing the Significance of Effects</b></p> <p>“Significance’ is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance below.).</p>	<p><b>Imperceptible</b></p> <p>An effect capable of measurement but without significant consequences.</p> <p><b>Not Significant</b></p> <p>An effect which causes noticeable changes in the character of the environment but without significant consequences.</p> <p><b>Slight Effects</b></p> <p>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p> <p><b>Moderate Effects</b></p> <p>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.</p> <p><b>Significant Effects</b></p> <p>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p> <p><b>Very Significant</b></p> <p>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.</p> <p><b>Profound Effects</b></p> <p>An effect which obliterates sensitive characteristics.</p>
<p><b>Describing the Extent and Context of Effects</b></p> <p>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.</p>	<p><b>Extent</b></p> <p>Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.</p> <p><b>Context</b></p>

	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
<p><b>Describing the Probability of Effects</b></p> <p>Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.</p>	<p><b>Likely Effects</b></p> <p>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.</p> <p><b>Unlikely Effects</b></p> <p>The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.</p>
<p><b>Describing the Duration and Frequency of Effects</b></p> <p>'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful</p>	<p><b>Momentary Effects</b></p> <p>Effects lasting from seconds to minutes</p> <p><b>Brief Effects</b></p> <p>Effects lasting less than a day</p> <p><b>Temporary Effects</b></p> <p>Effects lasting less than a year</p> <p><b>Short-term Effects</b></p> <p>Effects lasting one to seven years.</p> <p><b>Medium-term Effects</b></p> <p>Effects lasting seven to fifteen years</p> <p><b>Long-term Effects</b></p> <p>Effects lasting fifteen to sixty years</p> <p><b>Permanent Effects</b></p> <p>Effects lasting over sixty years</p> <p><b>Reversible Effects</b></p> <p>Effects that can be undone, for example through remediation or restoration</p> <p><b>Frequency of Effects</b></p> <p>Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)</p>
<p><b>Describing the Types of Effects</b></p>	<p><b>Indirect Effects (a.k.a. Secondary Effects)</b></p> <p>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</p> <p><b>Cumulative Effects</b></p>

The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.

**‘Do-Nothing Effects’**

The environment as it would be in the future should the subject project not be carried out.

**‘Worst case’ Effects**

The effects arising from a project in the case where mitigation measures substantially fail.

**Indeterminable Effects**

When the full consequences of a change in the environment cannot be described.

**Irreversible Effects**

When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

**Residual Effects**

The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

**Synergistic Effects**

Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

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

A specific human health assessment has been undertaken in accordance with available UK guidance entitled ‘*Health Impact Assessment Tools: Simple tools for recording the results of the Health Impact Assessment*’ published by the UK Department of Health (DH) (2010). This guidance provides an overview of the 5-Stage Health Impact Assessment (HIA) process as follows: -

- **Stage 1** - Screening;
- **Stage 2** - Identify Health Impacts;
- **Stage 3** - Prioritise Important Health Impacts;
- **Stage 4** - Analysis: Quantify or Describe Health Impacts; and,
- **Stage 5** - Recommendations to Improve Policy.

Stage 1 comprises an initial risk screening process with five key criteria to be considered as follows:

1. *Will the proposal have a direct impact on health, mental health and wellbeing?*
2. *Will the policy have an impact on social, economic and environmental living conditions that would indirectly affect health?*
3. *Will the proposal affect an individual's ability to improve their own health and wellbeing?*
4. *Will there be a change in demand for or access to health and social care services?*
5. *Will the proposal have an impact on global health?*

If no potential impacts are identified at Stage 1 - Screening, then the HIA is complete and no further assessment is required. This screening approach is consistent with the HIA Screening process recommended by the World Health Organisation (WHO)<sup>3</sup>.

### 3.2.2.1. Preparation of a Human Health Risk assessment via. Source-Pathway-Receptor (S-P-R) model

A preliminary assessment of direct and indirect impacts on health which could potentially arise due to the construction and operation of the proposed development, and also unplanned events, has been evaluated using a simple Source-Pathway-Receptor (S-P-R) model. This approach involves the identification of contaminant sources, environmental pathways and receptors, and the identification of any valid direct / indirect potential pollutant linkages. This risk-based approach is advocated by the EPA in relation to human health impact assessment. Risk assessment is defined by the EPA (2022) as follows;

*'An analytical study of the probabilities and magnitude of harm to human health and the environment associated with a biological, physical or chemical agent, activity or occurrence.'*

## 3.3. Receiving Environment

A description of the relevant aspects of the current state of the environment (baseline scenario) in relation to population and human health is provided below. In line with guidance provided by the EPA and the Department, the assessment of impacts on population and human health refers to those environmental topics under which human health effects might occur e.g. noise, water, air quality etc., but is not duplicated throughout this section.

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

- Land use and Settlement Pattern;
- Demographics and Local Population;
- Population Density;
- Age Profile;
- Household Size;
- Affluence and Deprivation:
- Employment;
- Local Services;
- Education and Childcare Facilities;
- Health Services;
- Human Health; and
- Risk of Major Accidents and Disasters.

The study area for the consideration of population and human health is the Site and its immediate environs (the wider Bray area).

### 3.3.1. Land Use and Settlement Pattern

The Site is located on the former Bray Golf Club and presents an infill site located ca.1km from Bray town centre, straddling the boundary between counties Dublin and Wicklow.

The Site is currently largely unused and consists of remnants of the former golf course and a hardstanding area in the south western portion of the Site. The lands are used on a casual basis by walkers and dog walkers. Access and egress to the Site is currently provided off the private access road to Philomena's Primary School and Coláiste Raithin Post Primary School which is accessed from the R761 to the west of the Site at the R176 / Ravenswell junction and the R761 / Chapel Lane / Northern Access junction.

The Site is generally bounded to the north by the existing public open space at Corke Abbey Valley Park and existing housing estate at Corke Abbey, to the east by the Irish Rail Dublin-Rosslare main rail line, to the south and south-west by the River Dargle and Harbour Point Masterplan lands (Phase 2), and to the west by the existing Ravenswell schools campus. Land uses in the area are mixed, but predominantly those of a large town.

<sup>3</sup> [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0007/101500/HIA\\_Toolkit\\_1.pdf](https://www.euro.who.int/__data/assets/pdf_file/0007/101500/HIA_Toolkit_1.pdf)



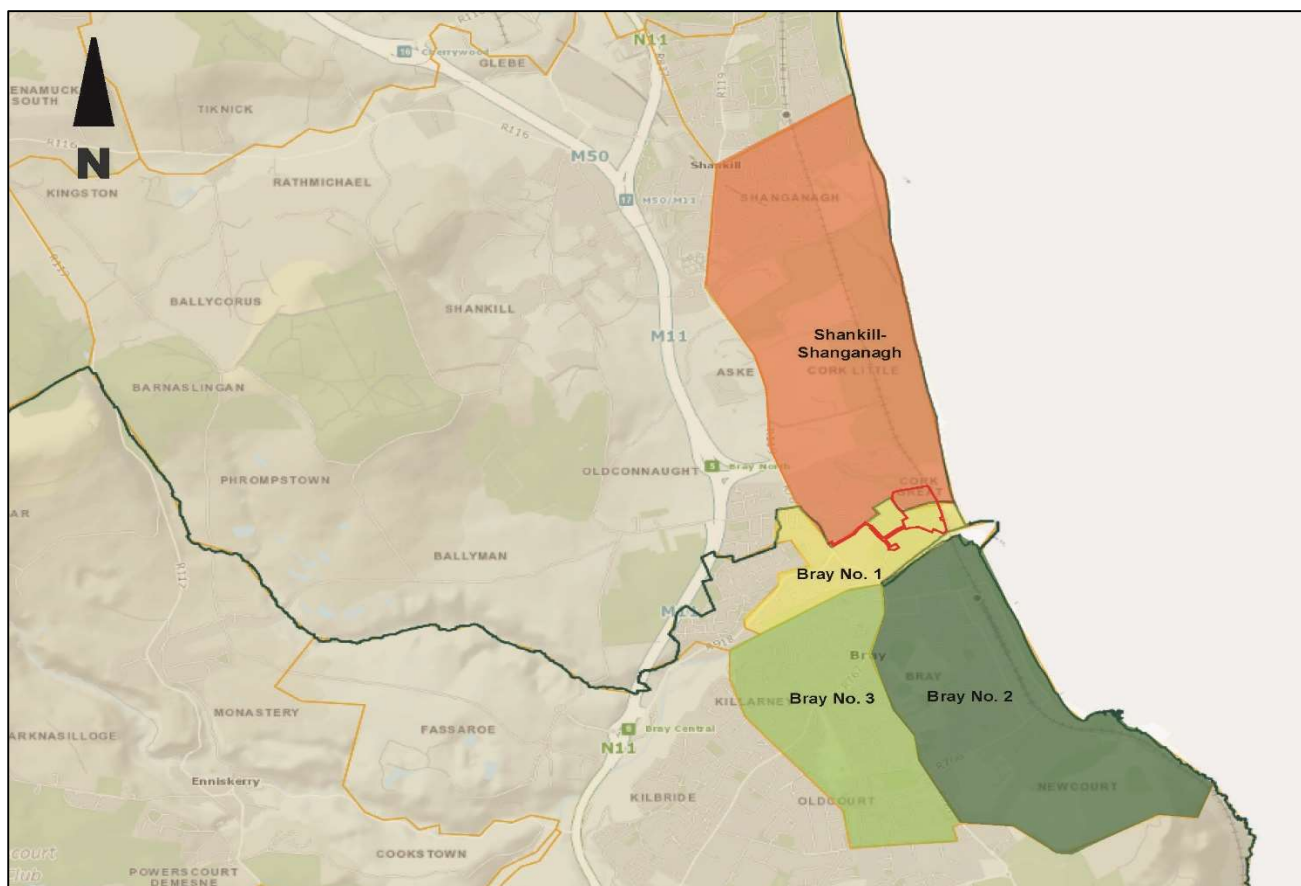
The Coastal Quarter extends into three townlands (Cork Great, Ravenswell and Bray Commons). The townland boundary between Ravenswell and Cork Great also forms the county boundary between counties Dublin and Wicklow. The area of the Site within County Dublin is located within the administrative area of Dún Laoghaire-Rathdown County Council. The subject lands within the Dún Laoghaire-Rathdown administrative area are zoned “Objective A: To protect and-or improve residential amenity” and Objective F “To preserve and provide for open space with ancillary active recreational amenities”. The subject lands within County Wicklow are zoned Mixed Use (MU) “To provide for mixed use development.” Land use zoning objectives are consistent with the national and regional policy which seek the development of serviced sites within settlements designated for development. The National Planning Framework and Regional Spatial and Economic Strategy support the provision of additional housing and the better use of under-utilised sites in accessible urban locations benefitting from public transport and other facilities.



**Figure 3-1 - Site Location Map**

### 3.3.2. Demographic and Local Population

The most recent Census of Population was undertaken in April 2022. At this time, a limited quantity of relevant data from the 2022 Census has been published, pertaining chiefly to overall population in counties and Electoral Districts (EDs). The 2022 data has been utilised where available. Data from the 2016 census continues to be used where the 2022 Census is unavailable. Demographic trends are analysed at state, county and local levels for the purposes of the EIAR. For the purposes of examining census population data, those EDs wholly or partially included within the study area were examined. In this regard the Site falls within two Electoral Divisions, Bray No.1 ED (CSO Area Code: 15003) in County Wicklow and Shankill-Shanganagh (CSO Area Code: 05062) in County Dublin. The location of the Site in the context of the EDs is illustrated in Figure 3-2.



**Figure 3-2 - Electoral Division Map**

Source: Basemap CSO.ie

Given the nature of the proposed development it is considered the key study areas are the ‘Local Area’ (comprised of Bray No.1 and Shankill-Shanganagh EDs) and the County Area (consisting of Dún Laoghaire- Rathdown and Wicklow). Population growth within the state, Counties Wicklow and Dún Laoghaire- Rathdown and Bray No.1 and Shankill-Shanganagh EDs is shown in Table 3-2.

**Table 3-2 - Population Growth 2002-2022**

Area	2002	2006	2011	2016	2022	% Change 02 - 22
State	3,917,203	4,239,848	4,581,269	4,761,865	5,123,536	30.8
Dún Laoghaire- Rathdown	191,792	194,038	206,261	218,018	233,457	21.7
Wicklow	114,676	126,194	136,640	142,245	155,485	35.6
Bray No.1	1,619	1,700	1,746	1,839	1,864	15.1
Bray No.2	5,972	6,305	6,192	6,414	6,786	13.6
Bray No.3	6,684	6,557	6,424	6,459	6,602	-1.2

Shankill-Shanganagh	5,322	5,295	5,334	5,488	5,493	3.2
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Source: cso.ie

There has been a consistently high level of population growth within the state and within County Wicklow over this period of time. There has also been significant population growth, though at a markedly lower level within Dún Laoghaire-Rathdown. Population growth within the considered EDs is lower again and indeed the population of Shankill-Shanganagh has dropped. The relatively low level of population growth within Dún Laoghaire-Rathdown may in part be attributed to a significant area of the county being already urbanised prior to 2002 and there being limited areas of new development and reductions in population in some areas due to ‘empty nest’ syndrome.

There have been very low levels of population growth within the Shankill-Shanganagh ED. There are significant areas of greenspace within the Shankill-Shanganagh ED and there is potential for further increases in population within the electoral division. Such growth would be supported by upgraded public transport links, including the North – South Corridor (DART Expansion) which includes proposals for a new station at Woodbrook-Shanganagh ca. 1.3km to the north of the Site.

### 3.3.3. Population Density

As shown in Table 3-3 the population density for County Wicklow is marginally above the state average (70 per sq.km) while Dún Laoghaire-Rathdown has a population density of 1,853 per sq.km. A large part of County Wicklow is mountainous and occupied by green open space, in comparison to Dún Laoghaire-Rathdown which is largely built up within a smaller area therefore has a significantly higher population density.

While much of Shankill-Shanganagh is relatively undeveloped it has a very similar population density to that of Dún Laoghaire-Rathdown. Bray No. 1 ED, as might be expected for an electoral division within an existing large town has a much higher population density.

**Table 3-3 - Population Density 2022**

Area	Area Size (sq.km)	Population 2022	Population Density (per sq.km)
State	67,980.5	5,123,536	75
Dún Laoghaire-Rathdown	126	233,457	1,853
Wicklow	2,027	155,485	77
Bray No.1	0.56	1,864	3,323
Shankill-Shanganagh	2.98	5,493	1,843

Source: cso.ie

### 3.3.4. Age Profile

In comparison to other countries within the EU, Ireland has a relatively young population with only 13.4% of the population 65+ in 2016, a 1.7% increase since 2011. The age profile of the population of the state, Dún Laoghaire-Rathdown and Wicklow for 2011 and 2016 is highlighted in Table 3-4. There is a somewhat older age profile within Dún Laoghaire-Rathdown than Wicklow. This may reflect the established nature of urban development within Dún Laoghaire-Rathdown as compared to the more dynamic population growth within County Wicklow in recent decades.

**Table 3-4 - Population Structure by Age**

Area / Age	0-14 (%)	15-24 (%)	25-44 (%)	45-64 (%)	65+ (%)
State 2011	21.3	12.6	31.6	22.7	11.7
State 2016	21.1	12.1	29.5	23.8	13.4
Change	-0.2	-0.5	-2.1	1.1	1.7
Dún Laoghaire-Rathdown 2011	18.2	14.1	29.5	23.7	14.4

Dún Laoghaire-Rathdown 2016	18.4	13.6	28.3	23.8	15.9
Change	1.0	-3.6	-4.1	0.4	9.9
Wicklow 2011	22.8	12.1	30.4	23.7	11.0
Wicklow 2016	22.7	11.4	27.9	24.9	13.0
Change	-0.4	-5.9	-8.5	4.9	16.6

Source: cso.ie

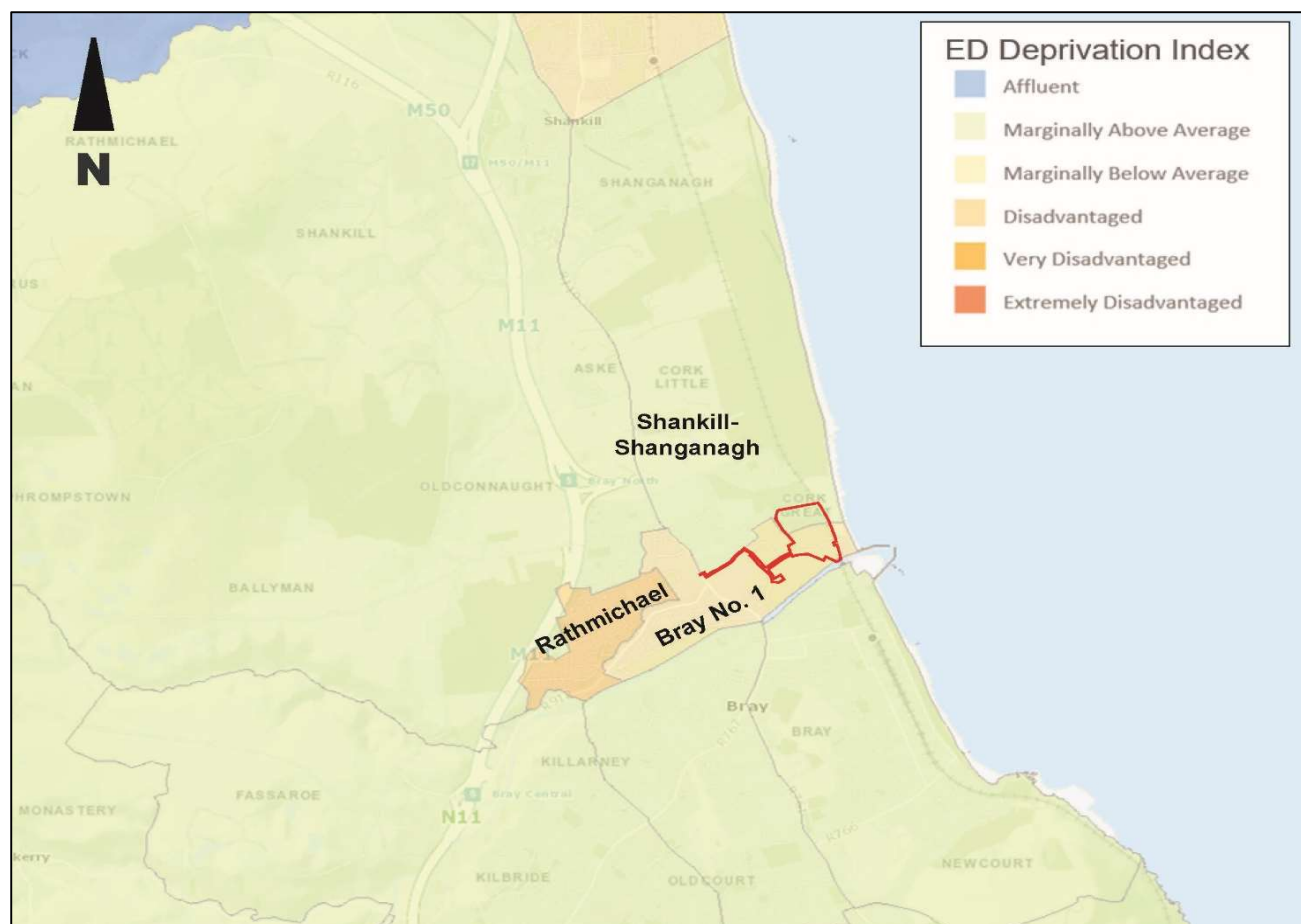
### 3.3.5. Household Size

In 2011, there were an average 2.73 persons per household within the state. This figure slightly increased to 2.75 in 2016. In Dún Laoghaire-Rathdown the average household size in 2011 was slightly below that state average (2.67 persons per household) but increased to 2.71 persons per household in 2016. The average persons per household was higher in Wicklow in 2016 (2.86 persons) which had increased from 2.82 persons per household in 2011. The larger household size in Wicklow may be related to the younger age profile within the county.

### 3.3.6. Affluence and Deprivation

The Pobal Deprivation Index is Ireland's most widely used social gradient metric, which scores each small area (50 – 200 households) in terms of affluence or disadvantage. The index uses information from Ireland's census, such as employment, age profile and educational attainment, to calculate the score. Bray No.1 ED is classified as "marginally below average" and Shankill-Shanganagh is classified as "marginally above average".

The majority of the surrounding EDs are classified as "marginally above average" however Rathmichael (Bray) ED located to the east of the Site is classified as "disadvantaged" as seen in Figure 3-3.



**Figure 3-3 - Affluence and Deprivation Index**

Source: Pobal.ie

### 3.3.7. Employment

The 2016 Census of Population was examined to determine trends in relation to employment including the number of persons at work, unemployment levels and the sectoral composition of the population, based upon principal economic status.

Table 3-5 shows the overall unemployment rate as measured by the responses from the 2011 and 2016 Census. The unemployment rate is calculated by adding the number of persons unemployed to first time job seekers, and then dividing the total by the overall labour force (i.e. total amount of unemployed persons and employed persons).

**Table 3-5 - Principal Economic Status 2011-2016**

	State 2011	State 2016	DLR 2011	DLR 2016	Wicklow 2011	Wicklow 2016
At work	1,807,360	2,006,641	87,490	95,925	52,907	59,134
Looking for First Regular Job	34,166	31,434	391	927	789	791
Unemployed or given up on Previous Job	390,677	265,962	10,064	6,789	11,885	7,812
Overall Unemployed	424,843	297,396	10,445	7,716	12,674	8,603
Labour Force	2,232,203	2,304,037	108,390	111,357	78,255	76,340
Unemployment Rate (%)	19.0%	11.5%	9.3%	6.1%	24%	14.5%

Source: cso.ie

It can be seen that the unemployment rate across the state, Dún Laoghaire-Rathdown and Wicklow has decreased significantly between 2011 and 2016, the largest decrease occurred in Wicklow where the unemployment rate decreased from 24% in 2011 to 14.5% in 2016.

More recent data on employment is provided in the CSO Labour Force Survey published quarterly. This shows that in Q1 2022 the national unemployment rate was 4.8%.

The number of persons aged 15-74 years who were unemployed decreased by 25.7% in the year to Q1 2022, using standard International Labour Organisation (ILO) criteria. The unadjusted unemployment rate for persons aged 15-74 years decreased from 7.1% to 4.8% over the year to Q1 2022.

### 3.3.8. Local Services / Amenities

Local Services / Amenities (Social Infrastructure) includes a wide range of services and facilities including health, education, community, cultural, play, faith, recreation and sports facilities that contribute to the quality of life. The Site is located within Bray and ca.1km from Bray town centre which is served by a wide range of community facilities typical of a large town including shops, schools, sports clubs, gyms and public open spaces including:

- A number of primary and secondary schools and childcare facilities (details provided in Section 3.3.8.1)
- Bray Library;
- Bray Post Office;
- Bray Medical Centre;
- Sports clubs including;
- Bray Wanderers Football Club;
- Bray Boxing Club;
- Bray Emmets GAA Club;
- Bray Hockey Club;
- Bray Runners Athletic Club;
- Bray Cricket Club;
- A range of convenience stores and consumer goods retailers;

- Banks, financial, legal and professional services;
- Restaurants, cafes and bars;
- Blue Flag Beach and Bray Head Cliffs;
- Transport links and parks; and,
- Mermaid Arts Centre.

Bray Garda Station is located ca. 1km south of the Site with Bray Fire Station located ca. 2.2km south west of the Site. Numerous religious buildings are located within 2km of the Site including St. Peter's Church, Conerstone Church at the Well, Snowball Church and St. Andrew's Church.

A number of Community Groups are located within the Town of Bray including Bray Area Partnership Disability Network, Bray Active Retirement Association and Irish Countrywomen's Association (I.C.A). A number of parent and toddler groups are also present at various locations within Bray (including Moms & Tots and Tots on Thursday groups which take place at Conerstone Church at the Well) and would be of interest to young families of the proposed residential development and also local residents.

#### 3.3.8.1. Childcare Facilities

There is a total of 37no. childcare facilities within a 3km radius of the Site as shown in Figure 3-4 and listed in Table 3-6 to Table 3-8; 11no. are within a 1km, 10no. are within 2km and 16no. are within 3km. There are at least 1,040no. childcare places within 3km of the Site. This figure is an underestimation as 5no. facilities did not disclose capacity information, therefore the total number of places in the area is somewhat higher. Within 1km of the Site there are 236no. places. The closest childcare facility adjacent to the Site is Happy Days Playschool within 100m of the Site.

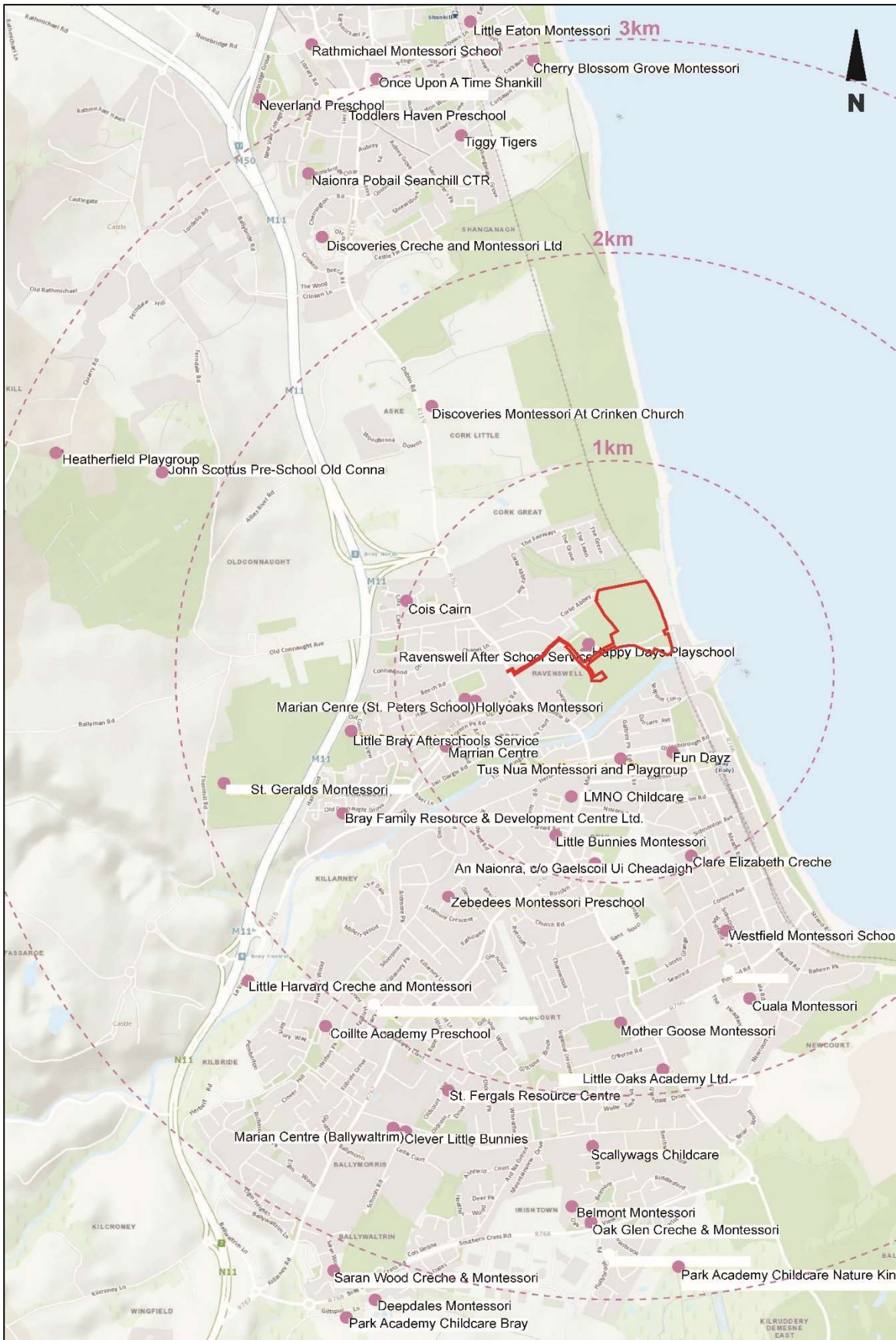


Figure 3-4 - Childcare Facilities (Source: Pobal.ie)

Directly west of the Site are 2no. childcare services, Happy Days Playschool and Ravenswell After School Service. A list of childcare providers within the study area based on information provided on An Pobal, Wicklow County Childcare Committee and Dún-Laoghaire-Rathdown Childcare Committee is provided below in Tables 3-6, 3-7 and 3-8.

**Table 3-6 - Childcare Facilities within 1km**

No.	Name:	Address:	Services Provided:	Age Profile:	Capacity:
1.	Happy Days Playschool	Ravenswell Primary School, 4 Ravenswell, Bray.	Sessional	2-6 years old	22
2.	Ravenswell After School Service	Ravenswell Primary School, Dublin Road, Bray.	Information not provided.		
3.	Fun Dayz	6 Prince of Wales Tce, Quinsboro Rd., Bray.	Information not provided.		
4.	Tús Nua Montessori & Playgroup	St Andrews (Old School), Eglinton Road, Bray	Sessional	2-6 years old	33
5.	Little Bunnies Montessori	Unit 1, Aubrey Court, Parnell Road, Bray.	Sessional	2-6 years old	44
6.	Clare Elizabeth Creche	1 Ellerslie Villas, Sidmonton Road, Bray	Full Day & Sessional	1-6 years old	100
7.	An Naionra, c/o Gaelscoil Ui Cheadaigh	Vevay Road, Bray.	Sessional	2-6 years old	33
8.	Marian Centre	Greenpark Rd, Bray.	Sessional	2-6 years old	53
9.	Marian Centre (St. Peters School)	Ledwidge Crescent, Little Bray, Bray.	Sessional	2-6 years old	20
10.	Hollyoaks Montessori	St. Peters NS, Bray.	Sessional	2-6 years old	22
11.	LMNO Childcare	9A Purcell Lane, Rear Main Street, Bray.	Full Day	2-6 years old	30
<b>Total:</b>					<b>357</b>

Source: Tusla.ie

**Table 3-7 - Childcare Facilities within 1km – 2km**

No.	Name:	Address:	Services Provided:	Age Profile:	Capacity:
12.	Cois Cairn	Cois Cairn Youth & Community Facility, Cois Cairn, Old Connaught Avenue, Bray.	Sessional	2-6 years old	22
13.	Discoveries Montessori	St James Church, Crinken.	Sessional	2-6 years old	22
14.	St Gerard's Montessori	St Gerard's Montessori, Thornhill Rd.	Full Day	2-6 years old	22
15.	Little Bray Afterschools Service	Little Bray Community Centre, Old Connaught View, Fassaroe, Bray	Sessional	5-11 years old	Information not provided.



16.	Zebedee's Montessori Preschool	Glenlucan House, Killarney Road.	Part-time / Sessional	2-6 old	years	50
17.	Westfield Montessori School	Westfield House, Sidmonton Road	Part-time / Sessional	2-6 old	years	11
18.	Cuala Montessori	3 Cuala Grove, Bray, Co. Wicklow A98 X832	Sessional	2-6 old	years	22
19.	Mother Goose Montessori	Wolfe Tone District Youth Club, Bray, Co. Wicklow	Sessional	2-6 old	years	40
20.	Little Oaks Academy Ltd	Vevay Road, Bray, Co. Wicklow	Part-time	2.5-5 old	years	33
21.	Little Rascals, Little Bray, Family Resource Centre, New Ard Chualann, Fassaroe, Bray	Ard Chuallan, Fassaroe	Sessional / Part-time / Drop-in	0-6 old	years	14
Total:						236

Source: Tusla.ie

**Table 3-8 - Childcare Facilities within 2km – 3km**

No.	Name:	Address:	Service Provided:	Age Profile:	Capacity:
22.	Cherry Blossom Grove Montessori	23 Corbawn Drive	Sessional	2-6 old	years 22
23.	Tiggy Tigers	Unit 1, Quinns Rd., Shankill, Dublin 18	Information not provided.		
24.	Toddlers Haven Preschool	St. Anne's Resource Centre, Shankill, Co. Dublin	Information not provided.		
25.	Naionra Pobail Seanchill CTR	Croí na Coille, Lower Road, Shankill, Dublin	Full Day / Part-time / Sessional	2-6 old	years 50
26.	Discoveries Creche & Montessori Ltd	Olcovar, Shankill, Co. Dublin	Full Day	0-6 old	years 47
27.	Heatherfield Playgroup	Heatherfield, Quarry Road, Shankill, Co. Dublin.	Sessional	2-6 old	years 18
28.	John Scottus Pre-School Old Conna	Old Conna, Ferndale Road, Rathmichael	Full Day / Sessional	2-6 old	years 57
29.	Little Harvard Creche & Montessori	Upper Dargle Road, Riverdale, Bray.	Full Day / Sessional / Part-time	2-6 old	years 100
30.	Coillte Academy Preschool	2 Cill Sarain, Herbert Road, Bray	Sessional	2-6 old	years 22
31.	Jolly Tots St. Fergals Resource Centre	107 Oldcourt Avenue	Sessional / Part-time	0-6 old	years 13

32.	Marian Centre (Ballywaltrim)	Marian Centre, Ballywartrim Centre, Boghall Rd., Bray.	Sessional	2-6 years old	30
33.	Clever Little Bunnies	Ballywaltrim Community Centre, Boghall Road, Bray, Co. Wicklow	Information not provided.		
34.	Scallywags Childcare	25 Bentley Avenue, Bray, Co. Wicklow	Sessional	2-6 years old	22
35.	Belmont Montessori	235 Belmont, Bray, Co. Wicklow	Sessional	2.5-5.5 years old	11
36.	Oak Glen Creche & Montessori	20 Oak Glen View.	Sessional	2-6 years old	20
37.	Park Academy Childcare Nature Kindergarten	Pigwood, Killruddery Estate, Bray.	Full Day	2-6 years old	25
Total:					447

Source: Tusla.ie

### 3.3.8.2. Education Facilities

There are 10no. primary schools within a ca. 3km radius of the Site. Details of these primary schools as per the Department of Education and Skills website are presented in Table 3-9.

**Table 3-9 - Primary Schools within a 3km Radius**

Primary School	Address	Enrolled Pupils (boys and girls)	Ave Class Size 2018/2019	Ave Class Size 2019/2020	Walking distance
Ravenswell Primary School	Ravenswell, Bray, Co. Wicklow A98X8X7	Total – 402	20	20	330m
St. Peters Primary School	Hawthorn Road, Bray, Co. Wicklow A98YH93	Total - 159	28	20	1.2km
Gaelscoil Uí Chéadaigh	Bóthar Vevay, Bré, Co. Chill Mhantáin	Total – 231	27	28	1.5km
Scoil Chualann	Bóthar Vevay, Bré, Co. Chill Mhantáin	Total – 225	28	28	1.5km
St. Patricks Loreto Primary School	Vevay Road, Bray, Co. Wicklow A98F652	Total – 764	25	24	2.2km
St. Gerard's School <sup>4</sup>	Thornhill Road, Bray, Co. Wicklow A98R242	Total - 230	-	-	2.3km
St. Cronan's Boys' National School	Vevay Road, Bray, Co.	Total – 480	25	27	2.4km

<sup>4</sup> Detailed information not available on Education.ie. Information based on <https://www.stgerards.ie/>

	Wicklow A98NW42				
St. Andrews National School	Newcourt Road, Bray, Co. Wicklow	Total – 211	26	26	2.7km
Bray School Project N.S	Killarney Road, Bray, Co. Wicklow A98 RT02	Total – 229	25	25	2.9km
St. Fergal's National School	Ballywaltrim, Bray, Co. Wicklow	Total – 420	-	-	2.8km
Total		3,351	26	25	Avg. 2.0km

Source: education.ie

There is a total of 7no. secondary schools within the Study Area with a combined total of 3,481no. pupils enrolled between the ages of 13-18 years old from the school year 2021/2022. The schools and enrolment numbers are presented in Table 3-10.

**Table 3-10 - Post Primary Schools within a 3km Radius**

Secondary School:	Address:	Enrolled Pupils (boys and girls):	Walking Distance from Subject Site:
Coláiste Raithín	Bóthar Bhaile Átha Cliath, Bré, Co. Chill Mhantáin	329	300m
North Wicklow Educate Together Secondary School	Dublin Road, Bray, Co. Wicklow A98EF88	323	1.1km
Woodbrook College	Dublin Road, Woodbrook, Bray, Co. Wicklow A98AW64	485	1.3km
St. Gerard's School	Thornhill Road, Bray, Co. Wicklow A98R242	584	2.3km
Presentation Catholic College	Putland Road, Bray, Co. Wicklow A98P270	719	2.4km
Loreto Secondary School	Vevay Road, Bray, Co. Wicklow A98C822	644	2.6km
St. Killian's Community College	Ballywaltrim, Bray, Co. Wicklow	397	3.2km
Total within the Study Area		3,481	1.7km

Source: education.ie

In 2013 it was announced St. Thomas' Community College was to close in 2015. The closure was phased to allow for alternative arrangements and to allow pupils finish their time at the college. The Bray Institute of Further Education Third-Level College is now operating on the same campus. There is also a special needs school located in the study area. St. Kieran's Special School is located in Old Conna, Bray, County Wicklow. Marino School is a special school under the patronage of Enable Ireland Services. The locations of all these schools are shown in Figure 3-5.



**Figure 3-5 - Locations of Schools in vicinity of the Site**

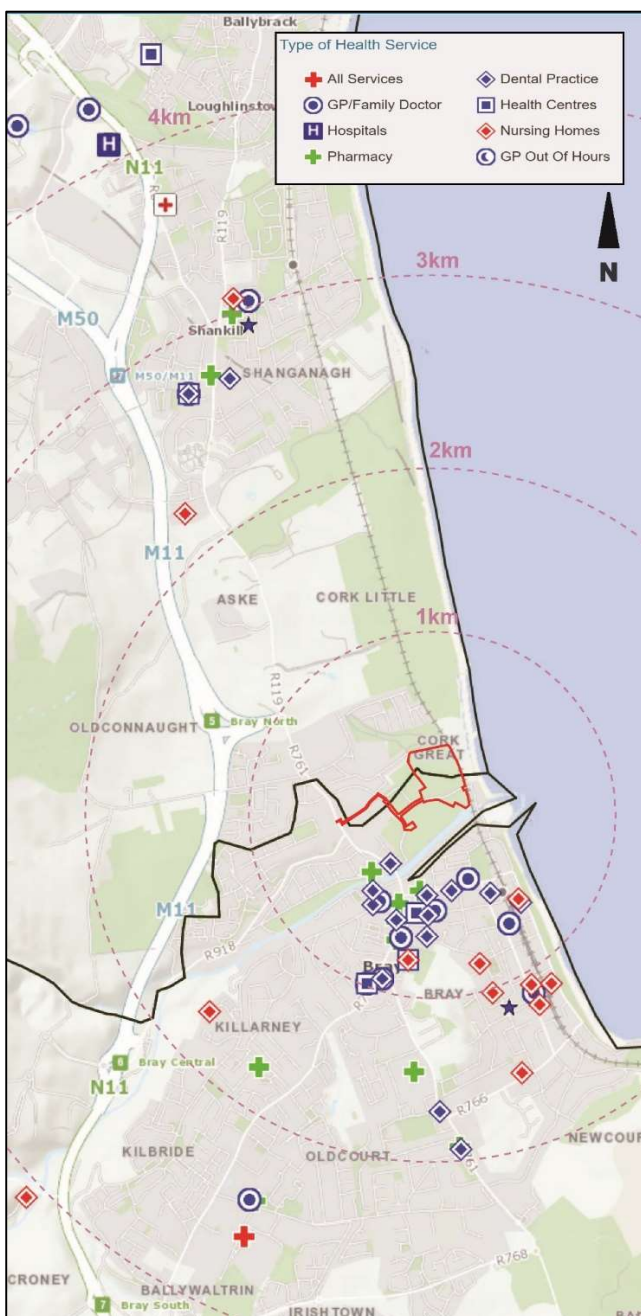
Source: Basemap Google Maps

### 3.3.9. Health Services

There are 6no. medical General Practices located within close proximity to the Site comprising the following:

- Bray Medical Centre, Clonmore, Herbert Road, Bray, County Wicklow;
- Duncairn Medical Centre, 9 Duncairn Terrace, Quinsborough Road, Bray, County Wicklow;
- Dargle Clinic, 11a Eglinton Road, Bray, County Wicklow;
- The Carlton Clinic, 1/ 2 Carlton Terrace, Novara Avenue, Bray, County Wicklow;
- Dr Fidelma Sacage, 2 Donard House, Novara Avenue, Bray, County Wicklow; and
- Town Hall Clinic, Market Court, Main Street, Bray, County Wicklow.

A distribution of health facilities close to the Site as listed above and additional facilities are illustrated below in Figure 3-6.



**Figure 3-6 - Health Services**

Source: Basemap Google Maps

Those medical General Practices located closest to the Site are Bray Medical Centre and Duncairn Medical Centre. Both are ca. 600m from the Site. Bray Medical Centre provides GP services, women's and men's health services, sport pre-participation screening, paediatric health, cardiovascular risk screening and treatment, over 70's health and specialist occupational health services. Duncairn Medical Centre provides GP services, women's health services, mother and baby care and minor surgeries.

The Bray Primary Care Centre, located on Killarney Road, Bray ca. 1.2km from the Site opened in the second half of 2020 and provides specialist diagnostic clinics, GP clinics, dental clinics, drug treatment service, mental health services, physiotherapy and occupational therapy, a new meals on wheel service for older people and those requiring support in Bray and a pharmacy.

### 3.3.10. Human Health

The Department of Health's report *Health in Ireland Key Trends, 2021* provides statistical analysis on health in Ireland over the last 10no. years. Chapters 1 and 2 of the report deal specifically with life expectancy and health. Life expectancy data shows that there has been a continual upward trend for women since 1996 and it currently stands at 84.7 years. Male life expectancy has shown a continual rise since 2006 and now stands at 80.84 years. It is also noted in the report that the gap between male and female life expectancy has continued to narrow over the last decade. Overall life expectancy has increased by ca. 33% at age 75 since 1997. An upward trend is evident in the life expectancy of older age groups reflecting decreasing mortality rates from major diseases. Older Irish people's life expectancy (65 years of age) to be lived in good health, is higher for both men and women compared with the EU average.

The report also states that "*Ireland has the highest self-perceived status in the EU, with 83.9% of people rating their health as good or very good*". Overall population health at the national level shows decreasing mortality and a rise in life expectancy over the last ten years. The health in Ireland report also goes on to state, "*age-standardised mortality rates have declined for all causes over the past decade by 16%*."

The results of the Census in 2016 reported that the vast majority of people in Dún Laoghaire-Rathdown (89.9%) and Wicklow (88.7%) reported that their health was good and very good.

The receiving environment for human health in the context of biophysical factors such as air, noise and water, as relevant are outlined in Land, Soils and Geology (Chapter 9), Water (including Hydrology and Hydrogeology) (Chapter 10), Air Quality and Climate (Chapter 6), Noise and Vibration (Chapter 7), Traffic (Chapter 8) and Material Assets (Chapter 12).

### 3.3.11. Risk of Major Accidents and Disasters

The 2022 EIAR Guidelines state that an EIAR must include the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project. There are two key considerations; the potential of the project to cause accidents and/or disasters and the vulnerability of the project to potential disasters / accidents.

The Site location is outside the consultation zones of all SEVESO Sites and is therefore considered to not be susceptible to any particular exceptional human health risks.

## 3.4. Potential Impacts on Population and Human Health

For the purposes of this assessment, the potential impacts of the construction and operation of the proposed development have been assessed. No demolition works are required as part of the proposed development.

### 3.4.1. Construction Phase

#### 3.4.1.1. Land Use and Settlement Pattern

Bray is the largest town in County Wicklow, situated in a strategic location within the metropolitan area and at the eastern gateway to the County. The town is within easy commuting distance to Dublin City and surrounds via the N11 / M11 transportation corridor (including M50), DART/ rail line and quality bus service. The economic future of this core town is positive; this along with the population increase in Bray and its environs over the last ten years, suggests that the proposed residential development is in line with existing and emerging trends for the area. Compliance with Wicklow County Council and Dún Laoghaire-Rathdown County Council Development Plan Zoning and Site specific local objectives are discussed separately in the Planning Report, submitted as part of this application.

With regards to land-use, the proposed residential development is largely located in a zoned residential area with existing low-density housing. A small portion on the north of the site is located in lands zoned 'F' (open space). No residential development is proposed within the F zoned lands. Hard and soft landscaping only, in accordance with

the F zoning is proposed. Therefore, while the proposed development will result in a permanent change in land-use from a former golf course to residential, this change is consistent with existing and emerging development trends, and the current and draft WCC Development Plans and DLRCO County Development Plan (2022-2028).

The proposed development complies with the statutory land use zoning. There will be no severance of land, loss of rights of way, or impacts to existing connections or amenities as a result of the construction works associated with the proposed development.

The Site will temporarily be a construction Site. The construction phase of the proposed development will primarily consist of site clearance, excavation (and piling as required) and construction works, and has the potential to impact adversely and result in the temporary degradation of the local visual environment on a short-term basis. The visual impacts precipitated by the proposed development are assessed in greater detail in Chapter 5 - Landscape and Visual. Construction works will also halt the use of the site by casual walkers and dog walkers.

Secondary land use impacts include off-site activity in relation to building materials and appropriate disposal sites for removed spoil. Construction works are addressed in more detail in the Construction Environmental Management Plan (CEMP) (document ref.: 5214419DG0005) and Construction Resource and Waste Management Plan (RWMP) (document ref.: 5214419DG0011) prepared by Atkins Consulting Engineers.

The construction phase impacts on land use and settlement pattern will be short term in duration, limited in extent and slight in significance. In EIAR terms these are not significant.

#### 3.4.1.2. Demographics and Local Population

The construction phase is considered unlikely to result in a significant increase or decrease to the local population. Construction workers would be anticipated to travel from their existing residence as opposed to using temporary accommodation in the local area. There will, however, be a short term increase in the local working population during the construction phase of development.

The impact of construction on the local population is considered to be neutral, imperceptible and short term in nature, therefore the impact is not considered to be significant in EIAR terms.

#### 3.4.1.3. Economic Activity and Employment

A significant portion of the capital inputs required for construction will require the purchase of Irish sourced goods and services. The construction phase will provide a boost for the local construction sector in terms of employment generation and capital spend on materials and construction labour costs.

It is difficult to estimate the number of employees who will be engaged on a phased residential development such as this. It is expected that during peak activities, approximately 300 operatives will be working directly on the construction site. However for much of the construction period the level of operatives onsite shall be considerably less than this. The staff will comprise of managerial, technical, skilled and unskilled workers.

As far as practicable local labour or those construction workers already working in the immediate area will be employed. It is unlikely that the proposed development will increase the population of the area as a result of the construction phase.

In addition to direct employment, there will be off-site employment and economic activity associated with the supply of construction materials and provision of services such as professional firms supplying financial, architectural, engineering, legal and a range of other professional services to the project. There will also be induced employment arising from the spending of those employed directly and indirectly. The Transport Infrastructure Ireland document Transport Research & Information Note - The Employment Benefits of Investment Projects has provided estimates of employment effects arising from various types of construction projects including social housing. This effectively estimates that employment effects will be 56.3% direct, 30.4% indirect, and 13.3% induced.

There will be moderate short term positive effects arising in respect of economic activity and employment. In EIAR terms these are not significant.

#### 3.4.1.4. Local Services/Amenities

Specific potential for effects on local services / amenities are considered under the specific topics of the environmental media by which they might be caused including air, traffic and noise. It is envisaged that there will be no additional discernible impact on local services and amenities. Local businesses, such as retail food outlets may experience a slight positive impact arising from the increase in construction employment.

#### 3.4.1.5. Human Health

A Stage 1 Human Health screening assessment has been undertaken, in accordance with relevant UK guidance (UK DH, 2010) based on five key screening criteria. The construction and operation of the proposed residential development will not negatively impact on mental health and wellbeing, will not negatively impact on social,

economic and environmental living conditions that would indirectly affect health, will not affect an individual's ability to improve their own health and wellbeing, will not result in a change in demand for or access to health and social care services, and will not have an impact on global health.

Potential impacts on human health have also been considered in the context of valid environmental pathways and associated transport mechanisms, using the risk-based approach advocated by the EPA (2022). Refer to the Source-Pathway-Receptor (S-P-R) preliminary conceptual model for human health assessment presented in Table 3-11.



**Table 3-11 - Preliminary S-P-R Model for Human Health Assessment**

Source	Pathway (and transport mechanism)	Potential Human Health Receptors	Plausible Health Impact?
Dust Emissions	Dust emissions (inhalation)	<ul style="list-style-type: none"> <li>→ New Residents (onsite)</li> <li>→ Crèche, café, commercial users (onsite)</li> <li>→ Maintenance Workers (onsite)</li> <li>→ Construction Workers (onsite)</li> <li>→ Existing residents (offsite)</li> <li>→ Existing School campus users (offsite)</li> </ul>	Yes. Mitigation measures required. Refer to Chapter 6 – Air Quality and Climate.
Fuel / Chemical Spills / Leaks	Soil (direct contact, ingestion, volatilisation)	<ul style="list-style-type: none"> <li>→ New Residents (onsite)</li> <li>→ Crèche café, commercial users (onsite)</li> <li>→ Maintenance Workers (onsite)</li> <li>→ Construction Workers (onsite)</li> </ul>	Yes. Mitigation measures required. Refer to Chapter 9 – Land, Soils and Geology.
	Surface water (direct contact)		No (Refer to Chapter 10 - Water)
	Groundwater (direct contact, ingestion)		No (Refer to Chapter 10 - Water)
Baseline Soils (naturally occurring Barium)	Soil (ingestion)	→ New Residents (onsite)	Yes. Mitigation measures required. Refer to Chapter 9 – Land, Soils and Geology.
Storm Water Discharge	Attenuated storm water (direct contact)		No (Refer to Chapter 10 - Water)
	Surface Water (direct contact)		No (Refer to Chapter 10 - Water)
Noise Emissions	Noise emissions	<ul style="list-style-type: none"> <li>→ New Residents (onsite)</li> <li>→ Crèche, café, commercial users (onsite)</li> <li>→ Maintenance Workers (onsite)</li> <li>→ Construction Workers (onsite)</li> <li>→ Existing residents (offsite)</li> <li>→ Existing School campus users (offsite)</li> </ul>	Yes. Mitigation measures required. Refer to Chapter 7 – Noise and Vibration.

The following plausible impacts to human health have been identified during the construction phase:

- Potential risk to receptors (i.e. construction workers, onsite and offsite residents, and existing school users) through inhalation of dust emissions;
- Potential risk to receptors (i.e. construction workers) through direct contact, ingestion or inhalation with any soils which may potentially contain low level hydrocarbon concentrations from Site activities (potential minor leaks and spills of fuels, oils and paint);
- Potential risk to i.e. construction workers, onsite and offsite residents, and existing school users) through noise emissions; and,
- Potential risk to receptors (i.e. new residents) through ingestion of naturally occurring barium in soils in two localised hotspots in the vicinity of the proposed housing / duplex units.

Construction impacts are likely to be short term and will be subject to control through a CEMP. The construction methods employed and the hours of construction proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced. Accordingly, no significant human health impacts are likely to arise during the construction phase of the proposed development.

#### 3.4.1.6. Risk of Major Accidents or Disasters

There is always the possibility of unplanned events (including traffic / machinery accidents, fire, collapse / equipment failure and spill / leaks of fuel, chemicals or paint) occurring during the construction phase of a development of this scale given the type of work being carried out. However, the potential human health risk will be reduced and managed through the implementation of mitigation measures as detailed further in Section 3.5.

The construction phase impacts on human health will be short term in duration, limited in extent and not significant.

### 3.4.2. Operational Phase

#### 3.4.2.1. Land Use and Settlement Pattern

The proposed development complies with the statutory land use zoning and national (National Planning Framework), regional (Regional Spatial and Economic Strategy) policy supporting the provision of additional housing. The proposal is also consistent with National Planning Framework policy supporting the better use of under-utilised sites in accessible urban locations benefitting from public transport and other facilities. Currently, use of the site is largely limited to use by walkers and dog walkers. There will be no severance of land, loss of rights of way or amenities as a result of the proposed development. The proposed development facilitates connections through the railway underpass thereby enhancing connectivity to the waterfront. Pedestrian, cyclist and vehicular connectivity to the town centre is provided via the Fran O'Toole Bridge and to the north, pedestrian and cyclist connections to Corke Abbey Valley Park are provided. The boardwalk connecting with the People's Park to the west will be readily accessible from the Site. The operational phase of the proposed development will provide residential accommodation land use which will provide much needed housing for the growing population of the immediate area. A significant quantity of open space consisting of recreational and amenity space is also proposed, underpinning healthy communities.

The provision of a residential community with supporting ancillary facilities and retail and café facilities as proposed will have a moderate, positive effect of permanent duration on land use and settlement.

#### 3.4.2.2. Demographics and Local Population

Once the development has been constructed and is occupied, the most significant impact will be the resident population increase. The proposed development of 586no. units can be expected to accommodate ca. 1,500no. people (based on an average household size of 2.5 as advocated by the Project Ireland 2040 - National Planning Framework). An increase in the population of Bray accords with its designation as a 'Key Town' in the Regional Spatial and Economic Strategy.

#### 3.4.2.3. Economic Activity and Employment

The constrained housing supply has been identified as a potential threat to the competitiveness and economic growth of the Greater Dublin Area. The proposed apartments represent a small increase in overall housing supply and as such contributes positively to economic activity.

There will also be a modest number of people directly employed in the proposed childcare facility, retail unit, café, commercial units and general management operatives.

The future resident population will generate additional spending within the area which will likely have a long-term moderate positive impact on economic activity within Bray. The new residential and working population will have a local permanent moderate impact on economic activity and employment.

#### 3.4.2.4. Local Services/Amenities

The proposed development includes a childcare facility, retail / commercial units, shared residential services, landscaped public spaces, play facilities and enhanced pedestrian links to Bray town centre, the seafront and Corke Abbey Valley Park. The provision of these facilities within the development will be of benefit to future residents and existing residents in the local environs.

The Childcare Demand Analysis report that accompanies this application concludes that the proposed development proposes childcare places in excess of the demand generated by the proposed development.

The School Demand & Concentration report that accompanies this application concludes that there will be sufficient capacity to accommodate students generated by the proposed development, particularly in an overall context of projected future declining demand for school places.

There are significant local health services available to serve the proposed development which facilitate the planned population growth.

The increased population shall have a positive impact on retail shops and services located in Bray through an increase in turnover arising from a larger customer base

The proposed open space and recreational provision including new cycle links, pedestrian walkways and playgrounds will help provide a high quality residential environment with provision for exercise and play and will be a valuable amenity and cultural resource to surrounding residential areas. Such provisions shall also promote psychological comfort, aesthetic pleasure and a sense of belonging and civic pride.

The overall effect is considered to be positive, not significant and long-term in duration.

#### 3.4.2.5. Human Health

The operational stage of the development is unlikely to precipitate any significant impacts in terms of human health. The design of the proposed development has been formulated to provide for a safe environment for future residents and visitors alike. The paths, roadways and public areas have all been designed in accordance with best practice and the applicable guidelines. Likewise, the proposed residential units and commercial units accord with the relevant guidelines and will meet all relevant safety and building standards and regulations, ensuring a development which promotes a high standard of health and safety for all occupants and visitors.

The proposed development incorporates design principles such as shared surfaces and a layout which prioritises walking and cycling, providing links to Bray town centre, the seafront, Corke Abbey Valley Park local park and existing and planned high capacity public transport links therefore has the potential to positively impact on population and human health.

As indicated in the SPR model in Table 3-11 the following plausible impact to human health has been identified during the operational phase:

- Potential risk to receptors (i.e. new residents) through ingestion of naturally occurring barium in soils in two localised hotspots in the vicinity of the proposed housing / duplex units.
- A moderate negative permanent impact on human health, associated with the current soil conditions beneath localised portions of the Site has been identified during the operational phase.
- The proposed development will have a slight positive permanent impact on mental health and wellbeing during the operational stage through the provision of pedestrian and cyclist facilities, open space and crèche.

#### 3.4.2.6. Risk of Major Accidents or Disasters

In the case of unplanned events occurring within the development while operational, key potential risks considered include the following:

- Significant traffic accidents (and associated spills);
- Risk of onsite / offsite flooding;
- Risk of onsite fire / emergency;
- Risk of onsite landslides; and,
- Risk of onsite building collapse or equipment failure.

With regards to the potential for traffic accidents, all vehicular, cyclist and pedestrian routes, along with the internal and external road layouts have been carefully designed in order to reduce any potential for traffic accidents / collisions. Thus, the risk of significant traffic accidents (and associated spills) is considered to be low during the operational phase of this development.

A detailed 'Flood Risk Assessment', prepared by Atkins (2022) (document ref.: 5214419DG0019) for the proposed development is included in Appendix 10.1 and makes the following conclusions:

*'In accordance with the planning guidelines, flood risk identification was carried out as required to identify if there are any flooding or surface water management issues related to the proposed development site that may warrant further investigation. Following the flood risk identification, it was determined that the primary flood risks identified for the proposed development site are both fluvial and tidal/coastal flooding. It was considered that insufficient quantitative information was available as part of the screening exercise and therefore a detailed and robust analysis of the fluvial flooding and tidal/coastal regime at and in the vicinity of the proposed development site was required.*

*A detailed hydrological analysis was undertaken of the River Dargle in order to identify the predicted 1 in 100 year (1% AEP) and 1 in 1000 year (0.1% AEP) flood events in the vicinity of the proposed development site. In addition, the predicted 1 in 200 year (0.5% AEP) and 1 in 1000 year (0.1% AEP) tidal flood levels have been analysed in the vicinity of the site.*

*This detailed analysis of the Fluvial and Tidal/Coastal flooding was carried out as outlined above and it was determined that no 'highly vulnerable' development is proposed within the delineated Flood Zone 'B'. The proposed open space (park) area within the south of the Coastal Quarter Development site shall flood during the fluvial 1 in 100 year and 1 in 1000 year event along with the tidal 1 in 200 year and 1 in 1000 year flood events. This open space area is however deemed 'water compatible' in line with the guidance outlined by the Dept. of the Environments guidelines for planning authorities 'The Planning System and Flood Risk Management' and therefore may flood in these low frequency storm events.*

*The proposed 'less vulnerable' main access road and Market Square area are proposed to be located within the footprint of Flood Zone B however, the limited volume of displaced flood water resultant from this will be catered for within the proposed southern open space (park) area within the Coastal Quarter Development.*

*Due to the location of the proposed development adjacent to and partially within a flood zone a Justification Test was carried out in line with the criteria outlined by the Dept. of the Environments guidelines for planning authorities 'The Planning System and Flood Risk Management'. This Justification Test satisfied the required criteria and therefore determined that there is no residual risk of flooding to the proposed Coastal Quarter Development except for that which is planned (during the fluvial 1 in 100 year and 1 in 1000 year event along with the tidal 1 in 200 year and 1 in 1000 year flood events) within the south of the subject site in the open space area. In addition, the proposed development does not pose an increased flood risk to people or the surrounding property outside of the applicant's landholding.*

*The Finished Floor Levels (FFL) of the proposed units within the Coastal Quarter development have been set at a minimum level of 6.10mOD. A freeboard of 2.131m above the peak 0.1% AEP flood level has been provided which is significantly higher than the minimum freeboard requirement of 500mm. The level of flood protection also provided by the recently constructed River Dargle Flood Defence Scheme mitigates the level of flood risk to people, property and the urban environment*

*In summary, the development as proposed shall not result in an adverse impact to the existing hydrological regime of the area nor increase flood risk to areas outside of the landowners' holdings, nor create unacceptable levels of flood risk within the proposed development and is therefore considered to be appropriate from a flood risk perspective.'*

In addition, the potential cumulative impacts with regards to flood risk from the proposed development, particularly in the context of the proposed Harbour Point Masterplan, were reviewed by IE Consulting Ltd. who concluded that *'While the Masterplan concept design for the Lands outside of the subject site has considered the relevant information, any future application and development of these Masterplan Lands will be subject to a stand-alone Stage 3 Flood Risk Assessment including a Justification Test in consultation with Wicklow County Council....The remaining portion of the Masterplan lands will be progressed in tandem with the stand alone Stage 3 FRA noted above to ensure that there will be no increased risk of flooding to the Coastal Quarter Development. The design will also ensure that there will be no increased flood risk to any other existing adjacent developments or properties. The building positions and their levels above ground will be such that they will facilitate an overland flow route, and will not impact on the function of the emergency storm outlets on the northern flood defence wall.'* Refer to the technical note presented in Appendix 10.4 (IE Consulting Ltd., 2022).

Accordingly, the risk of onsite or offsite flooding associated with the proposed development has been fully addressed and will not result in any significant environmental or human health risks during the operational phase. The potential future risk of impact to the proposed development caused by rising sea levels associated with climate change is considered to be low based on the site topography, and the findings of the site-specific flood risk assessment report (Atkins, 2022) which takes into account climate change.

Regarding the risk of onsite fire or emergency, fire assembly points will be clearly marked throughout the development. Permanent 24-hour emergency access and egress to the development will be provided. The proposed access road leading into the proposed development is located above the maximum flood level and therefore, in the unlikely event of flooding it will have no impact on the primary emergency access route. A proposed secondary emergency access route has also been indicated in Chapter 8 - Traffic. This secondary emergency access route road would comprise an unsealed road and has been identified as a route to be used by emergency vehicles to access the development in a rare event when the primary access route may be potentially impassable. This secondary emergency access route is located within the extents of the existing 1 in 1000-year (0.1% AEP) fluvial flood extents, it is noted that this flood event is a very low frequency event. The probability that the secondary emergency access route would be required due to the primary emergency access being impassable at the same time as a 1 in 1000-year (0.1% AEP) flood event is considered to be a very low probability event and therefore highly unlikely. Therefore, based on this, the secondary emergency access route is deemed acceptable from a flood risk perspective. As noted previously, Bray Garda Station is located ca. 1km south of the Site with Bray Fire Station located ca. 2.2km south west of the Site. The proposed development will be designed, constructed and maintained in accordance with all relevant statutory building and fire safety requirements.

With regards to the potential risk of landslides or building collapse, there is no evidence of significant historic landslides in the vicinity of the proposed development. The proposed development will be designed, constructed, certified and maintained in accordance with all relevant statutory building and health and safety requirements. Accordingly, the risk of onsite building collapse or equipment failure is considered to be low.

## 3.5. Mitigation Measures

### 3.5.1. Construction phase

During the construction phase, all legal duties under the Construction Regulations (Safety, Health and Welfare at Work (Construction) Regulations 2013) will be adhered to. In accordance with these duties, a Project Supervisor Design Process (PSDP) will be appointed by the relevant contractor to co-ordinate the design effort and minimise the construction risks during the design period. In addition, a Project Supervisor - Construction Stage (PSCS) will be appointed to coordinate and supervise all safety aspects of the project.

The CEMP (document ref.: 5214419DG0005) for the project which accompanies this planning application, sets out the basic measures to be employed in order to mitigate potential negative effects during construction. This document represents a comprehensive approach to construction phase mitigation which in accordance with good practice, will be refined and added to as the project proceeds on Site. The CEMP includes the following with regard to population and human health.

*“A rodent and pest control plan will be put in place so as to manage and limit any potential disturbance to populations that may utilise the Site. The pest control plan will be in accordance with the Chartered Institute of Environmental Health’s “Pest minimisation Best practice for the construction industry” guidelines or a similar appropriate standard.”*

Procedures shall also be adopted to ensure that noise impacts from construction operations are minimised, to protect local amenity as detailed in Chapter 7 - Noise and Vibration. The proposed mitigation measures to minimise noise impacts during the construction phase are detailed in Section 7.7.1 in Chapter 7 – Noise and Vibration. Prior to the commencement of construction, the CEMP will be refined by the selected contractor prior to work commencing on Site.

The main purpose of a CEMP is to provide a mechanism for implementation of the various mitigation measures which are described in this EIAR and contained within the CEMP that accompanies this application under separate cover.

All personnel will be required to understand and implement the requirements of the CEMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.

There are a number of existing significantly scaled open spaces available for use by walkers and dog walkers in the local environs including, Bray Promenade and Beach, the People’s Park and Corke Abbey Valley Park.

Mitigation measures will be implemented during the detailed design, and construction phase, and are detailed in full in the following sections of this EIAR: Chapter 6 – Air Quality and Climate; Chapter 7 – Noise and Vibration; and Chapter 9 – Land, Soils and Geology.

Adherence to the construction phase mitigation measures presented in this EIAR will ensure that the construction of the proposed development will have an imperceptible and neutral impact in terms of health and safety.

### 3.5.2. Operational Phase

Mitigation measures will be implemented during the detailed design and construction phase, as described in full in Chapter 9 – Land, Soils and Geology, to remove the potential identified risk during the operational phase to human health receptors (i.e. new residents) through ingestion of naturally occurring barium in soils in two localised hotspots in the vicinity of the proposed housing / duplex units. Accordingly, no significant human health impacts are likely to arise during the operational phase of the proposed development.

There are a number of existing significantly scaled open spaces available for use by walkers and dog walkers in the local environs including, Bray Promenade and Beach, the People's Park and Corke Abbey Valley Park. In addition the operational site will provide new routes connecting existing public spaces for use by all along with proposed public open space.

## 3.6. Residual Impacts

Taking account of the nature and extent of the proposed development, detailed impact assessments which have been completed in respect of air quality and climate, noise and vibration, land soils and geology, traffic and water (presented in Chapter 6 to Chapter 10 respectively), analysis of childcare and school provision and proposed mitigation measures, no residual adverse impacts to population or human health are anticipated as a result of the proposed development. All identified potential key risks associated with unplanned events occurring have been evaluated, and do not pose an unacceptable risk to human health.

The overall impact on population and human health will be positive (ranging from slight to moderate) and permanent, as the proposed development will provide employment and will also benefit the local economy through spin-off activities and will provide high-quality housing at a sustainable level to the local community. The provision of onsite facilities, including pedestrian and cyclist facilities, high-quality amenity open space and child care facilities via a crèche, will also result in a positive contribution to the mental health and wellbeing of the residents and local amenity users.

## 3.7. Do Nothing Scenario

A do-nothing scenario would result in the subject lands remaining undeveloped and the potential for the delivery of key objectives of the 'MU' and 'A' land zonings would remain unrealised. National and regional policy is supportive of population growth in key towns and locations served by high capacity public transport. There is a significant opportunity cost associated with a failure to develop the subject site as follows:

- The local economy would not experience the direct and indirect positive effects of the construction phase of development, including employment creation;
- Under-utilisation of zoned and serviced suburban lands within a Key Town at a location served by existing and planned high level public transport services; and,
- Failure to provide residential development in a timely fashion at a time of acute housing scarcity.

The failure to provide housing at this location would:

- Encourage unsustainable development of greenfield lands more remote from high capacity public transport services;
- Have adverse effects on the character of the area. Anti-social behaviour is often associated with vacant sites and this could have a negative effect on the local population; and,
- Failure to deliver the proposed residential units would result in existing housing need and demand remaining unmet. The new pedestrian and cycle links, and public open spaces to be provided in the development and serving the wider area would also not be provided.

The positive impacts on the retail and services sector within Bray would also be foregone.

### 3.8. Monitoring Requirements

Measures to avoid negative impacts on population and human health are largely integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development.

Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Monitoring of compliance with Health and Safety requirements will be undertaken by the Project Supervisor for the Construction Process.

It is considered that the monitoring measures outlined in regard to the other environmental topics will ensure that the proposed development is unlikely to result in any adverse impacts in relation to population and human health.

## 4. Biodiversity

### 4.1. Introduction

Shankill Property Investments Limited are applying to An Bord Pleanála (ABP) for permission for a Strategic Housing Development comprising 586 no. residential units in a mix of apartments, duplex and houses, all associated and ancillary development and infrastructural works, hard and soft landscaping and boundary treatment works, associated car and bicycle parking spaces at surface and undercroft levels on the former Bray Golf Club lands in the administrative areas of Dún Laoghaire-Rathdown and Wicklow County Councils. It is proposed that 274 no. units will be located within the administrative area of Dún Laoghaire-Rathdown County Council and 312 no. residential units, a childcare facility, café, retail unit, and a commercial unit will be located within the administrative area of Wicklow County Council. The site is generally bounded to the north by existing public open space at Corke Abbey Valley Park, to the east by the Irish Rail Dublin-Rosslare main rail line, to the south by the River Dargle and to the west by the remains of the former golf course lands and the existing Ravenswell schools campus.

A Natura Impact Statement has also been prepared for the proposed project (Atkins document ref: 5214419DG0006) and accompanies this application. This should be read in conjunction with this ecological assessment.

In the context of this assessment 'Site' refers to the proposed development project in Bray. The approximate Site location and indicative application site boundary is presented in Figure 4-1.

### 4.2. Methodology

This assessment has been undertaken in accordance with and has regard to the following relevant guidelines, legislation, policies and plans: -

- EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Local Government and Heritage 2018);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018; 2022 reprint);
- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);
- A Guide to Habitats in Ireland. The Heritage Council. The Heritage Council (Fossitt, 2000);
- Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council, Church Lane, Kilkenny, Ireland (Smith et al., 2011);
- European Commission (EC) Habitats Directive 92/43/EEC;
- European Commission (EC) Birds Directive 2009/147/EC;
- European Communities (Birds and Natural Habitats) Regulations, 2011-2015;
- Flora (Protection) Order, 2022;
- EIA Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014;
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018);
- The Wildlife Act, 1976 (as amended);
- The Planning and Development Act, 2000 (as amended);
- Third National Biodiversity Action Plan 2017 – 2021 (Department of Culture, Heritage and the Gaeltacht, 2017);



- County Wicklow Biodiversity Action Plan 2010-2015.<sup>5</sup> Wicklow County Council;
- Dún Laoghaire-Rathdown County Biodiversity Action Plan 2021-2025
- Dún Laoghaire-Rathdown County Development Plan, 2022 – 2028;
- Wicklow County Development Plan, 2016 – 2022;
- Draft Wicklow County Development Plan 2022 - 2028
- Bray Head Special Amenity Area Order 2007 (Wicklow County Council 2007);
- Bray Municipal District Local Area Plan, 2018-2024;
- Planning for Watercourses in the Urban Environment. Inland Fisheries Ireland 2020; and,
- All-Ireland Pollinator Plan 2021-2025. National Biodiversity Data Centre.

Consultation was undertaken with National Parks and Wildlife Service (NPWS) via the Development Applications Unit (DAU) of the Department of Housing, Local Government and Heritage. Comments and responses were received on 15/03/2021. This assessment has been informed and developed by the responses received on nature conservation from NPWS.

This assessment has also been informed by the conditions and recommendations outlined in the ABP Inspector's Report ABP-311181-21. This assessment has also taken account of the comments received from ABP during the pre-application consultation for the proposed development.

The methodology used to carry out the various ecological surveys undertaken of the Site, to evaluate the ecological value and baseline ecological environment, and to prepare this impact assessment is outlined as follows.

#### 4.2.1. Desk Study

The locations of conservation sites, protected species occurrences and areas of ecological interest were reviewed in context of the Site using online sources such as Google Earth, Google maps<sup>6</sup> and Bing maps<sup>7</sup> (last accessed on 26/07/2022).

Sources of data including; published reports, records, datasets and on-line mapping, which were used to collate and compile information of ecological features of interest and importance within and around the Site include: -

- National Parks and Wildlife Service (NPWS) webpage / data;
  - Information on sites designated for nature conservation, including spatial data (NPWS);
  - Habitats and species data
  - Wildfowl Sanctuaries
  - Red List of Terrestrial Mammals (Marnell *et al*, 2019)
- National Biodiversity Data Centre (NBDC)
  - Protected species records
  - Invasive species records
- Environmental Protection Agency
  - Watercourses and lake spatial files
  - Water quality data
  - Corine land cover data
- Geological Survey of Ireland
  - Underlying geology, soils and hydrogeology
- Ordnance Survey Ireland (OSI) mapping and aerial photographs
- OSI Historic mapping
- Birdwatch Ireland

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<sup>5</sup> <https://www.wicklow.ie/Living/Services/Arts-Heritage-Archives/Heritage/Natural-Heritage/Biodiversity-in-Wicklow/Biodiversity>

<sup>6</sup> <https://www.google.ie/maps>

<sup>7</sup> <http://www.bing.com/maps/>

- Bird count data from the Irish Wetland Bird Survey (I-WeBS)
- Birds of Conservation Concern in Ireland (Gilbert *et al.* 2021)
- Bat Conservation Ireland
  - Bat monitoring data
- Wetland Survey Ireland
  - Information on identified wetland habitats within the study area
- Inland Fisheries Ireland (IFI) - Eastern River Basin District River Surveys<sup>8</sup>

Relevant planning information for the surrounding area was reviewed using the planning enquiry systems of Wicklow County Council and Dún Laoghaire-Rathdown County Council. Search criteria were implemented to determine whether such projects or plans would be relevant to this study and this information was used to determine potential cumulative impacts from other plans / projects with the proposed development.

A Natura Impact Statement (NIS) was prepared with respect to the proposed development project (Atkins, 2022) (document ref: 5214419DG0006). The purpose of an NIS is to assess the implications of the proposed development for European sites / Natura 2000 sites. The NIS details avoidance and mitigation measures which will be implemented to eliminate any adverse effects on the integrity of European sites.

#### 4.2.2. Zone of Influence

The ‘*zone of influence*’ for a project is the area over which ecological features may be subject to significant effects because of the proposed project and associated activities. This is likely to extend beyond the project Site, for example where there are ecological or hydrological links beyond the Site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

It follows that given the nature of the proposed development at Bray, the zone of influence will be limited to the Site and immediate environs as well as areas connected via hydrological and hydrogeological pathways (surface or ground water) and landscape features such as hedgerows, treelines and watercourses.

Determining the potential for impacts and the zone of influence is based on the source-pathway-receptor chain principle and involves assessing likely significant effects on ecological receptors within the zone of influence in relation to three pathways:

- Surface water;
- Groundwater; and,
- Land & Air.

#### 4.2.3. Ecological Field Surveys

The Site was visited by Colin Wilson on 27<sup>th</sup> February, 16<sup>th</sup> July and 14<sup>th</sup> August 2020 and 21<sup>st</sup> July 2022. These site walkover surveys informed the scope of this assessment. Surveys were undertaken within the Site and also across the wider landscape including all the Harbour Point Masterplan lands, Rathmichael Woods to the north of the Site and scrublands to the east of the railway line / east of the Site.

During the course of both the winter and summer walkover surveys the Site was evaluated for the presence of and suitability for birds, mammals, amphibians and insect groups such as lepidoptera and hymenoptera. Incidental sightings of species were noted during the walkover survey to further evaluate the importance of the Site to flora and fauna in line with the approach set out in the *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018, 2022 reprint). The Site evaluation was also used to inform the need for any targeted / specialist ecological surveys.

In line with published guidance on ecological surveying techniques (NRA, 2009; CIEEM, 2018, 2022 reprint), a winter site visit was carried out during February 2020 to check the Site for the presence of terrestrial mammals. The Site was further visited during July 2020 and July 2022 to target protected terrestrial mammal species, such as badgers. During the February 2020 site visit the vegetation on-site had died back significantly making evidence of mammal refugia (e.g. badger setts) more easily observed. During the summer (2020, 2022) when mammals, such as badgers, are more active in the Site and immediate environs, all hedgerows and treelines were surveyed for any evidence of mammal activity such as trails, foraging signs, territorial marking, latrines, snagged hairs or paw prints. Incidental observations of terrestrial mammal activity were also provided by Dr Tina Aughney following dawn and dusk bat surveys.

<sup>8</sup> <http://wfdfish.ie/index.php/category/river-surveys-2017/>

A Phase 1 habitat survey was undertaken during 16<sup>th</sup> July and 14<sup>th</sup> August 2020 in line with published best practice (Smith *et al.*, 2011), with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000). Dominant plant species in each habitat type were recorded. Plant nomenclature follows the *Botanical Society of Britain and Ireland's List of Accepted Plant Names* (BSBI, 2019).

During all Site visits, invasive species noted while on Site were also recorded. Incidental sightings of birds, mammals, invertebrates and amphibians were noted during site visits to further evaluate the importance of the Site to flora and fauna (in line with the approach set out in the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017).

A number of Special Protection Areas for birds (SPAs) in the wider landscape support wintering bird species which can travel significant distances from their associated SPA. The site visits during both summer 2020 and 2022 and winter during 2020 therefore also assessed the Site for its potential to provide roosting or feeding opportunities for such species (e.g. field-feeding waders or geese).

Dr Tina Aughney was commissioned by Atkins to undertake bat surveys for the Site in line with published best practice. The Site was surveyed for evidence of bat activity during 12<sup>th</sup> and 15<sup>th</sup> July and 6<sup>th</sup> and 7<sup>th</sup> August 2020. Bat surveys were completed to assess the Site for evidence of roosting, feeding and commuting bats and included Tree Potential Bat Roost (PBR) Surveys, Static Detector Surveys, Dusk and Dawn Bat Surveys, Walking Transects and Building Inspections. The landscape value for bats was also considered (after e.g. Entwistle *et al.*, 2001; etc.), while lighting proposals were also reviewed. Full details of the bat survey are provided in the Bat Assessment Report included within Appendix 4.1.

Independent Tree Surveys were commissioned by Atkins to undertake a survey of the significant trees within the Site boundaries. The survey was compliant with BS 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*. Surveys included and recorded; tree species, height, stem diameter, crown spread, height of crown clearance, age class, physiological and structural condition, management recommendations, estimated remaining contribution in years, BS 5837 retention category and root protection areas. Tree surveys were undertaken during June 2020 and March 2021. A supplementary tree survey was undertaken in 2022 (APB Treecare Ltd., 2022).

During 16<sup>th</sup> July and 14<sup>th</sup> August 2020 and 21<sup>st</sup> July 2022 the hedgerows, trees and treelines within the Site were also assessed for signs of nesting bird activity. Bird activity was recorded on the Site during the course of each site visit.

The surveys undertaken are considered to be sufficient to provide an ecological appraisal of the Site in the context of the proposed development.

#### 4.2.4. Evaluation of Ecological Receptors

Ecological features can be important for a variety of reasons. Importance may relate, for example, to the quality or extent of the site or habitats found within, or the rarity of the habitat and / or species, the extent to which such habitats and / or species are threatened throughout their range, or to their rate of decline<sup>9</sup>.

The importance of an ecological feature was considered within a defined geographical context. The frame of reference used to determine ecological value relied on known and published accounts of the feature's ecological importance, rarity and distribution combined with professional judgement.

The following geographic frame of reference was used for evaluating the importance of ecological features within the Site: -

- International importance;
- National importance;
- County importance;
- Local importance (higher value); and,
- Local importance (lower value).

The geographical context for determining the value of ecological receptors followed recommendations as outlined in the *Guidelines for Assessment of Ecological Impacts of National Roads Scheme* (NRA, 2009). This methodology is consistent with the *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018, 2022 reprint).

<sup>9</sup> NRA's Guidelines for Ecological Impact Assessment of National Road Schemes (NRA, 2009), *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland* (CIEEM 2018).

#### 4.2.5. Determining Ecological Significant Effects

CIEEM (2022) defines an ecologically significant impact as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographic area.

The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified (CIEEM, 2022). The significance of predicted effects has been assessed in line with *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) and best scientific knowledge in the field. The evaluation of significant effects should always be based on the best available scientific evidence. If sufficient information is not available, further survey or additional research may be required. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect should be assumed. Where uncertainty exists, it must be acknowledged in the EclA.

#### 4.2.6. Mitigation & Overall Residual Ecological Impact

Where significant impacts have been identified, the mitigation hierarchy has been considered, as suggested in the 2018 CIEEM EclA Guidelines and 2022 EPA Guidelines, which sets out a sequential approach of avoidance of impacts where possible, application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied, along with any necessary compensation measures, and opportunities for enhancement incorporated, residual impacts have then been identified.

Overall residual, or mitigated, ecological effects are assessed by taking account of any expected beneficial ecological effects and those measures which have been integrated within the development proposals in order to avoid, eliminate or reduce the significance of ecological impacts (and any further recommended measures which attach a high probability of successful implementation). The following widely accepted strategy for mitigation (Chapter 6 of the CIEEM Guidelines) has been employed (see Table 4-1).

**Table 4-1 - Approach to Mitigation**

Avoidance	Where viable, the project has been re-designed to avoid adverse ecological effects.
Elimination	Where possible and feasible, measures which eliminate adverse ecological effects are employed.
Reduction	Measures intended to reduce the significance of adverse ecological effects are employed where options for avoidance or elimination have been exhausted or are deemed to be impractical.
Compensation	Where adverse ecological effects cannot be avoided or eliminated or reduced in significance to an acceptable level, consideration is given to compensating for residual adverse effects.
Remediation	Where adverse ecological effects are unavoidable, consideration is given to undertaking limiting remedial works.
Enhancement	Consideration is given to providing opportunities for ecological improvement, enhancement and the realisation of beneficial ecological effects.

#### 4.2.7. Uncertainty in Assessment

In Impact Assessment, uncertainty is associated with both the prediction and assessment of environmental effects. The precautionary principle, a central feature of environmental legislation, planning policy and professional guidance, provides a mechanism for managing uncertainty in ecological assessment – the precautionary principle requires that where there is a lack of full scientific certainty, the protection of the environment is prioritised.

Where confidence or uncertainty is expressed, an objectively defined scale, as detailed in Table 4-2<sup>10</sup> is employed. Decisions as to confidence in predictions are necessarily based primarily on expert judgement.

<sup>10</sup> The confidence levels employed were originally set out in an earlier (2006) version of the CIEEM guidelines, have been adapted and reproduced in several other guidance documents since then, and are widely applied and accepted in Ecological Impact Assessment.

**Table 4-2 - Confidence & Uncertainty**

Confidence Level	Details
Certain	Probability estimated at 95% chance or higher.
Probable	Probability estimated at above 50% but below 95%.
Unlikely	Probability estimated at above 5% but below 50%.
Extremely Unlikely	Probability estimated at less than 5%.

#### 4.2.8. Appropriate Assessment (AA)

The proposed development has been subject to the Appropriate Assessment process. Details of the assessment are provided for in the accompanying Natura Impact Statement (Atkins, 2022) (document reference: 5214419DG0006).

#### 4.2.9. Difficulties Encountered in Completion of this Chapter

No difficulties were encountered in completing survey work to inform this ecological assessment. Habitat surveys, terrestrial and volant mammal surveys were undertaken during the seasonally appropriate times of year. Datasets of species records was sought from and provided by the NPWS (last data received 19/07/2022). Datasets were sought from and provided by BirdWatch Ireland for I-WeBS high tide waterbird survey records in the coastal waters of Bray Harbour count site; 0T907. The latest and most up-to-date available I-WeBS data is for the winter periods 2017/18 and 2018/19 (the last data request was submitted to BirdWatch Ireland on 19/07/2022).

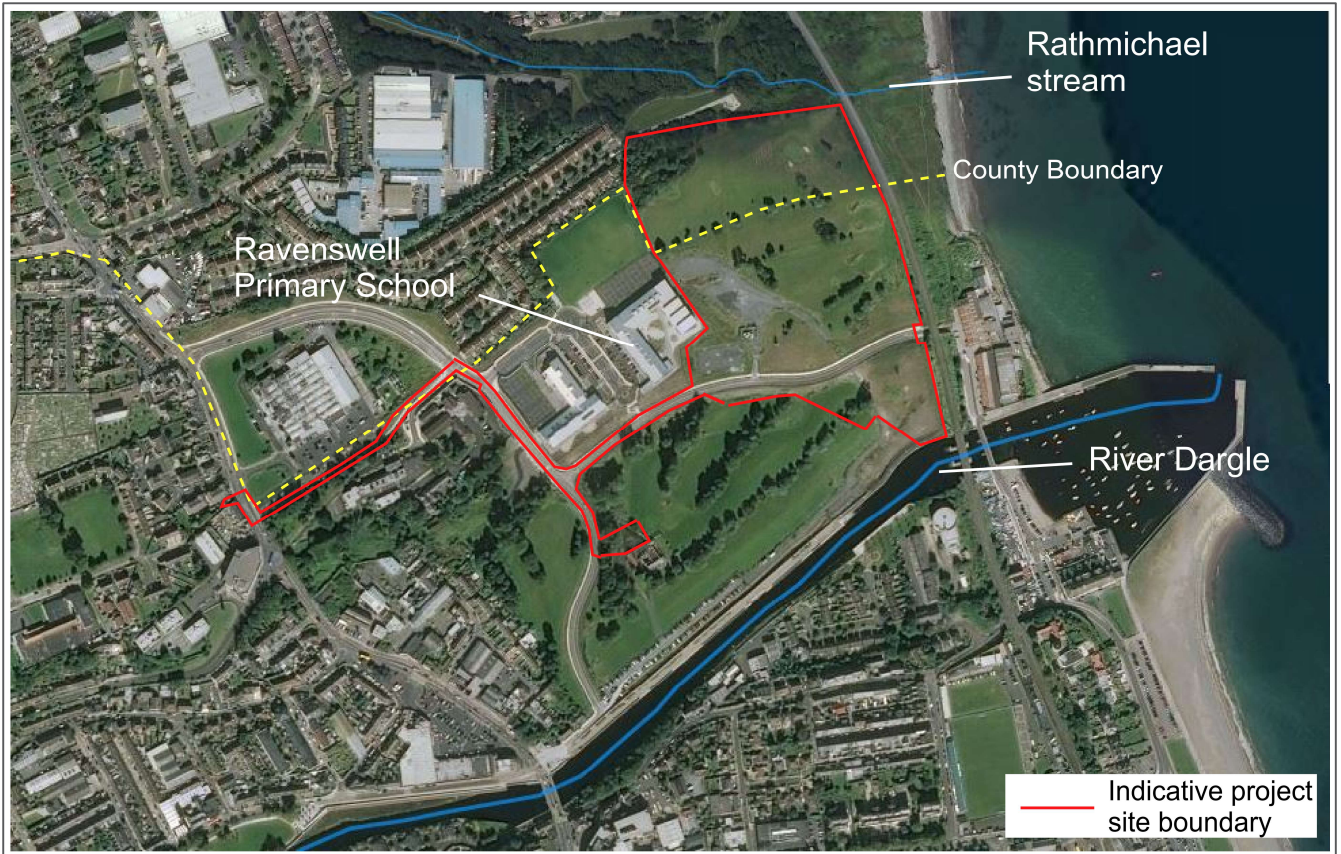
### 4.3. Description of Existing Environment

#### 4.3.1. General Description of Existing Environment

The Site for the proposed development is located largely on lands formerly used as a golf course (Bray Golf Course). The Site is largely greenfield in nature with mature and semi mature trees scattered throughout. The Site is located within the functional areas of two separate local authorities, namely Dún Laoghaire-Rathdown County Council (DLRCC) and Wicklow County Council (WCC).

The project Site is bordered to the south by former Bray Golf Club lands and the River Dargle which flows in an easterly direction outfalling to the Irish Sea in Bray Harbour ca. 50m from the southeast extent of the Site. This stretch of the river has been subject to flood alleviation works and the banks of the river have been recently developed into a formalised promenade and public amenity space. To the north of the Site the Rathmichael Stream flows in an easterly direction through wooded and grassland areas which have formalised public pathways throughout. To the east the Dublin to Rosslare railway line forms a continuous border for the entirety of the Site. The west boundary of the Site is dominated by school buildings and associated sports pitches.

The former Bray Golf Club lands have been subject to recent development in certain areas between 2016-2018. Ravenswell Primary School along with associated sports / recreational areas have been constructed on a ca. 5 ha site. Significant infrastructural works were also undertaken with a new road network in situ providing two main access routes, a Northern Access Route which borders the eastern and northern boundaries of the Industrial Yarns site and a Southern Access Road which facilitates access via the Upper Dargle Road. The Site, new school and new road network is shown in Figure 4-1 below along with the location of watercourses to the south and north.



**Figure 4-1 - Site Location**

### 4.3.2. Designated Conservation Areas

#### 4.3.2.1. European Designated Sites

The potential for impacts on European sites within the ‘zone of influence’ (Zoi) of the proposed Site was considered. Full details of the assessment are outlined in the accompanying Natura Impact Statement (Atkins, 2022) (document ref: 5214419DG0006). The Zoi for a project is the area over which ecological features may be subject to significant effects as a result of the development project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the Site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

A distance of 15km has been recommended in the case of plans, as a potential zone of influence and this distance is derived from UK guidance (Scott Wilson *et al.*, 2006). However, for projects the distance could be much less, and in some cases less than 100m. NPWS guidance<sup>11</sup> advises that this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

Thus, given the nature, scale and extent of the mixed use development project in Bray, the Zoi includes European sites with regard to the location of a European site, the Qualifying Interests of the site and their potential mobility outside that European site, the Cause-Pathway-Effect model and potential environment effects of the project.

The proposed project does not lie within any European site.

There are 13 no. European sites within the potential Zoi of the development project; 9 no. Special Areas of Conservation (SACs) and 4 no. Special Protection Areas (SPAs) for birds, as outlined in Table 4-3 below.

<sup>11</sup> DoEHLG (2009) *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*. Department of the Environment, Heritage and Local Government, Dublin,.

**Table 4-3 - European sites with potential Zol of the proposed Site.**

European Site (site code)	Distance from Works
Bray Head SAC (000714)	ca. 1.7km
Ballyman Glen SAC (000713)	ca. 2.2km
Knocksink Wood SAC (000725)	ca. 4.1km
Rockabill to Dalkey Island SAC (003000)	ca. 4.1km
Glen of the Downs SAC (000719)	ca. 7km
Wicklow Mountains SAC (002122)	ca. 7.5km
South Dublin Bay SAC (000210)	ca. 10km
The Murrrough Wetlands SAC (002249)	ca. 11km
Carriggower Bog SAC (000716)	ca. 11.3km
Dalkey Islands SPA (004172)	ca. 6.4km
Wicklow Mountains SPA (004040)	ca. 7.7km
South Dublin Bay and River Tolka Estuary SPA (004024)	ca. 10km
The Murrrough SPA (004186)	ca. 12.1km

The nearest European site is Bray Head SAC which is located along the coastline ca. 1.7km south of the project Site. There is no direct connectivity from the project Site to Bray Head SAC or any other European site via woodlands, treelines or any other vectors.

The proposed Site is bordered to the south by the River Dargle which outfalls to the Irish Sea. Given that a number of the European sites within the potential zone of influence of the project are coastal or marine in nature, hydrological connectivity exists from the proposed Site to the coastal and marine SACs/SPAs via the River Dargle and on through the Irish Sea.

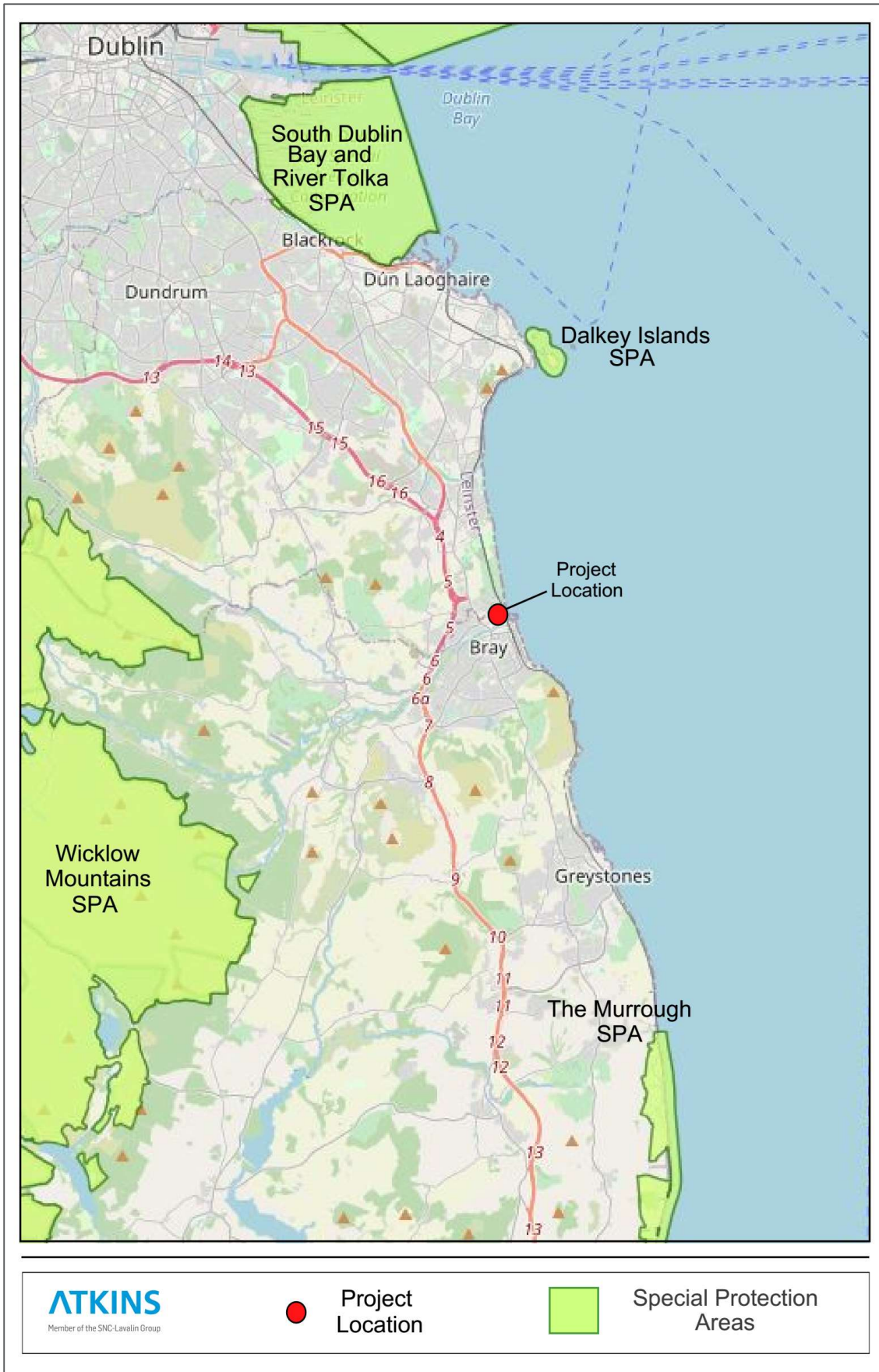
The closest European sites with connectivity via the Irish Sea are: Bray Head SAC (ca. 1.7km), Rockabill to Dalkey Island SAC (ca. 4.1km) and Dalkey Islands SPA (ca. 6.4km). As detailed in the Natura Impact Statement, mitigation measures will be employed during the construction and operational phases of the proposed development project to ensure construction activities and discharges from the proposed development do not affect the water quality of the River Dargle or the Irish Sea. Given that mitigation measures will be employed and given the dilution and dispersal that will occur within the Irish Sea, no impacts on any European sites are anticipated from either the construction or operation of the proposed development.

Figures 4-2 and 4-3 depict the locations of the European Sites within the potential Zol of the proposed development project.



Figure 4-2 - SACs within 15km of project location (Map source: EPA, 2022).





**Figure 4-3 - SPAs within 15km of project location (Map source: EPA, 2022).**

#### 4.3.2.2. Natural Heritage Areas

Natural Heritage Areas (NHAs) are nationally designated sites, which are considered important for the habitat, species or geological heritage. NHAs are legally protected under the Wildlife Act, 1976 (as amended). Proposed Natural Heritage Areas (pNHAs) are sites that are of significance for wildlife and habitats, but which have not (as yet) been statutorily designated; however, their ecological value is recognised by Planning and Licencing Authorities.

The proposed project does not lie within any NHA or pNHA site.

There are no NHAs and 9 no. pNHAs located within 5km of the proposed project as outlined in Table 4-4 below.

**Table 4-4 - proposed National Heritage Areas within 5km of the Site**

proposed National Heritage Area (site code)	Distance from project
Bray Head (000714)	ca. 1.7km
Ballyman Glen (000713)	ca. 2.2km
River Dargle Valley (001754)	ca. 3.5km
Loughlinstown Wood (001211)	ca. 3.7km
Dalkey Coastal Zone and Killiney Hill (001206)	ca. 4.0km
Knocksink Wood (000725)	ca. 4.1km
Powerscourt Wood (001768)	ca. 4.7km
Kilmacanoge Marsh (000724)	ca. 4.7km
Great Sugar Loaf (001769)	ca. 5km

There is no direct connectivity from the project site to Bray Head pNHA or any other proposed Natural Heritage Area via physical means such as woodlands, treelines or hedgerows.

There is no direct or indirect connectivity from the project site to any of the inland pNHA sites, namely; Ballyman Glen, River Dargle Valley, Loughlinstown Wood, Knocksink Wood, Powerscourt Wood or Great Sugar Loaf.

Indirect hydrological connectivity exists from the Site to the 2 no. coastal and marine pNHA sites via the River Dargle and on through the Irish Sea. Bray Head is the closest pNHA site (ca. 1.7km) with hydrological connectivity via the Irish Sea. Given the dilution and dispersal that would occur within the Irish Sea, this hydrological connectivity is not considered a viable pathway through which any of the coastal pNHA sites could be impacted. As such it is considered there is no viable indirect connectivity through surface water features, drains or any other vectors from the Site to any proposed Natural Heritage Area.

Figure 4-4 illustrates the locations of the pNHAs within 5km of the Site.

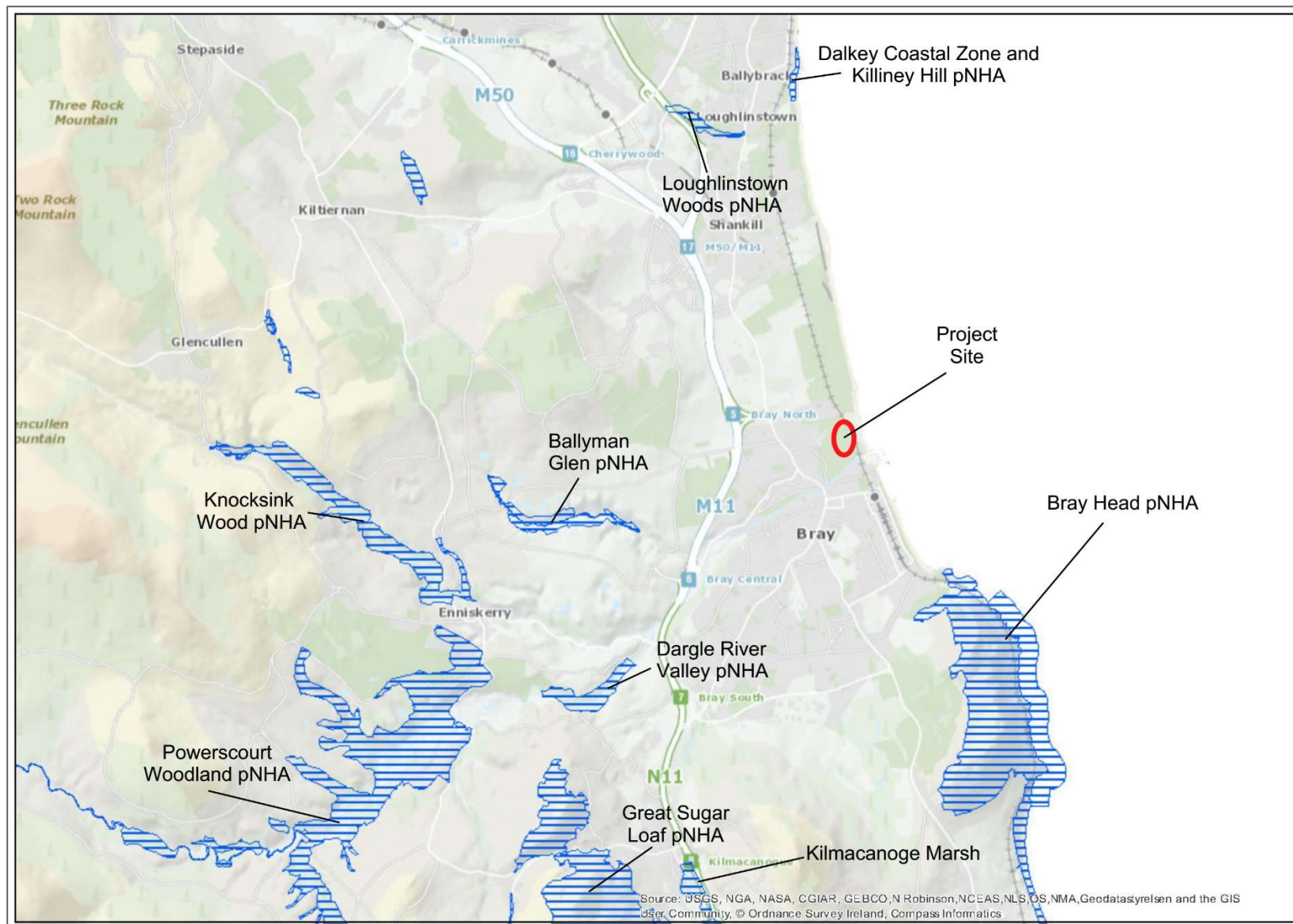


Figure 4-4 - pNHAs within 5km of the project site (Map source: NPWS, 2022).

#### 4.3.2.3. Other known sites of ecological value

There are no National Parks or National Nature Reserves within the immediate vicinity of the Bray project site. Wicklow Mountains National Park is ca. 7.9km from the Site. Knocksink Nature Reserve and Glen of the Downs Nature Reserve are ca. 4.4km and ca. 7.2km from the Site, respectively. There is no direct or indirect connectivity from the Site to any National Parks or Nature Reserves.

Habitats outside of Natura 2000 Sites but which conform to types listed on Annex I to the Habitats Directive were examined using the Article 17<sup>12</sup> reports (2019) and spatial data from the NPWS. There are no annexed habitats within or in the vicinity of the project site.

A review of wetland sites, as provided by Wetland Survey Ireland datasets<sup>13</sup>, did not identify any wetlands within or adjacent to the project site. There are no wetland sites within the project site designated under the Convention of Wetlands, i.e. Ramsar Sites.

A review of datasets for the Inventory of Long Established and Ancient Woodlands of Ireland<sup>14</sup> and the National Survey of Native Woodlands<sup>15</sup> did not identify any protected or long-established/ancient woodlands within or adjacent to the project site.

Datasets were reviewed of the Irish Semi-natural Grassland Survey 2007-2012, published by Department of Culture, Heritage and the Gaeltacht<sup>16</sup>. There are no semi-natural grasslands within project site.

The Irish Wetland Bird Survey (I-WeBS) has a waterbird count site located directly south / southeast of the project site. I-WeBS count site – Bray Harbour (Site code 0T907) covers the lower stretches of the River Dargle, Bray Harbour and a section of the Irish Sea at the mouth of the harbour. Datasets for wintering waterbird counts within the Bray Harbour I-WeBS site were requested from BirdWatch Ireland and are discussed below.

Bray Head is located ca. 1.7km from the project site; it is was subject to a Special Amenity Area Order since 2007. A Special Amenity Area Order (SAAO) is designed to protect areas that are of particularly high amenity value, which are sensitive to intense development pressure and which cannot be adequately protected by existing planning controls.

The Special Amenity Area Order for Bray Head lists; *Objectives in relation to the Preservation or Enchantment of the Character or Special Features of the Area*. A summary of the objectives detailed in Bray Head SAAO are as follows (non-exhaustive list);

- Objective 1.1 - *'In order to facilitate social inclusion, it is an objective of the Council to increase public access on foot to coastal, heathland and woodland areas for informal recreation.'*
- Objective 1.2 - *'To protect the special amenity area ensuring that its resources are used in an effective and sustainable manner.'*
- Objective 1.3 - *'To manage the area in order to conserve its natural and cultural assets and realise its exceptional potential as a place for informal recreation, tourism and environmental education.'*

The SAAO further outlines; *'Heath, a habitat listed on Annex I of the EU Habitats Directive, is the principle habitat over much of the Head. It occurs over the light sandy soils found in the upper slopes of Bray Head. The heath community is frequently accidentally or deliberately burned and this assists its development rather than hinders it.'* Bray Head SAAO lists as Policy 1.3.4; *'The Council, in accordance with the Wildlife (Amendment) Act, 2000 and the National Parks and Wildlife Service shall promote a Heathland Management Programme consisting of controlled burning of the site on a ten year rotation, in small patches, during the legal burning season.'*

### 4.3.3. Desktop Research

#### 4.3.3.1. Documented Rare and Protected Flora and Fauna

This section of the report outlines species that have been previously recorded within and around the Site. NBDC datasets of rare and protected species records<sup>17</sup> for the OSI 2km grid square; O21U, which covers/encompasses the entire Site, were examined to provide a detailed account of species previously recorded within the Site within the last 10 years (2012-2022). Note; the OSI 2km grid square; O21U also encompasses coastal waters and as such many coastal species (e.g. seaweeds, marine mammals) have been recorded, however, the Site does not provide for suitable habitat for many such species.

<sup>12</sup> Under Article 17 of the Habitats Directive each member state is obliged to report to the EC every 6 years on the status of the natural habitats and species in the Annexes and on the implementation of the measures taken under the Directive.

<sup>13</sup> <http://www.wetlandsurveyireland.com/wetlands/map-of-irish-wetlands--/map-of-irish-wetlands---map/index.html>

<sup>14</sup> Perrin, P.M. & Daly, O.H. (2010) A provisional inventory of ancient and long-established woodland in Ireland. Irish Wildlife Manuals, No. 46. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

<sup>15</sup> <https://maps.biodiversityireland.ie/Map>

<sup>16</sup> <https://data.gov.ie/dataset/irish-semi-natural-grassland-survey-2007-2012>

<sup>17</sup> <https://maps.biodiversityireland.ie/Map>

So as to review sightings within the wider area, including lands adjoining the Site, a review of NBDC species records was undertaken within the following OSI 2km grid squares; O22K, O22Q. Datasets of rare and protected species records were also sought and received from NPWS for OSI 10km × 10km grid square (hectad); O21.

## Birds

Within the OSI 2km grid square O21U, records of bird species listed on Annex I to the Bird Directive recorded include; Arctic Tern (*Sterna paradisaea*), Kingfisher (*Alcedo atthis*), Common Tern (*Sterna hirundo*), Little Gull (*Larus minutus*), Mediterranean Gull (*Larus melanocephalus*) and Sandwich Tern (*Sterna sandvicensis*). Records of Red-listed bird species on the Birds of Conservation Concern Ireland (BOCCI4; Gilbert *et al.*, 2021), other than those listed as Annex I species (above) includes; Black-legged Kittiwake (*Rissa tridactyla*), Kestrel (*Falco tinnunculus*), Swift (*Apus apus*), Razorbill (*Alca torda*), Redshank (*Tringa totanus*), Common Scoter (*Melanitta nigra*), Eurasian Curlew (*Numenius arquata*) and Stock Dove (*Columba oenas*).

Records of Amber-listed bird species on the BOCCI4, other than those listed as Annex I species (above) includes; Black-headed Gull (*Larus ridibundus*), Herring Gull (*Larus argentatus*), Barn Swallow (*Hirundo rustica*), Black Guillemot (*Cepphus grylle*), Brent Goose (*Branta bernicla*), Common Guillemot (*Uria aalge*), Linnets (*Carduelis cannabina*), Starling (*Sturnus vulgaris*), Shag (*Phalacrocorax aristotelis*), Cormorant (*Phalacrocorax carbo*), Great Crested Grebe (*Podiceps cristatus*), House Martin (*Delichon urbicum*), House Sparrow (*Passer domesticus*), Lesser Black-backed Gull (*Larus fuscus*), Mew (Common) Gull (*Larus canus*), Mute Swan (*Cygnus olor*), Northern Gannet (*Morus bassanus*), Red-throated Diver (*Gavia stellata*), Ringed Plover (*Charadrius hiaticula*) and Sand Martin (*Riparia riparia*).

It is noted that OSI grid square O21U also encompasses a section of coastal waters centred on the estuary of the River Dargle / Bray Harbour. BirdWatch Ireland includes Bray Harbour in the Irish Wetland Bird Survey (I-WeBS) as count site OT907; and many of the recorded sightings of bird species are from within coastal waters (as opposed to on land or within the Site) and are associated with wintering waterbirds in coastal habitats, including within the I-WeBS count sector.

The proposed project site is not included within Bray Harbour OT907 I-WeBS count site. There is no evidence that the proposed project Site supports field feeding waterbirds. The Site is subject to regular disturbance by walkers with dogs and experiences high levels of anti-social behaviour.

Datasets were sought from and provided by BirdWatch Ireland for I-WeBS high tide waterbird survey records in the coastal waters of Bray Harbour (count site OT907). The latest and most up-to-date available data is for the winter periods 2017/18 and 2018/19 (data request to BirdWatch Ireland; 19/07/2022). The annual peak count for each species of waterbird recorded within the coastal waters adjacent to the project site during the winters of 2017/18 and 2018/19 are given below in Table 4-5.

**Table 4-5 - Annual peak waterbird counts 2017-2019 for I-WeBS count site; Bray Harbour.**

Species	Species Latin	Peak 2017/18	Peak 2018/19
Greylag Goose (domestic)	<i>Anser anser</i>	3	3
Mute Swan	<i>Cygnus olor</i>	40	47
Mallard	<i>Anas platyrhynchos</i>	33	31
Mallard (domestic)	<i>Anas platyrhynchos</i>		2
Curlew	<i>Numenius arquata</i>		1
Turnstone	<i>Arenaria interpres</i>	67	64
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	87	98
Common Gull	<i>Larus canus</i>	8	2
Ring-billed Gull	<i>Larus delawarensis</i>		1
Great Black-backed Gull	<i>Larus marinus</i>	3	3
Herring Gull	<i>Larus argentatus</i>	281	187
Lesser Black-backed Gull	<i>Larus fuscus</i>		1
Red-throated Diver	<i>Gavia stellata</i>	1	
Cormorant	<i>Phalacrocorax carbo</i>	8	3
Grey Heron	<i>Ardea cinerea</i>	1	2

## Mammals

### Badger

Badger (*Meles meles*), is protected under the Wildlife Acts and although not recorded within the last 10 years within the 2km grid square within which the proposed development lies, badger sightings have been reported within the general wider area of the Site; i.e. within 10km, the latest sighting of which was in 2018 according to NBDC datasets (2022).

A review of the EIAR for another application<sup>18</sup> within the general vicinity of the proposed Site identified a breeding/maternity badger sett as being located north of the proposed Site in the area of Woodbrook. The EIAR details the following: 'A badger sett is located within a hedgerow/patch of scrub in the northern part of the Woodbrook Residential Area..... According to information provided by the local NPWS ranger this is a long-established sett, likely to be in excess of 100 years old. It has been subject to vandalism in recent years, however, following a period of monitoring undertaken in late 2018 / early 2019 (including for several weeks with a passive infrared camera) it was confirmed that the sett is an active 'main' sett, likely used by breeding badgers.'

In addition to and as confirmation of this, badgers were sighted during ecological surveys (commissioned for the Coastal Quarter development) south west of the proposed Site during August 2020 and these sightings included 1 no. adult badger and 3 no. cubs which would confirm the presence of a maternity/breeding sett as being within the wider area. Findings of badger/mammal surveys are outlined in greater detail in Section 4.3.4.4 below.

### Bats

All bat species in Ireland are protected under Wildlife Acts and all bats, and their breeding and resting places, are strictly protected under Section 51 of the Habitats Regulations (SI No. 477/2011, as amended), pursuant to Article 12 of the Habitats Directive. A review of NBDC (2022) datasets indicate that various bat species have been recorded within and around the proposed Site. It is reported that, within the 2km grid square within which the proposed development is located, Daubenton's Bat (*Myotis daubentonii*) has been recorded 15 times in the last 10 years. Various other bat species have been reported within lands to the north of the proposed development however such records pre-date 2010. A review of the 10km grid square surrounding the Site indicates that historically the following species have been recorded within the wider area; Brown Long-eared Bat (*Plecotus auritus*), Lesser Noctule/Leisler's Bat (*Nyctalus leisleri*), Common Pipistrelle (*Pipistrellus pipistrellus* sensu lato), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Daubenton's Bat.

### Otter

Otter (*Lutra lutra*) is listed on Annex II and Annex IV to the Habitats Directive and is also protected under the Wildlife Acts. Otter feeds on aquatic prey (e.g. salmonids, eels and sticklebacks) and requires refugia (holts) along or near watercourses and associated riparian habitats. Records show that, otters have been sighted within the lower stretches of the River Dargle as recently as 2017. Evidence of otter has also been noted by NPWS<sup>19</sup> staff on the Rathmichael Stream where a spraint was noted at the culvert under the railway line indicating that otters use this watercourse for access to the sea.

### Marine mammals

OSI grid square O21U also encompasses a section of the Irish Sea. Marine mammal recorded within the coastal waters around Bray Harbour include; Grey Seal (*Halichoerus grypus*), Bottle-nosed Dolphin (*Tursiops truncatus*) and Common (Harbour) Porpoise (*Phocoena phocoena*).

### Other mammals

Other mammal species listed on Annexes II and IV to the Habitats Directive and / or protected under the Wildlife Acts recorded within the proposed development lands include Hedgehog (*Erinaceus europaeus*). The lands within the wider area of the proposed development have been reported to support various mammal species including Pygmy Shrew (*Sorex minutus*) and the invasive Grey Squirrel (*Sciurus carolinensis*).

### Flora

The NBDC database and NPWS datasets were consulted to determine the presence of rare plant species and species protected under the Flora Protection Order (2022). There have been no recordings of protected floral species within the immediate vicinity of the proposed Site nor within the lands to the immediate north of the Site. Meadow Saxifrage (*Saxifraga granulata*), a species detailed as *Threatened Species: Regionally Extinct* is noted within NBDC records within the 2km grid square, however the location of the sighting is ca. 1km south of the project site in Bray town. Within lands of the wider area of the proposed development; i.e. within 10km, the only threatened species reported within the last 10 years is the Yellow Archangel (*Lamium galeobdolon*).

<sup>18</sup> Stephen Little and Associates (2019). Environmental Impact Assessment Report – Residential Development Woodbrook (Planning ref; DO7A/1716).

<sup>19</sup> An Bord Pleanála Inspector's Report ABP-311181-21

There are a number of records of invasive plant species within the wider area of the Site as follows; Giant Hogweed (*Heracleum mantegazzianum*), Traveller's-joy (*Clematis vitalba*) and Three-cornered Garlic (*Allium triquetrum*). The sightings of Giant Hogweed have all be within the vicinity of the River Dargle. Additionally, there have been several records of invasive species within the lands in the wider Bray area including; Japanese Knotweed (*Fallopia japonica*) and Cherry Laurel (*Prunus laurocerasus*). Giant hogweed and Japanese Knotweed are 'High-impact' species restricted under Section 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011, as amended).

It must be noted that the under-reporting of a protected and / or invasive species does not indicate its absence but rather that sightings have not been reported on the NBDC database.

## Other Species

Although not within the Site of the proposed development, the following protected butterfly and bee species have been reported within the wider environs of the Site within the last 10 years: - Lepidoptera; Small Blue (*Cupido minimus*), Wall brown (*Lasiommata megera*) and Hymenoptera; Gooden's Nomad Bee (*Nomada goodeniana*), Tawny Mining Bee (*Andrena (Andrena) fulva*) and Large Red-tailed Bumble Bee (*Bombus (Melanobombus) lapidarius*).

### 4.3.3.2. Hydrology/Aquatic Ecology

There are no watercourses or surface water features within the project site. The project site lies within the Dargle subcatchment (Subcatchment ID 10-5<sup>20</sup>). The River Dargle is located directly south of the project site and surface water drainage for the proposed development, which will employ SuDS techniques, will outfall via 2 no. attenuation/storage units to this watercourse. To the north of the Site, ca. 30m from the Site extents, there is a second watercourse namely the Rathmichael Stream (aka Crinken Stream / Woodbrook Stream). Both watercourses flow in a general easterly direction before outfalling to the Irish Sea.

Both the River Dargle and the Rathmichael Stream are detailed by the Environmental Protection Agency (EPA, 2022) as having 'Good' water quality status (2013-2018) and both are detailed as being 'Not at Risk' of failing to achieve favourable water quality. Biological water monitoring is undertaken on the River Dargle on a yearly basis and sampling results undertaken close to the proposed Site (1 km upstream of Bray Bridge) detail the watercourse as having a Biological Quality Rating (Q Value) of 4 within the 2019 and 2020 survey periods<sup>21</sup>. The Q Value 4 indicates a WFD Status of 'Good', a Pollution Status of 'Unpolluted' and a Condition of 'Satisfactory'. This is an improvement on the 2018 survey where the River Dargle was assigned a Q Value of 3-4 and this improvement is highlighted in the 2020 EPA assessment report<sup>22</sup> which states for the River Dargle; '*The diversity and abundance of pollution sensitive macroinvertebrate fauna indicated a welcome improvement to good ecological conditions at Rivervale<sup>23</sup> (0250) when surveyed in July 2019*'. The most recent biological monitoring undertaken by the EPA is at a sampling location ca. 3.4km upstream of the project site (Station; Bridge upstream of the Glencullen River) where a biological quality rating; Q value 2-5 is recorded for 2021 indicating a WFD Status of 'High', a Pollution Status of 'Unpolluted' and a Condition of 'Satisfactory'.

The main channel of the River Dargle is noted to be designated as Salmonid Waters under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293/1988). The river is within the Eastern River Basin District and Inland Fisheries Ireland (formerly the Eastern Regional Fisheries Board, ERFB) undertake fish stock surveys within this district along the River Dargle catchment (incorporating River Dargle, Glencree River, Killough River and Glencullen River). IFI survey reporting during the period 2017<sup>24</sup> and 2018<sup>25</sup> detail the River Dargle catchment as accommodating the following fish species; Brown trout (*Salmo trutta*), Salmon (*Salmo salar*), European eel (*Anguilla anguilla*) and Stone loach (*Barbatula barbatula*) with trout being the most abundant species captured during surveys. IFI reporting (2018) outlines in regard to the River Dargle; '*The river is one of Ireland's best sea trout rivers and also gets a small run of salmon (grilse)*'. The River Dargle also provides for foraging habitat for local otter populations with sightings of otter recorded within the main channel as recently as 2017. In the vicinity of the project site, and throughout Bray town, the River Dargle has been subject to flood alleviation works and the banks of the river have been recently developed into a formalised promenade and public amenity space. The banks of the river to the south of the project site are entirely artificial and are noted to be either vertical walls (flood walls) or shallow reinforced slopes (rock armour).

<sup>20</sup> <https://gis.epa.ie/EPAMaps/>

<sup>21</sup> EPA River Quality Surveys: Biological - Hydrometric Area 10 (2022).

<sup>22</sup> EPA River Quality Surveys: Biological - Hydrometric Area 10 (2020).

<sup>23</sup> Note; Riverdale 0250 – People's Park, Bray, EPA monitoring location for 2018, 1km upstream of Bray bridge.

<sup>24</sup> Matson, R., Delanty, K., Gordon, P., O'Briain, R., Garland, D., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrissey-McCaffrey, E., Brett, T., Ni Dhonnabhain, L. and Kelly, F.L., (2018) Sampling Fish in Rivers 2017 – Dargle Factsheet No. 5. National Research Survey Programme. Inland Fisheries Ireland.

<sup>25</sup> Matson, R., Delanty, K., Gordon, P., O'Briain, R., McCarthy, E., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrissey-McCaffrey, E., Brett, T., Gavin, A and Kelly, F.L., (2019) Sampling Fish in Rivers 2018 - Dargle, Factsheet No. 1. National Research Survey Programme. Inland Fisheries Ireland.

In context of the project site, there are no ditches or surface water features connecting the project site to either the River Dargle or the Rathmichael Stream.

#### 4.3.3.3. Hydrogeology

The project site lies within the Wicklow Groundwater Body (IE\_EA\_G\_076) and EPA records indicate this groundwater body is classified as 'Good' for the 2013 to 2018 monitoring period (EPA, 2022). The risk of failing to meet the relevant WFD objectives for this GWB by 2027 (EPA, 2022) is under 'review'. Groundwater vulnerability (in the bedrock aquifer) is predominantly Moderate (M) in the northern and central portions of the Site, and Low (L) in the southern portion of the Site (Geological Survey Ireland, 2022). Areas of Extreme (E) and Rock at or Near Surface or Karst (X) vulnerability are noted to be present offsite, to the south and southwest of the Site. Inferred groundwater flow is expected to follow topography in general easterly, southerly, and south easterly directions, towards the River Dargle (in the south) and the Irish Sea (in the east / south east).

#### 4.3.4. Field Survey Results

##### 4.3.4.1. Habitats & Flora

The habitats within the Site are shown on Figure 4-5 and are individually described and evaluated in the following text. The approach to determining ecological importance of the Site is set out in Section 4.2.4 of this report and is based on CIEEM (2018) guidance.

##### **Amenity Grassland GA2**

The Site is a former golf course and the lands are predominantly comprised of amenity grassland (GA2). The grasslands are well maintained and regularly mown for the large part, however, small areas of grassland (around scattered parkland trees and informal pathways) have been left uncut during the summer months. Grass species within the Site include; *Lolium perenne* (Rye grass), *Fescue* spp. and *Dactylis glomerata* (Cock's foot) (non-exhaustive list); and grassland herbs such as *Trifolium repens* (White clover). In areas where the grass has been left uncut *Rumex* spp. (Dock), *Senecio jacobaea* (Ragwort) and *Achillea millefolium* (Yarrow) have also established.

The grassland areas have numerous informal paths and the entire Site is heavily utilised by the public as a pathway (to Bray town from Woodbrook residential area), by dog walkers and also has numerous sites showing evidence of anti-social behaviour, vandalism and litter (camp fires etc.).

##### **Scattered Trees and Parkland WD5**

Within the central areas of the former golf course lands there are numerous scattered trees (WD5). The trees species found within the Site include: - *Acer pseudoplatanus* (Sycamore), *Fraxinus excelsior* (Ash), *Populus alba* (White Poplar), *Populus* spp. (poplars), *Pinus contorta* (Shore Pine), *Acer platanooides* (Norway Maple), *Prunus* spp. (flowering Cherry), *Sorbus intermedia* (Swedish Whitebeam) and *Sorbus aria* (Whitebeam). The former golf club lands are managed and maintained and all areas of scattered trees are underlain by mown amenity grassland (GA2). The tree species found within the central open spaces of the Site are noted to be predominantly sycamore (ca. 80%). There are 103 no. mostly semi-mature trees scattered throughout the central sections / grassland areas and compound area of the Site. Of the 103 no. specimens there are 10 no. mature trees, which are 6 no. sycamore, and 4 no. poplar. Sycamore is non-native and classed as a 'Medium-impact' invasive species in O'Flynn et al. (2014). Whilst scattered trees and parkland habitat (WD5) can often be of high conservation value the scattered trees with underlying well mown amenity grassland within the former golf clubs lands do not represent high conservation habitat.

##### **Mixed Broadleaved / Conifer Woodland WD2**

Within the northwest area of the proposed Site there is an area of mixed broadleaved and conifer woodland (WD2). The woodland is largely unmanaged and has numerous informal trails throughout. Tree species within the small area of woodlands include: Sycamore, *poplars*, *Abies* spp. (firs), *Picea* spp (Spruce), *Pinus* spp. (Pine), *Pinus sylvestris* (Scots Pine), *Aesculus hippocastanum* (Horse Chestnut), *Sorbus aucuparia* (Rowan), *Carpinus betulus* (Hornbeam) and Ash. The understorey of the woodland is largely Bramble (*Rubus fruticosus* agg.) and Nettle (*Urtica dioica*) and along the western fringe of the woodland there is a small area of Rosebay Willowherb (*Chamaenerion angustifolium*) which has developed along the new school fence line. The mixed-species woodland has mostly sycamore along the woodland edge and has a section of more densely stocked conifers and poplar trees towards the north-western boundary. Tree condition is variable, with wider spaced broadleaves specimens noted to be in mostly fair or good condition with the more crowded conifers in poorer condition with some fallen stems. Tallest trees are the emergent upright poplar stems. There has been no recent management of the woodland and there is considerable litter throughout and evidence of destructive antisocial behaviour, including fire damage to a number of trees [see also Section 4.3.4.2 Tree Survey].



### **Treelines WL2**

Along the entire northern extents of the Site, inside the boundary fence, there is a treeline which includes a number of large, mature *Cupressus macrocarpa* (Monterey Cypress) trees which are noted to be in poor condition. These trees have been heavily pruned on the north side to clear the overhead powerlines. They have also sustained storm damage and have been subject to vandalism. Species noted within the treeline are Monterey Cypress, Scots Pine, Shore Pine, *Chamaecyparis lawsoniana* (Lawson Cypress), *Pinus* spp. (other pines) and *Castanea sativa* (Sweet Chestnut).

### **Hedgerow WL1**

Hedgerows are found within the Site in only 2 no. areas, both along the eastern boundary. Along the northern side of the east boundary there is ca. 100m of hedgerow which is comprised predominantly of semi-mature *Crataegus monogyna* (Hawthorn) with occasional young Ash. Further south along the eastern boundary (in the vicinity of the new road and railway underpass) there is a further ca. 50m of hedgerow which is largely made up of young Ash with occasional Hawthorn. Along the south-eastern extents of the Site (inside the boundary of the railway line) from the railway underpass to the River Dargle there is a linear line of hedgerow which is outside of the project Site extents and is separated from the proposed development by a public pathway and fence line.

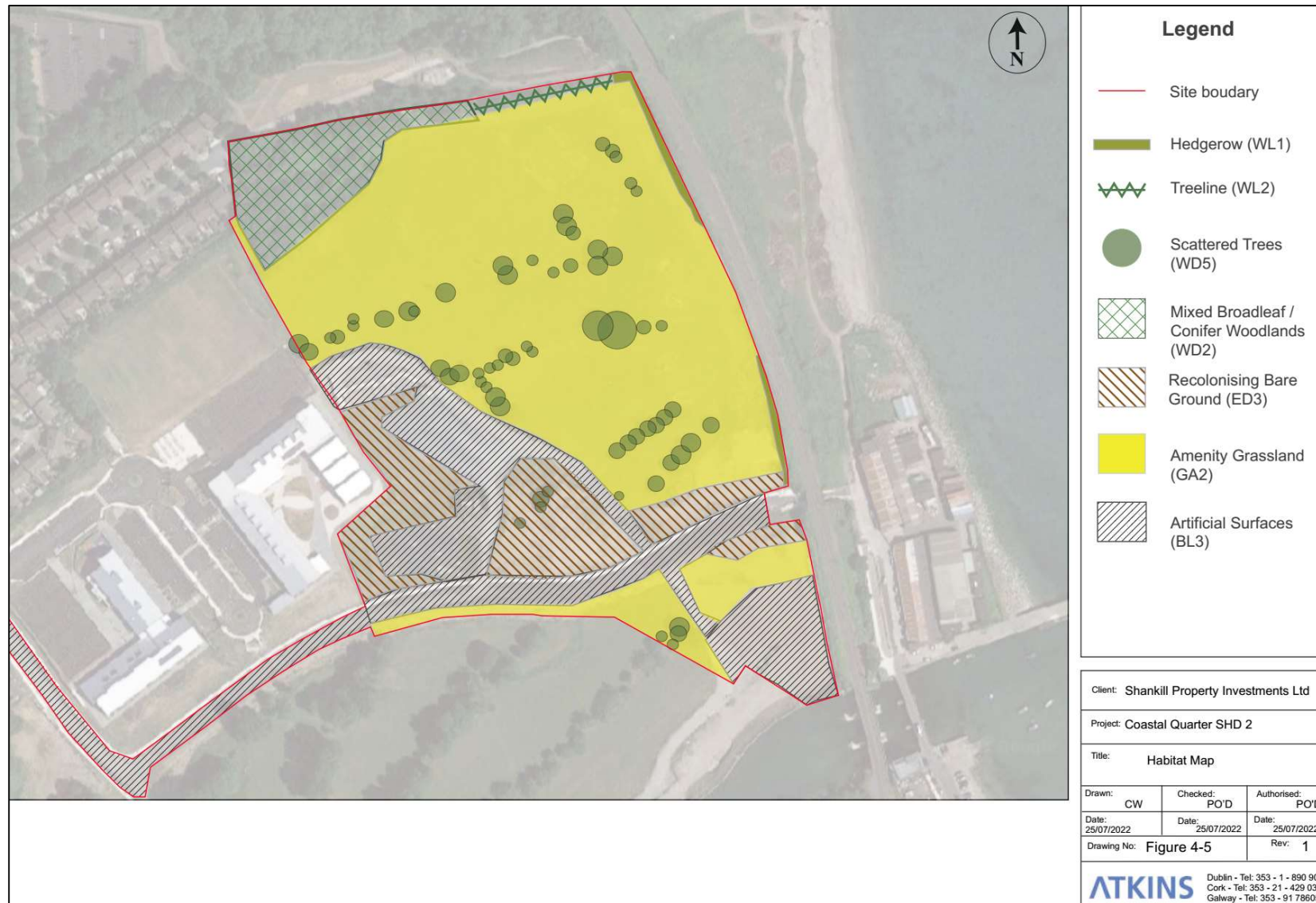
### **Recolonising Bare Ground ED3**

Within the southwest section of the Site, adjacent to the new primary school, the former golf clubs' lands have been subject to previous construction activities associated with the building of the new road and school. In this area ground has been previously cleared of grasses and soils and the area can be categorised as recolonising bare ground. Within this area Rosebay Willowherb, Dock, *Ulex europaeus* (Gorse), *Cirsium* spp. (Thistle), Ragwort, *Dipsacus fullonum* (Teasel) and *Hypochaeris radicata* (Cat's-ear) were noted on previously stripped ground.

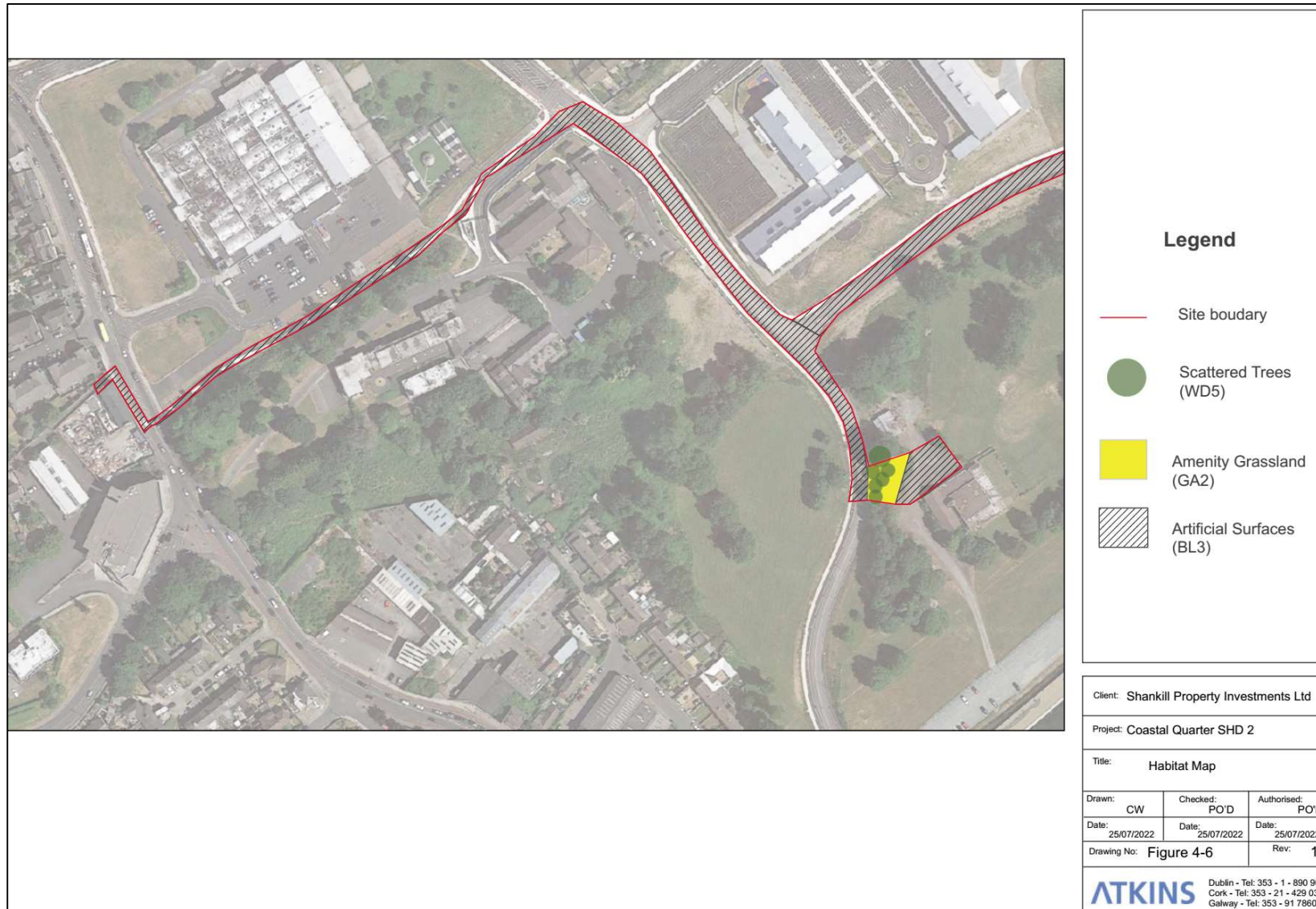
### **Artificial Surfaces BL3**

In the southwest section of the site adjacent to the new school there are hard standing areas in the form of gravel tracks and gravelled parking areas. Also, along the entirety of the southern section, where the site is in proximity to the River Dargle, there are hardstanding gravel areas where the former golf club lands have been previously cleared to accommodate works associated with the building of flood defences, promenade along the watercourse and upgrades to the neighbouring railway bridge.

There are no watercourses, drains or ditches within the grassland or woodland areas of the proposed project site. Whilst the Site is relatively close to the sea, there are no coastal habitats such as dunes within the project site. Plates 4-1 to 4-7 show the habitats found within the proposed Site and Figures 4-5 and 4-6 illustrate the locations of these habitats.



**Figure 4-5 - Habitat map of the proposed Site (main Site).**



**Figure 4-6 - Habitat map of the proposed Site, western extents.**



**Plate 4-1 Mixed broadleaf/conifer woodlands (WD2) along northern boundary.**



**Plate 4-2 Treeline (WL2) along northern boundary.**



**Plate 4-3 Scattered trees and parklands (WD5) with areas of uncut grassland.**



**Plate 4-4 Artificial surfaces (BL3) southwest area.**



**Plate 4-5 Hawthorn hedgerow (WL1) along northeast boundary.**



**Plate 4-6 Recolonising bare ground (ED3) southern area of site.**



**Plate 4-7 Amenity grassland areas (GA2) within central area of site.**

#### 4.3.4.2. Tree Survey

A Tree Survey was undertaken by Independent Tree Surveys during 2020 and 2021 for the proposed development which included all of the former golf club lands. The significant individual trees inside the Site were assessed from ground level using Visual Tree Assessment (VTA) techniques and relevant observations and findings were recorded in compliance with the industry standard document BS5837: *Trees in relation to design, demolition and construction (2012)*.

Approximate tree locations, BS5837 category, Root Protection Areas and approximate crown shape are shown in Tree Survey Drawings 20021\_TS Sheets 1-4 within the Tree Survey Report presented in Appendix 5.2. The bulk of the trees assessed within the entirety of the Site are classified as semi-mature or early mature with 10 no. of specimens within the central / grassland areas of the Site noted to be mature. The predominant tree species found within the Site is sycamore.

97 no. scattered parkland trees and ca. 0.24 hectares of woodland are directly within the footprint of the proposed development (i.e. are to be lost). The 97 no. scattered trees within the central/grassland areas of the Site are noted to be predominantly sycamore species. There are 6 no. trees within the area proposed for the site office compound (west of main site boundary), these 6 no. trees are sycamore, pines and flowering cherry. The trees within the small woodlands are comprised largely of sycamore specimens.

A follow up tree survey was also undertaken during August 2022. The *Tree Survey and Arboricultural Report Review* (APB Treecare Ltd., 2022) is presented in Appendix 5.2. The additional tree survey provided an update to the condition of trees within the Site.

Recommendations for tree protection and maintenance are included within the 2 no. tree survey reports.

#### 4.3.4.3. Invasive Plant Species

The Site was surveyed for invasive plant species listed restricted under Section 49 of the Habitats Regulation (SI No. 477/2011, as amended). Species surveyed for included Japanese knotweed (*Fallopia japonica*) and associated hybrids, as well as other invasive plant species. Surveys were undertaken during August 2020 and July 2022 which is within the seasonally appropriate window to assess the Site for the presence of invasive plant species.

No evidence of legally restricted invasive plant species were recorded within the extents of the Site.

#### 4.3.4.4. Fauna

##### Bats

Bat surveys were undertaken by a bat specialist (Dr Tina Aughney) during July and August 2020. The full Bat Assessment Report for the proposed Site is included with Appendix 4.1. The information presented in this section of the report provides a summary of the findings of the bat surveys and assessment.

The surveying for evidence of bats involved the following: -

- Daytime inspections of trees to assess their potential to accommodate bat roosts (PBR surveys);
- Night-time bat detector surveys (dawn, dusk and walking transect surveys); and,
- Passive Static Bat Detector Surveys (5 no. bat detectors left in field for 5 no. nights).

Bat surveys not only recorded bat activity and surveyed for bat roosts but also assessed the proposed Site and the wider area for potential bat foraging habitats and potential bat commuting routes. In order to understand bat movements and activity in the wider environs surveys also encompassed areas outside of the project site including the woodlands around Rathmichael Stream (north of the Site boundary), golf club lands and the dark corridor of the River Dargle (south of the project site boundary) and old buildings and structures (southwest and west of the project site).

Bat species recorded within the Site are noted to be: Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*). Outside of the Site, along the River Dargle a fourth bat species was recorded; Daubenton's bat (*Myotis daubentonii*).

Bat detector surveys did not confirm the presence of any bat roosts within the proposed Site. Within former golf club lands to the south, outside the boundaries of the proposed Site, 2 no. oak trees had confirmed bat roosts (species noted to be Common pipistrelle). The 2 no. oak trees are outside of the project site boundary and are not required to be removed to facilitate construction activities nor for the development of the Site compound. The 2 no. oak trees are ca. 150m from nearest area of proposed housing unit construction area and ca. 75m from the proposed Site compound. The Surveying indicates that there is a Common pipistrelle roost as well as a likely Leisler's bat roost site in buildings within lands to the southwest of the Site (old school buildings / near St John of God's lands ca. 275m from nearest proposed housing unit construction area).

The PBR survey identified 6 no. trees within the proposed Site which have the potential to be utilised as bat roosting habitat. All 6 no. trees (species noted to be 2 no. semi-mature Poplar and 4 no. mature Sycamore) are within the grasslands / central area of the Site. In regard to bat usage, all 6 no. trees are assessed as having 'Low-Medium' potential of having bat roosts present<sup>26</sup>.

Common pipistrelle was the most frequently recorded bat species and this is reflective of the number of bat roost locations adjacent to the project site. Figures 4-7, 4-8 and 4-9<sup>27</sup> illustrate bat activity and bat encounters within and around the Site for Common pipistrelle, Soprano pipistrelle and Leisler's bat respectively. Common pipistrelle was the most frequently recorded bat species during surveys. Activity was concentrated along treelines such as those adjacent to the old golf club house (south, outside of the project site boundary) and to the north of the Site leading into the woodland area of Rathmichael Stream (Figure 4-7). Soprano pipistrelles were infrequently recorded during walking transect surveys (Figure 4-8). Leisler's bats was the second most frequently encountered bat species and again activity was concentrated along treelines (Figure 4-9).

As part of the survey data analysis, heat maps were produced in relation to common pipistrelle and Leisler's bat encounters (the two most frequently encountered bat species). Figures 4-10 and 4-11<sup>24</sup> below are heat maps in relation to activity level locations for common pipistrelle and Leisler's bats. The two white boxes on the heat map for common pipistrelle coincides with areas where roosts were confirmed for this species. While a Leisler's bat roost was not confirmed, the time of early encounters for this species indicate that the roost is in the vicinity of the survey area and the buildings of old Ravenhill School are likely candidates.

Common pipistrelle was the most frequently encountered bat species and a medium-high level of bat activity was recorded. Leisler's bats were recorded commuting into the survey area from a north-easterly direction but the early time of detection during the dusk surveys may indicate that some individuals are roosting in close proximity to the proposed Site. The bat survey report identifies a moderate level of bat activity was recorded for this species of bat. Whilst Soprano pipistrelles were recorded foraging and commuting within the survey area, the timing of their encounters indicated that they travelled some distance before arriving to forage and therefore the roosting sites are not within the proposed Site nor immediately adjacent to it. A low level of bat activity was recorded for this species of bat. Daubenton's bats were only recorded on the River Dargle and this was at a low level of bat activity.

Extensive foraging was recorded within the proposed development area with common pipistrelle and Leisler's bats the most frequently recorded foraging. The parkland trees and boundary of treelines, particularly to the west of the Site are important foraging areas. Overall, the level of bat activity could be considered as Medium-High level for the proposed Site.

The former golf club lands are an important foraging area for bats and treeline boundaries provide commuting habitat to and from the River Dargle and Rathmichael Stream. The urban areas of Bray town surround the proposed Site along the west, north and south, as a consequence, the rivers (and associated habitats) and coastal zone are essential areas which allow bats to commute to the wider landscape to the north and west of Bray urban area.

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<sup>26</sup> PBR value Classification according to Collins, 2016.

<sup>27</sup> Figures extracted from Bat Assessment Report, refer to Appendix 4.1 for full report.

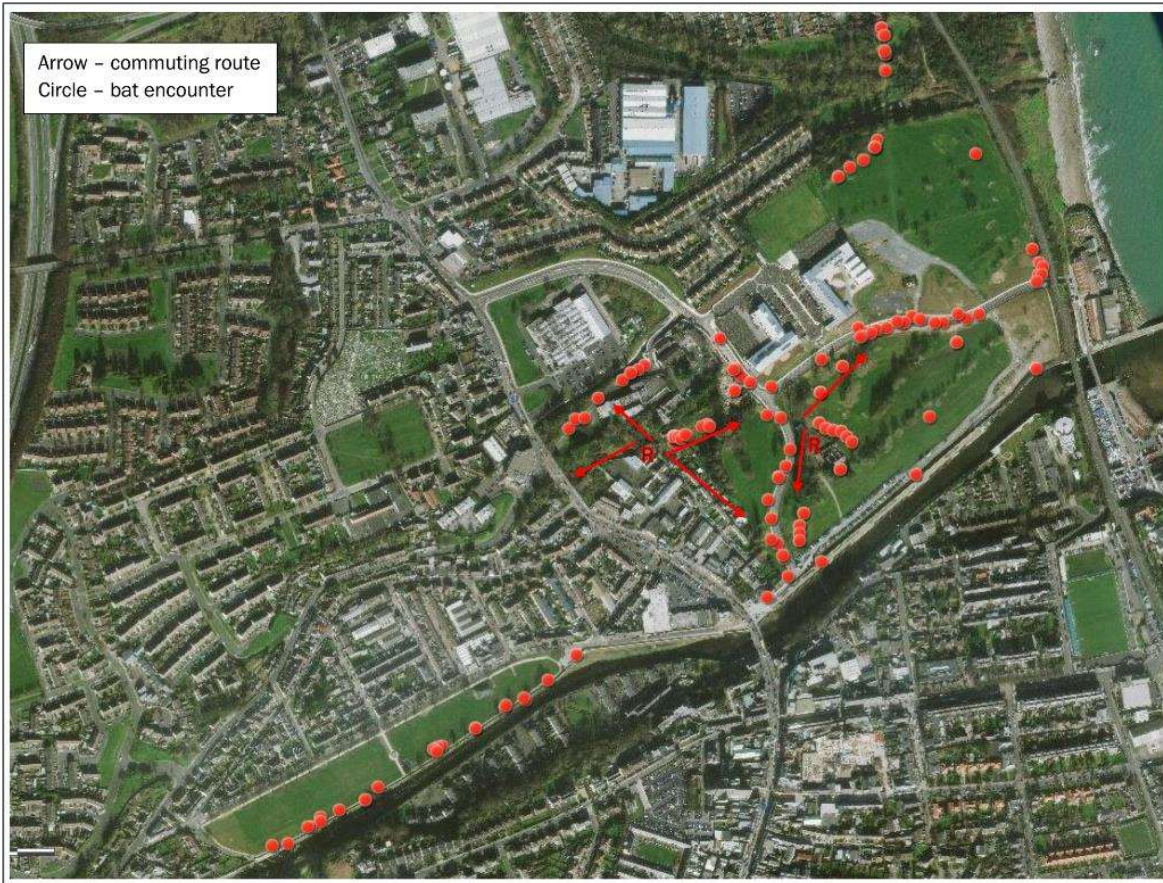


Figure 4-7 - Common pipistrelle bat encounters recorded during Walking Transects (Map source: ArcGIS).



Figure 4-8 - Soprano pipistrelle bat encounters recorded during Walking Transects (Map source: ArcGIS)

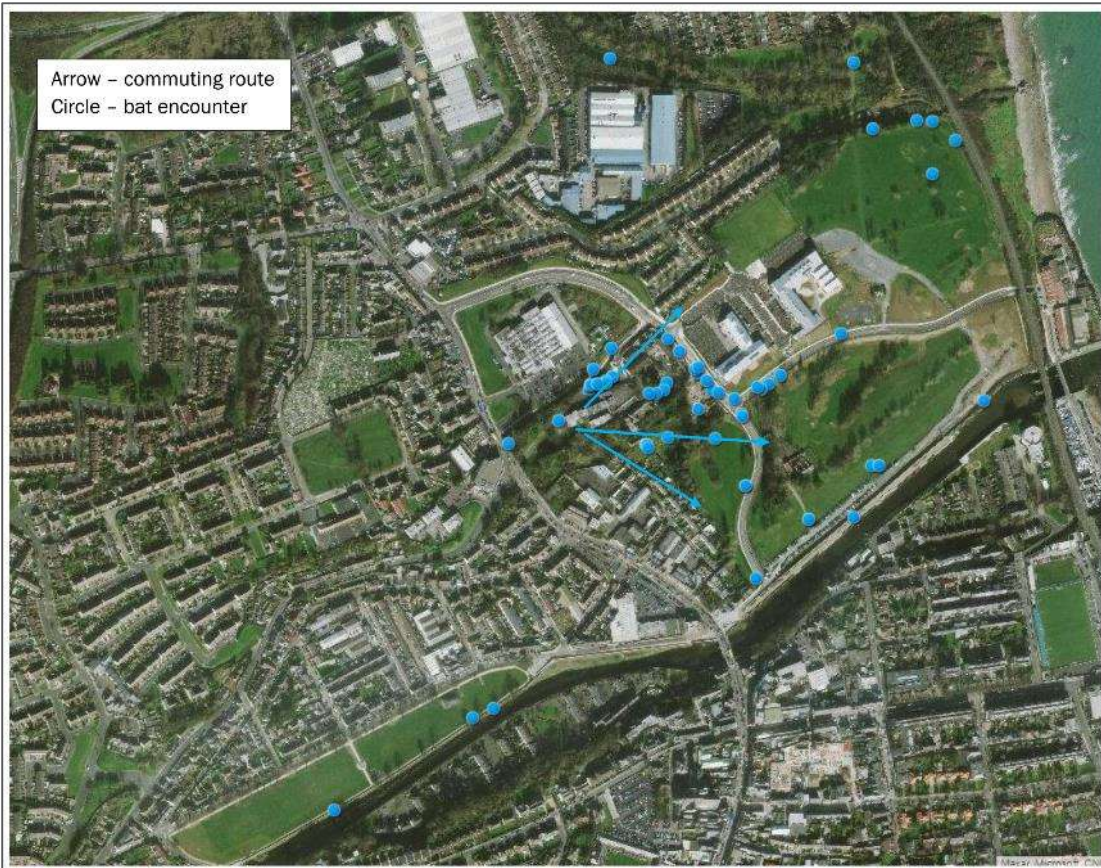


Figure 4-9 - Leisler's bat encounters recorded during Walking Transects (Map source: ArcGIS)

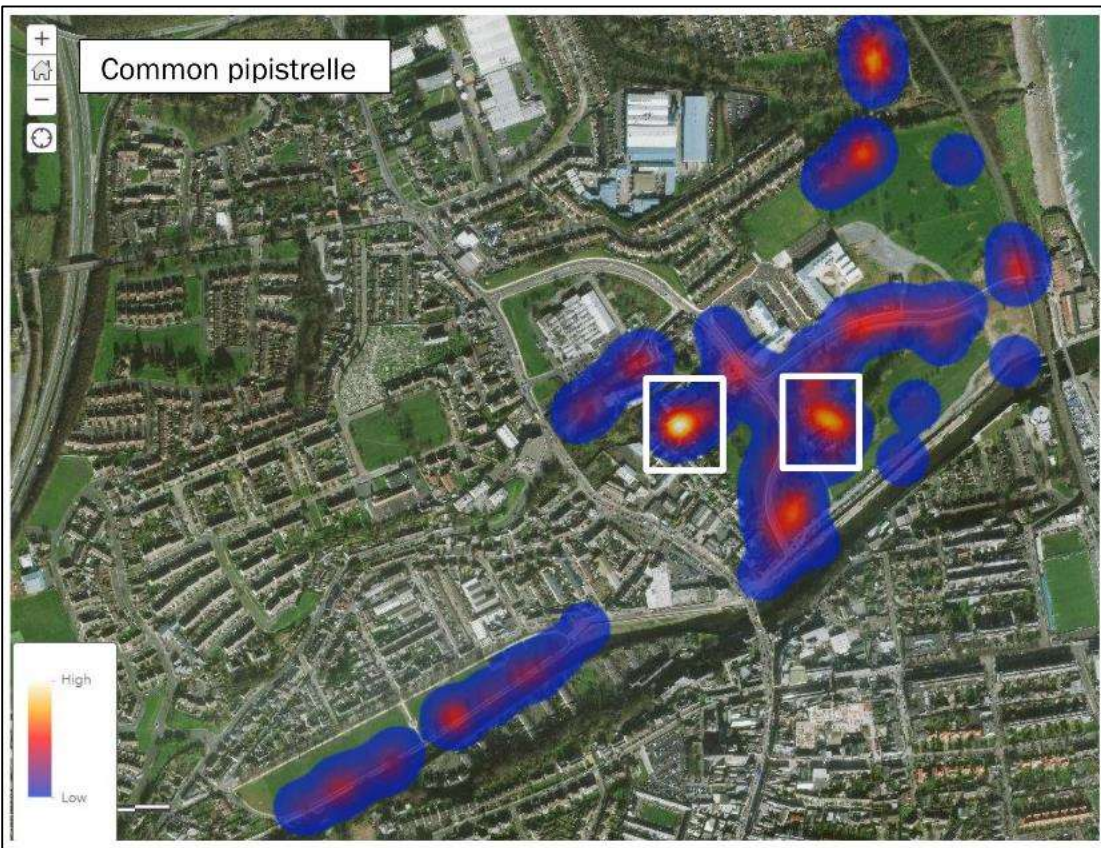
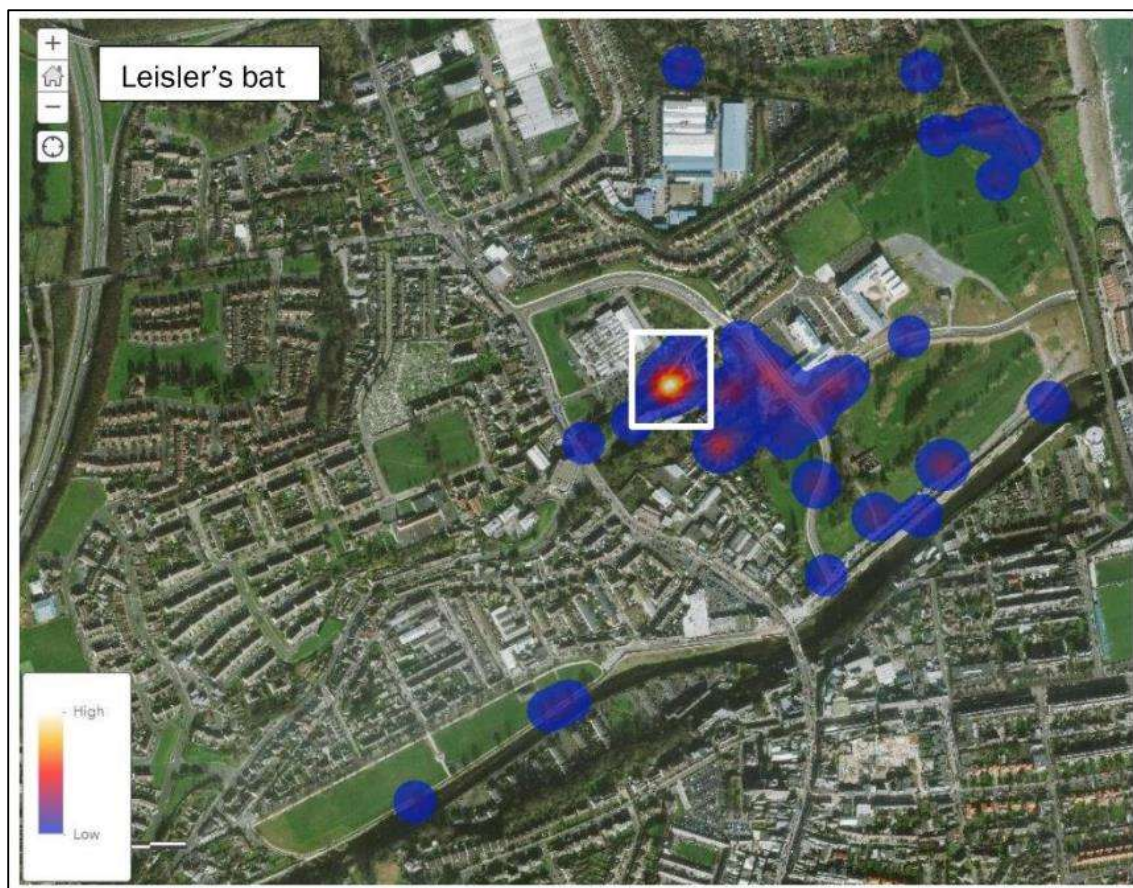


Figure 4-10 - Heat Map illustrating activity zones for Common pipistrelle (Map source: ArcGIS).





**Figure 4-11 - Heat Map illustrating activity zones for Leisler's Bat (Map source: ArcGIS).**

### **Badgers and other large mammals**

The Site and surrounding lands were surveyed for evidence of terrestrial mammal activity and mammal refugia (badger setts, fox dens) during February, July, August 2020 and July 2022. The Site was surveyed for evidence of badger, otter, fox, hedgehog, and squirrel activity as these species have been historically recorded within the environs of the Site. Surveys paid particular attention to any evidence of protected mammal species; badger as there is a known and recorded breeding/maternity sett located in lands to the north (outside) of the proposed development site.

Whilst there is no seasonally appropriate window for surveying for evidence of badger activity, surveying during the winter months (February) is preferable to assess the Site for its potential for accommodating a badger sett as ground cover vegetation has died back. Surveying for evidence of badger foraging activity and territorial range is preferable during the summer months (July / August) as badgers are more nocturnally active and as such there is greater potential for evidence of prints, faecal deposits, trails etc.

No badger setts were found within the proposed development site extents nor within 150m of the Site boundary.

Trails were noted in some sections of the woodland area (northwest area of the Site), however, the development site is heavily used by the public and dogs and as such confirmation that small trails are as a result of badger activity was not possible given the level of canine activity. Similarly, the open areas of grassland showed signs of digging activity in a number of locations on the west side of the Site (adjacent to the new school) and this could be as a result of badgers foraging for invertebrates and worms; however, this cannot be confirmed as badger activity given the usage of the Site by dogs and foxes.

During the summer surveys, direct evidence of badger activity was found within the extents of the proposed development site in the form of badger prints. Fox prints were also noted within the Site boundaries. In addition to this a badger 'latrine' was recorded within the Site extents, near the western boundary / new school. A badger latrine is a frequently used location for faecal deposits which can often be associated with territorial marking.

In addition, to badger activity within the Site boundaries, further evidence was also recorded to the south and east of the Site (outside of the Site boundaries). Badger faecal deposits were recorded in former golf club lands near the River Dargle and evidence of digging was noted in areas inaccessible to the public indicating digging is as a result of terrestrial / wild mammals as opposed to dogs.

As confirmation that the former golf club lands are within badger territory and are active badger foraging areas, there were confirmed sightings of an adult badger accompanied by 3 no. badger cubs. These sightings were for a period of 20 minutes in August 2020 during dawn surveys (undertaken for bat activity assessment). The location of the badger sighting was within scrubland habitat site ca. 200m west of the Site, refer to Figure 4-12 below. Terrestrial mammal surveying within the same week in this area of scrubland also found extensive areas of foraging / digging activity along densely vegetated slopes and banks.

Site survey evidence indicates the proposed development site is within the foraging territory and commuting area of badgers which have a sett located north of the Site in the Woodbrook area. It is considered likely that the local badgers in this area have territorial range throughout the Site, all of the former Bray Golf Club lands, the wooded corridor along the Rathmichael Stream, scrub lands to the east of the railway line as well as across the extensive areas of agricultural lands and Woodbrook Golf Club lands located north of the proposed development site. Local badgers are likely to range across both sides of the railway line utilising gaps in railway fencing and significantly the railway underpass and level crossing at the Woodbrook Golf Club and likely use the railway underpass directly adjacent to the proposed development site. The large area of scrubland / undeveloped lands on the east side of the railway line (adjacent to the Site) with dense vegetative cover provides connectivity from the Woodbrook Golf Club lands (north of the Site) to the railway underpass adjacent to the Site.

Site surveys indicate the boundary fence line along the railway line on the eastern side of the Site is intact with no noticeable gaps which could provide mammal access to the Site. The large gap (used for public access) in the Site's northern fence line leading to Woodbrook Stream/woodlands and also the railway underpass on the east side of the Site are considered key areas which are currently providing access for badgers utilising the former Bray golf clubs lands as foraging areas.

Based on Site surveys and available information from other studies<sup>28</sup>, the location of the badger sett being used by badgers observed near the Site is assumed to be the breeding sett located as part of surveys of the neighbouring Woodbrook Site. No other badger sett was recorded within the Site nor within the scrublands to the east of the railway line during Site surveys. The location of the Woodbrook Site badger sett is not illustrated due to its sensitivity; however, details can be provided in confidence upon request.

Plates 4-8 and 4-9 depict evidence of mammal activity (2020) within the extents of the Site. Figure 4-12 below illustrates the locations of mammal activity and the location of badgers sighted during ecological surveys.



**Plate 4-8 Badger print west side of Site. Plate 4-9 Badger latrine west side of Site.**

The southern boundary of the Site is alongside the north bank of the River Dargle for ca. 30m. The banks of the River Dargle were surveyed for evidence of otter (*Lutra lutra*) activity with no evidence noted. The northern banks of the River Dargle from Bray Harbour to Main Street Bridge within Bray (ca. 550m) are formed entirely of flood defence walls and public promenade and this linear, largely concrete, artificial river bank does not proffer habitat suitable for otter holts. No holts were noted during site surveys along this ca. 550m stretch of river bank. Whilst no evidence of otter activity was noted during riverbank surveys, the waterbody itself is likely utilised by local otter populations for foraging with NBDC datasets showing records of otter sightings in 2017.

<sup>28</sup> Stephen Little & Associates (2019) Environmental Impact Assessment Report – Residential Development Woodbrook (Planning ref; D07A/1716)



**Figure 4-12 – Field survey evidenced badger activity within and around Site.**

## Birds

The Site is in relatively close proximity to the coast and Bray Harbour; the lower stretches of the River Dargle and the coastal waters are a subsite counted as part of the Irish Wetland Bird Survey (I-WeBS). Waterbird species that habitually feed in fields only occur in small numbers within the Bray Harbour I-WeBS count site. The proposed project site is not included within Bray Harbour 0T907 I-WeBS count site and the proposed project Site is not a I-WeBS count area known for accommodating populations of wintering waterbirds. No waterbirds were noted during winter surveys within the Site extents and this may be as a result of the high level of human and dog activity; as well as frequent anti-social behaviour. Several species of gull were noted roosting with the former golf club lands south (outside) of the Site. Mute swan, mallard and gull species (Herring gull and Black-headed gull) were noted along the lower stretches of the River Dargle and numerous Mute swans and cygnets were noted roosting and sheltering on the small beach within Bray harbour. Mute swans, gulls and mallard were noted during both winter and summer months in the area of the River Dargle and estuary. The waterbirds in this area, in particular the Mute swans and gulls, seem habituated to human activity with pedestrians and cars noted within 2m of a Mute swan and gull roosting location on the beach within the harbour walls. No geese species, such as Light-bellied Brent Geese, were noted during site surveys of the harbour, coastal waters, former golf club lands or the Site and I-WeBS data indicates the Bray Harbour area is not an optimal site for geese. Stonechat (*Saxicola rubicola*) was noted in an area of gorse during July 2022 surveys.

The bird species noted within the Site during the site surveys are given in Table 4-6 below. Within this table the Birds of Conservation Concern in Ireland<sup>29</sup> (BoCCI) conservation status is listed for each species. The BoCCI study uses a 'traffic light' system to indicate the conservation status of bird species placing them on three lists: Red (high conservation concern), Amber (medium conservation concern) and Green (low conservation concern).

The Site is largely amenity grassland which is subject to regular human and dog disturbance. The wooded area to the north and hedgerow and treeline along the north-eastern boundary line provide for good nesting habitat for local passerine species. The scattered parkland trees do provide for nesting habitat, however, given their isolated nature within open grassland areas they are more likely to be favoured as feeding habitat for local song birds as opposed to optimal nesting habitat. The scattered trees within central / grassland areas of the Site were inspected by use of binocular for evidence of nests with none noted (July 2022).

**Table 4-6 - Bird Species recorded within the Site**

Species	Scientific name	BoCCI status
Stonechat	<i>Saxicola rubicola</i>	Green
Blackbird	<i>Turdus merula</i>	Green
Wood pigeon	<i>Columba palumbus</i>	Green
Robin	<i>Erithacus rubecula</i>	Amber
Goldcrest	<i>Regulus regulus</i>	Amber
Rook	<i>Corvus frugilegus</i>	Green
Blue Tit	<i>Cyanistes caeruleus</i>	Green
Song Thrush	<i>Turdus philomelos</i>	Green
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green
Hooded Crow	<i>Corvus cornix</i>	Green
House sparrow	<i>Passer domesticus</i>	Amber
Herring gull (overfly)	<i>Larus argentatus</i>	Red

## Other Species

During site survey July 2022, 2 no. Meadow brown (*Maniola jurtina*) butterflies were noted in open the grassland area at the northern end of the Site. No other species were recorded during site visits. No Hymenoptera species were noted. No invasive plant species (aside from Sycamore) were recorded within the Site extents. There are no temporary or permanent ponded areas or wet ditches within the Site and as such there are no habitats suitable for accommodating amphibian species within the Site extents.

<sup>29</sup> Gilbert, G., Stanbury, A. and Lewis, L. (2021). Birds of Conservation Concern in Ireland 4: 2020-2026. *Irish Birds* 43: 1-22.

### 4.3.5. Overall Evaluation of the Proposed Development Site

In summary, the proposed development site does not lie within any area that has been designated for nature conservation at an international or national level. There are no habitats listed on Annex I of the Habitats Directive or records of rare or protected plants within the Site. There are no plants which are listed as alien invasive species<sup>30</sup>. Boundary features and scattered trees within the Site are of local significance for a range of fauna, including protected species; bats, badgers and passerine birds.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). The ecological evaluation of the various habitats found within the Site is detailed in Table 4-7 below.

**Table 4-7 - Ecological evaluation of habitats within the proposed development site**

Habitats	Evaluation
Amenity Grassland (GA2) Recolonising bare ground (ED3)	Local Importance (Lower Value)
Hedgerows (WL1) Treeline (WL2) Scattered trees and parkland (WD5) / GA2 Mixed broadleaf / conifer woodland (WD2)	Local Importance (Higher Value)
Artificial surfaces (BL3)	No ecological importance

Adjacent to the Site, the River Dargle (main channel) is a designated salmonid watercourse which likely hosts a range of protected species. Salmon are listed as a protected species within Annex II of the Habitats Directive. This river also accommodates local otter populations. Otter is a species which is protected under the Wildlife Act, 1976 (as amended) and listed on Annexes II and IV to the Habitats Directive (92/43/EEC), and so is strictly protected under Section 51 of the Habitats Regulations (SI No. 477/2011, as amended). As such the River Dargle is considered to be of national importance and is noted to be a sensitive ecological receptor.

There are a number of trees which have Low-Medium potential to support roosting bats within the proposed development area at Bray and the Site is of importance for commuting and foraging bats. The level of bat activity is considered as Medium-High at a Site local level. The small area of woodlands, hawthorn hedgerows and tree lines within and around the Site are all of importance for nesting birds. The Site is of Local Importance (Higher Value) for bats and breeding birds and these species are considered to be sensitive ecological receptors.

Given the presence of an active 'main' badger sett in lands to the north of the Site along with evidence of badger foraging activity within and around the Site, the Site is considered to be of Local Importance (Higher Value) for badgers, which are considered to be sensitive ecological receptors.

Whilst rare Lepidoptera and Hymenoptera have been historically recorded within the surrounding area only 2 no. Meadow brown butterflies were noted throughout the entire site, Meadow brown butterflies are noted to be widespread throughout Ireland<sup>31</sup>. Given the Site is largely comprised of relatively well maintained amenity grassland, the Site is not considered to be highly favourable habitat for butterflies and bees.

<sup>30</sup> As listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/ 2011.

<sup>31</sup> [http://www.irishbutterflies.com/meadow\\_brown\\_butterfly\\_of\\_ireland.html](http://www.irishbutterflies.com/meadow_brown_butterfly_of_ireland.html)

## 4.4. Predicted Impacts

The potential impacts arising from the construction and operation of the proposed Coastal Quarter strategic housing development at Bray are discussed in the following sections.

### 4.4.1. Characteristics of Proposed Development

The proposed development will comprise 586 no. residential units, an access road, creche, car parking spaces, cycle storage areas, bin stores, open space / landscaped areas, and all associated ancillary works in a new community on a 8.812ha parcel of land and all associated landscaping and site development works. Sustainable urban Drainage System (SuDS) infrastructure and wastewater infrastructure will also be provided. A detailed description of the development is included in Chapter 2 – Project Description.

### 4.4.2. Potential impacts assessed

In the absence of mitigation measures the proposed project could have a range of potential impacts on the ecological receptors within the zone of influence of the proposed project during the construction and operational phases. The categories below describe the possible impacts which may occur through development onsite. These impacts are further assessed considering desktop and field survey data in Sections 4.4.5 – 4.4.7.

#### 4.4.2.1. Physical Damage/ Habitat Loss

Physical damage includes the degradation to, modification, fragmentation or loss of habitats. Direct physical damage of habitats could occur within working areas of the proposed project and along access routes where construction works are undertaken. Physical damage of habitats can also be an indirect impact and could occur, for example, through the introduction of fine sediments into an aquatic system, causing changes to the particle composition of the benthic habitats. Physical damage may be temporary or permanent in nature.

#### 4.4.2.2. Disturbance

Disturbance can cause sensitive species to deviate from their normal and preferred behaviour, resulting in stress and increased energy expenditure. Disturbance can result in species being displaced from suitable habitat areas that provide areas for feeding and foraging, commuting routes, and resting and breeding sites. Physical disturbance of species can also result in direct mortalities of species and thus, disturbance impacts can be both direct and indirect and may be temporary or permanent in nature. Examples of direct disturbance includes activities such as damage to a breeding or resting site of a protected species, e.g. a bat roost or badger sett. Indirect disturbance may result from the presence of works crews and personnel on site during construction, noise emanating from a construction site or artificial lighting of a bat foraging area, causing bats to avoid the area.

#### 4.4.2.3. Collision with buildings

With urbanization, collision with man-made structures, such as buildings and windows, has become a major threat for birds. Rates at which bird collisions with buildings can occur are influenced by a diverse range of factors. At the site level they will be influenced by the character of the proposed buildings, including features such as size, scale, height, proportion of glass and lighting, as well as its setting within the wider landscape. In the latter case the position of taller buildings relative to known foraging areas, roosting areas, flight paths between preferred habitats and migratory flight paths is an influencing factor. Bats are less susceptible to collision with buildings given their use of echolocation. Collision with man-made structures can result in the direct mortality of species and therefore would be permanent in nature.

#### 4.4.2.4. Changes in Water Quality

The release of pollutants to water can impact upon the relevant waterbodies and the species they support. This can result in impacts such as increased turbidity of the water column, a reduction in photosynthesis, contribution to eutrophication and changes to the species composition of the system as a result. The degree of impact depends on the type of pollutant released and the nature of the receiving receptor. For example, the release of fine sediments to a stream or river is likely to cause siltation of the river bed and interrupt the functioning of species, from aquatic plants to macroinvertebrates to fish, and larger predators that depend on these biotic groups as a food supply, e.g. otter. Impacts to water quality could be temporary in the form of surface water runoff during construction, or permanent in the form of a continued discharge impacting negatively on the receiving environment during the operation of the development.

#### 4.4.2.5. Dispersal of Invasive Species

Non-native invasive species can have negative impacts on biodiversity. Negative impacts of non-native invasive species on native biota occur through competition, predation, herbivory, habitat alteration, disease and genetic effects such as hybridisation. In the cases of non-native invasive species such as Japanese knotweed or Giant Hogweed, the main impacts are a reduction in species diversity due to dense plant growth, heavy shading and

disruption of trophic levels. These species can potentially be spread via plant fragments and soil containing plant material, and by vectors such as machinery and personnel.

#### 4.4.3. Do-Nothing Scenario

In the absence of development, in the short-term it is assumed that the Site will remain as amenity grassland, scattered trees and parkland and mixed broadleaved and conifer woodland if left in its current status and the 'Do-Nothing' Impact is likely to be continued semi-natural habitat on Site. The potential value of the Site to species such as nesting birds, foraging mammals and commuting bats would continue, provided that the linear landscape features (hedgerows/woodland) would not be lost due to other forms of development.

Currently, the Site is not under any significant threats and there are no apparent threats to the fauna that utilise the land, such as commuting bats, foraging badgers and nesting birds. There are, however, signs of antisocial behaviour within the Site including fire damage to trees and the small woodland area along the north-eastern boundary is largely unmanaged with fallen and damaged trees, informal paths and dog trails noted throughout.

Should no development be undertaken on the Site it could be expected that these species would remain. However, the development area is a significant part of the Bray Municipal District Local Area Plan 2018-2024 and as such development is highly likely to take place within the Site in the near future.

#### 4.4.4. Project Design

Where possible the design of the proposed development has been informed on an iterative basis by the findings of the baseline ecological assessment. The following design principles and "designed-in" mitigation have informed the assessment of impacts.

##### 4.4.4.1. Landscape Design

There will be loss of some improved amenity grassland, recolonising bare ground, parkland trees and mixed broadleaved and conifer woodland within the Site during the construction phase. However, potential impacts have been minimised where possible via ecological input, including bat specialist recommendations, into the landscape design plan prepared by Parkhood Chartered Landscape Architects (included within the design documents for the proposed development submitted as part of this planning application). The design calls for the retention of the existing treelines and hedgerows forming the Site boundary and inclusion of hedgerow planting where no boundary landscaping features are currently in situ. The development of the landscape design has been cognisant of existing flora and fauna on Site, retaining all boundary existing trees (excluding any unsafe trees) and maintaining strong native boundary planting to ensure wildlife corridors are retained. On the eastern side of the development site it is proposed to implement an extensive landscaping design which will connect to existing habitats including Corke Abbey Valley Park (stream and woodlands) to the north and the River Dargle and associated linear park to the south. This green buffer zone between the new housing development and the railway line will have large swathes of wild flower meadow, ornamental grasses, shrubs and herbaceous planting. In particular the ecologically friendly buffer zone will have mixed native hedge and woodland screening planting along the existing boundary fence to help maintain existing bat flight lines and foraging routes as well as providing connectivity between the dark zones of the River Dargle and Rathmichael Stream. The landscape design for the ecological buffer zone includes for shrub and screening planting which will allow for cover for the movement of mammals, including badgers, through the area. The planting mix will also include for gorse (*Ulex europaeus*) to provide habitat suitable for bird species such as stonechat.

On the northern boundary of the Site it is proposed to retain the boundary treeline and as much of the mixed broadleaf woodland as possible (ca. 30% retained). The landscaping design in this area calls for the planting of native wildflowers meadows and extensive planting of native trees with the aim to create semi-natural habitat akin to meadow and woodland edge. The planting schedule contains a mix of native plant species and emphasis has been placed on adhering to the objectives outlined in the All-Ireland Pollinator Plan, 2021-2025 with the aim of planting species which are beneficial to pollinating insects. Plant species have also been carefully selected to be suitable for the coastal conditions. In addition to the diverse planting species mix at ground level, the roof level of apartment blocks will be developed into green spaces to have a mix of sedum and wildflowers to further benefit pollinating species. Given the exposed nature of the Site a supplier of sedum carpets located in the east of Ireland has been identified to ensure the species are suitable for and acclimatised to the coastal conditions.

The design of the development also includes for multiple bird (10 no.) and insect boxes/hotels (10 no.) to be installed in landscaped areas (including roof gardens). Bird boxes will include for 2 no. of Swift (*Apus apus*) nesting boxes to be installed in the landscaped area along the northern boundary of the Site. Bird and insect boxes will also be fitted to trees throughout the scheme providing additional nesting and refuge for local passerine and insect species.

The design also calls for the installation of bat boxes. The locations and specifications of bat roosting sites/bat boxes has been informed by bat survey findings. There are 14 no. Rocket Bat boxes to be installed in the dark zones within northern woodland and treeline habitats. These will be free standing chambers on free standing poles. In addition, 14 no. Summer Bat Boxes (1FF Schwegler woodcrete or similar design) will be erected within the treeline on the northern boundary of the Site. In the area of the existing pumping station (south east of the Site) there is a screening wall of natural stone wall proposed for this location. The design calls for the insertion of 8 no. bat tubes within this structure (8 no. interconnecting units – such as Interconnecting Woodstone Bat Box or similar design). The wall will be at least 3m high and bat boxes are to be inserted at the highest points on the wall and no lighting will be directed towards the wall. The locations and installation of bat boxes will be done under the supervision of a bat specialist. Bat mitigation measures are also outlined below in Section 4.5.1.3.

#### 4.4.4.2. Lighting Design

The design of the lighting within and around the proposed development has also been designed to be cognisant of minimising effects on local nocturnal species, such as bats and badgers, and has been developed so as to allow for a dark ecological corridor around the northern and eastern boundaries of the Site. The lighting scheme for the Site has been developed with the following principals to the fore; only illuminating what needs to be illuminated (e.g. light directed to the path only), reducing night time light levels, reducing the height of the luminaires, shielding of luminaires and correct choice of light (e.g. a warm white spectrum <2700 Kelvins).

Project specific lighting designs include for: -

- All luminaires shall lack UV/IR elements to reduce impact;
- LED luminaires shall be used due to the fact that they are highly directional, have lower intensity, have good colour rendition and dimming capability;
- A warm white spectrum <2700 Kelvins shall be used to reduce the blue light component of the LED spectrum;
- Luminaires shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Column heights shall be carefully considered to minimise light spill. The shortest column height allowed shall be used where possible, ca. 5.5-6m or less;
- Bollard lighting shall be used for pedestrian and greenway areas, if lighting is deemed necessary;
- Only luminaires with an upward light ratio of 0% and with good optical control shall be used;
- Luminaires shall be mounted on the horizontal, i.e. no upward tilt;
- Any external security lighting shall be set on motion-sensors and short (1min) timers; and,
- The intensity of external lighting shall be limited to ensure that skyglow does not occur in order to reduce light pollution.

The lighting scheme has been designed in accordance with guidance contained in; *Institution of Lighting Professionals; Guidance Note 08/18; Bats and artificial lighting in the UK (ILP 2018)*. The lighting design has been reviewed by a bat specialist and recommendations have been incorporated into the design. A lighting design review letter, as provided by bat specialist Dr Tina Aughney (2022), is included in Appendix 4.2.

#### 4.4.4.3. Drainage Design

Sustainable urban Drainage Systems (SuDS) is also a key focus for the entire design of the development. Along with permeable paving for parking areas, the landscape design includes for attenuation areas throughout the development by channelling runoff to planted areas and tree pits. This has the added benefit of reducing surface water runoff rates. In addition, planted swales will be created areas to aid with storm water flow and these planted areas will contain suitably water tolerant plant species. The roof areas which will include sedum and wildflower green roof treatments will further slowdown the flow of water from areas that traditionally contribute to high runoff flow rates during rainfall events. Section 4.4.6.2 below outlines the SuDS drainage features in greater detail.

### 4.4.5. Construction Phase

The potential impacts likely to arise during construction of the proposed development are discussed in the following sections.

#### 4.4.5.1. Impact on Sites Designated for Nature Conservation

Potential negative impacts on European sites are discussed in the accompanying Natura Impact Statement (NIS) (Atkins, 2022). As noted, the proposed development is not located within the boundaries of any European site.



There will be no direct impacts to European sites; i.e. no land take or the permanent removal of habitat supporting qualifying interest and ecological features of the designated sites.

There are 13 no. European sites within 15km of the development site. The proposed development site is bordered to the south by the River Dargle which outfalls to the Irish Sea. The proposed development will involve construction of a surface water / storm water drainage outfall on the banks of the River Dargle. Drainage during the operational phase of the proposed development will outfall to the River Dargle and Irish Sea. Given that a number of the European sites within the potential zone of influence of the proposed project are coastal or marine in nature, hydrological connectivity exists from the development site to the coastal and marine based European sites via the River Dargle and Irish Sea. The closest European sites with potential indirect connectivity via the River Dargle and Irish Sea are; Bray Head SAC (ca. 1.7km) and Rockabill to Dalkey Island SAC (ca. 4.1km).

The NIS considers the potential for impact on European sites via the Irish Sea. Bray Head SAC is the closest European site with potential hydrological connectivity and this SAC is designated for the protection of heath and cliff habitats. The NIS outlines that potential indirect impacts via the hydrological pathway of the Irish Sea on terrestrial heath and cliff habitats are not considered likely. Also, given the dilution and dispersal that would occur within the Irish Sea this is not considered a viable pathway through which the conservation objectives of the SAC could be affected.

Potential impacts on SPAs have also been considered. The project is sufficiently remote that there is no risk of disturbance to waders and wildfowl within any SPA. The proposed project will not impact upon the migratory flight paths of SPA species nor restrict their mobility between wetland sites. The accompanying NIS (Atkins 2022) concludes that there will be no likely significant effects on Dalkey Islands SPA, Wicklow Mountains SPA, South Dublin Bay and River Tolka Estuary SPA and The Murrough SPA bird populations from potential collision with proposed apartment buildings. The project site is not a terrestrial site known for supporting roosting or foraging waterbirds. I-WeBs data identifies waterbird species that habitually field feed only occur in small numbers within the coastal waters of the Bray Harbour I-WeBs count site. Site surveys undertaken in winter 2020 did not record any SPA species within the proposed project site. No impacts to SPAs are anticipated as a result of the proposed project.

Potential impacts to marine based European sites are also considered. Rockabill to Dalkey Island SAC is considered the only European site within the zone of influence of the proposed project. This SAC is designated for the protection of qualifying interests; Reef habitats and marine mammal; Harbour porpoise. No impacts are anticipated upon reef habitats, either during the construction or operation of the proposed development. Porpoise have been recorded within coastal waters around Bray Harbour and potential impacts on this species from the proposed project via hydrological pathways has been assessed. Whilst the risk of impacts is assessed to be low, mitigation measures for the protection of the aquatic environment will ensure that there are no significant effects on the conservation of objectives of this Rockabill to Dalkey Island SAC qualifying interest species

The NIS concludes; *“Given the aforementioned mitigation measures, the quality of the storm water/surface water from the proposed development, either during construction or operation, is considered unlikely to impact on water quality within the River Dargle or Irish Sea. As such there are will be no significant effects to Rockabill to Dalkey Island SAC, or any other European site, from either the construction or operation of the proposed development via hydrological pathways.”*

#### 4.4.5.2. Impacts on Habitats

The development will result in a permeant loss of areas of Amenity grassland (GA2), Scattered trees and parkland (WD5), Mixed broadleaf/conifer woodland (WD2) and Recolonising bare ground (ED3). There will be 103 no. scattered parkland trees lost (predominantly sycamore species) and ca. 0.24 hectares of woodland lost (predominantly sycamore and pine species). These habitats range in value from Local Importance (Lower Value) (e.g. amenity grassland) to Local Importance (Higher Value) (e.g. Mixed broadleaf/conifer woodland (WD2)). Of note, boundary Treelines (WL2) or Hedgerows (WL2) will be retained where possible, those trees which are noted to be dangerous or in poor health as a result of storm damage or vandalism will be replaced.

At the southern extents the Site has been previously largely cleared of all vegetation and consists predominantly of hard standing areas and gravelled surfaces associated with the construction of the River Dargle flood defence and promenade works. Whilst the development site is predominantly separated from the watercourse by the physical barrier of public promenade and flood defence wall, the Site boundary does extend to the edge of the River Dargle and incorporates a small area of the riverbank of ca. 30m length. The surface water drainage network design for the development will involve the construction of an outfall pipe connecting to/outfalling at the northern bank of the River Dargle. This stretch of the river has been previously cleared of all natural habitats and consists of hardstanding areas/artificial surfaces (BL3) only, in the form of river walkway, promenade and flood defence walls. There are no natural / semi-natural riparian habitats or natural / semi-natural river banks along the River Dargle connecting to or directly adjacent to the proposed development site.

There are no habitats on Site of greater than local value. No ecological features of regional, national or European importance will be directly impacted by the proposed development. Semi-natural habitat of similar ecological value will be replaced as part of the landscape strategy and there will be a net gain in terms of tree numbers and thus the habitat loss impact will be temporary.

Negative impacts to semi-natural habitats would be restricted to within the development site. The habitats would therefore be assessed overall as important at a Site level and the effect of the habitat loss during the construction phase of the development would be adverse temporary significant at Site level only.

There will be no long-term significant impacts as a result of this habitat loss, however the amenity grasslands of the former golf club lands are of importance for foraging bats and badgers. These potential impacts are discussed below.

#### **Indirect habitat loss/damage via proximity of construction works**

Due to works being close to biodiversity features adjoining the Site, such as the Rathmichael Stream and associated woodland to the north and the River Dargle and associated aquatic habitats to the south, there is potential for a slight negative impact from construction activities to these features along the Site's boundaries.

At the north of the Site the buffering treeline and high fence is to be maintained between the development site and neighbouring Rathmichael watercourse/woodland to prevent negative impacts to the woodland and stream during construction. Therefore, impacts to Rathmichael watercourse/woodland are likely to be imperceptible.

At the south of the Site, the construction phase of the proposed development could have potential impacts upon aquatic environment of the River Dargle and also upon the downstream benthic habitats associated with the Dargle estuary via contaminated run-off or sediment from excavation materials entering the watercourse. However, instream works are not necessitated for the installation of the outfall pipe. Works on the artificial river bank will be of small scale, in a small work zone and of short duration. Any impacts as a result of sediment in the River Dargle will be imperceptible and temporary in nature at a local level and in turn the potential for sediment to reach to the benthic / estuarine habitats is not likely. As a result, sedimentation from the Site would not result in significant impacts to the River Dargle and estuary.

All construction activities will proceed in line with the surface water mitigation measures detailed in Section 4.5.1.6. below. Contamination of the aquatic environment from construction related activities such as excavated materials, silt, sediment, hydrocarbons or other pollutants will be prevented by these mitigation measures. Therefore, impact on the aquatic environment is mitigated so as to be not significant.

#### **Indirect habitat/species loss/damage via spread of invasive species**

No high impact invasive plant species have been recorded during ecological surveys within the extents of the proposed development site. Site biosecurity measures to reduce the introduction of invasive species, which can occur for example through the importation of soil materials, are included in Site mitigation measures (Refer to section 4.5.1.7 below) and as such this impact is mitigated to not significant.

#### **4.4.5.3. Impacts on bats**

This section details the principle potential impacts of the proposed residential development during the construction phase on bats.

#### **Loss of Foraging and Commuting Habitat**

The results of the bat activity survey undertaken for the proposed residential development indicate that the Site supports 3 no. species of foraging and commuting bat (soprano pipistrelle, common pipistrelle and Leisler's bat). A fourth species, Daubenton's bat, has been recorded outside the Site extents along the River Dargle. Whilst the Site accommodates these 3 no. bat species, the largest abundance of bat activity is recorded within the lands to the southwest (outside) of the Site extents.

Loss of grassland, trees and woodland areas during construction will impact on commuting and foraging bats and may reduce the available insect prey species and also reduce the feeding area available for bats in some locations. In the absence of mitigation, it is considered that the removal of foraging and commuting habitat would be a long-term significant negative impact at the local scale.

#### **Loss of Bat Roosts**

There are 6 no. trees within the Site extents which were identified during bat surveys as having Low-Moderate potential to support bat roosts. Whilst no roosts were confirmed within these 6 no. trees the loss of these trees could represent a slight negative impact on bat habitat at a local level from loss of potential roosting habitat.

In the absence of mitigation, the loss of potential bat roosts during the construction phase would have temporary slight negative impact at the local geographic scale. Loss of potential bat roosting habitat will be mitigated by the introduction of 36 no. bat boxes within landscaped areas and within structure (pumping station) walls.

## Lighting

Lighting can cause avoidance of an area for commuting bats and can prevent or reduce foraging for some species, including *Myotis* species<sup>32</sup>. Studies have also found that pipistrelle and Leisler's bat can congregate around white mercury street lights and white metal halide lamps feeding on the insects attracted to the light, however, even bat species that have been shown to opportunistically forage in lit conditions have subsequently been recorded being impacted by artificial lighting. In cities, for example, common pipistrelles have been recorded avoiding gaps that are well illuminated, thereby creating a barrier effect<sup>33</sup>. Temporary lighting measures which may be required during the construction phase may affect bats commuting through or feeding within the proposed Site.

In the absence of mitigation, disturbance to bats from lighting during the construction phase would have short-term significant adverse impact at the local geographic scale.

### 4.4.5.4. Impacts on badgers and other large mammals

Terrestrial mammal surveys undertaken within the proposed development site did not find any evidence of badger setts, otter holts, fox dens or any other large mammal refugia within the Site extents. The location of a badger 'main' sett in lands to the north of the project (north of Woodbrook residential area), the sighting of adult badger and cubs to the south east of the proposed development site and evidence of badger activity within the Site extents (prints, faecal deposits) indicate this is a foraging and commuting area for local badgers. Evidence of fox activity was also noted within and around the Site.

During the construction phase there will be a loss of grassland and woodland areas which will lead to a reduction in foraging habitat for larger mammals. The construction phase may also temporarily disrupt foraging habits and commuting routes.

In the absence of mitigation, it is considered that the removal of foraging and commuting habitat would be a long-term significant adverse impact on badgers at the local geographic scale.

No significant impacts on foxes, otters or any other large mammals are expected as a result of the proposed development.

### 4.4.5.5. Impacts on birds

Bird species recorded during site surveys (2020 and 2022) are common and no rare or uncommon species or species of high conservation value were recorded (Herring gull noted during Site surveys was an overfly). Historic records of protected bird species within the area are associated with the coastal waters around Bray Harbour. Waterbird species that habitually field feed only occur in small numbers within the Bray Harbour I-WeBs count site. I-WeBs do not include the terrestrial lands of the project site within the Bray Harbour I-WeBs count site and the project site is not a terrestrial site known for supporting roosting or foraging waterbirds. Site surveys undertaken in winter 2020 did not record any wintering waterbirds or wildfowl within the proposed project site. Given the high public usage of the Site it is considered not to be of prime value as a roosting or feeding area for waterbirds associated with the coastal waters. Given the location of the Site in relation to areas of high avian usage, during the construction phase, the physical erection of buildings and usage of cranes will not impact upon the migratory flight paths of waterbirds or wildfowl nor restrict their mobility between wetland sites. The usage of cranes and the erection of highly visual structures/buildings will not present a collision risk to birds during the construction phase of the proposed project (potential bird collision risk during the operational phase is assessed below).

There will be a net loss of semi-natural habitats within the proposed development area (grassland, trees, woodlands) and the loss of woodland in particular will have a localised effect on nesting and feeding resources for local passerine species.

In the absence of mitigation, the loss of habitat for breeding birds within the development site is considered a permanent slight negative effect on passerine bird species at a local geographic scale. No impacts on wintering and native waterbirds and wildfowl are anticipated.

### 4.4.5.6. Impacts on water quality

#### Indirect impacts to watercourses via surface-water run-off

During wet conditions sediment can mobilise in the form of over-ground run-off during excavations and/or movement of heavy machinery through the Site. Sediment is of particular concern for aquatic species within receiving water bodies.

<sup>32</sup> Stone E.L. (2013). Bats and Lighting: Overview of current evidence and mitigation.

<sup>33</sup> Bat Conservation Trust and Institute of Lighting Professionals (2018) Guidance Note 08/18: Bats and artificial lighting in the UK. ILP, Rugby.

However, the only works near the River Dargle are those involving the installation of the surface water drainage network for the proposed development. All other construction activities are remote from the watercourse and there is the physical barrier of the flood defence walls and public promenade separating the Site from the watercourse.

Given the physical barrier the flood defence walls, and promenade will present and the distance between the Coastal Quarter residential development works areas and the watercourse, the potential for large volumes of sediment to reach the River Dargle as a result of construction activities is very limited.

Any impacts as a result of sediment in the River Dargle will be imperceptible and temporary in nature at a local level and in turn the potential for sediment to reach the estuary is not likely.

Construction compounds are not located within 100m of the River Dargle and such there will be no storage of plant, machinery, equipment, fuels or chemicals near the watercourse. No impacts on surface water quality are anticipated from Site compound activities.

In addition, mitigation measures as set out in Chapter 9 - Land, Soils and Geology; and Chapter 10 - Water will be implemented during the Construction phase.

#### **Indirect Impacts during construction phase via groundwater (hydrogeological pathway)**

Water Chapter 10 details the potential impacts on the water quality of the River Dargle via groundwater pathways and outlines mitigation factors and measures for the control of pollution and protection of surface water and groundwater quality. The assessment anticipates adverse impacts on surface water or groundwater will be short-term and slight adverse during the construction phase of the proposed development, given the mitigation measures proposed. During the construction phase impacts on aquatic species accommodated within the River Dargle will be short term imperceptible.

No impacts to groundwater are anticipated from works associated with underground connections to local infrastructure; foul network connections and potable water connections.

#### **4.4.5.7. Disturbance and/or displacement of faunal species**

##### **Bats**

Whilst there are no confirmed bat roosts recorded within the proposed development Site the felling of mature trees creates a risk of roost loss and as a consequence a potential displacement of bats. The reduction in trees, woodland and grassland habitats during the construction phase can lead to reduced insect abundance in the short term.

The alteration and removal of grasslands and the 6 no. trees with low-medium potential to be bat roosting habitat will have a temporary slight negative impact to local bat species. In the absence of mitigation this will be a permanent moderate negative impact.

##### **Nesting Birds**

Some disturbance/displacement of passerine birds may occur during construction due to increased noise and disturbance. The loss of trees and woodland will also cause a reduction in bird nesting and feeding sites. In the absence of mitigation this will be a permanent moderate negative impact at a local scale.

##### **Terrestrial mammals**

While evidence of badger and fox have been recorded onsite no signs of badger or fox refugia were recorded i.e. setts or dens. Other mammal species historically recorded within the proposed development lands include Grey Squirrel and Hedgehog. During construction activities there is the potential for disturbance and disruption to the foraging habits and commuting routes of terrestrial mammals, in particular to local badgers.

It is considered that the disruption to foraging and commuting for terrestrial mammals would be a short-term moderate adverse impact on badgers at the local geographic scale.

##### **Other Species**

Protected butterfly and bee species have been recorded within the wider area, outside of the development site. It is not expected that impacts on Hymenoptera and Lepidoptera species will be significant, and the open space and landscaped areas provided as part of the proposed development will incorporate features suitable for use by these species.

It is considered that disturbance or displacement of insect species will be short term imperceptible at a local geographic level.

## 4.4.6. Operational Phase

### 4.4.6.1. Impact on Sites Designated for Nature Conservation

There is no direct connectivity from the proposed development site to any internationally or nationally designated sites and as such during the operational phase of the development there will be no direct impacts on European sites or nationally designated conservation sites.

During the operational phase, storm water / surface water from the development will outfall to the River Dargle and as such there is potential hydrological connectivity to marine / coastal based designated conservation sites via the River Dargle and Irish Sea. The closest designated sites with indirect connectivity via the Irish Sea are Bray Head SAC/pNHA (ca. 1.7km) and Rockabill to Dalkey Island SAC (ca. 4.1km). Mitigation measures for the protection of River Dargle and the aquatic environment offset any potential significant hydrological impacts during the operation of the development. As mitigation measures will be employed and given the dilution and dispersal that would occur within the Irish Sea, this indirect hydrological connectivity is not considered a viable pathway through which any designated site, or habitats or species associated with any designated site, could be impacted.

The proposed development once completed may lead to an increase in public footfall within Bray Head SAC/pNHA. There are formalised and managed pathways through Bray Head some of which are through heath habitats and along cliff tops. Bray Head was subject to a Special Amenity Area Order in 2007. The objectives and principles of Bray Head Special Amenity Area Order detail extensive measures for the management of increased public access as well as for the maintenance of recreational walkways to be undertaken in combination with the protection of the heath and cliff habitats. Given that the formalised paths through Bray Head are already heavily utilised by the public, and given the paths and protected habitats (heaths and cliffs) are subject to continued management and maintenance measures, it is considered that any increase in footfall that may occur along Bray Head's formalised pathways as a result of the proposed development will not likely effect Bray Head's heath and cliff habitats.

During the operational phase, foul effluent from the proposed development will be treated at Shanganagh WwTP. Following treatment, discharge from the plant is to the Irish Sea. Discharge from the WwTP is not anticipated to have any impact on any habitats or species associated with any designated conservation site given that it will be treated and given the dilution and dispersal that will occur within the Irish Sea.

No direct or indirect impacts are anticipated on internationally or nationally designated conservation areas during the operational phase of the Coastal Quarter development.

### 4.4.6.2. Impacts on Habitats

No further impacts on terrestrial habitats are predicted during operation of the proposed scheme. Landscaping proposals are discussed under Section 4.5 Mitigation, below.

#### **Impacts on aquatic environment**

Once built, surface water drainage from the development will discharge to the network which ultimately joins the River Dargle to the southeast of the Site. The proposed surface water drainage system for the development has been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works and Sewers (GDSDS). Refer to the Stormwater Impact Assessment Report<sup>34</sup> for discussion of surface water drainage, the use of SuDS and surface water attenuation.

The SuDS features to be used in the drainage network include modular permeable paving; swales; filter drains; tree pits and underground storage capacity with discharge to the River Dargle. There are green roofs on the development units (apartments) and much of the rainfall for this side of the Site will be absorbed by these sedum and wildflower areas. For areas of soft landscaping, e.g. woodland mix planting, wildflower meadows, grassland areas and residential gardens the rainfall will drain to ground mimicking nature and managing rainfall close to where it falls. The permeable paving similarly allows for localised management of rainfall where during low rainfall events surface water will infiltrate to ground. For larger rainfall events the permeable paving will have an outlet to allow storm water to discharge into the proposed surface water network. The soft landscaping and drainage designs also includes for swales which will also minimise surface water runoff to the local network by allowing rainfall to be slowed and soaked to ground. The SuDS drainage design allows for opportunities for using runoff rainfall where it falls which will ultimately allow for greatly reduced surface water outfall to the River Dargle whilst also providing for watering of extensive areas of soft landscaping. The drainage design also includes for underground attenuation systems and flow controls to slow and manage surface water drainage before final outfall to the River Dargle which will ensure there is protection to the natural flow regimes of the watercourse.

<sup>34</sup> Stormwater Impact Assessment Report – Atkins Document Reference; 5214419DG0012

Surface water runoff from the development will be attenuated to greenfield rates in accordance with GSDSDS using a hydrobrake on the surface water outlet from each catchment. Surface Water flow exceeding allowable outflow rates will be stored in underground storage units (for rainfall events up to 1 in 100-year return period, with a 20% allowance for climate change and 10% for urban creep). Adoption of a SuDS design also allows for treatment of surface water flow as close to source as possible. This is described in detail in the accompanying Stormwater Impact Assessment Report; with details provided as to how water from different sources and with different risk profiles are to be addressed.

The operational foul sewer amenities of the proposed development will connect to the existing operational Bray foul water network which is processed by the Shanganagh Wastewater Treatment Plant. Irish Water has confirmed that the plant has capacity to adequately process the additional input from the operational demand presented by the proposed Coastal Quarter development (Confirmation of Feasibility letter included the accompanying Engineering Planning Report<sup>35</sup>). Following treatment discharge from the plant is to the Irish Sea. Discharge from the WwTP is not anticipated to have any impact on the aquatic environment given that waters are treated at the plant before discharge and given the dilution and dispersal which will occur within the Irish Sea.

It is therefore considered that the operational phase of the proposed development will not negatively impact, directly or indirectly, any of the habitats or species accommodated within the aquatic environments of the River Dargle or Irish Sea.

#### 4.4.6.3. Impacts on bats

##### Lighting

The street and domestic lighting proposed for the development will increase light levels within the proposed development area. Increased lighting may reduce the availability of feeding sites for bats and would be a long-term significant adverse impact at the local geographic scale. As a consequence, specific mitigation measures have been incorporated into the design in order to avoid such impacts (see Section 4.5.2.1.).

##### Foraging and commuting routes

The connectivity of the habitats located to the north (Rathmichael woodlands/stream) and the south (River Dargle dark corridor) of the Site is of importance to local bat populations. The loss of connecting features, such as hedgerows and treelines, would have a long-term significant adverse impact at the local geographic scale. Boundary tree lines and hedgerows are to be retained and in addition the specific landscaping design incorporates additional planting along an ecological buffer zone along the north and east sides of the development lands. These measures are included in the design so as to ensure connectivity between habitats and will ensure important bat flight lines, foraging areas and commuting routes are provided for to avoid impact on foraging and commuting bats.

##### Roosting sites

Whilst there will be a loss of a number of trees which have the potential to have bat roosts, the design of the development includes for the installation of 36 no. bat boxes to act as summer and winter roosting sites. The landscape design also includes for the planting of native tree species which will in time provide for further potential roosting site habitat.

The specific mitigation measures for the addition of bat roosting habitat and foraging and commuting routes is outlined below in Section 4.5.2. As a result of the mitigation measures the impact on bats is likely to have a slight-moderate impact on bats in the long-term at a local level.

##### Collision Risk

Bats are highly mobile and agile flyers as is witnessed by their ability to hunt small insects on the wing in low light conditions. Bats use echolocation to navigate and forage for insect prey. There is research evidence<sup>36</sup> suggesting that some bats can mistake smooth, vertical surfaces (such as glass fronted buildings) as clear flight paths, however, the proposed development does not present such a scenario. Given that the proposed development does not include for uninterrupted expanses of glass and given the high agility of local bats which are accustomed to the urban, built up environment, the proposed development's buildings do not represent a collision risk to local bat populations.

#### 4.4.6.4. Impacts on badgers and other large mammals

There will be a loss of foraging habitat associated with the construction of the development in the form of grassland areas and sections of woodlands. Badgers are known to be located near Woodbrook golf club lands

<sup>35</sup> Engineering Planning Report - Atkins Document Reference; 5214419DG0018.

<sup>36</sup> Greif, Stefan & Zsebök, Sándor & Schmieder, Daniela & Siemers, Björn. (2017). Acoustic mirrors as sensory traps for bats.

to the north of the Site. There are large areas of undeveloped lands, primarily along the east side/coast side of the railway line, and it is important to ensure there is continued connectivity to available foraging habitats. The landscaping design calls for an ecological buffer zone along the northern and eastern sides of the development which will provide foraging and commuting routes for badgers known to be located in lands to the north. Refer to Landscape Planting Plans (Drawings Nos. 6948\_L-2000 & 2002) for details of the landscaping design. The connectivity of landscaping features from the Rathmichael Stream and woodlands (north of Site extents) to the railway underpass adjacent to the Site will also provide commuting routes from/to the large areas of scrub habitat and golf course lands to the east of the railway.

There is the potential for night-time light spillage from the development to impact otters utilising the Rathmichael Stream and woodland area to the north of the Site. The landscape design calls for the retention of the northern perimeter treeline (aside from unsafe trees) and includes for additional planting to thicken the existing treeline. The existing treeline, including cypress trees (bar unsafe specimens), along the northern perimeter will left in situ so as to provide for screening to minimise nocturnal light spill from the development onto the Rathmichael stream and woodlands area.

Whilst mitigation measures will ensure connectivity of habitats and some foraging habitat, there will be a loss of green field areas which are badger foraging habitat. The operational phase of the development will lead to a long-term moderate impact on badgers at a local level. With the retention of the northern treeline (where possible) disturbance impacts from light spill upon otters using Rathmichael Stream are likely to be imperceptible.

#### 4.4.6.5. Impacts on water quality

##### **Indirect damage to the aquatic environment via surface-water run-off**

During the operational phase, surface-water run-off associated with the Site will be collected by a new water drainage system for the development which has been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works and Sewers (GSDSDS). No significant impacts to aquatic species accommodated within the River Dargle are anticipated during the operational phase of the development.

##### **Indirect damage to environment via discharge of treated foul effluent**

Waste-water/Foul Effluent from the constructed development, will be collected via new sewer infrastructure at Site that will connect to an existing foul sewer associated with the operation of the Bray development. The foul sewer will discharge wastewater into existing/new public waste-water sewer network. This will ultimately be treated at the Shanganagh Plant (WwTP) and the treatment infrastructure has the capacity to deal with effluent arising from the proposed development. No impacts to ecological features are anticipated as a result of foul water generated from the use of the proposed development given that it will be treated and given the dilution and dispersal that will occur within the Irish Sea with treated discharge from the WwTP.

#### 4.4.6.6. Impacts on birds – collision risk

With urbanization, collision with man-made structures/buildings has become a threat for birds. Of key consideration when assessing collision risk is the location and design of the structure and how and where birds will fly through the wider landscape. In the case of the birds (waterbirds and wildfowl) using the Bray Harbour I-WeBs count site, their movement would be expected to be within the marine environment, along the coastline, within estuarine areas, along river channels and between wetland sites. The project site does not proffer any of the aforementioned habitats, nor does the Site lie between Bray Harbour I-WeBs count site and any of these habitat types. The Site is not situated between Bray Harbour I-WeBs count site and any sites of high avian use. The waterbirds and wildfowl accommodated within the Brar Harbour count site will not have regular or repeated passage across the Site in order to reach preferred habitats. As such the project will not restrict bird mobility between wetland sites and there will be no likely significant effects on the Bray Harbour's bird populations from potential collision with proposed apartment buildings. The accompanying NIS (Atkins 2022) concludes that there will be no likely significant effects on the bird populations associated with Dalkey Islands SPA, Wicklow Mountains SPA, South Dublin Bay and River Tolka Estuary SPA and The Murrough SPA from potential collision with proposed apartment buildings.

In addition, the design of the proposed apartment blocks does not include for large, uninterrupted expanses of glass (as for example is often the case with office block design) which due to the extensive areas of reflection can confuse birds and exacerbate collision risk for local passerine and near passerine species. Local bird species recorded within the Site (gulls, rooks, pigeons etc., refer to Table 4.6 above) are largely habituated and accustomed to foraging, roosting and nesting within the urban environment and are regularly found within built up cityscapes. Given the design of the taller apartment blocks; balconies, solid surfaces/walls between windows with no uninterrupted expanses of glass, the built up nature of the surrounding landscape (including existing apartment blocks and tall buildings) and that local native bird species are accustomed to the urban environment, the proposed buildings within the Site present an extremely low collision risk to local bird species. Moreover, it is

considered likely that local bird species will utilise the proposed development's taller buildings for roosting and potentially nesting (e.g. gulls, rooks, pigeons nesting on roof areas).

Given the location and design of the buildings, the lack of likely waterbird and wildfowl passage across the Site, that local native Passerines (e.g. rooks, blackbirds), Columbiformes (pigeons) and Charadriiformes (gulls) species are accustomed to the 'built-up' nature of the surrounding landscape, it is considered that potential the collision risk of waterbirds, wildfowl, near passerine and passerine species will be imperceptible at a local level. Given the location of the Site in context with the I-WeBS count site, the proposed project will not impact upon the migratory flight paths of wintering waterbird bird species nor restrict their mobility between wetland sites.

#### 4.4.6.7. Disturbance and/or displacement of faunal species

The proposed development when operational will be sufficiently distant from the River Dargle and Bray harbour so not to cause disturbance to wintering and native waterbirds, which are noted from I-WeBS counts to be predominantly gull species. Given that the harbour and estuary areas are heavily utilised by the public already, bird species accommodated within the coastal waters are likely habituated to human presence. As such disturbance related impacts on waterbirds is considered imperceptible.

As noted above, local passerine bird populations may be displaced off Site during the construction stage. Once works have finalised and landscaping becomes established common bird species will use the area again. During the operational phase, the levels of activity will stabilise and birds in the surrounding landscape will be expected to habituate to the volume of activity proposed.

The design calls for the establishment of landscaping areas which will include for wildflower areas and pollinator species which could lead to an increase in insect availability for birds (refer to Landscape Planting Plans Drawings Nos. 6948\_L-2000 & 2002). Mitigation measures also include for the installation of bird nesting boxes throughout the planted areas of the Site. Given the mitigation measures, the impact on local passerine birds is therefore predicted to be neutral during operation.

#### 4.4.7. Risk of Major Accidents and Disasters

The risk of a major accident onsite is low and would be confined to the construction phase of the development (e.g. there will be no oil storage tanks on site, removing the risk of oil spills associated with the finished development). Events such as a large hydrocarbon spill or release of high volumes of contaminants during the construction phase could potentially have a negative impact on high value sensitive sites such as the River Dargle and estuary. However, given the location of the Site relative to watercourses, and given the surface water mitigation measures as outlined in Water Chapter 10, it is unlikely that an accident of sufficient scale would occur that would negatively impact on surface water features or aquatic habitats. While impacts to local soil and groundwater could conceivably occur, the preventative measures and emergency response measures will limit the potential scale of this impact (refer to Chapter 9 Land, Soils & Geology and Chapter 10 Water for mitigation measures). Thus, allowing for the above, the magnitude of a major accident on site is likely to be significant at a Site level only and imperceptible in relation to ecologically important features such as the nearby River Dargle.

### 4.5. Mitigation Measures

#### 4.5.1. Construction Phase Mitigation

The appointed Contractor shall ensure specialist ecological surveying is undertaken where required i.e. mammal surveys, bat surveys, and nesting bird surveys as detailed further below. Construction phase ecological mitigation measures shall be developed and undertaken in coordination with ecological specialists (i.e. bat specialist and suitably qualified ecologist) as required.

##### 4.5.1.1. Protection of Sites Designated for Nature Conservation

Protection of sites designated for conservation, and the features of interests associated with designated sites, is through prevention of potential impacts to the aquatic environment during the construction phase.

Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase.

Works will follow best practice guidance as outlined in *Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters* (IFI, 2016).

##### 4.5.1.2. Mitigation of habitat loss/damage during construction

Hedgerows, treelines and boundary woodland areas are to be retained on-site; Site boundaries will be protected from any accidental damage during construction by means of exclusion through use of fencing. All trees, including cypresses, along the northern boundary will be retained with only unsafe trees being removed during the



construction phase. This is set out in full in the accompanying Tree Survey Report and Landscape Planting Plan. Measures will be taken to ensure that trees and hedges being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around retained trees and hedgerows and fencing will be erected so as to encompass the Root Protection areas (RPAs) of trees and hedgerows. The fencing will be at least 2m high and constructed in accordance with the RPA outlines in the Tree Survey Report (Appendix 5.2). Similarly, a buffer is to be maintained between the Site and neighbouring woodland to prevent negative impacts to woodland during construction.

Site clearance of potential bird nesting habitat is detailed below. Site clearance of potential bat roost habitat is detailed below.

To compensate for the loss of woodland substantial native tree and hedgerow planting will be planted on the Site and existing hedges which are to be retained will be reinforced with native planting. This will reduce the impact of the proposed development upon habitats in the area and there will be no significant operational impact upon habitats due to the provision of substantial native and pollinator friendly habitats proposed for the Site (refer to Landscape Planting Plan Drawings Nos. 6948\_L-2000 & 2002). Landscape enhancement measures are outlined in greater detail below in Section 4.5.1.10.

#### 4.5.1.3. Bats

##### **Loss of Foraging and Commuting Habitat**

Loss of commuting and foraging habitat at the Site will be mitigated by the landscaping proposals, which include hedgerow planting, wildflower and woodland planting. Planting schemes should ensure connectivity to linear/ woodland habitats in the wider landscape. It is noted that the landscaping proposals also include retention of hedgerow and boundary treeline and the planting of hedgerow where none is currently in situ. Trees that are being retained in the Site shall be protected during clearance and construction works in line with current guidelines e.g. British Standard 5837:2012 and National Roads Authority 2006a.

##### **Lighting**

To minimise disturbance to bats and other fauna (badger and otter) that are roosting/resting or active at night, no construction operations will be undertaken during the hours of darkness. If construction lighting is required during the bat activity period (dusk April to September), lighting shall be directed away from all hedgerow/ treeline habitats to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill.

##### **Bat Conservation Plan and Bat Roosts**

A Bat Conservation Plan has been developed for the construction phase of the proposed development. The Bat Conservation Plan is included in Appendix 4.3 of this document. The Contractor will appoint a bat specialist prior to construction activities to supervise and implement the Bat Conservation Plan. The Bat Conservation Plan includes the following commitments; all trees noted to have potential bat roosting habitat will be surveyed by the appointed bat specialist prior to Site clearance works and if roosts are found the bat specialist will develop a method statement for the tree / roost clearance in consultation with the planning authority and NPWS and will seek the necessary derogation licence from local NPWS staff (if required). The Bat Conservation Plan also includes for the surveying and protection of existing bat roosts identified in the 2 no. oaks trees located on the former golf clubs lands outside of the Site boundary (refer to Appendix 4.3 for Bat Conservation Plan).

Whilst there will be a loss of a number of trees which have the potential to have bat roosts, the design of the development includes for the installation of 36 no. bat boxes to act as summer and winter roosting sites. The installation of bat boxes will include 14no. winter bat boxes and 14 no. summer bat boxes to be installed within boundary landscaped areas and 8 no. bat tubes installed within walls around the pumping station (Refer to Landscape Masterplan for locations). The installation of bat boxes will be supervised and overseen by the appointed bat specialist. The landscape design also includes for the planting of native tree species which will in time provide for further potential roosting site habitat.

#### 4.5.1.4. Birds

Removal of nesting habitat (hedgerows, scattered trees and woodland utilised by local and common bird species) will be carried out outside the breeding bird season from 1<sup>st</sup> March to 31<sup>st</sup> August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff. The comprehensive landscaping design calls for the planting of native trees and plant species suitable for pollinating insect species. The landscape design also includes for gorse planting which will provide for habitat suitable for stonechat. The

landscape design should provide for a net gain in suitable bird nesting and foraging habitat. The landscaping design has followed the principles outlined in the All-Ireland Pollinator Plan 2021-2025.

#### 4.5.1.5. Terrestrial mammals

During the construction phase the Contractor will adhere to the ‘*Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*’ (NRA 2006). The Site and all areas within 150m around the perimeter of the Site will be resurveyed for badger activity and the presence of setts by a suitably qualified ecologist (appointed by the Contractor) prior to the commencement of construction activities. Should an active sett be noted within the Site or survey area, NPWS will be informed and consulted. The suitable qualified ecologist will develop a method statement in agreement with NPWS for construction activities near an active badger sett. Method statement for works near an active sett will include; there shall be no blasting or pile driving within 150m of an active sett during the breeding season (December to June) or construction works within 50m of such an active sett during the breeding season.

The creation of an ecological buffer zone along the northern and eastern boundaries of the Site will allow for connectivity of habitats and the continuance of the site to be used as a badger foraging area. The buffer zone allows for connectivity between Rathmichael woodlands/stream and the railway underpass which leads to scrub habitat and Woodbrook golf club lands which are known to be badger foraging territory. During the construction phase no works will be undertaken during night time hours and as such the construction activities will not take place whilst local badgers are foraging. During the construction phase an access track will be in situ along the northern and eastern boundaries which will allow for continued connectivity from Rathmichael woodlands to the railway underpass and to the important foraging habitats to the east of the railway line.

During the construction phase the following standard management and protection measures will be implemented during the construction works and monitored by the project ecologist:

- No excavations are to be left uncovered overnight or without a means of egress (e.g. a ramp or sloped plank) to prevent badgers from falling in or entering in search of food and becoming trapped;
- No buildings or storage units are to be left open overnight to prevent badgers from entering in search of food and becoming trapped;
- All food waste is to be properly secured and disposed of to avoid attracting badgers to the Site;
- No toxic, poisonous or potentially harmful substances or materials are to be left unsecured overnight; and,
- Should any new badger setts or mammal burrows be discovered within the Site or immediately adjoining areas the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS as necessary.

#### 4.5.1.6. Prevention of pollution to surface waters

Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase.

Works will follow best practice guidance as outlined in *Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters* (IFI, 2016).

#### 4.5.1.7. Invasive species prevention

No legally restricted invasive species, such as Japanese knotweed, were found onsite. Strict bio-security protocols will be implemented during the construction phase so as to ensure no imported materials potentially contaminated with invasive plant species are brought to Site. All imported soil materials will be visually inspected by the Contractor’s ecologist for signs of invasive plant contamination (such as root fragments, rhizome material) prior to arrival on Site.

#### 4.5.1.8. Disturbance of faunal species mitigation

Removal of nesting habitat (hedgerows, scattered trees and woodland) will be carried out outside the breeding bird season from 1<sup>st</sup> March to 31<sup>st</sup> August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff.

#### 4.5.1.9. Additional Construction Phase Ecological Mitigation Measures

With regard to potential impacts on ecological features the following mitigation measures are proposed:

- The Contractor shall engage a suitably experienced and qualified ecologist and/or specialist ecologist to undertake the required ecological surveying prior to construction activities. Pre-construction ecological surveys should include; terrestrial mammal surveys, bat roost surveys and breeding bird surveys (breeding bird surveys will be required if vegetation clearance is to be undertaken within nesting season 1<sup>st</sup> March – 31<sup>st</sup> August);
- The Contractor shall employ good practice environmental and pollution control measures with regard to current best practice guidance such as Environmental Good Practice On-site Guide (CIRIA, 2018);
- The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides ‘Control of Water Pollution from Construction Sites’ and ‘Groundwater control - design and practice’ to minimise as far as possible the risk of pollution;
- All of the mitigation measures for the protection of soils listed in Chapter 9 will be implemented onsite during the construction phase;
- The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle from construction activities. The mitigation measures for prevention of potential surface water impacts as detailed in Water Chapter 10 shall be implemented;
- The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle via the local groundwater body. All groundwater mitigation measures as outlined in Chapter 10 - Water shall be implemented; and,
- The Contractor shall take all necessary precautions to prevent potential impact upon habitats and species from dust generated during the construction phase. All air quality mitigation measures as outlined in Chapter 11- Air Quality & Climate shall be implemented.

The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further added to by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.

#### 4.5.1.10. Design Measure Mitigation

##### Landscaping

A comprehensive landscaping design has been developed for the Site which will include for additional boundary planting and the creation of an ecological buffer zone along the northern and eastern boundaries of the Site. In line with DLRCC and WCC Biodiversity Action Plans and the All Ireland National Pollinator Plan and in order to create a biodiversity net gain at the Site the landscaping plan will include areas of ecological enhancement such as substantial areas of native tree planting and wild flower areas. The planted areas will link with the Rathmichael woodland and the River Dargle. The landscape design incorporates additional standard size trees to be planted along the northern boundary to thicken the existing treeline to help minimise potential light spillage from the development on the Rathmichael stream and woodland area. The landscape design includes for linear shrub planting along the eastern boundary adjacent to the railway line, with the inclusion of gorse, to provide cover for the movement of terrestrial mammals and to provide for habitat suitable for bird species; stonechat. This planting will comprise an appropriate mixture of native trees and shrubs, preferably of local provenance, and including species attractive to pollinators. The planting will incorporate a range of species that will attract feeding invertebrates, including moths, butterflies and bees. Refer to Landscape Planting Plans (Drawings Nos. 6948\_L-2000 & 2002) for details of the landscaping design.

The landscape planting design provides for a net gain in number of trees within the Site. There are ca. 350 no. standard sized trees detailed within the proposed design including species:- *Pinus nigra*, *Tilia tomentosa*, *Quercus cerris*, *Acer pseudoplatanus*, *Crataegus laevigata* and *Prunus* ‘Accolade’. The soft landscaping design includes for additional hedgerow planting including species:- *Ilex crenata*, *Carpinus betulus*, *Escallonia* ‘Apple Blossom’, *Crataegus monogyna* and *Hedera helix* ‘Hibernica’.

Extensive areas of woodland screening planting is also included in the design. There are ca. 4,718m<sup>2</sup> of woodland mix screening planting including species:- *Quercus robur*, *Cornus alba*, *Ilex aquifolium*, *Betula pendula*, *Alnus glutinosa*, *Corylus avellana*, *Pinus sylvestris*, *Sorbus aucuparia*, *Crataegus monogyna*, *Prunus spinosa* and *Acer campestre*.

Extensive areas of wildflower meadows are also included in the soft landscaping design including species: - Black Medick, Common Vetch, Cowslip, Field Scabious, Greater Birdsfoot Trefoil, Hemp Agrimony, Common/Lesser Knapweed, Meadow Buttercup, Oxeye Daisy, Purple Loosetrife, Ragged Robin, Ribwort Plantain, Rough Hawkbit, Selfheal, Wild Carrot, Hedge Woundwort, Yarrow Iris, Yellow Rattle, Browntop Bentgrass, Slender

Creeping Red Fescue, Chewings Fescue, Musk mallow, Wild primrose and Corncockle. There are ca. 3,930m<sup>2</sup> of wildflower meadow to be planted within the Site.

### Bats

The following recommendations for enhancement are adapted from Landscape and Urban Design for Bats and Biodiversity (BCT, 2012). To attract nocturnal flying insects, plant:

- Mixtures of flowering plants, trees and shrubs to encourage a diversity of insects to sustain bats and other wildlife throughout the year. New planting will include pollinator-friendly tree species (Refer to Landscape Planting Plan Drawing No.6948-L-2002);
- Hedgerows will include a range of different species to provide food throughout the year, for example blackthorn for early season nectar; hawthorn and bramble for summer flowers and autumn berries; ivy for autumn nectar and later winter berries;
- Flowers that vary in colour, fragrance, shape, amount of nectar and time of flowering;
- Pale flowers that are more easily seen in poor light, so attracting insects at dusk;
- Single flowers, which tend to produce more nectar than double varieties; and
- Flowers with insect-friendly landing platforms and short florets, like those in the daisy families.

Other enhancement measures include:

- Bat roost boxes on mature trees and integrated bat boxes built into structures are included as biodiversity enhancement measures. 14 no. Rocket Bat boxes are to be installed in the dark zones within northern woodland and treeline habitats. These will be free standing chambers on free standing poles. 14 no. Summer Bat Boxes (1FF Schwegler woodcrete or similar design) will be erected within the treeline on the northern boundary of the Site. In the area of the pumping station (south east of the Site), 8 no. bat tubes to be installed within this structure. These are specifically designed boxes that provided alternative roosting for bats.

### Birds

Within the landscape plan wildflowers, shrubs and trees which have the potential to support foraging populations of birds are proposed in the landscape plan and include (non-exhaustive list): -

- Gorse (*Ulex europaeus*)
- Hawthorn (*Crataegus monogyna*)
- Holly (*Ilex aquifolium*)
- Rowan/Mountain Ash (*Sorbus aucuparia*)
- *Agapanthus africanus*
- *Alchemilla mollis*
- *Achillea millefolium*
- *Armeria maritima*
- *Rudbeckia fulgida*

The development design also includes for 10 no. bird nesting boxes to be erected in the woodland area to the northwest of the Site as well as along the ecological buffer zone along the northern and eastern boundaries of the Site.

### Invertebrates

The Landscape design for the proposed development includes for the creation of wildflower areas to incorporate plant species which will attract pollinating insects. The installation of 10 no. insect hotels will also form part of the wildflower landscaping measures and these insect boxes will allow for insects to establish and have refuge in the landscaped areas.

The planting schedule contains a mix of native plant species and emphasis has been placed on adhering to the objectives outlined in the All-Ireland Pollinator Plan 2021-2025 with the aim of planting species which are beneficial to pollinator species. Pollinator beneficial plant species include (non-exhaustive list): -

- *Nepeta* 'Walker Low'
- *Salvia nemorosa*

- *Lavandula angustifolia*
- *Achillea millefolium*
- *Armeria maritima*
- Hemp Agrimony
- Black Meddick
- Musk mallow
- Wild primrose
- Hedge woundwort

In addition, the roof level of apartment blocks will be developed into green spaces to have a mix of sedum and wildflowers to further benefit pollinating species. There are 11,980m<sup>2</sup> of green roof spaces within the design. Insect hotels are to be placed within these roof garden areas (Refer to Landscape Planting Plan Drawing No.6948-L-2002).

## 4.5.2. Operational Phase Mitigation

The following operational mitigation measures will be implemented either through the design of the proposed development (e.g. lighting, foul drainage, landscaping etc.), or by those in charge of maintenance and management of the development.

### 4.5.2.1. Lighting

The design of the lighting within and around the proposed development has been designed to be cognisant of minimising effects on local nocturnal species, such as bats and badgers, and has been developed so as to allow for a dark ecological corridor around the northern and eastern boundary of the Site. The lighting scheme for the Site has been developed with the following principals; only illuminating what needs to be illuminated (e.g. light directed to the path only), reducing night time light levels, reducing the height of the luminaires, shielding of luminaires and correct choice of light (e.g. a warm white spectrum <2700 Kelvins).

Project specific lighting designs include for:

- All luminaires shall lack UV/IR elements to reduce impact;
- LED luminaires shall be used due to the fact that they are highly directional, have lower intensity, have good colour rendition and dimming capability;
- A warm white spectrum <2700 Kelvins shall be used to reduce the blue light component of the LED spectrum;
- Luminaires shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Column heights shall be carefully considered to minimise light spill. The shortest column height allowed shall be used where possible. Ca. 5.5m or less;
- Bollard lighting shall be used for pedestrian and greenway areas, if lighting is deemed necessary;
- Only luminaires with an upward light ratio of 0% and with good optical control shall be used;
- Luminaires shall be mounted on the horizontal, i.e. no upward tilt;
- Any external security lighting shall be set on motion-sensors and short (1min) timers; and,
- The intensity of external lighting shall be limited to ensure that skyglow does not occur in order to reduce light pollution.

The lighting scheme has been designed in accordance with guidance contained in; *Institution of Lighting Professionals; Guidance Note 08/18; Bats and artificial lighting in the UK* (ILP 2018). The lighting design has been reviewed by a bat specialist and recommendations have been incorporated into the design. A lighting design review letter, as provided by bat specialist Dr Tina Aughney (2022), is provided in Appendix 4.2.

### 4.5.2.2. Surface water drainage

Sustainable drainage (SuDS) is also a key focus for the entire design of the development. Along with permeable paving for parking areas, the landscape design includes for attenuation areas throughout the development by channelling runoff to planted areas and tree pits. This has the added benefit of reducing surface water runoff rates. In addition, planted swales will be created to aid with storm water flow and these planted areas will contain

suitably water tolerant plant species. The roof areas which will include sedum and wildflower green roof treatments will further slowdown the flow of water from areas that traditionally contribute to high runoff flow rates during rainfall events. SuDS features are also outlined as mitigatory measures in the accompanying NIS (Atkins document reference; 5214419DG0006).

#### 4.5.2.3. Foul Disposal

Mains infrastructure for foul sewage disposal has been designed in accordance with Irish Water Code of Practice. All wastewater streams will be collected within the local foul water network and will be transferred to Shanganagh Wastewater Treatment Plant (WWTP). Irish Water has confirmed that the existing foul network has sufficient capacity to meet the wastewater discharge volumes expected from the proposed development, once operational.

#### 4.5.2.4. Landscaping Establishment

The landscape design calls for an ecological buffer zone around the northern and eastern boundaries of the Site. This planted buffer zone will ensure the area provides for bat flight lines and badger foraging connectivity to/from the ecological features to the north (Rathmichael woodlands), east (scrub habitat and golf club lands) and south (River Dargle and remainder of former Bray Golf Club lands). Once operational the implementation of the landscape plan and compensatory habitat such as wild flower meadows and additional planting will be inspected by the Contractor within one year post planting. If measures have failed due to lack of management an alternative solution will be proposed by the Contractor. Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development.

#### 4.5.2.5. Refuge Habitats

The design of the development calls for the installation of numerous bird nesting boxes, bat roosting boxes and insect boxes. Refuge boxes will be checked and maintained to ensure they do not fall into disrepair. It is recommended that bird boxes are checked and cleared of remnant nests during the winter season (as required). Operational phase monitoring in order to ensure the success of the refuge habitats shall be undertaken by those in charge of the maintenance and management of the development.

## 4.6. Monitoring

The Bat Conservation Plan (refer to Appendix 4.3) will be implemented by the Contractor under the supervision of the appointed bat specialist. Pre-construction (pre-site clearance) monitoring shall be undertaken by the Contractor appointed Bat Specialist where trees shall be inspected for the presence of roosting bats. Following the tree surveys, specific Site clearance protocols will be established and, if necessary and bat roosts are found within trees to be lost, then NPWS consultation will be undertaken. If required, method statements will be proffered and derogation sought from NPWS for the safe removal of bats from roost sites. The identified bat roosts in 2 no. oak trees off Site (refer to Appendix 4.3 for locations) will be surveyed for the presence of bats. These 2 no. oak trees will be retained and the bat and bat roost protection measures outlined in the Bat Conservation Plan will be adhered to throughout the construction phase.

Pre-construction / pre-Site clearance terrestrial mammal surveys will be undertaken by the Contractor appointed suitably qualified ecologist to assess if badgers, or any other protected mammals, have established refugia (e.g. a badger sett) within the Site. If protected mammal refugia is found within the Site, then consultation with NPWS will be undertaken by the project ecologist and associated method statements and mitigation will be proffered and derogation sought from NPWS.

Removal of nesting habitat (hedgerows, trees and woodland) must be carried out outside of the bird breeding season (from 1<sup>st</sup> March to 31<sup>st</sup> August). Consultation must be undertaken with the National Parks and Wildlife Service for any nesting habitat clearance works outside of this seasonal window (as detailed in the Construction phase mitigation measures above).

Once operational the implementation of the landscape plan and compensatory habitat such as wild flower meadows and additional planting should be inspected by the Contractor within one year post planting. If landscaping measures have failed an alternative solution should be proposed by the Contractor.

Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development. Operational phase monitoring in order to ensure the success of the refuge habitats shall be undertaken by those in charge of the maintenance and management of the development.

## 4.7. Residual Impacts

The proposed development will result in the loss of grassland, scattered trees and an area of mixed broadleaved and conifer woodland. Mitigation by avoidance is proposed for breeding birds, bats, trees, hedgerows and to prevent the spread of invasive species. Measures to reduce the effects of artificial lighting and loss of habitats are also proposed. Planting of native woody species and wildflower meadows in public spaces is also proposed as mitigation in the Landscape Masterplan (refer to accompanying Planning Pack).

Enhancement proposals incorporated into the Site landscape masterplan will improve the Site potential for foraging bats and birds and will increase the potential for nesting and roosting opportunities for both. There will be a loss of foraging area for badgers but no loss of habitat connectivity between foraging areas. The introduction of wildflower areas and insect boxes will lead to an increased availability for pollinating insects and food source for local bat and passerine bird populations.

This assessment has demonstrated that through iterative project design and assessment, and the identification of appropriate ecological mitigation measures, the residual ecological impacts of the development proposals are not expected to be significant and are expected to be localised to the Site and immediate environs. Local populations of bats, badgers and birds may suffer some disruption and habitat loss in the short term but, as the greater part of the Site is of low ecological value, habitat losses to development are not significant. Some minor beneficial effects are expected and some opportunities for enhancement measures are presented. Provided ecological mitigation measures and monitoring are implemented correctly no cumulative impacts are expected.

## 5. Landscape and Visual

### 5.1. Introduction

This chapter will assess the impacts of the proposed development on the existing landscape character and visual amenity of the subject site and its surroundings. Planning permission was granted on part of the subject site, for 234 no residential units, a childcare facility, café and retail unit, subject to compliance with the terms of conditions attached to reference An Bord Pleanála (“ABP”) ABP-311181-21. The proposed development includes development as permitted under ABP-311181-21 together with minor revisions chiefly addressing conditions, along with revised proposals, informed by the Inspector’s Report of December 2021, for Blocks A and B which were previously refused.

All work is undertaken in compliance with the Landscape Institute’s Code of Standards of Conduct and Practice for Landscape Professionals and checked in accordance with Park Hood’s ISO 14001:2015 and ISO 9001:2015. This chapter has been prepared by Mark Johnston, a Chartered Landscape Architect with 24 years of experience in all fields of Landscape Architecture including the preparation of Landscape and Visual Impact Assessments.

### 5.2. Methodology

The overall approach and methodology undertaken within this Landscape and Visual Impact Assessment (LVIA) is based on the Guidelines for Landscape and Visual Impact Assessment (3rd Edition) by The Landscape Institute and the Institute of Environmental Assessment (2013) (GLVIA) in addition to the Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA, May 2022. These Guidelines have also been accepted by the Irish Landscape Institute as the methodology for undertaking assessments in Ireland.

There are a number of published guidance documents including Development Plans relevant to the Study Area as listed below:

- The National Planning Framework (NPF) - IRELAND 2040;
- Wicklow County Development Plan 2016 – 2022 (including Landscape Assessment Appendix 5);
- Bray MD Local Area Plan 2018 – 2024;
- DLR County Development Plan 2022-2028 including Appendix 5;
- Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019);
- Urban Development and Building Heights Guidelines for Planning Authorities by Department of Housing, Planning and Local Government (DHPLG) (2018);
- Urban design manual - a best practice guide by the Department of Environment, Heritage and Local Government (2009);
- National Landscape Strategy 2015–2025;
- Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2018); and
- Sustainable Residential Development in Urban Areas and the accompanying Urban Design Manual: A Best Practice Guide (2009).

Other sources of information include:

- National Inventory of Architectural Heritage <http://www.buildingsofireland.ie>;
- National Parks and Wildlife Service (NPWS) and Environmental Protection Agency - <https://gis.epa.ie/EPAMaps>;
- <https://www.heritagecouncil.ie>, ESM Webtool, Environmental Sensitivity Mapping, project funded by the Environmental Protection Agency (EPA) and hosted by the OSI on GeoHive, the State Geospatial DataHub;
- Tree Survey Report, Harbour Point, Bray, Co. Wicklow, Independent Tree Surveys, June 2020, updated March 2021; and,
- Tree Survey Report, APB Treecare Ltd., 2022., August 2022.

The baseline assessment included a study of Ordnance Survey Ireland historical mapping and recent aerial photography to assess how Bray and the landscape setting has developed to date and to assess the value of key landscape and visual elements, for instance, land cover, land use, historic features, cultural heritage, viewpoints, by reference to, for example, designations, community values, recreational values etc.



## Definition of Landscape and Visual Effects

For the purpose of this assessment, this chapter adopts the definition of landscape presented in the European Landscape Convention and as such, the term 'landscape' refers equally to areas of rural countryside and urban – built up – areas (typically historically referred to as 'townscape'). The definition of landscape is:-

*“An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.”*

The assessment process helps identify the effects of the proposed development on views and on the landscape / townscape. Landscape and visual effects can be quite different and are assessed separately; although the process is similar and effects ultimately arise as a result of combined impacts upon the landscape and visual amenity of a proposed development. Developments can have significant visual effects but no impact on landscape/townscape character and some can be vice versa.

Landscape Effects are the effects on landscape / townscape as a resource and are as follows:

*“An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner.”* (GLVIA3 paragraphs 5.1 and 5.2)

Visual Effects are the effects on Views and Visual Amenity and are as follows:-

*“...establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points.”* (GLVIA3 paragraph 3.13)

## Study Area

The Study Area includes the Site itself and the wider landscape where the proposed development may have an influence either directly or indirectly. There is no specific guidance on extents of Study Areas applicable to this type of development in Ireland so it has been informed by site surveys and relevant protected views. Within this study, selected receptors have been considered within the boundary of the M11 to the west and the coast to the east, 6.5km north along the coastline and 1.8km to the south. Refer to the viewpoint location plan within Appendix 5.1 which illustrates the extent of the study area.

## Difficulties encountered during the completion of the study

This study was completed with minimal difficulty as all public areas were fully accessible in order to undertake the assessment of potential impacts. The timescale for preparation of the study also allowed both summer and winter verified views photography to be undertaken in favourable weather conditions.

## Consultation

The proposed development was discussed at a pre-planning meeting with Dún Laoghaire-Rathdown County Council (DLRCC) held on 12/8/2020 and in a pre-application consultation with Wicklow County Council Planning Department on 22/7/2020. Further discussion regarding connections from the site in to Corke Abbey Valley Park took place with DLRCC Parks on 13/6/2022.

**Table 5-1 – Responses to issues raised**

Date and Consultee	Issue raised	Where addressed in Environmental Statement
DLRCC - Response to Pre-Planning Submission and Pre-Planning Meeting held on 12 August 2020	Green roof requirements	Roof level of apartment blocks will be developed into green spaces and be planted with a mix of sedum and appropriate wildflowers to further benefit pollinating species. Addressed more fully in Biodiversity and Drainage Chapters.
DLRCC - Response to Pre-Planning Submission and	Details required as to what remains of the County boundary and how this will be treated. Detail should be shown on the site	Featured on Landscape Masterplan drawing 6948-L-2000

Date and Consultee	Issue raised	Where addressed in Environmental Statement
Pre-Planning Meeting held on 12 August 2020	layout and the Pale boundary should be referenced/recognised in the scheme.	and Landscape Design Strategy Report.
DLRCC - Response to Pre-Planning Submission and Pre-Planning Meeting held on 12 August 2020	Southern boundary of DLR lands indicated on CDP mapping to show Area of Archaeological Potential. The matter of archaeology to be addressed.	There are no designated or previously unrecorded architectural heritage features located within the Site or its close environs and it is not located within an Architectural Conservation Area. The construction phase of the proposed development will, therefore, have no predicted impact on the architectural heritage resource. See Cultural Heritage Chapter sections on Potential Impacts during Construction Phase and Operation Phase.
DLRCC - Response to Pre-Planning Submission and Pre-Planning Meeting held on 12 August 2020	Regarding parks and open space strategy, permeability to the indicative East Coast Cycle Trail Route and existing park/open space to the north would be important elements.	Addressed on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.
DLRCC - Response to Pre-Planning Submission and Pre-Planning Meeting held on 12 August 2020	Clarity regarding the nature of the open space in the podium garden (in apartment block, west of rail line). How is the podium garden accessed, and is this publicly accessible, or is it communal or private open space.	Addressed on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.
DLRCC - Response to Pre-Planning Submission and Pre-Planning Meeting held on 12 August 2020	Open space calculations for the scheme are required, which show compliance with the DLR County Development Plan 2022-2028 standards and with the Apartment Guidelines (Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities, March 2018).	Addressed on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.
DLRCC - Response to Pre-Planning Submission and Pre-Planning Meeting held on 12 August 2020	Visualisations of the proposed development in winter when the trees are not in full leaf would be advisable.	These have been taken and are shown in Appendix 5.1.
DLRCC - Response to Pre-Planning Submission and Pre-Planning Meeting held on 12 August 2020	Further shadow cast analysis on adjacent properties (namely Corke Abbey Valley Park) to be carried out.	Addressed in Daylight and Sunlight Assessment Report
Wicklow County Council	Care should be taken to ensure that the open space area between the buildings and the rail track is an attractive, well supervised area and active area. The finish and treatment of the eastern facades and the landscaping proposals requires careful attention, in order to avoid a 'tunnel' effect within this open space area.	Addressed on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.

Date and Consultee	Issue raised	Where addressed in Environmental Statement
Wicklow County Council	Requires that 15% of a site is public open space.	Addressed on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.
Wicklow County Council	Consideration needs to be given to ensuring that heritage is protected in accordance with Government Policy.	Addressed in Cultural Heritage Chapter and summarised within this Chapter.
Recommendations in the ABP Inspector's report related to Case Number ABP-311181-21, which was refused for Blocks A and B.	Blocks A and B: poor design in terms of façade treatment, architectural expression and disposition on site. Not in accordance with criteria set out under section 3.2 of Urban Development and Building Heights Guidelines for Planning Authorities (2018).	Redesign of Phase 2, informed by Inspector's report. See Architect's Design Statement.
	Neutral or negative impacts on Landscape and Visual from proposed Block A and Block B due to its elevational design and materiality.	Blocks A and B have been comprehensively redesigned. See Architect's Design Statement. The gaps between buildings allow views of the skyline and once planting has matured there will be 'green' gaps, which along with the additional planting proposed on the eastern boundary will soften the impact and add visual interest. The popular walking routes tend towards Bray Head (Viewpoints 21, 22) where visibility is minor neutral. In addition, visibility further north along the coast (Viewpoints 28 to 35) are negligible.
	Privacy screens, including height and materials, to the roof terraces on Block D.	See Architect's Design Statement.
	Full details of proposed green roofs.	Roof areas to receive mixed sedum rolls over-seeded with native wildflower seed mix for bees and pollinators. See Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.
	Revised site layout plan indicating a 1.5m privacy strip to all ground floor apartments.	Ground floor units have been redesigned to improve privacy where possible. See Architect's Design Statement.
	Car parking spaces at 'The Orchard' car park shall be omitted and in its place an area of open space.	Car parking has been removed from the Orchard, which will serve as the mobility hub for the development along with a multi-sports area for community use. Featured on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.
	Revised plans and particulars in relation to boundary treatments including details in	Existing boundary treatments are replaced with new low-level

Date and Consultee	Issue raised	Where addressed in Environmental Statement
<p>Recommendations in the ABP Inspector's report related to Case Number ABP-311181-21, which was refused for Blocks A and B.</p>	<p>relation to northern boundary and retention of trees and planting at this location.</p>	<p>fencing on the northern boundary and additional substantial planting is proposed to strengthen existing tree cover, providing greater privacy. A more permeable, natural boundary is proposed to the east through the retention of the existing hedgerow and majority of the existing boundary fence, along with the introduction of new areas of tree planting and a section of feature stone wall. Featured on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.</p>
	<p>2.4m high block wall along eastern boundary to be omitted and revised permeable, high quality boundary treatment.</p>	<p>The existing fencing along the railway is to be retained. Existing boundary planting is to be retained with additional buffer planting proposed for screening and ecological benefit to allow small mammals to pass through along the railway boundary. The boundary will incorporate a feature stone wall, approximately 22m in length. See drawing 6948-L-2003 Boundary Treatment and Landscape Design Strategy Report.</p>
	<p>North-south path along the eastern boundary to be redesigned as a shred footpath and cycleway, with a minimum width of 3m, and to connect to street to the south of the railway underpass and two pedestrian access points in the northern boundary. Design solution for proposed pedestrian/bicycle connections at the northern boundary of the site linking into Corke Abbey Valley Park.</p>	<p>A combined north-south footpath and cycle way (with emergency vehicle access) to run along the eastern boundary, approximately 3m wide with natural play areas dispersed along the footpath route. Proposed connections at the north end to Corke Abbey Valley Park, subject to agreement with DLRCC. Connection to Dargle Riverside walkway at the south end and a new connection plaza created at the existing underpass. Featured on Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.</p>
	<p>A revised pedestrian route through the open space to the front of Block C.</p>	<p>See Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.</p>
	<p>Additional planting of semi-mature trees along the northern boundary. Also increase planting of shrub species, in particular furze in the 'Coastal Garden'</p>	<p>Addressed in drawing 6948-L-2002 Sitewide Softscape Layout.</p>

Date and Consultee	Issue raised	Where addressed in Environmental Statement
<p>Recommendations in the ABP Inspector's report related to Case Number ABP-311181-21, which was refused for Blocks A and B.</p>	<p>adjacent to the railway and review of wildflowers proposed.</p>	
	<p>Details of proposed finishes at Market Square and revised pedestrian route through Market Square to support a direct route from west to the railway underpass to the east.</p>	<p>A fully compliant route is provided to the periphery of the Market Square due to constraints with ground levels within the square and a new plaza has been created at the existing underpass to provide a direct connection. See Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.</p>
	<p>Detail planting plan for proposed open space to the southeast, which shall incorporate grasscrete or gravel path.</p>	<p>Addressed in drawing 6948-L-2002 Sitewide Softscape Layout.</p>
	<p>Boundary treatment and planting plan at the proposed open space to the southeast to improve existing pedestrian/cycle path.</p>	<p>Has been addressed. See drawing 6948-L-2003 Boundary Treatment.</p>
	<p>Details of access route from MUGA to boundary with school site.</p>	<p>See drawing 6948-L-2000, Landscape Masterplan.</p>
	<p>Details of the materials, colours and textures of all the external finishes to the proposed buildings and detailed public realm finishes, including pavement finishes and bicycle stands, shall be submitted to and agreed in writing with the relevant planning authority. The render finish to external elevations of Block C and Block D shall be replaced with an alternative durable, high quality material or finish in the interest of visual amenity.</p>	<p>See Architect's Design Statement and drawings.</p>
	<p>Details of the bicycle parking space location, layout, access to the undercroft parking and storage arrangement for bicycles.</p>	<p>See Architect's/Landscape Design drawings.</p>
	<p>Details of public furniture and benches.</p>	<p>See Landscape Design drawings.</p>
	<p>Proposed locations of trees at appropriate intervals and other landscape planting including specification and biodiversity enhancement measures.</p>	<p>See drawing 6948-L-2002 Sitewide Softscape Layout.</p>
	<p>Tree and shrub protection measures.</p>	<p>See drawing 6948-L-0001 – Vegetation Development Impact.</p>
	<p>The linear earthwork identified as Recorded Monument (WI 004-005) and (DU 026-124) referred to locally as the 'Nun's Walk' shall be incorporated into the design from the western to the eastern boundary. Details of interpretation and/or presentation shall be provided and agreed with the National Monuments Service.</p>	<p>See Mitigation, Design Considerations for detail. Refer to Landscape Masterplan drawing 6948-L-2000 and Landscape Design Strategy Report.</p>

Further consultation was carried out with DLRCC Parks Department on 14/12/20 regarding connectivity with the adjacent existing parkland area at Corke Abbey Valley Park.

The methodology for the Landscape assessment and Visual assessment is described separately in the following sections.

### Baseline Landscape Character Assessment

The baseline studies extend to include the wider context into which the proposed development will be introduced. The baseline description of existing conditions forms an objective evaluation of the townscape / landscape character and visual amenity of the Study Area. This forms the base against which the townscape / landscape and visual effects deriving from the proposed development can be identified, assessed and measured. It involves a desk-top analysis, site visits and walkovers carried out on 24/6/20 and 26/8/20 and review of material including:-

- National and Regional Landscape Character or local Landscape Character Assessments;
- Review of historical planning applications on the Site;
- Existing National, Regional or Local Designations and relevant Planning Policy;
- Current and historical Ordnance Survey Ireland (OSI) Maps evidence;
- Aerial Photographs via Bing, Google and OSI; and
- Relevant environment / ecology, cultural heritage, historical and archaeology evidence.

As part of the baseline assessment, the combination of desk-top analysis and site survey allows a judgment to be made on the key elements that contribute to the landscape character and its wider condition (positive, neutral or negative) and wider value and sensitivity. Landscape value, quality and sensitivity are affected by the following factors.

- whether the resource is common or rare;
- whether it is considered to be of local, regional, national or global importance;
- whether there are any statutory or regulatory limitations / requirements relating to the resource;
- the quality of the resource;
- the maturity of the resource, and
- the ability of the resource to accommodate changes.

Guidance as to the assessment of landscape value and sensitivity is given Table 5-2.

**Table 5-2 - Determination of Landscape Value and Sensitivity**

Terminology	Definition	Summary
Highest Value Landscape	Nationally or regionally important landscape with high quality, highly valued rare or unusual features recognised by designation such as National Parks, Areas of Scenic Value or World Heritage Sites. Distinct landscapes that exhibit a strong structure and character with valued features that combine to give the experience of scenic quality, tranquillity, rarity and harmony.	Very vulnerable to change. High Sensitivity
Very Attractive Landscape	Locally or regionally designated landscapes – as designated in Area Plans or by the EPA - or areas where local evidence is indicated as being more valued than the surrounding area.	Some ability to absorb change in some situations without having significant effects. Medium Sensitivity
Medium Landscape	“Everyday” or community / undesignated landscapes which may be appreciated by the local community but has no or little wider recognition of its value	Able to accommodate change without significant effects. Low Sensitivity
Poor Landscape	Low importance and degraded landscapes with few redeeming features. No evidence of being valued by the community	Damaged landscapes very capable of accommodating change. Very Low Sensitivity

**Criteria for Landscape Character Impacts**

This chapter considers how the proposed development would impact on existing landscape elements and resources which are normally associated with the direct effects on the Site itself. The indirect impacts of the proposed development on the wider landscape are assessed with reference to landscape types or character areas.

This is affected by factors including:

- the physical extent and nature of the key elements that make up the proposal;
- the landscape context of these effects; and
- the time-scale of impact, such as whether it is temporary (short, medium or long term), permanent with reversible potentials, or irreversibly permanent.

The consideration of landscape sensitivity together with the assessment of magnitude of change given in Table 5-3 informs judgements on the significance of effects with regard to a specific development proposal.

**Table 5-3 - Magnitude Criteria for Landscape Character Effects**

Terminology	Definition
Major	Total loss or major alteration to key elements / features / characteristics of the baseline (i.e. pre-development) landscape and /or introduction of elements considered to be totally dominant when set within the attributes of the receiving landscape.
Moderate	Partial loss or alteration to one or more key elements / features / characteristics of the baseline (i.e. pre-development) landscape or view and /or introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.
Slight	Minor loss or alteration to one or more key elements / features / characteristics of the baseline (i.e. pre-development) landscape or view and /or introduction of elements that may not be uncharacteristic when set within the attributes of the receiving landscape.
Negligible	Very minor loss or alteration to one or more key elements / features / characteristics of the baseline (i.e. pre-development) landscape or view and /or introduction of elements that are not uncharacteristic with the surrounding landscape - approximating the 'no change' situation.

In those instances where there would be no change to the landscape, the magnitude is recorded as 'zero' and the level of effect as 'no change'.

**Visual Amenity Assessment**

Visual Effects are concerned wholly with the effect of the development on views, along with the general visual amenity and are defined by the Landscape Institute in GLVIA3, Paragraph 6.1 which states:-

*“An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern here is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements.”*

The baseline studies establish the area from which the proposal may potentially be visible and the different groups of people (“visual receptors”) who may experience views or changes to view context.

Viewpoints are usually identified in locations that are publicly accessible, such as roads, public realm / domain areas, footpaths or publicly accessible open spaces. Selection is also based on a determination of the extent of visibility towards the Site or from locations where there may be significant numbers of visual receptors who will see the proposed development e.g. main roads. Viewpoints are chosen to be representative, specific or illustrative and cover as much of the Study Area as reasonable or necessary and address all areas where there may be changes in terms of views or visual amenity.

The issue of potential overshadowing of existing adjacent properties and the loss of daylight is also a factor that needs to be considered within the visual impact assessment.

Viewer sensitivity is based on the nature of the visual receptor (resident, tourist, commuter etc.) and the visual quality or value attached to a particular view as indicated in Table 5-4.

**Table 5-4 - Viewer Sensitivity and Types**

Terminology	Definition	Summary
High	Notable views of heritage assets, quality, valued or scenic landscapes. Views that may be designated or feature in guidebooks, scenic tours, associated with culture, literature and art or an important contributor to experience.	People engaged in outdoor activity whose interest is likely to be focused on the landscape or particular views. e.g. hill-walkers, tourists, scenic tours, users of public rights of way or visitors to heritage assets. Residents (at home).
Medium	Ordinary views where the reason for visual receptor to be in the area and does not involve or depend upon an appreciation of the views of the landscape.	Outdoor activity with focus on recreation, sports or water-based activities such as golf, mountain biking, or country sports. Travellers on road and rail.  Residents / Communities living within close proximity of the proposal.
Low	Areas that may be viewed by the majority as incidental landscapes where the focus of the viewer is on their work or activity and the setting is not important to the visual amenity or quality of working life.	Workers with employment related to construction and management / maintenance activity and likely to have a low interest or appreciation of the view.

The visual effects deriving from the proposed development are based on the combined judgement of the anticipated change in nature, visual amenity and duration of the particular view (magnitude) and the nature of the visual receptor (sensitivity). The magnitude (see Table 5-5 criteria) and nature of visual effects are based on a number of factors including:

- Scale of change;
- Distance from proposed development site;
- Contrast in terms of mass, colour, form and texture deriving from new feature(s);
- Extent of intervening vegetation (and seasonality if deciduous) or buildings and topography;
- Speed of passing visual receptor (and how long view is experienced);
- Angle and elevation of view e.g. oblique, direct, perpendicular;
- Extent of potential overshadowing or impact on daylight provision to existing adjacent properties;
- Nature of backdrop or skyline; and
- Duration of change or effect.

Where mitigation measures are proposed or relevant, these are described as part of any judgement.

**Table 5-5 - Magnitude Criteria for Visual Effects**

Terminology	Definition
Major	A major change or obstruction of a view that may be directly visible, appearing as a prominent and contrasting feature and/or appearing in the foreground / middle ground.
Moderate	A moderate change or partial view of a new element within the view that may be readily noticeable, directly or obliquely visible including glimpsed, partly screened or intermittent views, appearing as a noticeable feature in the middle ground.
Slight	A small level of change, affecting a small part of the view that may be obliquely viewed or partly screened and/or appearing in the background landscape. May



	include moving views at speed. The proposal forms a minor component in the wider view which might be missed by the casual viewer / observer.
Negligible	The proposal is barely discernible or may be at such a distance that it is very difficult to perceive equating to a no-change situation.

**Nature of Landscape and Visual Effects**

The assessment process aims to be objective and quantify effects as far as possible. However, landscape and visual assessment has aspects of it that can be considered subjective. Magnitude of change to a view can be factually defined but any subsequent objective assessment should be based on professional training, experience, observation, evidence and informed opinion.

The following system of categorisation is used for the nature of the impact, which may be adverse or beneficial.

**Table 5-6 - Nature of Landscape and Visual Effects**

Terminology	Definition
Positive Effect	A change that improves the quality of the landscape character and fits very well with the existing setting.
Neutral	A change which does not affect the scale, landform or pattern of the landscape and maintains existing quality.
Adverse Effect	A change which reduces the quality of the landscape and cannot be fully mitigated.

**Significance Criteria and Determination**

Final judgment is made about which landscape effects are significant. Significance of an effect is determined by the combination of sensitivity or value of the affected receptor(s) and the predicted magnitude of change which combine to form a level of effect. See Table 5-7.

The assessment of likely significant environmental effects as a result of the proposed development takes into account the construction and operational phases. The duration of the effect has been assessed as either ‘short-term’, ‘medium-term’ or ‘long-term’. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years. Note that this proposed development is regarded as being permanent and long-term in LVIA terms.

This LVIA bases “Significance” of effects on the following definitions:-

“Significant” in the Oxford Dictionary 2020 is defined as “Sufficiently great or important to be worthy of attention; noteworthy.”; and

“Significance” in the GLVIA guidelines 2013 is defined as “A measure of the importance or gravity of the *environmental effect, defined by significance criteria specific to the environmental topic.*”

The significance attributed to effects can be a central issue when the findings of an EIAR come under scrutiny, for example during an appeals process for a controversial project.

The EIAR Guidelines 2022 define the significance (of impact) as the importance of the outcome of the impact (or the consequence of change) for the receiving environment. Significance is determined by a combination of (objective) scientific and subjective (social) concerns.

While guidelines and standards help ensure consistency, the professional judgement of competent experts plays a role in the determination of significance. These experts may place different emphases on the factors involved. As this can lead to differences of opinion, the EIAR sets out the basis of these judgements so that the varying degrees of significance attributed to different factors can be understood.

**Table 5-7 - Summary Scale of Significance**

<ul style="list-style-type: none"> <li>▪ Sensitive views or visual receptors;</li> <li>▪ Effects on recognised scenic, rare or distinctive landscapes;</li> <li>▪ Effects on mature or diverse landscape elements, features, characteristics, aesthetic or perceptual qualities;</li> <li>▪ Large scale changes;</li> <li>▪ Affecting elements and/or characteristics (including aesthetic and perceptual aspects) that are key to landscape character (which may include nationally valued landscapes);</li> <li>▪ Effect may be long term and/or irreversible, and/or over an extensive area.</li> </ul>	<p>More Significant</p>
<ul style="list-style-type: none"> <li>▪ Effects on poorer condition or degraded landscapes;</li> <li>▪ Effects on low sensitivity visual receptors;</li> <li>▪ Small scale changes;</li> <li>▪ Characteristics (including aesthetic and perceptual aspects) that contribute to but are not key to the character of the landscapes;</li> <li>▪ Effect may be reversible and/or of short duration.</li> </ul>	<p>Less Significant</p>

Significance of landscape and visual effects is not absolute and can only be defined in relation to each development and its specific location. Usually an effect is considered 'significant' if the level of effect is 'moderate/substantial' or 'substantial'. The significance of landscape and visual effects is determined by cross-referencing sensitivity of landscape or view with the magnitude of change. See Table 5-8.

**Table 5-8 - Assessment of Significance Matrix**

Landscape and Visual Sensitivity	Magnitude of Impact			
	Negligible	Low	Medium	High
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

### 5.3. Receiving Environment

#### Site Location

The Site lies on the northern outskirts of Bray town centre on Bray Golf Club lands. To the west, adjacent to the Site are primary and post primary schools. The former Industrial Yarns premises, now the Industrial Yarns Complex, lies to the north west and comprises supermarkets and other commercial premises. The R761, Dublin Road, is ca. 0.5km to the west. The eastern boundary lies adjacent to the railway line, with Bray Daly railway station lying ca. 800m south. To the west is St. Philomena’s Primary School and Corke Abbey Valley Park residential estate. To the north is Corke Abbey Valley Park, an area of public open space/woodland with the residential development located further north. Access to the proposed development will run from Dublin Road, circumventing the primary and post primary school complex adjacent to the Site. In addition, a network of pedestrian and cycle connections will be provided to residential developments via Corke Abbey Valley Park, the adjacent Ravenswell Primary School, the River Dargle walkway and Bray Harbour, Promenade and town centre.

#### Baseline Landscape Character

##### Landform, Topography and Drainage

The Site is roughly rectangular in shape. The topography of the site falls from north to south, with the northern portion located at an elevated position to the southern portion and adjacent to Ravenswell Road. The land slopes gently from west to east, down to the coastline at Bray Beach. The remnants of the features of the golf course remain, with bunkers around greens and scattered trees.

A linear earthwork noted in the Sites and Monuments Record, comprises a continuous curving section of flat-topped bank running on a NNE-WSW axis following the line of the county boundary across the Site and is in flat coastal terrain with some mature Sycamores growing along its side. This is known locally as ‘Nun’s Walk’. Full details of the results of excavations are given in the Cultural Heritage Chapter, Archaeological and Historical Context with photographs in Chapter 11, and Appendix 11.1: Photographic record.

The proximity of the Site to the River Dargle makes it vulnerable to flood risk, despite flood defence works. Separate reports on flood and drainage are included within this submission which outline the level of risk.

##### Land use and Vegetation

The Site is a former golf course with no formal function. It comprises ca. 8.812 ha of scattered trees and parkland with large areas of amenity grassland. A small area of woodland lies in the north western corner of the Site, screening the end of a double row of housing on Corke Abbey. A tree survey report has been carried out for the Site – refer to Appendix 5.2. The report identifies the species, height, girth and condition of existing trees and provides recommendations with regards to health and safety and vigour of each tree or tree group.

The Site is bordered to the south by the River Dargle, which outfalls to the Irish Sea in Bray Harbour ca. 50m from the southeast extent of the Site. This stretch of the river has been subject to flood alleviation works and the banks of the river have been recently developed into a formalised promenade and public amenity space. To the north of the Site the Rathmichael Stream flows through wooded and grassland areas which have public pathways throughout. The Dublin to Rosslare railway line forms a continuous border for the entirety of the eastern boundary of the Site. The west side of the Site is dominated by the Dublin Road and the urban development of Bray town.

The Site is located within the Dargle subcatchment. Both the River Dargle and the Rathmichael stream are detailed by the Environmental Protection Agency (EPA) as having Good water quality status and are both detailed as being Not at Risk. The River Dargle is designated as a Salmonid River. The lower stretches of the River Dargle, Bray Harbour and the surrounding coastal waters is a monitoring site for the Irish Wetland Bird Survey.

The northern portion of the Site lies in the extreme south east corner of DLRCC district, bordering Wicklow County. It is largely urban but contains significant areas of landscape importance, generally around the south-western rural area focussing around the foothills of the Dublin Mountains and the higher plateau areas around Carrickgollogan, Ballycorus, Kiltiernan and Ballyman. Green space within Dún Laoghaire-Rathdown comprises of agricultural lands, bogs and heath in the uplands, woodlands, grasslands and a number of open spaces in residential areas. There are also a number of large parks including Shanganagh Park, which lies to the north of the Site.

The area north and north west of the Site beyond the urban area of Bray, comprises a number of golf courses, agricultural fields, settlements such as Old Connaught, National Sites and Monuments and County Geological Sites including Carrickgollogan and Enniskerry Delta.

The 17km coastline of Dún Laoghaire-Rathdown is diverse varying from rocky headlands with a variety of inlets, long established harbours and high quality beaches. Seapoint and Killiney Bay have Blue Flag status. A 5.3km long coastal section of glacial sediments (interbedded diamicts) runs from the Site up to Killiney.

### **Settlement and Infrastructure**

A small woodland lies in the north west corner of the Site, which is adjacent to Corke Abbey residential development from which there is access into Corke Abbey Valley Park, a public woodland with walks.

A certain amount of development has recently taken place to the west of the Site. Between 2016-18 Ravenswell Primary School, Colaiste Raithin Post Primary School along with associated sports and recreational areas were developed. Significant infrastructure works were also undertaken with a new road network, a Northern Access Route bordering the eastern and northern boundaries of the Industrial Yarns site and a Southern Access Road facilitating access via the Upper Dargle Road. The Site is located ca. 840m walking distance to Bray DART station and 750m to the bus corridor on Castle Street.

Within the wider context, Bray is the most northerly and largest town in County Wicklow, located in a strategically important position within the metropolitan area and at the eastern gateway to the County. The town has the best transport links in the County. Protecting the heritage and amenities of the town is particularly important.

The town developed initially around the castle built in the 12<sup>th</sup> century on a rocky promontory (now known as Castle Terrace) overlooking a ford on the river Dargle. The construction of the railway in 1854 saw Bray start to take its current form; the seafront esplanade was developed, with wide boulevards linking the town down to the station and coast.

Little Bray and Bray Commons that lie to the west of the Site underwent more haphazard and piecemeal development until the turn of the 20<sup>th</sup> century with the construction of model 'artisan dwellings' between Castle Street and Sunnybank.

Development has principally focussed on lands between the town centre and the seafront and to the west initially bound by the Dargle River and subsequently the transport network. The Bray Municipal District Local Area Plan points out that the relocation of Bray Golf Club (in the early 2000's) has left a large area of land vacant in the heart of the town.

### **Public Amenities and Facilities**

Bray Seafront and Bray Head draw a significant number of day trippers to the town. Bray Seafront, running parallel to Bray Beach is a locally distinctive and significant area in the town. It is rich in architectural and natural heritage, comprising the beach, the Esplanade and many fine architectural structures dating to Victorian times, many of which are listed in the Record of Protected Structures. In addition, bathing water sampled from Bray South Promenade and South of Bray Harbour in September 2022 was found to be Excellent. (<https://beaches.ie>)

1.7kms to the south of the Site is Bray Head, the mountainous region surrounding the town of Bray. This is an area of national geological importance and has a 'Special Area Amenity Order' and SAC designations. It is also an important location for recreation amenity both locally and for visiting tourists. There is, however, no direct connectivity from the Site to this site or any other European site via physical means such as woodlands, hedgerows or treelines (DLR County Council Pre-Planning Submission Response, October 2020).

There are many local attractions along the coast to the north of the Site including the Woodbrook Golf Club, Shanganagh Park, various registered Sites and Monuments and Killiney Hill Park and Dalkey Hill, giving expansive views of Bray Head and the Sugar Loaf Mountains. Vico Baths at Hawk Cliff is a popular swimming point. Sorrento Point on the promontory has a ferry crossing point to Dalkey Island, a SAC and SPA with several registered Sites and Monuments.

### **Planning and Landscape Designations**

The proposed development accords with the National Planning Framework, (underpinned by the Regional Spatial and Economic Strategies (RSES), and seeks to locate a greater portion of future housing development within and close to the footprint of existing built-up areas and on infill/brownfield sites. The objective being to provide high density and people intensive uses of existing built-up areas and ensure that future development facilitates sustainable travel patterns and is co-ordinated with the delivery of key water infrastructure and public transport projects.

## **Wicklow County Development Plan 2016-2022 (WCDP)**

The WCDP introduction notes that the town of Bray has its own Local Area Plan and defers to this so it does not form part of the WCDP. However, the WCDP provides the key parameters and broad strategy for the future economic and social development that are included in Local Area Plans.

Bray Town and its environs are designated as a Level 1 'Metropolitan Area Consolidation Town' settlement. The Site is annotated as part of an "Urban Area" in terms of landscape classification and category throughout the WCDP (e.g. WCDP Map 3.16 CDP 2010 – 2016 Landscape Categories).

The WCDP Section 4.5.6 Urban Areas notes the following:-

*"All locations designated as 'settlements' in the County settlement hierarchy (i.e. areas falling within Levels 1-6) are considered 'urban' areas for the purpose of landscape classification. In terms of landscape classification, these settlements have already been deemed suitable for development (of the type allowed by the settlement strategy and the development standards of this plan) and the impacts on the wider landscape of such development has already been deemed acceptable. Therefore it will not be necessary for developments in urban areas to have regard to the surrounding landscape classification or to carry out landscape or visual impact assessment."*

WCDP Appendix 5 Landscape Assessment notes "Wicklow, 'The Garden County', is one of the more attractive and scenic counties in Ireland with its mountains, rolling foothills, beaches, forests, lakes and attractive views and prospects". The National Park and the Wicklow Mountain range dominate the County and much of this is designated an Area of High Amenity (AHA) encompassing a total of c. 495km<sup>2</sup>.

The WCDP has outlined a hierarchy of landscapes ranging from those with potentially low to high vulnerability to development. The Site is located in an area with a rating of "low vulnerability" (See WCDP Figure 1.1 Wicklow's Landscape Classification Map 2010-2016).

In terms of landscape sensitivity, the Site is rated Category 1 "Low Sensitivity" with the highest rated landscapes (Category 5) being predominantly the central mountainous upland areas of the County, the eastern coastline and a number of significant river valleys. (See WCDP Figure 2.1: Landscape 'sensitivity' map).

## **Draft Wicklow County Development Plan 2021-2027**

Bray is identified as a Level 1 Metropolitan Key Town in the Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region. It states that *"There is significant potential to delivery compact growth and regeneration in the established town centre and built up area. Land at the former Bray Golf Course and at the Harbour are designated for high density mixed-use development ...."*

Regional Policy Objectives for Bray Key Town include RPO 4.37 *"Support the continued development of Bray including the enhancement of town centre functions, development of major schemes at the former Bray golf course and Bray harbour ... "* and RPO 4.39 *"To promote the consolidation of the town centre with a focus on placemaking and the regeneration of strategic sites to provide for enhanced town centre functions and public realm, in order to increase Bray's attractiveness as a place to live, work, visit and invest in."*

Section 2.4.3 Strategic County Outcome 4 noted *"Investment in a well-designed public realm which includes public spaces, parks, playground, streets and recreational and sport infrastructure to cater for all ages is essential."*

Section 8.5 Built Heritage Objectives CPO 8.5 states *"To facilitate new or improved public access to and erection of appropriate interpretive signage at National Monuments ... in State or private ownership, as identified in Schedule 08.02 and Map 8.02 of this plan, in co-operation with landowners."*

The Draft Plan includes a number of amendments with stronger wording.

Section 17.4 Natural Heritage and Biodiversity Objectives. In relation to woodlands, trees and hedgerows CPO 17.18 notes *"To promote the preservation of trees, groups of trees or woodlands in particular native tree species, and those trees associated with demesne planting, in the interests of the long-term sustainability of a stable ecosystem amenity or and the environment generally, as set out in Schedule 17.05A and B and Maps 17.05 and 17.05A – H of this plan."*

Objective CPO 17.21 notes *"To strongly discourage the felling of mature trees to facilitate development and to encourage tree surgery rather than felling if such is essential to enable development to proceed."*

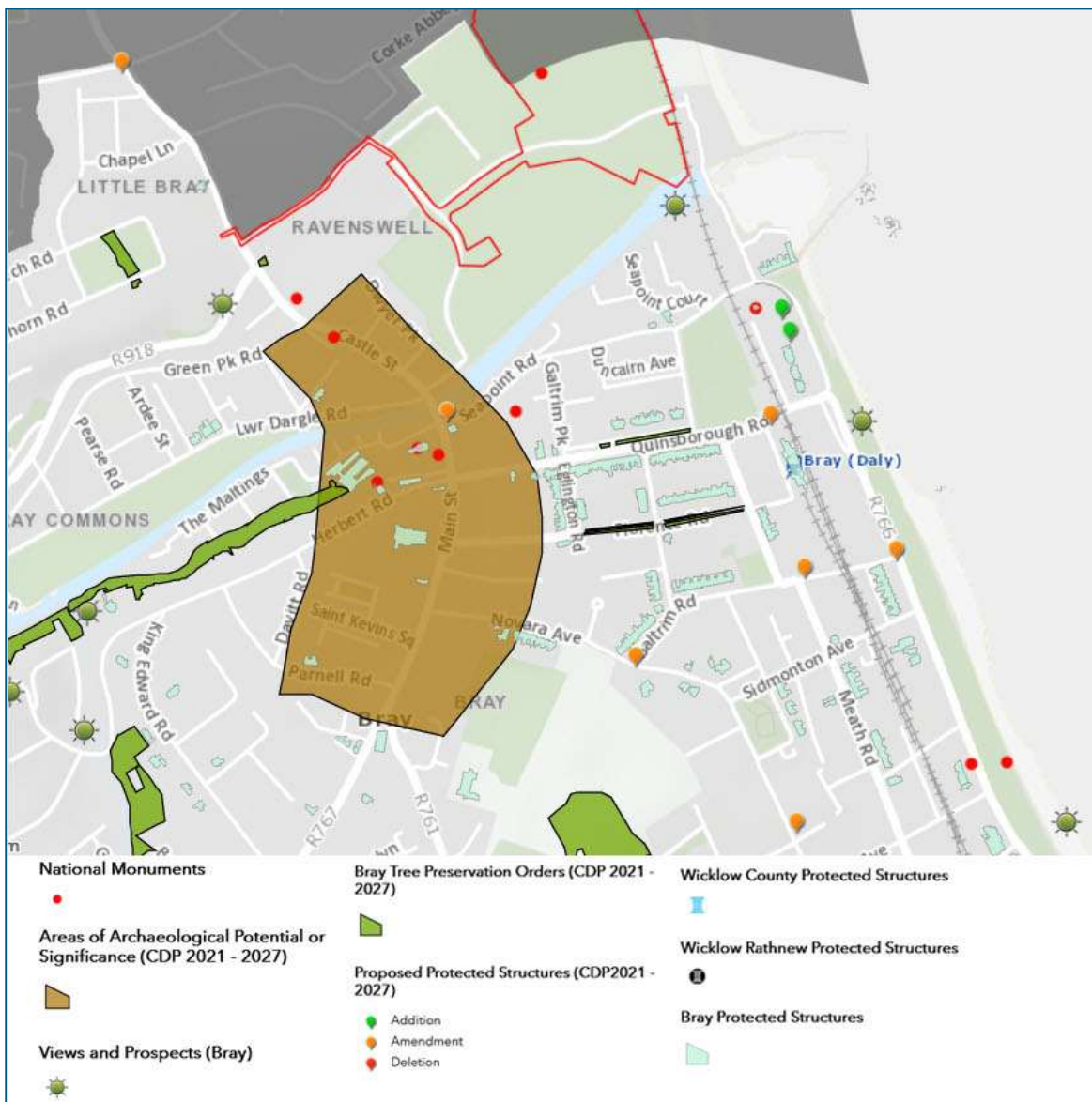
Objective CPO 17.22 notes *"To require and ensure the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, as part of the development management process, and to require the planting of native broad-leaved species, and species of local provenance in all new developments."*

Objective CPO 17.23 notes *"To require the retention of hedgerows and other distinctive boundary treatment in the County. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable,*

provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site (unless otherwise agreed by the Planning Authority).

The Natural Heritage and Biodiversity Map No 17.03 notes Bray Head as a proposed Natural Heritage Area. Map No 17.05B does not indicate any trees/woodlands on site with existing Preservation Orders nor are any new ones proposed.

Figure 5-1 is the interactive map in the draft WCDP 2022-2028 and has Protected Structures, National Monuments, Areas of Archaeological Potential or Significance, Views and Prospects that are also present in Figure 5-2 Cultural Heritage Map and Figure 5-3 Natural Heritage Map. The Linear earthworks on the Site are indicated in Figure 5-1 and the views and prospects accord with Figure 5-3 with the views along the coast looking towards Bray Head, in the opposite direction from the Site.



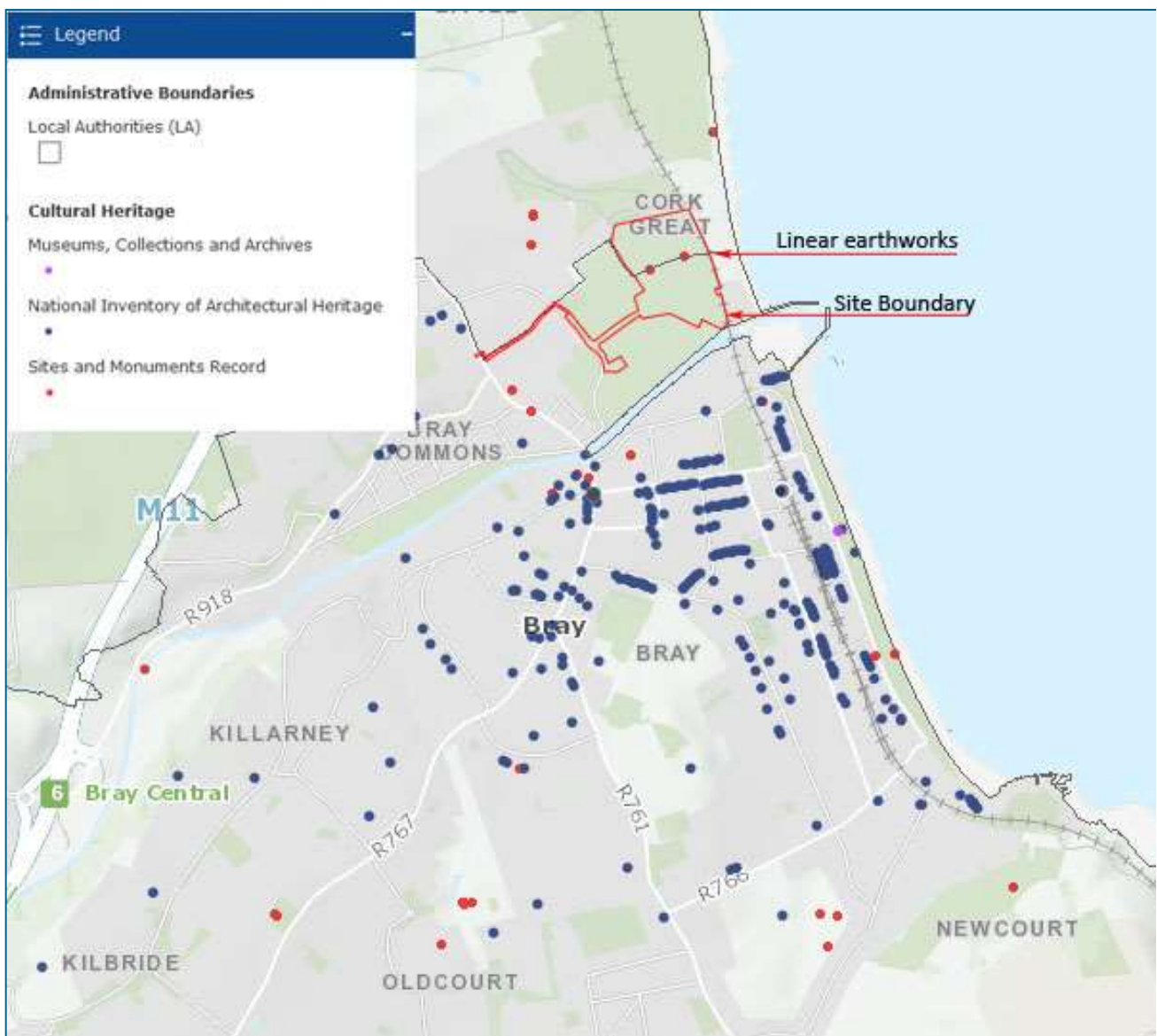
**Figure 5-1 Draft Wicklow County Development Plan 2021-2027**

**Bray Municipal District Local Area Plan 2018-2024**

The former Bray Golf Course on which the proposed development is sited is noted under Specific Local Objectives (SLO) 03, which states that this land be developed as mixed commercial, residential education/community facilities and open space zone (MU: mixed use).

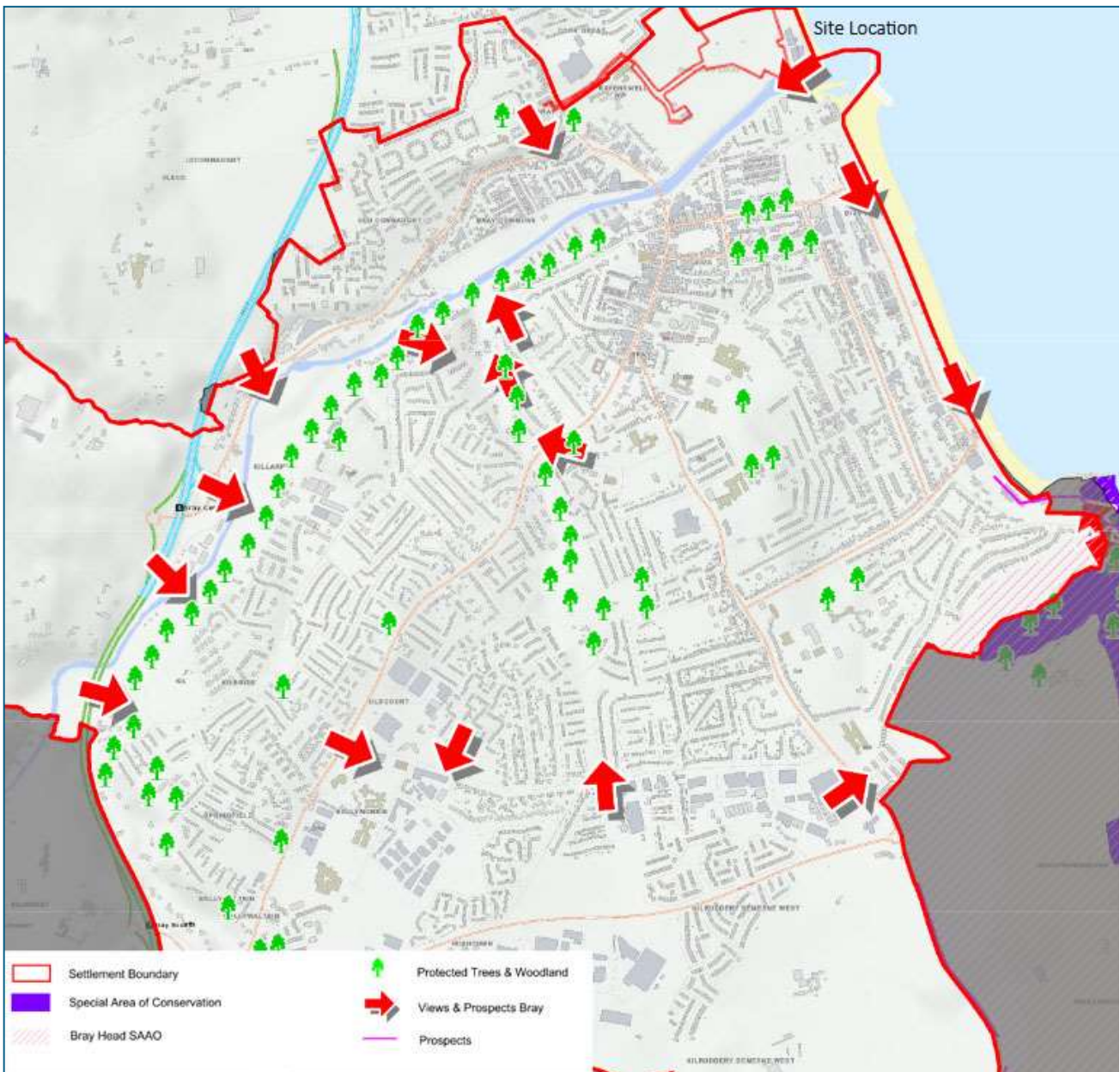
Figure 5-2 Map H1 Cultural Heritage indicates the National Monuments and the Sites of Archaeological Importance. The heritage asset on the Site is a linear earthwork.

The Site traverses the administrative boundaries of DLRCC and Bray Municipal District of Wicklow County Council as previously stated.



**Figure 5-2 - Environmental Sensitivity Mapping Web tool – Cultural Heritage (Source: GeoHive - <https://aiomaps.geohive.ie/ESM/>)**

The Environmental Sensitivity Mapping web tool is a support tool for environmental assessment processes in Ireland. Map H4 Bray Settlement Natural Heritage Map identifies Views and Prospects across Bray. The view in H4 to the south of the Site is from the Harbour looking up the Dargle River. Refer to Viewpoint 6 (Table 5-16) and Viewpoint 7 (Table 5-17) for assessments of the impact. The views along the coast are looking towards Bray Head, in the opposite direction from the Site. Other views shown in Map H4 are not directed towards the north of Bray and the Site.

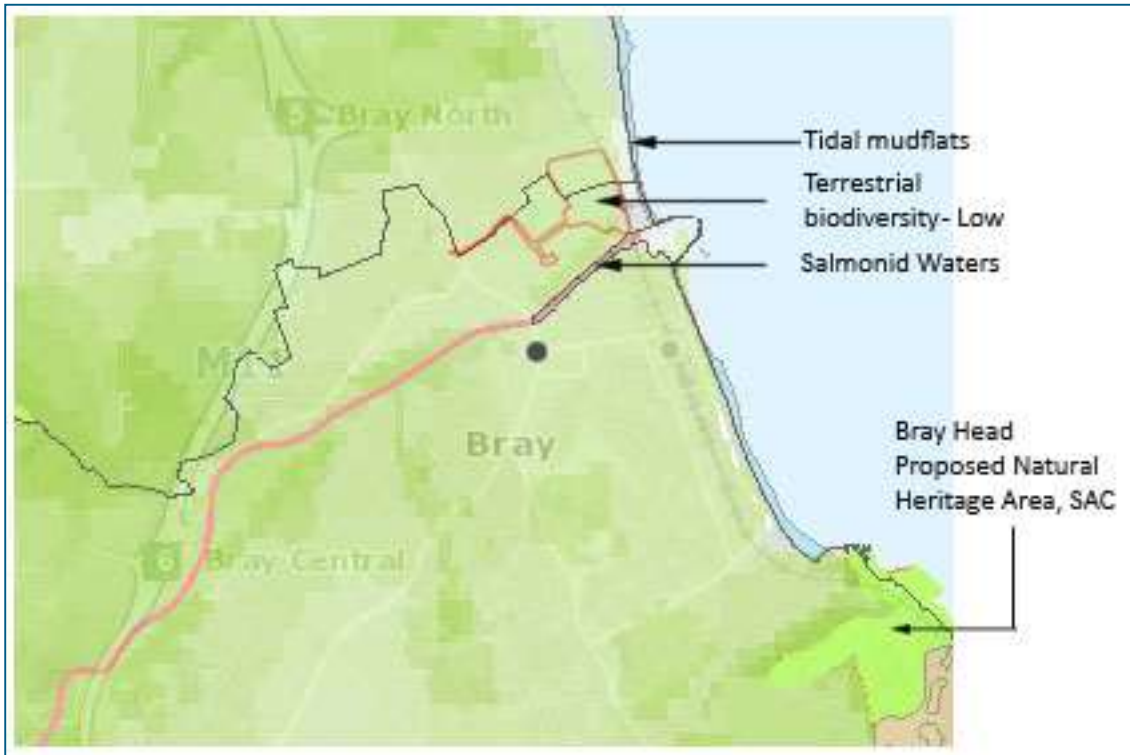


**Figure 5-3 - Map H4 Bray Settlement Natural Heritage Map**

No Tree Preservation Orders are located on or near the Site as indicated in Figure 5-4.

Figure 5-3 shows the biodiversity in and around the Site. The Site is not in close proximity to a designated area. The River Dargle adjacent to the site has Salmonid Waters and the coast has tidal mudflats, an Annex 1 Habitat. The Terrestrial Biodiversity is assessed as Low.



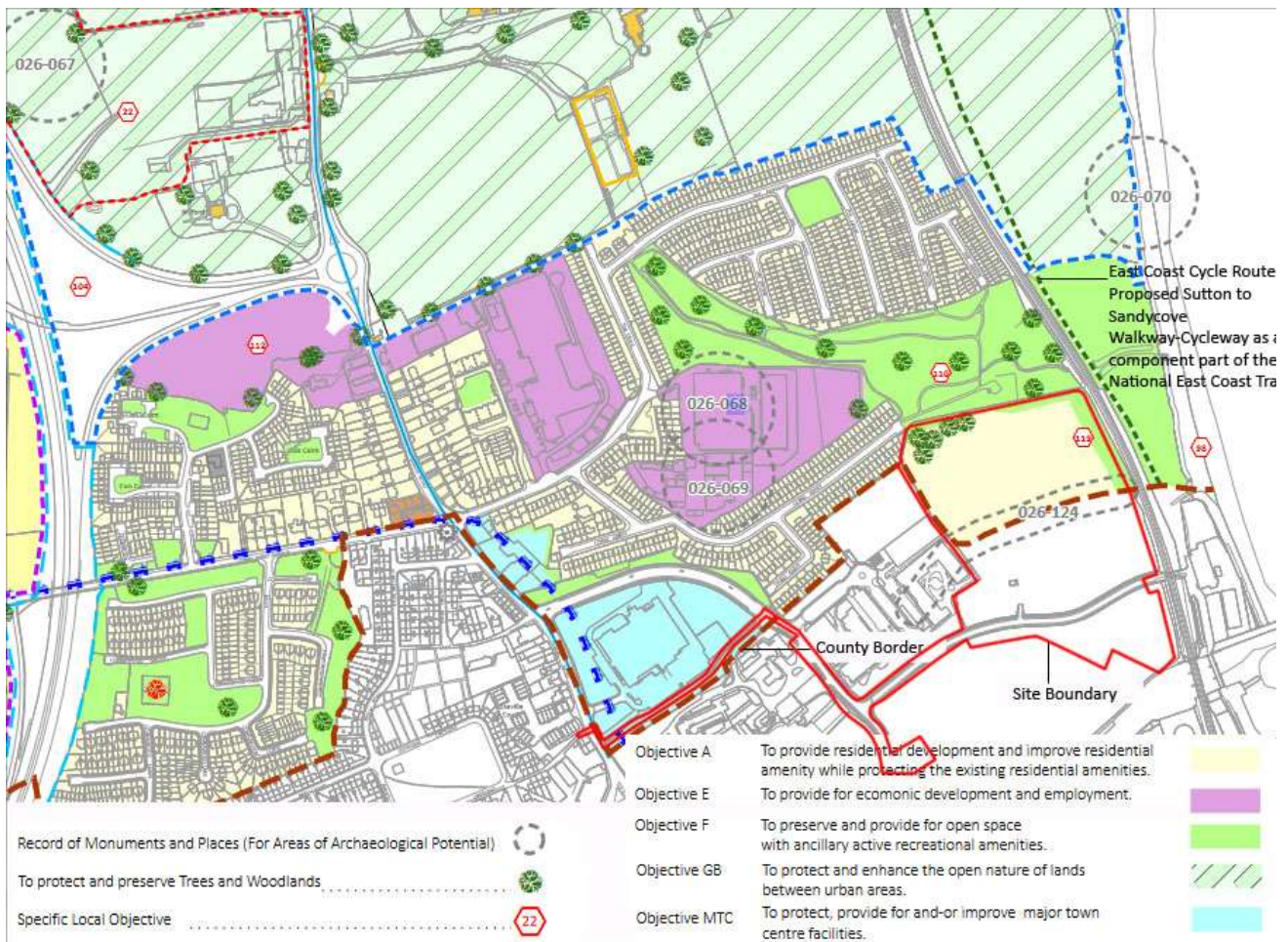


**Figure 5-4 - Environmental Sensitivity Mapping Webtool – Biodiversity Flora and Fauna**

**The Dún Laoghaire-Rathdown County Development Plan 2022-2028**

This sets out objectives for the lands of the Site and surrounding areas, which are predominantly subject to zoning objective A that seeks ‘to protect and/or improve residential amenity while protecting and the existing residential amenities’. Two small areas along the northern extent of the site and a strip of land along the eastern extent are subject to zoning objective F, which seeks to ‘preserve and provide for open space with ancillary active recreational amenities’ and to provide a permeability link between the Green Area/Linear Park. This is shown in Figure 5-4.

The open space to the north of the Site is subject to Special Local Objective SLO110, which seeks to ‘upgrade and enhance the linear park at Woodbrook Glen-Corke Abbey’ and is subject to an objective to ‘protect and preserve Trees and Woodlands’. SLO119 seeks to provide a permeability link between Green Area/Linear Park between Corke Abbey and Corke Abbey Valley Park and any development on the Former Bray Golf Club lands to allow access towards Bray Harbour.



**Figure 5-5 - Dún Laoghaire-Rathdown County Development Plan 2022-2028**

The Record of Monuments and Places lists one recorded archaeological site located within the proposed development site and this comprises a linear earthwork referenced in the Cultural Heritage Chapter as DU026-124--/WI004-005, which will be removed during the construction phase. A number of archaeological investigations of this feature including manual test trenching have indicated that it is of 19<sup>th</sup>/20<sup>th</sup> century date and it does not, therefore, comprise an archaeological site. The Cultural Heritage report indicates that there are no potential unrecorded archaeological features identified within the proposed development boundary. The proposed development will, therefore, have no predicted direct impacts on any previously unrecorded archaeological features during the construction phase. The known archaeological resource within the surrounding Study Area includes the recorded locations of a number of sites that are now occupied by modern developments and no potential indirect impacts on any extant sites were identified. There are no designated or previously unrecorded architectural heritage features located within the proposed development site or its close environs and it is not located within an Architectural Conservation Area. The construction phase of the proposed development will, therefore, have no predicted impact on the architectural heritage resource.

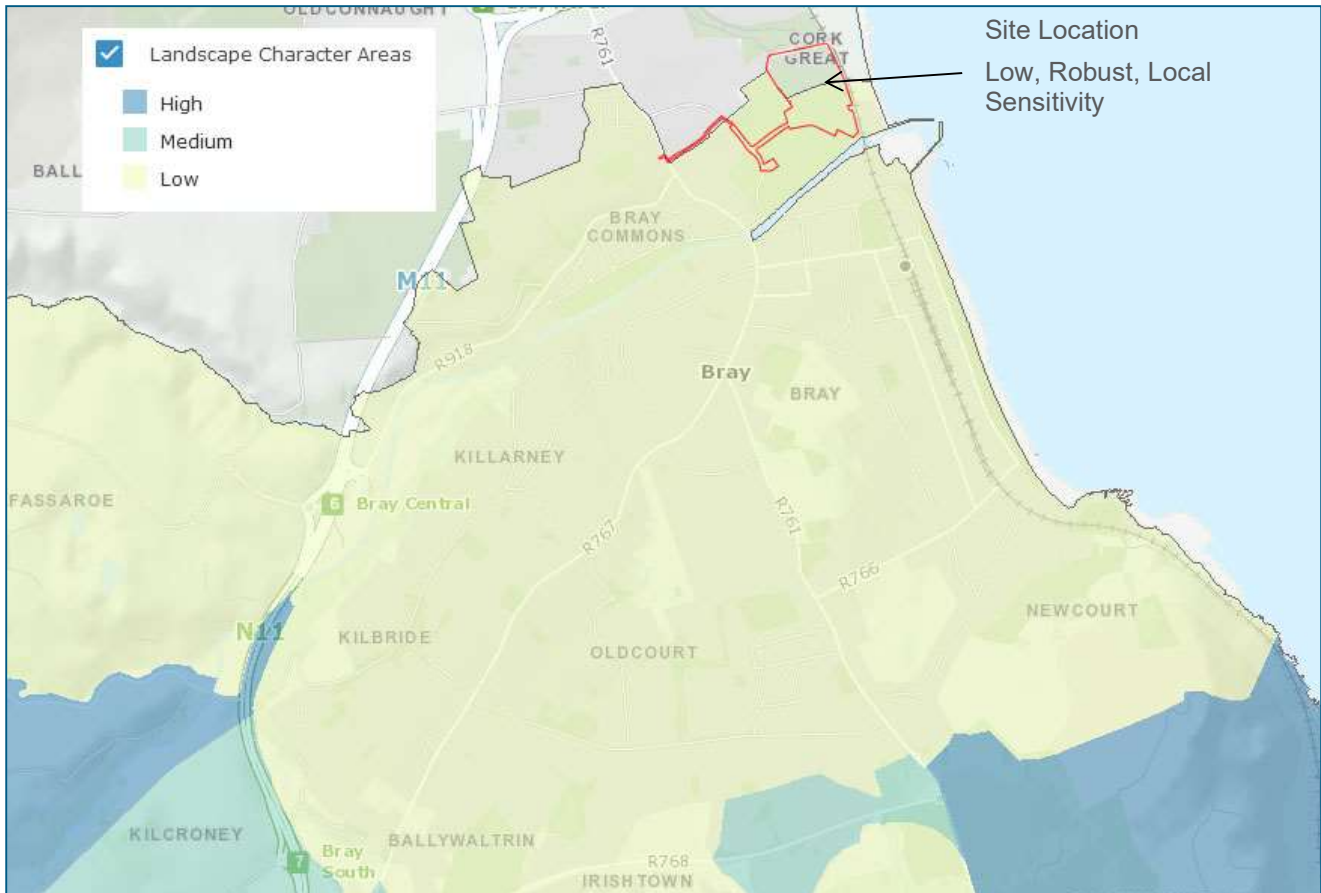
It is proposed to mark with hard landscaping features part of the boundary between County Dublin and County Wicklow where it runs through the area of open space between apartment blocks A and B. See Mitigation section for further details.

The proposed development is in accordance with the objectives set out in the Dún Laoghaire-Rathdown County Development Plan 2016-2022, which states that 'A key strand of the overall Settlement Strategy focuses on the 'continued promotion of sustainable development through positively encouraging consolidation and densification of the existing urban/suburban built form – and thereby maximising efficiencies from already established physical and social infrastructure.'

**Landscape Sensitivity**

Sensitivity is based on the landscape's physical landform shape, scale, pattern, its visual environment/enclosure, any sense of remoteness or tranquillity, presence of man-made features, its skyline, inter-visibility with adjacent sensitive areas and the presence of sensitive or rare features. Landscape sensitivity ultimately is an assessment of the ability of a surrounding landscape or townscape to accommodate and absorb change within the Site without affecting its character.

In terms of published guidance, the Environmental Sensitivity Mapping software referenced in Figure 5-1 describes the portion of the Site lying within Wicklow as being of Low, Robust, Local Sensitivity and thus able to absorb change without impacting on the special characteristics of the area. See Figure 5-5. This is also the assessment in the WCDP Appendix 5, Landscape Assessment 2016-2022.



**Figure 5-6 - Environmental Sensitivity Mapping –Landscape (Source: GeoHive - <https://aiomaps.geohive.ie/ESM/>)**

There is no published assessment of the area in the north of the Site but given its proximity to the urban fabric, an assessment of Low Environmental Sensitivity is appropriate. The site possesses nothing that would be categorised as sensitive in terms of landscape character with no notable elements or natural features.

## Landscape Quality and Value

Table 5-9 assesses the landscape value of the Site.

**Table 5-9 - Assessment of Landscape Value of Site**

Criteria	Assessment of Value
Landscape quality (condition)	Low – the land is typical of a former golf course with grassland, bunkers and scattered trees. The north west corner has robust trees and vegetation providing separation from the Corke Abbey residential development and the northern boundary has mature trees leading to an area of woodland, providing separation from the residential area of Corke Abbey Valley Park.
Scenic quality	Low/Medium - The intervisibility between the Site to the west and north is limited due to the built environment and boundary trees. The course slopes gently from west to east, down to the coastline at Bray Beach, where there are views across the Irish Sea. In addition, there are glimpses of the hills south of Dublin and Bray Head to the south of the site.
Rarity	Low – The boundary vegetation to the north represents a relatively distinct landscape component within the built-up urban environment. There are no designated or previously unrecorded architectural heritage features located within the Site or its close environs and it is not located within an Architectural Conservation Area.
Representativeness	Low – There are no internal landscape features of note within the Site that do not exist elsewhere within the area.
Conservation Interests	Low – The existing boundary and woodland planting to the north of the site and scattered trees within the site represent some ecological interest. However, the grassland and bunkers, which occupy the majority of the site do not exploit the ecological potential of the area. It is a heavily maintained manmade landscape.
Recreation Value	Low – This is a former golf course, of which there are two other golf courses to the north and south of the site. The site while open and accessible for public use has no formally recognised recreational value.
Perceptual aspects	Low/Medium – The area is bound by urban built form, although the views out to the Irish Sea and the open vistas, taking in the surrounding hills gives it a sense of tranquillity.
Associations	The County Boundary between Dublin and Wicklow is located on the Site. This will be marked by hard landscaping within the design proposals allowing the boundary to be highlighted within the landscape and become an interactive feature within the open space.

The Site does not have any value in terms of comparative rarity, distinctiveness or amenity value and is typical of a former golf course with grassland, bunkers and scattered trees. The site is influenced by the presence of existing development. Whilst it is in a prominent position adjacent to Bray Beach and the Dargle River, it is not in a prime position from which to view the beach or river, as there are industrial/commercial buildings around the harbour and along Harbour Road. Whilst it may be appreciated by local walkers it has no wider recognition and the assessment of the value of this landscape is **low**.

In terms of the susceptibility of the landscape resource to accommodate change of the type proposed, it is considered that the presence of the adjacent existing development to the west, proximity of housing to the north

and the railway to the east reduces the susceptibility of the Site to change resulting from residential development. The susceptibility is considered **low** and sensitivity is assessed as **low**, which accords with the WCDP Appendix 5, Landscape Assessment 2016-2022 published assessment.

## 5.4. Potential Landscape and Visual Impacts during Construction Phase

### 5.4.1. Introduction

The aim of the LVIA is to objectively and professionally assess how the proposed development will affect the landscape, townscape and visual amenity around Bray and the wider area. The magnitude and significance of any effect is determined by the scale and context of the proposed development and any resulting contrast between this and the existing landscape setting and visual amenity. A further consideration is not just its proximity to adjacent landscape or townscape areas but also the number of people who use or pass through this area who may feel that the visual and landscape/townscape quality of the area has been affected by this proposal.

Before any impacts from construction of the proposed development can be considered, the 'Do Nothing' scenario should be assessed. This scenario will result in the continued change/evolution of a landscape in the absence of the proposed Development. In this case the former golf course lands will continue to be overtaken by nature but will also be open to potential vandalism, antisocial behaviour and ongoing degradation of the landscape.

### 5.4.2. Building Heights

- Block B (between 4/5 and 12 storeys) and C (6 storeys) come under the administration of Wicklow County Council.

The only specific mention within the current Wicklow LAP is as follows: *“Generally, a height of 4 storeys (including ground floor) will be considered appropriate in Bray ‘town centre’ zone, irrespective of adjoining property heights. However, the Council may permit heights above this, where the specific context of the site and the design of the building allow it (for example where additional storeys are set back from street frontage).”* p.32.

This Wicklow County Development Plan 2021-2027 is still in draft but has been referred to, to gain an understanding of height recommendations for the Site.

It refers to the 'Urban Development and Building Heights Guidelines for Planning Authorities' (2018), stating that *“these guidelines acknowledge that increasing prevailing building heights has a critical role to play in addressing the delivery of more compact growth in our urban areas particularly the large towns through enhancing the scale and density of development. The Guidelines require that building heights must be generally increased in appropriate urban locations.”* It goes on to state that *“Proposals including buildings that are of a height and scale significantly greater than the prevailing height and scale shall be assessed in accordance with the development management criteria set out in Section 3.0 of the Urban Development and Building Heights Guidelines (DHPLG 2018). It goes on “Local Area Plans shall identify locations where increased height and density will be supported where it forms part of strategic redevelopment, regeneration and infill development proposals.”*

- Blocks A (between 4 and 7 storeys) and D (4 storeys) come under Dún Laoghaire-Rathdown County Council (DLRCC).

Appendix 5 of the DLR County Development Plan 2022-2028 notes in Section 1.3.1 that Section 28 Guidelines *“recommend against what they call ‘Blanket numerical limitations on Buildings Height’”*. Disadvantages noted are that such practice may lead to lack of flexibility and lack of adaptation to changing economic circumstances and requirements over time. In addition, it may hinder innovation in urban design and architecture leading to poor planning outcomes.

The DLR County Development Plan 2022-2028 sets out performance-based criteria (Section 5) that the Planning Authority will use in assessing applications for increased height in the County (defined as buildings taller than the prevailing building heights in the surrounding urban areas) or taller buildings or for a building that is higher than the parameters set out in any LAP or any specific guidance set out the County Development plan. The proposals must demonstrate satisfaction with the following criteria.

**Table 5-10 – Criteria to determine building height strategy**

Criteria	
<b>At County Level:</b>	<b>Demonstration that criteria are satisfied in proposed development</b>
Proposals assists in securing objectives of the NPF, in terms of focusing development in key urban centres, fulfilling targets in relation to brownfield, infill development and delivery compact growth.	Section 1.5.2.5 in the DLR County Development Plan 2022-2028 notes that the Dublin Metropolitan Area Strategic Plan sets out a vision for the future growth of the Dublin Metropolitan area, identifying strategic corridors based on their capacity to achieve compact sustainable and sequential growth along key public transport corridors along with large scale strategic residential, employment and regeneration development. The Metropolitan Key Town of Bray is recognised as having significant growth potential and the RSES makes an allowance for up to 20% of the targeted growth in Dublin City and Suburbs area to be transferred to other settlements in the MASP, which includes Bray. In addition, Bray is within the strategic North-South corridor (DART).
Site must be well served by public transport, ie within 1000m/10 minute walk bank of DART station, 500m/5 minute walk of Bus Priority Route.	The Site is located ca. 840m walking distance to Bray DART station and 750m to the bus corridor on Castle Street.
Proposal must successfully integrate into/enhance the character and public realm of the area.	See Landscape Design Strategy.
Protected Views and Prospects: proposals should not adversely affect the skyline or detract from key elements within the view.	See Visual Impact Assessment within this LVIA.
Infrastructural carrying capacity of area as set out in Core Strategy of CDP.	Bray is a strategic location on the north-south corridor, DART.
<b>At District/Neighbourhood/Street Level</b>	<b>Demonstration that criteria are satisfied in proposed development</b>
Proposal must respond to its overall natural and built environment and make a positive contribution to the urban neighbourhood and streetscape.	See Mitigation, Design Considerations within this report.
Proposals should not be monolithic and should avoid long, uninterrupted walls of building in the form of slab blocks.	The proposals for Blocks A & B present a diversity of building heights with green 'gaps' and gardens between the blocks. See Architect's Design Statements.
Proposals must show use of high quality, well considered materials.	See Architect's Design Statement.
Proposals where relevant must enhance urban design context for public spaces and key thoroughfare and marine or river/stream frontage.	See Architect's Design Statement.
Proposals must make a positive contribution to the improvement of legibility through the site or wider urban area. Where the building meets the street, public realm should be improved.	Footpath and cycle links with exercise routes, play provision and gardens, run along the eastern boundary culminating in a large park in the south east corner of the Site, adjacent to the River Dargle riverside walkway. The proposals will improve permeability and connectivity from Corke Abbey Valley Park and Corke Abbey and the adjacent school development through to Bray Harbour, Promenade and town centre.

Proposals must make positive contribute to the mix of uses and/or building/dwelling typologies available in the area.	The proposed development comprises 586 no. residential units in a mix of apartments, duplexes and houses. In addition, a childcare facility, café, retail unit and 1 no. commercial unit are proposed along with all associated and ancillary development and infrastructural works, hard and soft landscaping, open spaces, boundary treatment works, ancillary car and bicycle parking spaces at surface, undercroft and basement levels. Block A will accommodate 162 no. Build-to-Rent (BTR) units.
Proposals should provide an appropriate level of enclosure of streets or spaces.	See Landscape Design Strategy. There are a variety of boundary treatments across the site to provide enclosure, safety and security.
Proposals should be of an urban grain that allows meaningful human contact between all levels of buildings and the street or spaces.	See Landscape Design Strategy and Architect's Design Statements. Extensive podium gardens will provide apartment residents with communal amenity space.

There are no residential properties to the east, west or south of the proposed development. The eastern end of Corke Abbey abuts the north western corner of the proposed development, which is well screened by mature trees and woodland along the extent of the northern boundary, which is to be further strengthened. In addition, Block D located to the north west is 4 storeys. Educational establishments adjacent to approximately half of the terraced properties on the eastern boundary of the proposed development. Open space lies to the south west and the coast to the east.

The maximum height of Block A within DLR is 7 storeys. The supporting Architect's and Landscape Architects design drawings, statements and LVIA satisfy the performance-based criteria in Section 5 of the DLR County Development Plan 2022-2028 for buildings that may be defined as taller than the prevailing building heights in the surrounding urban areas, although there are not comparable buildings within close proximity. Planning Reference ABP30584419 in the Townland of Corke Little, Woodbrook is 700m from the proposed development and received planning approval from DLRCC in February 2020. Buildings in this development in DLR range from 2 to 8 storeys. Both this location and the location of the proposed development have similar benefits both locally, at county level and national level as noted below.

Section 1.5.2.5 in the DLR County Development Plan notes that the Dublin Metropolitan Area Strategic Plan sets out a vision for the future growth of the Dublin Metropolitan area, identifying strategic corridors based on their capacity to achieve compact sustainable and sequential growth along key public transport corridors along with large scale strategic residential, employment and regeneration development. The Metropolitan Key Town of Bray is recognised as having significant growth potential and the RSES makes an allowance for up to 20% of the targeted growth in Dublin City and Suburbs area to be transferred to other settlements in the MASP, which includes Bray. In addition, Bray is within the strategic North-South corridor (DART).

For the above reasons, this report considers that Block A between 4 and 7 storeys and Block B between 4 and 12 storeys is acceptable in the current context. In addition, the ABP Inspector's Report of December 2021 relating to ABP311181-21, approved phase of this development, with conditions, but refused Blocks A and B (heights ranging from 4 to 8 storeys) on the basis of *"poor design in terms of façade treatment and architectural expression, in combination with their disposition on the site,"* rather than height issues.

### 5.4.3. Predicted impacts on landscape during construction phase

Landscape and visual impacts will be most pronounced during the construction stage when the initial unfamiliarity, disturbance and visual intrusion associated with general construction activity and development of new structures will be aspects of particular attention.

General construction operations are likely to include the following:

- Site establishment, including access roads, hoardings, security and safety lighting and provision of compounds;
- Earthworks, stripping of soils and alteration of levels;
- Fixed construction plant, including cranes, scaffolding and gantries;
- Mobile construction plant, such as excavators and lorries;

- Progressive construction of new buildings and infrastructure including a mix of apartments, duplexes and houses in addition to a childcare facility, café, retail unit and 1 no mixed use commercial unit, ancillary car and bicycle parking spaces at surface, undercroft and basement levels, with all associated and ancillary development and infrastructural works.
- The proposed houses and duplexes range in height from 2-3 storeys. Block A and Block B of apartments range in height from 3-12 storeys. The maximum height of Block A is 7 storeys (+34420). The maximum height of Block B is 12 storeys (+43300). Block C has a maximum of 6 storeys (+27200m) and Block D has a maximum of 4 storeys (+24375).
- Finishing hard and soft landscaping including open spaces, communal gardens, boundary treatment works, roads, footpaths, cycleways, play areas and planting. (Full details are given in Chapter 2 of this report).

The site is annotated as part of an 'Urban Area' in terms of landscape classification and category throughout the WCDP 2016-2022 and the landscape to the north, west and south is influenced by urban residential, commercial and small industrial development. Therefore, the construction activities whilst introducing elements that will be prominent are of a temporary nature will not have any effect on the landscape character in the wider area.

Site access will be from an existing junction on Dublin Road, skirting south of the existing schools and providing two entrance/egress points to the development. Increased construction traffic and changes to the road infrastructure will cause short-term, temporary delays and diversions along Dublin Road and the roads giving access to the Site.

An area of ca. 410m<sup>2</sup> of vegetation on the north western boundary will be removed to facilitate construction of Block D and the residential units to the north western extent of the proposed development. The boundary trees will be retained with 26no. trees recommended for removal in the Tree Survey Report due to very poor condition, removed on a phased basis over time to ensure tree cover while replacement planting establishes. See Appendix 5.2. The scattered trees that were integral to the golf course (ca. 100no. trees) will be removed. A very small amount of poor-quality conifer hedging which screens the waste water station at the entrance to the site will also be removed.

The significance of the impact on the landscape character locally, in close proximity to the Site, is assessed as **moderate adverse**, and **negligible** in the wider context.

#### 5.4.4. Predicted impacts on visual amenity during construction phase

This landscape and visual assessment is accompanied by a range of Photomontages (i.e. Accurate Visual Representations), which have been prepared in order to represent the physical and visual nature of the proposed development and to assist in describing the likely visual impact. Locations in the surrounding area were selected as being representative of the views toward the Site/proposed development from the nearer and wider surroundings. 23 viewpoint locations were agreed at pre-planning meetings with Dún Laoghaire-Rathdown County Council (DLRCC) held on 12/8/2020 and in a pre-application consultation with Wicklow County Council Planning Department on 22/7/2020. 12 further viewpoints have been selected in consultation with Dún Laoghaire-Rathdown County Council (DLRCC), to illustrate the new proposals for Blocks A and B, on the eastern side of the site, which were previously refused planning permission. The locations selected are from:

- 1: South of Ravenswell Primary School
- 2: Flood alleviation works opposite Ravenswell Road
- 3: Bridge over River Dargle
- 4: Seymour Road
- 5: Strand Road
- 6: Harbour wall
- 7: Harbour Road
- 8: The Green
- 9: The Lawn
- 10: Corke Abbey
- 11: Corke Abbey
- 12: Old Connaught Avenue
- 13: Dublin Road



- 14: Dublin Road
- 15: Upper Dargle Road
- 16: Bray promenade
- 17: Killarney Road
- 18: The People's Park
- 19: Sans Souci Wood
- 20: Upper Dargle Road
- 21: Bray Head Cliff Walk
- 22: Vevay Road
- 23: Bray Head
- 24: R918, on bridge of Fassaroe Junction
- 25: Lordello Road
- 26: Car park for Shanganagh Park/Shanganagh Cemetery
- 27: Shanganagh Cemetery
- 28: Seafield
- 29: Station Road, Killiney
- 30: Strathmore Road
- 31: Vico Road
- 32: Killiney Hill
- 33: Vico Road
- 34: Sorrento Park
- 35 Sorrento Road

In each instance the 'As Existing' and 'As Proposed' version of the view is presented In Appendix 5.1. Where the proposed development is not visible in a view, an outline of it is shown in red for reference purposes.

The Accurate Visual Representations were generated by 3D Design Bureau using a range of photography, topographical surveying, mapping and three-dimensional (3D) modelling and rendering procedures, including calibrated cameras and surveying equipment for on-site data collection, CAD software for mapping, 3D modelling, and rendering images to match baseline photographs. Interim and final images are assembled in Adobe Photoshop using survey reference data. The process is ISO accredited. Refer to Appendix 5.1 for a full methodology.

These photomontage views have been used to predict the impacts of the construction phase on the view and the anticipated impacts during construction are noted below.

#### 5.4.4.1. Residents

The tallest structures within the proposed development and so likely to have the greatest visual impact are Blocks A and B, in the eastern extent of the Site. Block A is adjacent to Corke Abbey Valley Park with storeys ranging from 4 to 7 stories in height. The tallest building within Block B (12 storeys) is located in the south eastern corner, furthest away from the residential housing. Those residents at the north eastern end of Corke Abbey (Viewpoint 10) are adjacent to the site and while visibility is oblique and limited due to screening by existing vegetation, the impacts from the higher construction plant such as cranes and scaffolding, which may be visible will be of **major/moderate** and **moderate adverse** significance respectively.

The impact for residents further afield in Cork Great (Viewpoints 8 and 9) will be lessened due to the woodland between the proposed development and the housing, although the impacts of the higher construction, particularly on Block B will be **minor adverse** significance.

Residences on Seafield Road and Strathmore Road (Viewpoints 28, 30) face the sea at an oblique angle to the proposed development and visibility of construction works will be screened by built form and woodland. Sorrento Terrace on Sorrento Road is 6.6km from the Site facing Killiney Bay and the construction works on the proposed will be imperceptible. The impacts will be of **negligible** significance.

Distance, landform and intervening vegetation renders the Site imperceptible from residents further north on Seafield Road (Viewpoint 28), Vico Road (Viewpoint 31) and Sorrento Road (Viewpoint 35) and residents in these areas are unlikely to be aware of the construction works. The impact will be of **negligible** significance.

#### 5.4.4.2. Road users

The significance for road users bordering Ravenswell Primary School development (Viewpoint 1) and the secondary school will be **Minor adverse** as the construction works will be perceptible for a short distance and short term. Changes related to construction traffic will not cause significant traffic delays in close proximity to the Site, as deliveries are generally during off-peak times and Dublin Road is a regional road within a short distance of the M11.

Construction works on Seymour Road (Viewpoint 4) and Upper Dargle Road (Viewpoints 15, 20) will have negligible significance.

There will be views of the construction activities in the middle distance on Strand Road as it crosses the River Dargle (Viewpoint 7). Visibility will be greatest as the height of Blocks A and B progresses. The impact will be **slight** and the significance **minor** as the harbour buildings and railway are prominent features from the bridge. Construction activities on the Site are in the middle distance and whilst visible and prominent on the skyline will not be incongruous in the context.

Distance and screening from the Bridge over the River Dargle on Main Street (Viewpoint 3), will render the impact of construction work as **slight** and significance as **negligible/minor**.

Dublin Road to the west of the Site will give access to the principal route through to the proposed development. Construction activities will have no visual impact on road users, pedestrians and commercial and business enterprises to the west of the Site at the junction of Connaught Avenue (Viewpoint 12). Heading south to the junction of Dublin Road and the new road built to access the school development and ultimately the Site (Viewpoint 13), the significance will be **negligible**. This also applies to further south along Dublin Road, at the junction with the vehicle and pedestrian route to the new Lidl store (Viewpoint 14).

Some 1.03km south of the Site on Killarney Road beside Bray Town Hall (Viewpoint 17), the significance of construction activities will be of **negligible**.

Road users on major road networks (Viewpoint 24) are travelling at speed and focussing on their journey and unlikely to be aware of the construction activities, which will also be screened by built form on Upper Dargle Road. The impact will be **negligible** and of **negligible** significance.

Seafield Road (Viewpoint 28) is a no-through-road and serves the residents and gives access to the public open space bordering the residential area on Shanganagh Cliffs. Car users will not be driving for any time to be aware of construction activities at the proposed development. The impact of **negligible** significance.

Car users on Strathmore Road (Viewpoint 30), Vico Road (Viewpoints 31 and 33) will be focussing on the coastal road and distance will render visibility of the proposed development imperceptible. The impact will be of **negligible** significance.

There is very little visibility beyond the vegetation and Sorrento Terrace housing bordering the majority of the south side of Sorrento Road (Viewpoint 35) and the impact of construction works will be of **negligible** significance.

#### 5.4.4.3. Open Space and recreation spaces

There will be no visibility of the construction activities from the People's Park (Viewpoint 18) or from the open land adjacent to Loreto Convent on San Souci Wood (Viewpoint 19), due to distance and the built environment.

Distance will render any visibility of the construction works on the proposed development imperceptible from Viewpoints 32 and 34.

#### 5.4.4.4. Public Rights of Way and pedestrian routes

Construction activities will be barely perceptible for the majority of the build along the pedestrian path of Ravenswell Road (Viewpoint 2). The significance is assessed as **minor adverse**.

On Strand Road to the south of the harbour (Viewpoint 5), Martello Terrace and the built environment will screen the proposed development and cranes and higher elements are unlikely to be perceptible. Viewpoint 16 on Bray Promenade is .7km from the proposed development and is only just perceptible in the far distance beyond Martello Terrace with **minor adverse** impact.

The proposed development is ca. 400m away from the end of Bray Harbour wall (Viewpoint 6). Visibility of construction activities will be greatest as the taller elements of Blocks A and B progress. The impact will be of moderate adverse significance.

Visibility of construction activities from Shanganagh Park and Cemetery (Viewpoints 26 and 27) will be screened by mature trees on the boundaries and closer to the proposed development by Woodbrook Glen housing and woodland. The significance will be negligible.

#### 5.4.4.5. Educational establishments

The western side of the proposed development comprises terraced housing with approximately 13 of the rear gardens in addition to a proposed community orchard and recreation area, adjacent to the school development. The construction works will be prominent from within the school development adjacent to the proposed housing and recreation area and will be of **moderate adverse** significance. The construction works will be temporary and short term and ultimately the school may have access to the recreation area.

## 5.5. Potential Landscape and Visual impacts during Operational Phase

For cumulative impacts on landscape and visual amenity during the operational phase refer to Section 5.8.

### 5.5.1. Predicted impacts on landscape during operational phase

The landscape planting design provides for a net gain in the number of trees within the Site. There are ca. 380no. standard sized trees (height +5m) included within the proposed design along with additional hedgerow planting and extensive areas of woodland screening and wildflower meadows to ensure no net loss of biodiversity. Planting schedules have been developed with reference to the National Biodiversity Action Plan 2017-2021, Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013 (DLR Biodiversity Action Plan 2021-2025 is in consultation), County Wicklow Biodiversity Action Plan 2010-2015 and the All Ireland Pollinator Plan 2021-2025. The planting plans accord with the "Pollinator Friendly Planting Code – Professional planting recommendations 4" of the All-Ireland Pollinator Plan 2021-2025.

The former golf course lands do not currently exploit the ecological potential of the area. It is a heavily maintained manmade landscape. The proposed development will represent a significant change to the site character as the landscape of a golf course with its scattered trees and manicured grassland, is changed to accommodate a mixed residential development with associated outlets and facilities. This is a change of context and sense of place. However, whereas the whole site was formerly used for recreation the proposed development will provide mixed residential in addition to leisure and recreation facilities including pedestrian and cycle links through the proposed development to existing surrounding residential developments, the River Dargle walkway, Bray Harbour, Promenade and town centre. The adjacent school and wider community will be able to take advantage of a multi user games area. In addition, open spaces for communal activities including markets will be set amongst gardens, an orchard, lawns and meadows, which accords with the Wicklow County Development Plan 2016-2022, HD2, HD8, and promotes new developments with social and community facilities.

A comprehensive landscaping design has been developed for the Site and is presented in Appendix 1-1, which will include additional boundary planting and the creation of an ecological buffer zone along the northern and eastern boundaries of the Site. In line with DL RCC and WCC Biodiversity Action Plans and the All Ireland National Pollinator Plan 2021-2025 and in order to create a biodiversity net gain at the Site the landscaping plan will include areas of ecological enhancement such as substantial areas of native tree planting and wild flower areas. The planted areas will link with the Rathmichael woodland and the Dargle River. This planting will comprise an appropriate mixture of native trees and shrubs, preferably of local provenance, and including species attractive to pollinators. The planting will incorporate a range of species that will attract feeding invertebrates, including moths, butterflies and bees. Refer to Landscape Planting Plans (Drawings Nos. 6948-L-2200 - 2207) for details of the soft landscape design proposals.

The proposed development extends the settlement area 'infilling' an open area of land, however, the character assessment has identified the Site as influenced by the existing surrounding development, thus reducing its susceptibility to change. It is acknowledged that there would initially be a high degree of change, with new built elements making a substantial alteration to the existing open landscape setting but it is considered the proposals would not introduce elements significantly at odds with the local prevailing character. Over a period of time, as the planting matures the residential housing will be set within a high quality semi-natural environment incorporating new native tree and hedgerow planting, wildflower meadow and shrub blocks which would assist with increasing the biodiversity within the Site.

## 5.5.2. Predicted impacts on visual amenity during operational phase

Please refer to Appendix 5.1 for the verified view montages (VVM) that have been prepared for the scheme, referred to as Viewpoint 1 – Viewpoint 35 in the following text. The following tables summarise the views and context of the 36 no. representative viewpoints and the likely impact on the views and visual quality derived from the proposed development.

**Table 5-11 - Viewpoint 1**

Receptors: Road users, Pedestrians	Viewpoint to the south of Ravenswell Primary School
Viewpoint Baseline	View looking north east towards Bray Harbour. On the left is a new school development incorporating a primary and secondary school, with two 3 storey blocks visible on the skyline, bordered by shrubs and vegetation and a green mesh fencing ca. 2.4m high. Green mesh fencing on the other side of the road borders the former golf course with scattered trees and shrubs. There are wide views of the sky and the focus is on the narrow gap between the building to the left and the planting to the right. This viewpoint is also representative of views from the adjacent school complex across the existing golf course lands.
Viewpoint Sensitivity	Low
Predicted Visual Changes	<p>This view presents the gateway to the proposed development. Block C will be partially visible and the south western elevation of Block B, comprising 5 storeys, will be visible. The 12 storey block of Block B will be generally screened in the summer and winter months by mature trees and vegetation.</p> <p>The proposals represent changes within the view that are readily noticeable to road users and pedestrians as the proposed buildings close the vista, albeit narrow, and create enclosure. Whilst there is an increase in the built form this view is balanced and the new proposals are of the scale and mass of the existing development to the left.</p> <p>The seasonality will affect the visibility from this viewpoint as proposed planting along the boundary of the open spaces in the Orchard and Market Square zones in spring and summer will help soften the built elements. The significance is assessed as <b>moderate/minor neutral</b>.</p> <p>The western side of the proposed development comprises terraced housing with approximately 13 of the rear gardens at the southern end adjacent to the eastern boundary of the school development. However, the school is a place of work and study, populated only during working hours, where the focus of the receptors is on their work and activity.</p>
Magnitude of Impact	The magnitude is assessed as <b>moderate</b> . It is not uncharacteristic when set aside the existing buildings and the character of the receiving landscape, which lies in close proximity to the commercial and retail developments on Castle Street and Dublin Road.
Cumulative Impact	No combined cumulative impact.
Significance Summary	Moderate/Minor neutral

**Table 5-12 - Viewpoint 2**

Receptors: Pedestrians, Recreation	Viewpoint 2 – Flood alleviation works opposite Ravenswell Road
Viewpoint Baseline	View looking north east towards Bray Harbour. This stretch of the river has been subject to flood alleviation works and the banks of the river have been recently developed into a formalised promenade and public amenity space with planting. In the foreground to the left of the promenade is a new stone wall with black loop topped fencing and trees and grassed areas beyond. Partial glimpses of the existing school development are also visible to the left of the photomontage. To

		the right of the foreground is the old stone wall and river beyond. In the far distance on the opposite side of the river is a large tank with associated buildings and rows of residential housing with the railway crossing the river just beyond.
Viewpoint Sensitivity		The view from Bray Harbour looking south west up the River Dargle is noted as a Prospect/View on the Map No: H4 Bray Settlement Natural Heritage Map. This view is going in the opposite direction and is considered of <b>medium</b> sensitivity.
Predicted Changes	Visual	The view is wide and expansive. The 12-storey eastern end of Block B is a discernible addition on the skyline in the middle/far distance. During the summer months the top 7 floors will be visible. The visibility will be greater during the winter months, when 8/9 storeys will be visible. It is difficult to discern other buildings within the proposed development as mature trees screen them in both summer and winter and only very partial glimpses will be visible through the existing scattered trees on the land between the promenade and the proposed development. The effect will be <b>slight</b> as the proposals take up a very small element of the view and do not affect its quality.
Magnitude of Impact		The majority of the proposed development is low lying and unobtrusive and on a similar scale to the small industrial units on the opposite side of the river and largely screened by mature trees. The eastern end of Block B is visible on the skyline but the vista at this point is wide and open and the visible element of the proposed development is a small percentage of the overall view. The magnitude is assessed as <b>slight</b> .
Cumulative Impact		There is combined cumulative impact with Seapoint Residential Development, Seapoint Road (Planning Ref 22188 Wicklow), which is located on the north side of Seapoint Road. This development is proposed in an area with existing residential development. The magnitude and significance of the cumulative impact is <b>slight/negligible</b> . See Section 5.8 Cumulative Impacts for further information.
Significance Summary		Minor neutral

**Table 5-13 - Viewpoint 3**

Receptors Car users, Pedestrians,		Viewpoint 3 – View from Bridge over the River Dargle between Castle Street and Main Street
Viewpoint Baseline		View looking north east towards Bray Harbour.  In the foreground is the bridge passing over the River Dargle flowing down to Bray Harbour. On the right of the panorama is a narrow patch of woodland between the river and Seapoint Road. To the left in the foreground are residences on Ravenswell Road, behind which the top floor of the existing school development is just visible. In the middle ground is the car parking area adjacent to the promenade and scattered trees and grassland of the southern end of the disused golf course. In the far distance is Bray Harbour with its associated buildings and small works.
Viewpoint Sensitivity		The view from Bray Harbour looking south west up the River Dargle is noted as a Prospect/View on the Map No: H4 Bray Settlement Natural Heritage Map. This view is going in the opposite direction and is considered of <b>medium</b> sensitivity.
Predicted Changes	Visual	This is a long distance view with the River Dargle featuring prominently. During the winter months when there is less screening the majority (9 storeys) of the south eastern section of Block B will be visible in the middle/far distance and partial glimpses of Block C will be visible through the existing scattered trees on the land between the promenade and the proposed development. During the summer months the horizontal visibility of the proposed development is reduced, and approximately half of the southern end of Block B is visible (6/7 storeys) through the scattered trees. The buildings are not out of scale or incongruous in this context. During the summer months the intervening trees will screen the majority of the buildings and reduce the horizontal and vertical visibility. The effect will be <b>slight</b> .

Magnitude of Impact	The proposed development will introduce new elements into the baseline, which during the winter months will be discernible on the skyline in the middle/far distance. The vista at this point is wide and open and the visible element of the proposed development is a small percentage of the overall view. The magnitude is assessed as <b>slight</b> .
Cumulative Impact	No combined cumulative impact.
Significance Summary	Minor neutral.

**Table 5-14 - Viewpoint 4**

Car users, Pedestrians,	Viewpoint 4 – On Seymour Road at the junction with Seapoint Road.
Viewpoint Baseline	View looking north.  In the foreground to the right is the wall at the entrance to Carlisle Grounds sports/football pitches, with cars in the car park. To the left are railings bordering a terrace of residential housing. In the middle distance are the gable ends of housing.
Viewpoint Sensitivity	This viewpoint is from the built-up residential area to the north east of Bray and is considered of <b>low</b> sensitivity.
Predicted Visual Changes	There is no visibility of the proposed development, which lies at a lower elevation and is screened by landform and the built environment. The level of effect is <b>negligible</b> .
Magnitude of Impact	Negligible
Cumulative Impact	No combined cumulative impact.
Significance Summary	Negligible

**Table 5-15 - Viewpoint 5**

Car users, Pedestrians, Recreation	Viewpoint 5 – On Strand Road at the northern end of the promenade.
Viewpoint Baseline	View looking north west.  The viewpoint is on Strand Road. In the foreground to the right is a path through to the promenade and beach and a wall and railings bordering a small patch of young trees and shrubs. The gardens of Martello Terrace, which was built in the mid 19th century lies in the centre of the panorama. To the left is a bank with built in garages for the residential housing above. In the far distance to the left of the Martello Terrace is a partial glimpse of a café/bar.
Viewpoint Sensitivity	Medium
Predicted Visual Changes	There is no visibility of the proposed development, which is screened by the terrace of houses, in the middle of the panorama. The level of effect is <b>negligible</b> .
Magnitude of Impact	Negligible
Cumulative Impact	Planning Ref 22188 Wicklow and Planning Ref 313442 ABP are both screened by landform.
Significance Summary	Negligible

**Table 5-16 - Viewpoint 6**

Pedestrians, Recreation	Viewpoint 6 – on the harbour wall
Viewpoint Baseline	Broad, panoramic view looking north west across Bray Harbour. The baseline changes with the tides and weather conditions. In the middle distance are the harbour buildings and associated works including the large tank, which are prominent to the left of the panorama. This view ties in with the Views and

		Prospects from Bray Harbour illustrated in Map H4 Bray Settlement Natural Heritage Map (Fig 5-2), although the length of view along the river is restricted by the existing railway bridge across the River Dargle. To the right is the northern harbour wall and beyond that in the far distance are the mountains to the north west of the Site on the borders of County Dublin and County Wicklow. On a clear day with a high tide the harbour buildings and mountains in the distance are more prominent. The view shows a functional harbour typical of many seaside resorts on the east coast, which have a high degree of human intervention and little vegetation. The structures on the harbour and front are low lying, with receptors most likely focussing on the tank and moored boats and views to Bray Beach to the south.
Viewpoint Sensitivity		Medium
Predicted Changes	Visual	Blocks A, B and C of the proposed development are directly visible and a discernible addition with significant building in terms of mass and scale on the Bray seafront. The proposed development and particularly the southern elevation of Block B will rise above the mountains in the far distance. While having a significant visual effect, this is rated <b>moderate</b> due to the baseline context, nature of view and distance. The proposals will contribute to the townscape, giving Bray seafront a sense of place and introducing visual interest to the current low lying, linear nature of the seafront. Native planting to the coastal gardens bordering the railway boundary will introduce planting and soften the façade of Blocks A and B from views from the Harbour Wall and beach.
Magnitude of Impact		The proposed development introduces a readily noticeable feature in the wide panoramic view towards Bray harbour. The magnitude is assessed as <b>moderate</b> .
Cumulative Impact		Planning Ref 22188 Wicklow will be partially glimpsed through the boat masts and infrastructure in the harbour.  Planning Ref 313442 ABP will be glimpsed in the distance, although partially screened by the existing structures on Bray Harbour, particularly the large tank. Distance (.8km) reduces the visibility and prominence of this development.  The magnitude and significance of the cumulative impact is <b>slight/negligible</b> . See Section 5.8 Cumulative Impacts for further information.
Significance Summary		Moderate neutral.

**Table 5-17 - Viewpoint 7**

Car users, Pedestrians,		Viewpoint 7 – View from the road bridge crossing the River Dargle on Harbour Road.
Viewpoint Baseline		View looking north west comprises functional harbour buildings and the railway infrastructure. To the left is the viaduct with scaffolding. To the right is the harbour and in the middle distance are the associated harbour buildings. In the far distance are scattered trees bordering the railway and former golf course. The view clearly illustrates the impact of the existing bridge structure on the view illustrated in Map H4 Bray Settlement Natural Heritage Map (Fig 5-2).
Viewpoint Sensitivity		Low
Predicted Changes	Visual	The proposals will introduce new elements into the view, which incorporates a working landscape with harbour walls and transport infrastructure. During the winter months the top 6/7 storeys of the southern and eastern elevations of Block B will be visible. There will also be partial glimpses of the top floor of Block C, although sheeting on scaffolding screens much of it. During the summer months the top 3 storeys of Block B will be visible with lower storeys partially screened by existing vegetation. The level of effect is assessed as <b>slight</b> .
Magnitude of Impact		While the proposals will introduce new elements into the view and these will be readily noticeable, they are not incongruous in this context or visually intrusive. The existing railway bridge and vegetation on the railway embankment assist in

	screening the lower sections of the proposed development. The magnitude is assessed as <b>slight</b> .
Cumulative Impact	No combined cumulative impact.
Significance Summary	Minor neutral

**Table 5-18 - Viewpoint 8**

Car users, Pedestrians Residents	Viewpoint 8 – The Green.
Viewpoint Baseline	View looking south east.  This viewpoint is taken on a suburban street in Corke Great, ca. 35m from the wooded and grassland area that borders the northern boundary of the proposed development. The Green is a wide tree line residential road, with sloping drives and front gardens, and grassed verges. In the far distance is the entrance through gates to the public wooded and grassed area, which has paths running through it and may be used by residents to access the town centre.
Viewpoint Sensitivity	Medium
Predicted Visual Changes	During the winter months there will be partial glimpses of the top of the northern side of Block A and the taller building in Block B, through the mature trees of the parkland. During the summer months visibility will be largely screened by the housing and the mature trees. If there is any visibility, it will be barely perceptible and not uncharacteristic when set within the attributes of the receiving townscape.
Magnitude of Impact	Slight
Cumulative Impact	Planning Ref 22188 Wicklow is screened by the proposed development.
Significance Summary	Minor neutral

**Table 5-19 - Viewpoint 9**

Car users, Pedestrians Residents	Viewpoint 9 – The Lawn
Viewpoint Baseline	View looking south east.  This viewpoint is taken on a suburban street in Corke Great ca. 60m from the wooded and grassland area that borders the northern boundary of the proposed development. The Lawn is a wide tree line residential road, with drives and front gardens, and grassed verges. In the far distance is the entrance through gates to the public wooded and grassed area, which has paths running through it and may be used by residents to access the town centre.
Viewpoint Sensitivity	Medium
Predicted Visual Changes	Any glimpses of the proposed development through the mature vegetation of the parkland will be imperceptible during summer months and barely perceptible during the winter months.
Magnitude of Impact	Slight/Negligible
Cumulative Impact	Planning Ref 22188 Wicklow is screened by the proposed development and built form and Planning Ref 313442 ABP is screened by intervening built form.
Significance Summary	Minor/negligible neutral

**Table 5-19 - Viewpoint 10**

Car users, Pedestrians Residents	Viewpoint 10 – Corke Abbey
Viewpoint Baseline	View looking east.



		<p>This viewpoint is taken on the suburban tree lined street with grassed verges at the eastern most end of Corke Abbey. The majority of the properties are semi-detached, with drives and front gardens.</p> <p>To the left of the panorama is the entrance through gates to the public wooded and grassed area, which has paths running through it and may be used by residents to access the town centre. This park is at a lower ground level than the proposed development and currently access from the park to the application site is by informal footpaths up a steep embankment. The mature trees lie on the boundary of the parkland.</p> <p>The residence to the right of the panorama is no 112 Corke Abbey. The existing mature trees which are 12m high currently cast shade over the property and external amenity areas of no 112 Corke Abbey during morning hours. Refer to Appendix 5.3 Daylight and Sunlight Assessment Report for further details.</p>
Viewpoint Sensitivity		Medium
Predicted Changes	Visual	<p>During the summer and winter months partial glimpses of Block D, which has four storeys will be possible from this viewpoint.</p> <p>No 112, the end semi-detached house and the adjacent neighbours at this end of Corke Abbey lie at an oblique angle to Block D. Residences further west along the other side of Corke Abbey may have oblique views of the rear gardens and housing along the west boundary of the proposed development.</p> <p>Those residents on the other side of Corke Abbey are likely to be largely screened by intervening housing and vegetation but may have glimpses from their top windows of Block A and the housing. However, glimpses of the proposed development through the mature vegetation of the parkland and garden planting will not be incongruous in the current context.</p> <p>While construction of Block D and the residential units to the north western extent of the proposed development will necessitate removal of a number of trees, the trees on the northern boundary will be retained apart from ca. 20 trees, which will be removed over time, as recommended in the survey, due to poor condition. These will be replaced with new standard tree planting as outlined in the Planting Plans, Drawing no's: 6948-L-2200 - 2207. Replacement planting will be carried out judiciously to ensure the degree of separation and screening is maintained.</p> <p>There will be no additional overshadowing of no 112 Corke Abbey as a result of the proposed development. The management of existing trees adjacent to this property will potentially increase the levels of daylight/sunlight during the morning hours and any shading caused by the proposed development will not extend beyond the site boundary of the Site by 10am in the March and June studies or by 12 noon in the December study. Refer to Appendix 5.3 Daylight and Sunlight Assessment Report for further details.</p> <p>The existing trees along the boundary of Corke Abbey Park will be retained and these will screen views of Block D from this area of parkland. The remainder of this boundary between the proposed development and the Corke Abbey Park will be retained as open space to ensure the aspect to and from the park remains similar to the existing conditions with existing boundary trees being retained and proposed enhancements through the creation of formal, complaint pathway access.</p>
Magnitude of Impact		Moderate
Cumulative Impact		Planning Ref 22188 Wicklow and Planning Ref 313442 ABP will be screened by vegetation, the proposed development and built form.
Significance Summary		Moderate/Minor adverse

**Table 5-20 - Viewpoint 11**

Car users, Pedestrians Residents	Viewpoint 11 – Corke Abbey
Viewpoint Baseline	View looking east.

		<p>This viewpoint is taken at the southern end of Corke Abbey on the street that lies adjacent to the new school development and its large rectangular playing fields.</p> <p>This is a wide tree line residential road, with drives and front gardens, and grassed verges. The majority of the houses are semi-detached.</p> <p>Existing tree vegetation along the rear boundary of these properties provides screening and will also create a degree of over shadowing during the morning hours.</p>
Viewpoint Sensitivity		Medium
Predicted Visual Changes		<p>The street is at a slightly higher elevation than the proposed development. Any glimpses of the proposed development through the gaps between the semi-detached houses and rear garden tree vegetation from this viewpoint will be imperceptible during winter and summer months. The housing on the western boundary of the development will be partially screened by the new school development but may be visible from the upper floors of rear rooms from a small number of the properties. However, the proposed development is not incongruous in this particular context as it is a residential development, adjacent to a large school complex with traffic circulation and parking.</p> <p>The proposed development will have no impact on the daylight/sunlight experienced by these properties due to distance and the presence of existing boundary tree vegetation.</p>
Magnitude of Impact		Slight
Cumulative Impact		Planning Ref 22188 Wicklow and Planning Ref 313442 ABP will be screened by vegetation and intervening built form.
Significance Summary		Minor neutral

**Table 5-21 - Viewpoint 12**

<b>Car users, Pedestrians</b>		<b>Viewpoint 12 – Dublin Road at the junction with Old Connaught Avenue</b>
Viewpoint Baseline		<p>View looking south east.</p> <p>This viewpoint is taken at the junction of Dublin Road and Old Connaught Avenue, which is the border of County Dublin and County Wicklow. This is a busy road network surrounded by residential housing and commercial outlets.</p> <p>Residential houses on Dublin Road and on Old Connaught Road are on the left of the panorama. In the centre of the panorama is the Axa Insurance building and car park, a car showroom and garage and retail outlets further on Dublin Road. Bray Head is just visible in the far distance to the right of the panorama.</p>
Viewpoint Sensitivity		Low
Predicted Visual Changes		There is no visibility of the proposed development from this viewpoint.
Magnitude of Impact		Negligible
Cumulative Impact		Planning Ref 22188 Wicklow and Planning Ref 313442 ABP are at a lower elevation than this viewpoint and will be screened by land form and intervening urban development.
Significance Summary		Negligible

**Table 5-22 - Viewpoint 13**

<b>Car users, Pedestrians, cyclists</b>		<b>Viewpoint 13 – Dublin Road</b>
Viewpoint Baseline		View looking east.

	<p>This viewpoint is taken at the junction of Dublin Road and a newly built road with cycle lane built to access the new school development and which will also provide access to the proposed development.</p> <p>Residential houses lie to the left of the panorama and the rear of a small shopping centre which includes Lidl, is visible to the right. In the far distance is residential housing.</p>
Viewpoint Sensitivity	Low
Predicted Visual Changes	The proposed development will be imperceptible from this viewpoint, screened by the residential and commercial urban development.
Magnitude of Impact	Negligible
Cumulative Impact	Planning Ref 22188 Wicklow will be screened by land form and intervening urban development. The upper storeys of Planning Ref 313442 ABP may be perceptible. However, this viewpoint is set within an urban context with residential housing along with educational institutions and commercial outlets and there will be no cumulative impact with the proposed development.
Significance Summary	Negligible

**Table 5-23 - Viewpoint 14**

<b>Car users, Pedestrians, cyclists</b>	<b>Viewpoint 15 – Dublin Road</b>
Viewpoint Baseline	<p>View looking north east.</p> <p>This viewpoint is taken at the junction of Dublin Road at a road leading to a car park for the Lidl and retail outlets. The bollards to this road are in the foreground. Access is currently on the road 40m north. The pedestrian and cycle access route is on the right of the panorama.</p>
Viewpoint Sensitivity	Low
Predicted Visual Changes	The proposed development will be imperceptible from this viewpoint, which lies in the middle/far distance and is largely screened by the urban development and vegetation.
Magnitude of Impact	Negligible
Cumulative Impact	Planning Ref 22188 Wicklow and Planning Ref 313442 ABP are at a lower elevation than this viewpoint and will be screened by land form and intervening vegetation.
Significance Summary	Negligible

**Table 5-24 - Viewpoint 15**

<b>Car users, Pedestrians</b>	<b>Viewpoint 15 – Upper Dargle Road</b>
Viewpoint Baseline	<p>View looking east.</p> <p>This viewpoint is taken on Upper Dargle Road ca. 70m from the Ravenhall Development. To the left is a raised bank with vegetation and hedgerows beyond which are three blocks of apartments. To the right is a small terrace of residential housing with the entrance gate and steps on a pedestrian path behind the vehicle crash barrier.</p>
Viewpoint Sensitivity	Low
Predicted Visual Changes	There is no visibility of the proposed development from this viewpoint.
Magnitude of Impact	Negligible
Cumulative Impact	Planning Ref 313442 ABP may be glimpsed on the skyline but there will be no cumulative impact with the proposed development.
Significance Summary	Negligible

**Table 5-25 - Viewpoint 16**

Pedestrians, Recreation		Viewpoint 16 – Bray promenade
Viewpoint Baseline		View looking north west.  The viewpoint is the long view along Bray promenade just north of Bray Aquarium. In the foreground is the wide grass terrace between the promenade and the hotels, food outlets, housing and parking on Strand Road, similar to many promenades of seaside towns. Strand Road and Bray Promenade converge in the far distance at Martello Terrace (the terrace of white houses). To the right are the harbour walls and the hills around Killiney are just visible.
Viewpoint Sensitivity		Medium
Predicted Visual Changes		The proposed development is ca. 785m from this viewpoint. Strand Road and Bray Promenade converge on Martello Terrace, which screens the majority of the proposed development. A narrow horizontal extent of the top floors (5 storeys) of Block B are just perceptible, however, this will not be the focus of the pedestrians who will be walking the promenade with its shops and bars and views out to the Irish Sea. The proposed development affects a very minor part of a wider view full of distractions of the seaside and is unlikely to be perceptible at this distance with the intervening built environment.
Magnitude of Impact		Slight
Cumulative Impact		Planning Ref 22188 Wicklow and Planning Ref 313442 ABP will be screened by intervening built form. There is no cumulative impact.
Significance Summary		Minor neutral

**Table 5-26 - Viewpoint 17**

Car users, Pedestrians		Viewpoint 17 – Killarney Road
Viewpoint Baseline		View looking north west.  The viewpoint is on Killarney Road close to the junction with Vevay Road beside Bray Town Hall which has an outlet for McDonalds (off the panorama, to the right). The road junction lies in the foreground with the Wyvern sculpture. Killarney Road leads to the Main Street with various retail and commercial shop frontages. The roads converge and bear west crossing the River Dargle at Ravenswell Road.
Viewpoint Sensitivity		Low
Predicted Visual Changes		This viewpoint is ca. 1.03km from the Site and the distance and built urban environment screens any visibility of the proposed development.
Magnitude of Impact		Negligible
Cumulative Impact		Planning Ref 22188 Wicklow and Planning Ref 313442 ABP will be screened by intervening built form. There is no cumulative impact.
Significance Summary		Negligible

**Table 5-27 - Viewpoint 18**

Pedestrians, Recreation		Viewpoint 18 – The People's Park
Viewpoint Baseline		View looking north east.  The viewpoint is at the westerly end of People's Park and looks across an open community parkland with recreational grass areas and footpaths. To the left behind an avenue of mature trees are glimpses of mixed residential housing on Lower Dargle Road. To the right is the stone faced flood alleviation wall for the Dargle River. In the far distance on the left is the park building and residential housing on Lower Dargle Road as it bears east.
Viewpoint Sensitivity		Medium

Predicted Visual Changes	This viewpoint is ca. 1.16km from the Site and the distance and built urban environment screens any visibility of the proposed development. The proposed development is imperceptible during the worst-case scenario of winter, and also summer.
Magnitude of Impact	Negligible
Cumulative Impact	Planning Ref 22188 Wicklow and Planning Ref 313442 ABP will be screened by intervening vegetation and built form. There is no cumulative impact.
Significance Summary	Negligible

**Table 5-28 - Viewpoint 19**

<b>Pedestrians, Recreation</b>	<b>Viewpoint 19 –Sans Souci Wood outside Loreto Convent</b>
Viewpoint Baseline	View looking north.  The viewpoint is at the corner of Sans Souci Wood overlooking the open land. In the foreground is the open parkland bordered by mature trees. To the left is residential housing with drives, front gardens and grass verges. This section of the road is elevated (48m) and gradually slopes down giving views across in the far distance to the Irish Sea and the mountains south of Dublin.
Viewpoint Sensitivity	Medium
Predicted Visual Changes	This viewpoint is ca. 1.34km from the Site and the distance, elevation, built urban environment and vegetation screens any visibility of the proposed development. The proposed development will be barely perceptible during the worst-case scenario of winter, and also summer.
Magnitude of Impact	Negligible
Cumulative Impact	Planning Ref 22188 Wicklow and Planning Ref 313442 ABP will be screened by intervening vegetation and built form. There is no cumulative impact.
Significance Summary	Negligible

**Table 5-29 - Viewpoint 20**

<b>Road users, Pedestrians, Recreation</b>	<b>Viewpoint 20 –Upper Dargle Road</b>
Viewpoint Baseline	View looking north east.  The viewpoint is on Upper Dargle Road next to the bus stop visible in the foreground. To the left, just out of the panorama are houses set back from the road with mature shrubs. To the right are mature shrubs and trees bordering the Dargle River.
Viewpoint Sensitivity	Medium
Predicted Visual Changes	This viewpoint is ca. 2km from the Site and at a similar elevation. The distance, built urban environment and vegetation screens any visibility of the proposed development. The proposed development is imperceptible during the worst-case scenario of winter, and also summer.
Magnitude of Impact	Negligible
Cumulative Impact	Planning Ref 22188 Wicklow and Planning Ref 313442 ABP will be screened by intervening vegetation and built form. There is no cumulative impact.
Significance Summary	Negligible

**Table 5-30 - Viewpoint 21**

<b>Pedestrians, Recreation</b>	<b>Viewpoint 21 – Bray Head Cliff Walk</b>
Viewpoint Baseline	View looking north west.

		<p>This is a wide expansive view of the sea, with views along the seafront of Bray to Killiney and to Sorrento Point. The viewpoint is on the Bray Head Cliff Walk. In the foreground is a path to a circular viewing point. The path to the right continues down to Strand Road. The first red and white building visible on the left of the panorama is the Star Leisure Amusements and Casino along with car parking on Strand Road which continues with its hotels, food outlets and recreation into the middle distance. In the far distance the walls of the harbour are visible and to the left are the Dublin Mountains.</p>
Viewpoint Sensitivity		Medium
Predicted Visual Changes	Visual	<p>The proposed development is ca. 1.7km from this viewpoint and just perceptible on the skyline above Martello Terrace. It fits into the urban area of Bray with the mix of residential housing, retail and hospitality outlets and does not spoil the quality of the view of a typical seaside front. Its distance and screening from the built environment renders it a very minor part of a wider view full of distractions of the seaside and the Irish Sea.</p>
Magnitude of Impact		Slight
Cumulative Impact		<p>There will be no cumulative impact with the proposed development. There is some distance between the proposed development and Planning Ref 22188 Wicklow and Planning Ref 313442 ABP, and all can be subsumed into the urban seaside landscape to no detriment.</p>
Significance Summary		Minor neutral

**Table 5-31 - Viewpoint 22**

<b>Pedestrians, Recreation</b>	<b>Viewpoint 22 – Vevay Road</b>	
Viewpoint Baseline		<p>View looking north east.</p> <p>The viewpoint is on Vevay Road near the junction with Boghall Road. The grounds of St Andrew's National School and it's boundary wall are prominent elements within the view and existing residential development at Newcourt Road provides a backdrop to the view.</p>
Viewpoint Sensitivity		Medium
Predicted Visual Changes	Visual	<p>There is no visibility of the proposed development from this viewpoint.</p>
Magnitude of Impact		Negligible
Cumulative Impact		<p>Neither the proposed development nor Planning Ref 22188 Wicklow or Planning Ref 313442 ABP will be perceptible from this location. There will be no cumulative impact.</p>
Significance Summary		Negligible

**Table 5-32- Viewpoint 23**

<b>Pedestrians, Recreation</b>	<b>Viewpoint 23 – Bray Head</b>	
Viewpoint Baseline		<p>View looking north west.</p> <p>The viewpoint is from an elevated position on Bray Head. The location provides wide panoramic views of Bray town centre, the Irish Sea, the Dublin Mountains to the west and distant views towards Dublin to the north. The Promenade and beach are prominent elements within the view from this popular location.</p>
Viewpoint Sensitivity		Medium
Predicted Visual Changes	Visual	<p>The proposed development will be perceptible from this viewpoint although the change from the existing green open space to built form is not easy to discern in the far distance amongst the built-up urban area of Bray. The proposed development is ca. 2.5km from this viewpoint and is part of a wide panoramic view with numerous elements attracting the viewer's eye. The proposed development is</p>

	in scale with existing surrounding development and is again a minor part of a wider view full of distractions of the seaside and the Irish Sea coastline looking towards Dublin.
Magnitude of Impact	Slight
Cumulative Impact	It will be difficult to discern the proposed development from this viewpoint and will also be difficult to discern Planning Ref 22188 Wicklow and Planning Ref 313442 ABP. There will be no cumulative impact.
Significance Summary	Minor neutral

**Table 5-33 - Viewpoint 24**

Road users	Viewpoint 24 – R918, on bridge of Fassaroe Junction, leading to Junction 6 of the N11, Wexford, and the R918 to Bray. 2.2km to Site
Viewpoint Baseline	View looking north east The photograph is taken on the bridge crossing the N11 at a busy road junction. The grassed central reservation is in the foreground and woodland screening the motorway dominates the viewpoint.
Viewpoint Sensitivity	Low, the view is dominated by a major road network and its infrastructure including signage and lighting. Receptors will be travelling at speed.
Predicted Visual Changes	There is no visibility of the proposed development from this viewpoint.
Magnitude of Impact	Negligible
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-34 - Viewpoint 25**

Pedestrians	Viewpoint 25 – Lordello Road 2.5km to Site
Viewpoint Baseline	View looking south east This view is taken on the bridge crossing the exit from the M11, the M50 and entry on the M11. In the summer months the foreground and middle distance are dominated by woodland beside the road network screening any visibility of the residential area of Shankill. In the winter months the tops of the housing in the residential area of Crinken Glen is glimpsed through the trees. Bray Head is visible in the far distance.
Viewpoint Sensitivity	Low, the view is dominated by a major road network and lighting.
Predicted Visual Changes	There is no visibility of the proposed development which is screened by the residential area of Crinken Glen and the dense woodland bordering the road network.
Magnitude of Impact	Negligible
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-35 - Viewpoint 26**

Receptors Visitors/staff for park and cemetery	Viewpoint 26 – From the car park for Shanganagh Park and Shanganagh Cemetery. 1.4km to Site
Viewpoint Baseline	View looking south east.

		This viewpoint is enclosed by mature street trees. In the foreground is the car park serving Shanganagh Park, home of Shankill Football Club, and Shanganagh Cemetery. In the centre of the photograph in the far extent of the car park are metal gates to the recycling centre. The car park lies between the two sides of cemetery, which are separated by Dublin Road. Further south between the car park and the Site is Corke Abbey Valley Park housing and woodland, adjacent to the northern boundary of the Site.
Viewpoint Sensitivity		Low/Medium
Predicted Visual Changes		The car park is at 24m AOD and the north boundary of the Site is 11m AOD. There will be no visibility of the proposed development, which will be screened in both the winter and summer months by the standard trees in the car park and further south by residential development.
Magnitude of Impact		Negligible
Cumulative Impact		There is no cumulative impact.
Significance Summary		Negligible

**Table 5-36 - Viewpoint 27**

Receptors Pedestrians, visitors/staff in cemetery		Viewpoint 27 – View from the northern boundary of the eastern section of Shanganagh Cemetery 1.5km to Site
Viewpoint Baseline		View looking south east.  In the foreground is the road circumventing the graveyard. To the east lies the railway line. To the west are two fields and Woodbrook Golf Course. The linear organisation of the graves lie in the middle distance bordered by woodland. Bray Head can be glimpsed beyond the conifer trees bordering the cemetery.
Viewpoint Sensitivity		Low/Medium
Predicted Visual Changes		The car park is at 24m AOD and the north boundary of the Site is 11m AOD. There will be no visibility of the proposed development, which will be screened in both the winter and summer months by the standard trees in the car park and further south by residential development,
Magnitude of Impact		Negligible
Cumulative Impact		There is no cumulative impact.
Significance Summary		Negligible

**Table 5-37 - Viewpoint 28**

Receptors Car users, Pedestrians, Residents		Viewpoint 28 – Seafield 3km to Site
Viewpoint Baseline		View looking south.  The wide grass verge and railings border the slope down to Shanganagh Bay Beach. The residences on Seafield lie to the right and Bray Head is visible in the far distance.
Viewpoint Sensitivity		Medium
Predicted Visual Changes		The residences on Seafield are at an oblique angle to the proposed development, in addition to which the conifers in the middle distance along with the intervening built form and woodland will screen any visibility of the proposed development.
Magnitude of Impact		Negligible
Cumulative Impact		There is no cumulative impact.
Significance Summary		Negligible



**Table 5-38 - Viewpoint 29**

Receptors Train travellers	Viewpoint 29 – Station Road, Killiney 4.8km to Site
Viewpoint Baseline	View looking south.  This view is taken beside the lift serving the glass bridge giving access to platforms on the DART railway line accessed via Station Road. Killiney Beach is adjacent to the railway line and dominates the photograph. Bray Harbour and Bray Head are visible in the far distance, flanked by the built up residential area of Bray.
Viewpoint Sensitivity	Medium
Predicted Visual Changes	Distance and landform will screen the proposed development from this viewpoint.
Magnitude of Impact	Negligible
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-39 - Viewpoint 30**

Receptors Pedestrians, car users, residents	Viewpoint 30 – Strathmore Road 5.2km to Site
Viewpoint Baseline	View looking south.  Strathmore Road runs parallel with the railway line, which is visible in the foreground adjacent to Killiney Beach. Residencies in large plots, set back from the Strathmore Road lie to the right of the photograph. The viewpoint is taken on the corner of Strathmore Road, which turns sharply inland between residences set in large wooded plots. Just north of the viewpoint is a Battery (DU026-012), a registered Site and Monument. The railway infrastructure, metal fencing and concrete walling bordering the gardens and railway line dominate the view, which looks across to Bray Head and Little Sugar Loaf Mountain.
Viewpoint Sensitivity	Low
Predicted Visual Changes	Distance and landform will screen the proposed development from this viewpoint.
Magnitude of Impact	Negligible
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-40 - Viewpoint 31**

Receptors Pedestrians, car users, residents	Viewpoint 31 – Vico Road 5.7km to Site
Viewpoint Baseline	View looking south.  Vico Road is a single lane road running parallel with the coast at 60m AOD along the hillside from Strathmore Road to Sorrento Road. In the foreground is vegetation in the gardens of a villa. The coastal area with Corke Abbey Valley Park is visible in the middle distance. The urban area of Bray flanks the Little Sugar Loaf Mountain in the far distance.  This is an affluent area with Victorian villas in large landscaped plots either side of the road. To the south the railway line runs parallel with Vico Road. To the north

	the R119/Vico Road borders Killiney Hill Park. Vico Road has a pedestrian path with stone walls giving glimpses through mature trees and shrubs to the coast. To the north of the viewpoint the hill, with ornamental trees and vegetation, rises steeply, reverting to mature woodland when Vico Road joins the R119. Vico Road is a popular spot for tourists and residents. Approximately 1km north east along the coast road is a well visited swimming area, Vico Baths, accessible from a gap in the stone wall on Vico Road. There are several pedestrian paths to the north of Vico Road in Killiney Hill Park and Dalkey Hill with registered Land with Sea Views ( <a href="https://gis.epa.ie/EPAMaps/">https://gis.epa.ie/EPAMaps/</a> Seascapes – Land with Sea views). 1.3km north east is Sorrento Park and Coliemore Park, with views and a ferry crossing point to Dalkey Island, a SAC and SPA, with several registered Sites and Monuments including a Martello tower.
Viewpoint Sensitivity	High
Predicted Visual Changes	Distance, intervening landform and vegetation will render the proposed development barely imperceptible from this viewpoint.
Magnitude of Impact	Negligible
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-41 - Viewpoint 32**

Receptors Pedestrians	Viewpoint 32 – Killiney Hill 5.8km to Site
Viewpoint Baseline	View looking south.  This viewpoint is at 137m AOD on Killiney Hill in an area registered as Land with Sea Views ( <a href="https://gis.epa.ie/EPAMaps/">https://gis.epa.ie/EPAMaps/</a> Seascapes – Land with Sea views). The built up area of Bray is visible in the far distance. Bray Head, Little Sugar Loaf and Great Sugar Loaf mountains are visible on the skyline. Looking towards Bray Head from this viewpoint the green space with trees and shrubs along the coastline is very noticeable. Killiney Hill is a popular place to enjoy the views along the coast and out to sea and visit the obelisk.
Viewpoint Sensitivity	High
Predicted Visual Changes	Distance, landform and the vegetation with stands of mature trees will render the proposed development imperceptible from this viewpoint.
Magnitude of Impact	Negligible,
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-42 - Viewpoint 33**

Receptors Pedestrians, car users	Viewpoint 33 – Vico Road 6.2km to Site
Viewpoint Baseline	View looking south.  Vico Road is double lane at this point running parallel with the coast at 54m AOD along the hillside. In the foreground is vegetation on the cliff. This is a popular viewpoint (registered Seascapes – Sea Surface Visible from Land ( <a href="https://gis.epa.ie/EPAMaps/">https://gis.epa.ie/EPAMaps/</a> )). of the coastal area and Killiney Bay, with parking. and pedestrian paths ascending from the road to Dalkey Hill and descending through Dalkey Commons with a railway crossing to White Rock Beach.  The coastal area with Corke Abbey Valley Park is visible in the middle distance. The urban area of Bray flanks the Little Sugar Loaf Mountain and the Great Sugar Mountain in the far distance.

	<p>To the north from this viewpoint the land rises steeply through Dalkey Commons and wooded, rocky terrain to Dalkey residential area. The only residence in close proximity to this view is White Rock House, 62m to the north east, accessed via a single track road.</p> <p>Approximately 500m north east along the coast road is a well visited swimming area, Vico Baths, accessible from a gap in the stone wall on Vico Road. .9km north east is Sorrento Park and Coliemore Park, with views and a ferry crossing point to Dalkey Island, a SAC and SPA, with several registered Sites and Monuments including a Martello tower.</p>
Viewpoint Sensitivity	High
Predicted Visual Changes	Distance, landform and the green space with mature planting and stands of trees will render the proposed development imperceptible.
Magnitude of Impact	Negligible,
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-43 - Viewpoint 34**

Receptors Pedestrians	Viewpoint 34 – Sorrento Park 6.6km to Site
Viewpoint Baseline	View looking south.  This viewpoint is taken at a high point in Sorrento Park. In the foreground is the cliff edge with the end of Sorrento Terrace, an exclusive development built in the 1850s on the Sorrento Point promontory. The wide, expansive views look across Killiney Bay to Bray Head and the Little Sugar Loaf Mountain and the Great Sugar Mountain in the far distance. Sorrento Park is a popular spot for walkers to enjoy the expansive views of the Bay and mountains in the far distance.
Viewpoint Sensitivity	High
Predicted Visual Changes	Distance and the expanse of Killiney Bay render the proposed development. Imperceptible.
Magnitude of Impact	Negligible
Cumulative Impact	There is no cumulative impact.
Significance Summary	Negligible

**Table 5-44 - Viewpoint 35**

Receptors Pedestrians, residents, car users	Viewpoint 35 – Sorrento Road 6.6km to Site
Viewpoint Baseline	View looking south.  This viewpoint is taken on Sorrento Road between the end of Sorrento Terrace and mature trees and shrubs bordering the road. In the foreground are the gates and boundary to no 8 Sorrento Terrace. an exclusive development built in the 1850s on the Sorrento Point promontory. The Killiney Bay to Bray Head and the Little Sugar Loaf Mountain and the Great Sugar Mountain in the far distance.
Viewpoint Sensitivity	High
Predicted Visual Changes	From this distance the coastal area of Bray occupies a narrow horizontal component of land below the mountains in the far distance. The proposed development will be barely perceptible from this viewpoint and occupy is very small part of the wide expansive view in the far distance. It is difficult to distinguish individual components of the landscape and the level of effect is negligible.

Magnitude of Impact	Negligible,
Cumulative Impact	Planning Ref 22188 Wicklow will be screened by the proposed development and Planning Ref 313442 ABP will be imperceptible at this distance with the intervening vegetation and built form. There will be no cumulative impact.
Significance Summary	Negligible

**Table 5-45 - Summary of Visual Impact Assessment**

Viewpoint number and location	Viewpoint sensitivity	Magnitude of Impact		Significance of Effect	
		Construction	Operation	Construction	Operation
1: South of Ravenswell Primary School	Low	Moderate	Moderate	Minor/ Moderate adverse	Moderate/Minor neutral
2: Flood alleviation works opposite Ravenswell Road	Medium	Slight	Slight	Minor adverse	Minor neutral
3: Bridge over River Dargle	Medium	Slight	Slight	Negligible/Minor	Minor neutral
4: Seymour Road	Low	Negligible	Negligible	Negligible	Negligible
5: Strand Road	Medium	Negligible	Negligible	Negligible	Negligible
6: Harbour Wall	Medium	Moderate	Moderate	Moderate adverse	Moderate neutral
7: Harbour Road	Low	Slight	Slight	Minor adverse	Minor neutral
8: The Green	Medium	Slight	Slight	Minor adverse	Minor neutral
9: The Lawn	Medium	Slight	Slight/ Negligible	Minor adverse	Minor/negligible neutral
10: Corke Abbey	Medium	Major	Moderate	Moderate/ major adverse	Moderate/Minor adverse
11: Corke Abbey	Medium	Moderate	Slight	Moderate adverse	Minor neutral
12: Old Connaught Avenue	Low	Negligible	Negligible	Negligible	Negligible
13: Dublin Road	Low	Negligible	Negligible	Negligible	Negligible
14: Dublin Road	Low	Negligible	Negligible	Negligible	Negligible
15: Upper Dargle Road	Low	Negligible	Negligible	Negligible	Negligible
16: Bray promenade	Medium	Slight	Slight	Minor adverse	Minor neutral
17: Killarney Road	Low	Negligible	Negligible	Negligible	Negligible
18: The People's Park	Medium	Negligible	Negligible	Negligible	Negligible
19: Sans Souci Wood	Medium	Negligible	Negligible	Negligible	Negligible
20: Upper Dargle Road	Medium	Negligible	Negligible	Negligible	Negligible
21: Bray Head Cliff Walk	Medium	Slight	Slight	Minor neutral	Minor neutral
22: Vevay Road	Medium	Negligible	Negligible	Negligible	Negligible
23: Bray Head	Medium	Slight	Slight	Minor neutral	Minor neutral
24: Bridge of Fassaroe Junction	Low	Negligible	Negligible	Negligible	Negligible
25: Lordello Road	Low	Negligible	Negligible	Negligible	Negligible
26: Car park for Shanganagh Park/Cemetery	Low/ Medium	Negligible	Negligible	Negligible	Negligible
27: Shanganagh Cemetery	Low/	Negligible	Negligible	Negligible	Negligible

	Medium				
28: Seafield	Medium	Negligible	Negligible	Negligible	Negligible
29: Station Road	Medium	Negligible	Negligible	Negligible	Negligible
30: Strathmore Road	Low	Negligible	Negligible	Negligible	Negligible
31: Vico Road	High	Negligible	Negligible	Negligible	Negligible
32: Killiney Hill	High	Negligible	Negligible	Negligible	Negligible
33: Vico Road	High	Negligible	Negligible	Negligible	Negligible
34: Sorrento Park	High	Negligible	Negligible	Negligible	Negligible
35: Sorrento Road	High	Negligible	Negligible	Negligible	Negligible

### 5.5.2.1. Residents

Those residents at the north eastern end of Corke Abbey particularly residents in no 112 Corke Abbey Road (Viewpoint 10) and neighbouring properties, are adjacent to the site and while visibility is oblique the magnitude of impact and significance will be reduced by maintaining as much of the existing tree and vegetation cover as possible (refer to Tree Survey Report in Appendix 5.2) and replacing trees with new mature native trees, which will help ensure the maximum possible visual containment of the proposed development, resulting in a **moderate/minor adverse** significance. Existing housing will screen residents on the north side of Corke Abbey. Those on the west side (Viewpoint 11) are 300m from Block A with the terraced housing ca. 150m directly opposite. However, this is not obtrusive in the context of the existing urban setting of Corke Abbey, again resulting in a **minor neutral** significance. The effects on residents further afield in Cork Great (Viewpoints 8, 9) will be of **negligible or minor neutral** significance.

Those residencies along the coast, north of the Site, (Viewpoints 28, 30, 31, 35) face Killiney Bay at an oblique angle to the proposed development and are set in large plots with dense mature vegetation. The proposed development will have **negligible** impact and significance on the residents in close proximity to these viewpoints.

### 5.5.2.2. Road users

The greatest impact on road users will be on the relatively small stretch of roads that border the Ravenswell School Development (Viewpoint 1). This is assessed as a **moderate** impact and **moderate/minor neutral** significance. This extent of road is a very minor proportion of the road network of Bray. Although Blocks C and B will be directly visible to road users and pedestrians the new proposals are of the scale and mass of the existing school development and whilst the narrow vista is obstructed by the proposed development, it provides enclosure and balance to the view.

Views of the top floors of Blocks B and C of the proposed development are fairly prominent from Strand Road as it crosses the River Dargle (Viewpoint 7), however, the significance is reduced because of the prominence of the harbour buildings and railway and the fact that the views are in the middle distance. The distance and screening from mature trees renders the impact of the proposed development from the Bridge over the River Dargle on Main Street as of **minor neutral significance**.

A number of viewpoints were taken along Dublin Road, which is one of the main roads through Bray town centre, to the west of the Site, and will give access to the principal route through to the proposed development. There is no visibility of the site at the junction with Connaught Avenue (Viewpoint 12), nor further south at Viewpoints 13 and 14. Further south on Killarney Road (Viewpoint 17) does not give any visibility of the proposed development. The significance in all these locations will be **negligible**.

There is no visibility of the proposed development east of the River Dargle, on Seymour Road (Viewpoint 4) nor on Upper Dargle Road (Viewpoints 15, 20) and Vevay Road (Viewpoint 22). The significance in all these locations will be **negligible**.

Road users on major road networks R918 (Viewpoint 24) are travelling at speed and focussing on their journey and unlikely to be aware of the proposed development, which will also be screened by built form on Upper Dargle Road. The impact will be of **negligible** significance.

Seafield Road (Viewpoint 28) is a no-through-road and serves the residents and gives access to the public open space bordering the residential area on Shanganagh Cliffs. Car users be driving to and from their residence and will not be aware of the proposed development. The impact will be **negligible** and of **negligible** significance.

Car users on Strathmore Road (Viewpoint 30), Vico Road (Viewpoints 31 and 33) will be focussing on the coastal road and distance will render visibility of the proposed development imperceptible. The impact will be of **negligible** significance.

There is very little visibility beyond the vegetation and Sorrento Terrace housing bordering the majority of the south side of Sorrento Road (Viewpoint 35) and the car users will be focussing on the road with little opportunity to glimpse the proposed development.

#### 5.5.2.3. Open Space and Recreation Spaces

There is no visibility of the proposed development from the south west end of People's Park (Viewpoint 18) nor from the open land adjacent to Loreto Convent (Viewpoint 19) on San Souci Wood. The significance of the impact on open space and recreation spaces in these locations will be **negligible**.

Distance will render any visibility of the proposed development imperceptible from Viewpoints 32 and 34.

#### 5.5.2.4. Public Rights of Way and Pedestrian Routes

Only a small proportion of the proposed development will be perceptible from the pedestrian path of Ravenswell Road, off Main Road (Viewpoint 2), with a **minor neutral** significance. On Strand Road and Bray Promenade to the south of the harbour (Viewpoints 5, 16), Martello Terrace and the built environment will screen the proposed development, with a **negligible** and **minor** significance from these respective locations. The distance from Bray Head Walk and Bray Head (Viewpoints 21, 23) will render the proposed development barely perceptible with a **minor neutral** significance.

Blocks C, A and B of the proposed development are directly visible from Bray Harbour Wall (Viewpoint 6) and a discernible addition with significant building in terms of mass and scale on the Bray seafront. The distance along with the baseline context and nature of view renders the proposed development of **moderate** Significance. The proposals will give the Bray seafront a sense of place and introduce visual interest to the current low lying, linear nature of the seafront.

Visibility of the proposed development from Shanganagh Park and Cemetery (Viewpoints 26 and 27) will be screened by mature trees on the boundaries and closer to the proposed development by Corke Abbey Valley Park housing and woodland. The significance will be **negligible**.

### 5.5.3. Conclusions on potential landscape and visual impacts

The Site, traversing the administrative boundaries of DL RCC and Bray Municipal District of Wicklow County Council, is a former golf course located to the east of the urban centre of Bray adjacent to a large school development and in close proximity to housing to the north and south and the railway to the east. The Site is classified as an 'Urban Area' throughout the current WCDP and the draft WCDP 2022-2028 and is therefore deemed suitable for development (of the type allowed by the settlement strategy and the development standards of the plans). In the current WCDP the Site is described as an area with a rating of 'low vulnerability' and 'low sensitivity'. The Bray Municipal District Local Area Plan SLO 03 states that the Site be developed as mixed use.

The objectives within the draft WCDP support "*development of major schemes at the former Bray golf course and Bray harbour..*". The proposed development conforms to Strategic Outcome 4 by including "*public spaces, parks, playgrounds, streets and recreational and sport infrastructure to cater for all ages..*" In addition, the proposed development is retaining as much of the boundary planting as possible and enhancing the biodiversity of the Site with extensive planting of native broad leaved trees in accordance with section 17.4 Natural Heritage and Biodiversity Objectives. A linear earthwork registered as a National Monument is the only asset recorded on the Site and it is to be marked as a feature within the hard landscape.

The proposed development is in accordance with the objectives set out the Dun Laoghaire-Rathdown County Development Plan 2016-2022 by consolidation and densification of the existing urban built form and maximisation of efficiencies from already established physical and social infrastructure.

It is considered that given the adjacent existing development to the west, proximity of housing to the north and the railway to the east the Site is able to accommodate the change of the type proposed.

Construction activities will introduce some elements that are prominent, however, they are of a local and temporary nature and will not have any effect on the landscape character in the wider area. In the local area the

magnitude of the landscape effects during construction are assessed as **moderate adverse** significance due to the fact that the effects are local, temporary and short term.

The greatest effects of the construction activities will be on the residents at the north eastern end of Corke Abbey (Viewpoints 10) adjacent and in close proximity to the site, those road users bordering the school development along with the staff and pupils of the schools (Viewpoint 1). Visibility of construction activities from Bray Harbour Wall (Viewpoint 6) will have a **moderate** impact, as the taller elements of the proposed development progress.

Visibility of construction activities further away from the Site when viewed in the middle and far distance are barely perceptible or screened by the built environment and vegetation and significance ranges from **minor to negligible adverse**.

The impacts and significance are similar once the proposed development is operational. The greatest impacts will be on those road users and staff and pupils bordering the Ravenswell School Development (Viewpoint 1) with **moderate/minor neutral** significance, residents at the north eastern end of Corke Abbey (Viewpoint 10) with **moderate/minor adverse** significance and pedestrians on the Harbour Wall as they look back towards Bray (Viewpoint 6) with **moderate neutral** significance.

The proposed development will not create any additional overshadowing of the adjacent existing dwellings at Corke Abbey due to the presence of significant existing mature trees along the boundary in this location which create some overshadowing during morning hours as a result of the aspect of the rear garden areas of these properties.

## 5.6. Mitigation Measures

### 5.6.1. Construction Stage Mitigation

Due to the nature of construction, it is inevitable that adverse effects will occur to the landscape and visual amenity in the immediate area. The significance of these temporary effects will be limited by implementing the following measures:

- Construction methods and procedures should accord to an agreed
  - Construction Method Statement
  - Construction Management Plan
  - Construction Environmental Management Plan
  - Earthworks/materials Management Plan
  - Detailed design of drainage, including SuDs, water and sewerage disposal to mitigation against flooding, discharge of storm/surface waters with potential pollution discharge, increase of silt and sediment from construction works
  - Construction impact assessment to mitigate against dust pollution, noise and light pollution.
- Phasing to assimilate changes into the landscape;
- Temporary hoarding erected around construction areas to clearly delineate working areas and protect the public from the works. This will reduce visual effects on adjoining roads and pedestrian paths;
- Publicity materials may be displayed on the hoardings to inform the public and passer-bys about the proposed development;
- Advance planting and retention of key woodland areas.

### 5.6.2. Design Considerations

- The external and internal network including roads, cycle lanes, parking areas, footpaths and kerbs, pedestrian crossings and car parking will be constructed to avoid traffic congestion in the vicinity. It will also improve permeability and connectivity from, for instance Corke Abbey Valley Park and Corke Abbey and the adjacent school development through to Bray Harbour, Promenade and town centre.
- The design, finishes of buildings will draw reference and inspiration from the existing traditional town centre with the development flowing from 'old' to 'new' and matching in scale, format and design.
- Public and Communal open space is overlooked and dispersed throughout the scheme with a strong visual and functional relationship with the scheme. The maintenance responsibilities for all public open space areas will be the responsibility of the development Management Company to ensure all mitigation measures contained within these areas are fully maintained over a long-term basis to ensure they provide the maximum required impact.



- The development has a series of new public open spaces including the Market Square incorporating space for artisan markets, seasonal community events and commercial ventures providing an element of social, community and residential services and The Orchard area with a multi-sports ball court and dog exercise area. Natural play areas will be developed within the open space areas to provide focal points along walking routes.
- To increase biodiversity and wildlife habitats, the roof level of the apartment blocks will be planted with a mix of sedum and wildflowers to increase wildlife habitats. In addition, bird and bat boxes will be fixed to existing trees or on stand alone poles throughout the scheme and insect hotels will be introduced in wild flower meadow areas and on roofs.
- The streets will be tree lined providing enclosure and a sense of place. Footpaths will be designed to encourage walking and cycling and seating areas will encourage social interaction and a sense of community.
- Sustainable drainage is a key focus of the landscape treatment for the entire development. Along with permeable paving for parking areas, attenuation areas in the form of planting beds, tree pits and green roofs are incorporated into the landscape proposals.
- The positioning of the roads and residential blocks have been arrayed so that they form a spatial marker (or morphological memory) of the 'Nun's Walk' former location and alignment. The Nun's walk will feature and be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A. The space also allows for the potential installation of public artwork to further define the character and mark the history of the space, including delineation of the alignment of the earthwork through paving, interpretive text and imagery. In addition, the design provides for a feature stone wall along this section of the railway boundary to act as 'stage scenery' and reinforce the importance of this area of open space. This open space will provide connectivity with the Green Spine and the Coastal Gardens character areas to maintain pedestrian permeability throughout the development. The Landscape Design also provides for high quality surface materiality - refer to the Landscape Design Strategy Report and Cultural Heritage Chapter for further information.
- Whilst the public can enjoy the variety of spaces in the proposed development including the Market Square adjacent to apartment Block C, the Woodland Park on the northern boundary which provides a link to the existing adjacent Corke Abbey Valley Park; the Coastal Gardens which run along the eastern boundary of the site and link Corke Abbey Valley Park with the existing riverside pathway and cycle path to Bray Harbour; the Riverside Park – a new parkland area adjacent to the River Dargle in the south eastern corner of the Site; the Green Spine through the centre of the site which links with the Woodland Park and Coastal Gardens and provides access to apartment Block A; the Orchard on the existing underground Irish Water foul storage tank site at the site entrance, there are also semi-private communal amenity areas in the podium gardens of the apartment Blocks A, B and C and a communal woodland garden for the residents of apartment Block D. All houses, duplex units and apartments will also avail of private open space to the required standards.
- The residential housing will incorporate car parking spaces. Car parking for the apartment blocks will be at the centre of the ground floor level enclosed by the creche, café, retail outlets, and services such as refuse area, cycle parking and other plant services.

### 5.6.3. Landscape Design

- The landscape design comprises of the following outdoor spaces:
  - Home Zone – tree lined streets that provide shade and privacy to pedestrians and residents, SuDs integrated into planting schemes to enhance biodiversity in an urban setting, wide footpaths to encourage walking and cycling, seating area and car parking (not dominating space).
  - Private and communal gardens;
  - Play/recreation/leisure;
  - General landscape/public amenity/park;
  - Boundary treatments
  - Open space for areas for outdoor commercial opportunities; tables and seating and market.
- Proposed habitats include:
  - Woodland;

- Hedgerows;
  - Shrub and herbaceous planting;
  - Amenity grass;
  - Meadow planting;
  - Green roofs – incorporating sustainable urban drainage within sedum planting;
  - Bat, bird and insect boxes/hotels.
- The proposed development will retain existing trees where possible and maintain strong native boundary planting to ensure existing wildlife corridors are retained, particularly along the northern, eastern and western boundaries of the site. It is intended to retain the hedgerow along the northern boundary and include additional planting along the entire boundary.
  - The landscape planting design provides for a net gain in number of trees within the Site. There are ca. 380no. standard sized trees included within the proposed design.
  - The north west corner of the site is densely stocked with existing conifers and poplar trees, some of which will need to be removed to facilitate the construction of Block D – refer to Appendix 5.2. It is proposed to create a woodland setting across the northern boundary, which will help to integrate Block D in the landscape and provide screening from the adjacent residential development on Corke Avenue.
  - Plans include a connection with Corke Abbey Valley Park and access routes through to Corke Abbey Valley Park, all subject to agreement with DLRCC.
  - The Coastal Gardens border the eastern side of the proposed development and run parallel with the railway line. They incorporate a combined footpath and cycleway, with play provision dispersed along the path leading to the existing railway underpass and a link to Bray town centre, the popular walk from Bray seafront to Greystones and the future East Coast Trail along with a connection to the Dargle Riverside Walkway.
  - Native planting to the Coastal Gardens bordering the railway boundary will create a green corridor and also soften the façade of Blocks A and B from views from the Harbour Wall and coastal path. Part of this boundary will incorporate a feature stone wall of approximately 22m.
  - A Green Spine runs through the centre of the northern half of the proposed development and links into the Woodland Setting. This incorporates footpaths, green spaces and pocket parks uniting the residential area, providing new habitat creation and Sustainable Urban Drainage.
  - Creation of the following habitats are included as biodiversity enhancement measures:
    - 14no. Rocket Bat Boxes – free-standing chamber on free standing poles - will be provided in dark zones within woodland and treeline habitats;
    - 14no. summer bat boxes will be provided on mature trees;
    - existing pumping station screened with feature stone walls with 8no. interconnecting bat tubes;
    - 20no. bird nesting boxes attached to existing trees or on standalone poles including 2no. swift nesting boxes along the northern boundary and 10 no nesting boxes on the eastern boundary;
    - 10 no. insect hotels to be provided in wild flower meadow areas and on roofs.
  - Hard landscaping materials have been chosen based on suitability for a residential scheme and long-term use with variations provided in the form of shape, unit size, mix and colour. All of the specified materials are robust in nature in order to maximize the longevity of the development and minimise maintenance issues.
  - Root protection in accordance with BS 5837:2012 will be applied to the existing trees to be retained to ensure ongoing viability – refer to 6948-L-0001 – Vegetation Development Impact. All recommendations for tree removal due to poor condition will also be followed to maintain the ongoing safety of the site.

## 5.7. Residual Impacts

### 5.7.1. Construction

- The proposed development will change the nature of the landscape character during construction, but this will be short term and temporary and remain localised to the Site. The former golf course, albeit not in pristine condition, will become a building site, however, construction will be managed in accordance with agreed standard plans which will set out intended construction practice for the development.

- Ecological – 20no. trees on the northern boundary of the Site will be removed over time as recommended in the Tree Survey Report (June 2020, March 2021 & updated August 2022) and the woodland group in the north western corner of the Site will need to be reduced along with 118no. trees in the centre of the site to facilitate the construction. See drawing 6948 L-0001 – Vegetation Development Impact.
- However, this will be more than compensated for by:
  - 379no. new standard trees;
  - ca. 4500m<sup>2</sup> of native whip planting;
  - 11,980m<sup>2</sup> of green roofs;
  - 4,718m<sup>2</sup> of mixed screen planting;
  - 14,430m<sup>2</sup> of amenity grass;
  - 3930m<sup>2</sup> of meadow grass
  - 2480m<sup>2</sup> of shrub and herbaceous planting;
 in line with the All-Ireland Pollinator Plan 2021-2025, and will result in moderate beneficial ecological effects.
- Residents and community – during construction residents, pedestrians and those in the school development in close proximity to the site (Viewpoints 1, 10, 11), will experience adverse visual intrusion and even with the mitigation measures outlined in the Construction Environmental Management Plan, effects will be moderate adverse. Receptors on the Harbour Wall, Viewpoint 6, will experience moderate adverse visual effects but the distance will preclude other disturbances from construction.
- Socio-economic – Minor/Moderate beneficial effect of construction employment and spending in the local area by demolition and construction workers.

## 5.7.2. Operation

- The increased built form on the former golf course will give a sense of increased densification of the area, although the character of the landscape/townscape locally and in the wider area will not change. The proposals will result in the addition of a significant development into the landscape/townscape character of the area. Whilst these changes will be substantial, the baseline setting of a largely urban coastal town, with relatively dense residential areas of mixed housing, with some light industry, business and retail outlets and parks and some popularity as a holiday destination,
- Existing residents on Corke Abbey that either directly face the rear gardens of the proposed development or lie at an oblique angle to the rear gardens, may experience more noise and activity, which would result in **slight adverse** effects.
- There is likely to be increased traffic at peak times in the morning and late afternoon on the roads in close proximity to the Site and along Dublin Road, which is considered a **slight adverse** effect. However, there may be more passengers making use of the Bray (Daly) DART railway, which is ca. 600m from the Site and considered a moderate beneficial effect environmentally.
- Socio-economic – several moderate and minor beneficial effects are predicted. These include increased employment necessary for the site e.g. maintenance operatives, effects on property values, greater wellbeing and sociability fostered through the provision of public open spaces, play provision and gardens, improved accessibility to attractive parts of Bray including the beach, promenade and Dargle River.
- The footpaths, play areas, planting may be enjoyed and benefit the wider community and encourage more outdoor activity and social mixing.
- Positive effect with regard to population and material assets due to the increase in housing stock in the town.
- The current view of Bray harbour and north of the beach area when viewed from the harbour wall and seascape is a very functional landscape, by no means pristine. There are opportunities with the proposed development to enhance this view and give Bray harbour a sense of place and a more contemporary, prosperous feel.

## 6. Air Quality & Climate

### 6.1. Introduction

This chapter assesses the likely air quality and climate impacts associated with the proposed residential development at Bray Co. Wicklow. A full description of the development is available in Chapter 2 – Project Description.

### 6.2. Methodology

#### 6.2.1. Criteria for Rating of Impacts

##### Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or “Air Quality Standards” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 6-1 and Appendix 6.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, which are applicable in relation to this project (see Table 6-1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions (see Appendix 6.1).

**Table 6-1 - Ambient Air Quality Standards**

Pollutant	Regulation <sup>Note 1</sup>	Limit Type	Value
Nitrogen Dioxide (NO <sub>2</sub> )	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m <sup>3</sup>
		Annual limit for protection of human health	40 µg/m <sup>3</sup>
		Critical level for protection of vegetation	30 µg/m <sup>3</sup> NO + NO <sub>2</sub>
Particulate Matter (as PM <sub>10</sub> )	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m <sup>3</sup>
		Annual limit for protection of human health	40 µg/m <sup>3</sup>
Particulate Matter (as PM <sub>2.5</sub> )	2008/50/EC	Annual limit for protection of human health	25 µg/m <sup>3</sup>

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

##### Dust Deposition Guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM<sub>10</sub>) and less than 2.5 microns (PM<sub>2.5</sub>). The EU ambient air quality standards outlined in Table 6-1 have set ambient air quality limit values for PM<sub>10</sub> and PM<sub>2.5</sub>.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in

Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of the proposed development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m<sup>2</sup>\*day) averaged over a one-year period at any receptor outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m<sup>2</sup>\*day) to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

### 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 adaptation 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 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<sub>2e</sub> 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 Dún Laoghaire-Rathdown County Council Climate Change Action Plan 2019 – 2024 published in 2019 (Dún Laoghaire - Rathdown 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, better integration of transport and land use planning, increasing public bike facilities, developing public transport routes, development of flood resilient designs, promotion of the use of green infrastructure and waste prevention initiatives. The implementation of these measures will enable the Dún Laoghaire - Rathdown County Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Action Plan and incorporate climate friendly designs and measures where possible.

The Wicklow County Council Climate Change Adaptation Strategy published in 2019 (Wicklow County Council and Climate Action Regional Office (CARO), 2019) outlines goals and plans in response to the impact climate change has had and will have on Wicklow county. There are six key themes within the report: Local Adaptation Governance and Business Operations, Infrastructure and Built Environment, Land Use and Development, Drainage and Flood Management, Natural Resources and Cultural Infrastructure and Community Health and Wellbeing. Further information on the overall strategy being undertaken can be found in the Climate Change Adaptation Strategy. These measures need to be taken into consideration for future developments so as to protect against climate change.

### 6.2.2. Construction Phase

The current assessment focuses on identifying the existing baseline levels of PM<sub>10</sub> and PM<sub>2.5</sub> 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.

The Institute of Air Quality Management in the UK (IAQM) guidelines (2014) outline an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely magnitude of the dust impacts in the absence of mitigation measures.

Construction phase traffic also has the potential to impact air quality and climate. The UK 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 TII guidance (2011) recommends the use of the UK guidance and was based on the previous version of the UK DMRB guidance (UK Highways Agency, 2007). This notes that the TII guidance should be adapted for any updates to the DMRB (see Section 1.1 of *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes, 2011*). The following are the criteria outlined under the DMRB guidance:

- 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; and,
- A change in carriageway alignment by 5m or greater.

The construction stage traffic does not meet the above scoping criteria and therefore, has been scoped out from any further assessment as there is no potential for significant impacts.

### 6.2.3. Operational Phase

#### Air Quality Assessment

The air quality assessment has been carried out following procedures described in the publications by the EPA (2015; 2022) 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 is a somewhat outdated assessment tool. The *LA 105* guidance document states that the DMRB spreadsheet tool may still be used for simple air quality assessments where there is unlikely to be a breach of the air quality standards. Due to its use of a “dirtier” fleet, vehicle emissions would be considered to be higher than more modern models and therefore any results will be conservative in nature and will provide a conservative assessment.

The 2019 UK Highways Agency DMRB air quality revised guidance *LA 105 Air Quality* states that modelling should be conducted for NO<sub>2</sub> for the base, opening and design years for both the do minimum (do nothing) and do something scenarios. Modelling of PM<sub>10</sub> is only required for the base year to demonstrate that the air quality limit values in relation to PM<sub>10</sub> are not breached. Where the air quality modelling indicates exceedances of the PM<sub>10</sub> air quality limits in the base year then PM<sub>10</sub> should be included in the air quality model in the do minimum and do something scenarios. Modelling of PM<sub>2.5</sub> is not required as there are currently no issues with compliance with regard to this pollutant. The modelling of PM<sub>10</sub> can be used to show that the project does not impact on the PM<sub>2.5</sub> limit value as if compliance with the PM<sub>10</sub> limit is achieved then compliance with the PM<sub>2.5</sub> 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<sub>2</sub>. Concentrations of PM<sub>10</sub> have been modelled for the base year to indicate that there are no potential compliance issues. Modelling of operational NO<sub>2</sub> concentrations has been conducted for the do nothing and do something scenarios for the opening year and design year.

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 DMRB scoping criteria outlined above in Section 6.2.2 has been used in the current assessment 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.

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 are outlined in Appendix 10 of the TII guidance and have been adopted for the proposed development. The

significance criteria are based on NO<sub>2</sub> and PM<sub>10</sub> as these pollutants are most likely to exceed the annual mean limit values (40 µg/m<sup>3</sup>).

Conversion of NO<sub>x</sub> to NO<sub>2</sub>

NO<sub>x</sub> (NO + NO<sub>2</sub>) 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<sub>x</sub> emitted as NO<sub>2</sub>, rather than NO is increasing. With the correct conditions (presence of sunlight and O<sub>3</sub>) emissions in the form of NO, have the potential to be converted to NO<sub>2</sub>.

Transport Infrastructure Ireland states the recommended method for the conversion of NO<sub>x</sub> to NO<sub>2</sub> 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 DEFRA's NO<sub>x</sub> to NO<sub>2</sub> 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<sub>3</sub> and proportion of NO<sub>x</sub> emitted as NO for each local authority across the UK. O<sub>3</sub> is a regional pollutant and therefore concentrations do not vary in the same way as concentrations of NO<sub>2</sub> or PM<sub>10</sub>.

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<sub>2</sub> and NO<sub>x</sub> for Ireland. The “All Other Urban UK Traffic” traffic mix option was used.

Update to NO<sub>2</sub> Projections using DMRB

In 2011 the UK DEFRA published research (Highways England, 2013) on the long term trends in NO<sub>2</sub> and NO<sub>x</sub> for roadside monitoring sites in the UK. This study marked a decrease in NO<sub>2</sub> 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<sub>2</sub> concentrations which UK DEFRA previously published and monitored concentrations. The impact of this ‘gap’ is that the DMRB screening model can under-predict NO<sub>2</sub> 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<sub>2</sub> as a result of the proposed development.

Traffic Data Used in Modelling Assessment

Traffic flow information was obtained from the consulting engineers on this project for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the base year 2020, opening year 2024 and design year 2039 were provided. The traffic data in AADT is detailed in Table 6-2 along with the % HGV for each link in brackets. Only road links that met the DMRB scoping criteria outlined in Section 6.2.2 and that were within 200m of receptors were included in the modelling assessment. The traffic data used in the modelling assessment represents a worst-case approach as it is based on current traffic levels. In reality traffic is likely to decrease in future years and therefore the traffic assessed is likely higher than future traffic levels and therefore allows for the greatest impact in terms of potential traffic related air emissions. Background concentrations have been included as per Section 6.3.2 of this chapter based on available EPA background monitoring data (EPA, 2021a).

**Table 6-2 - Traffic Data used in Modelling Assessment**

Road Name	Speed (kph)	Base	Do Nothing		Do Something	
		2020	2024	2039	2024	2039
Link E	50	6,706 (10%)	6,706 (11%)	6,706 (10%)	8,264 (13%)	8,264 (12%)





**Figure 6-1 – Location of Sensitive Receptor Used in Modelling Assessment**

**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 200 m of the proposed development 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; and
- A significant change in AADT flows (>5%) will occur.

Bray Head, a proposed Natural Heritage Area (pNHA) and Special Area of Conservation (SAC) (site code 000714) is approximately 2km from the proposed development site. However, as the site is not within 200m of any impacted road links a detailed assessment has been scoped out as there is no potential for significant impacts to the designated site.

**Climate Assessment**

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 30% reduction in non-ETS sector GHG 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 with reference to EPA data on annual GHG emissions (see Section 6.3.3). The impact of the proposed development on climate is determined in relation to this baseline. Road traffic associated with the proposed development will emit certain volumes of carbon dioxide (CO<sub>2</sub>) and, to a lesser degree, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and, potentially, hydrofluorocarbons, all of which have global warming potential.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There is 1 no. road link that will experience an increase of 10% or more in the AADT, this link has been included in the detailed climate assessment (see Table 6-2).

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<sub>2</sub>). 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 6-2).

The EU guidance (2013) also states that indirect GHG emissions as a result of a proposed development must be considered, this includes emissions associated with energy usage. In addition to the EU guidance, the Institute of Environmental Management and Assessment (IEMA) guidance note on 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (IEMA, 2022) states that "*the crux of significance regarding impact on climate is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*". Mitigation has taken a leading role within the guidance compared to the previous edition published in 2017. Early stakeholder engagement is key and therefore mitigation should be considered from the outset of the project and continue throughout the project's lifetime in order to maximise GHG emissions savings.

The Building Lifecycle Report prepared by Aramark for the proposed development has been reviewed to inform the operational phase climate assessment. A number of measures have been incorporated into the overall design of the development to reduce the impact to climate, where possible (see Section 6.5.2).

## 6.3. Receiving Environment

### 6.3.1. 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). 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<sub>10</sub>, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM<sub>2.5</sub>) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM<sub>2.5</sub> - PM<sub>10</sub>) will actually increase at higher wind speeds. Thus, measured levels of PM<sub>10</sub> will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport, which is located approximately 25 km north 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 6-2). For data collated during five representative years (2017 – 2021), the predominant wind direction is westerly to south-westerly, with generally moderate wind speeds (Met Éireann, 2022).

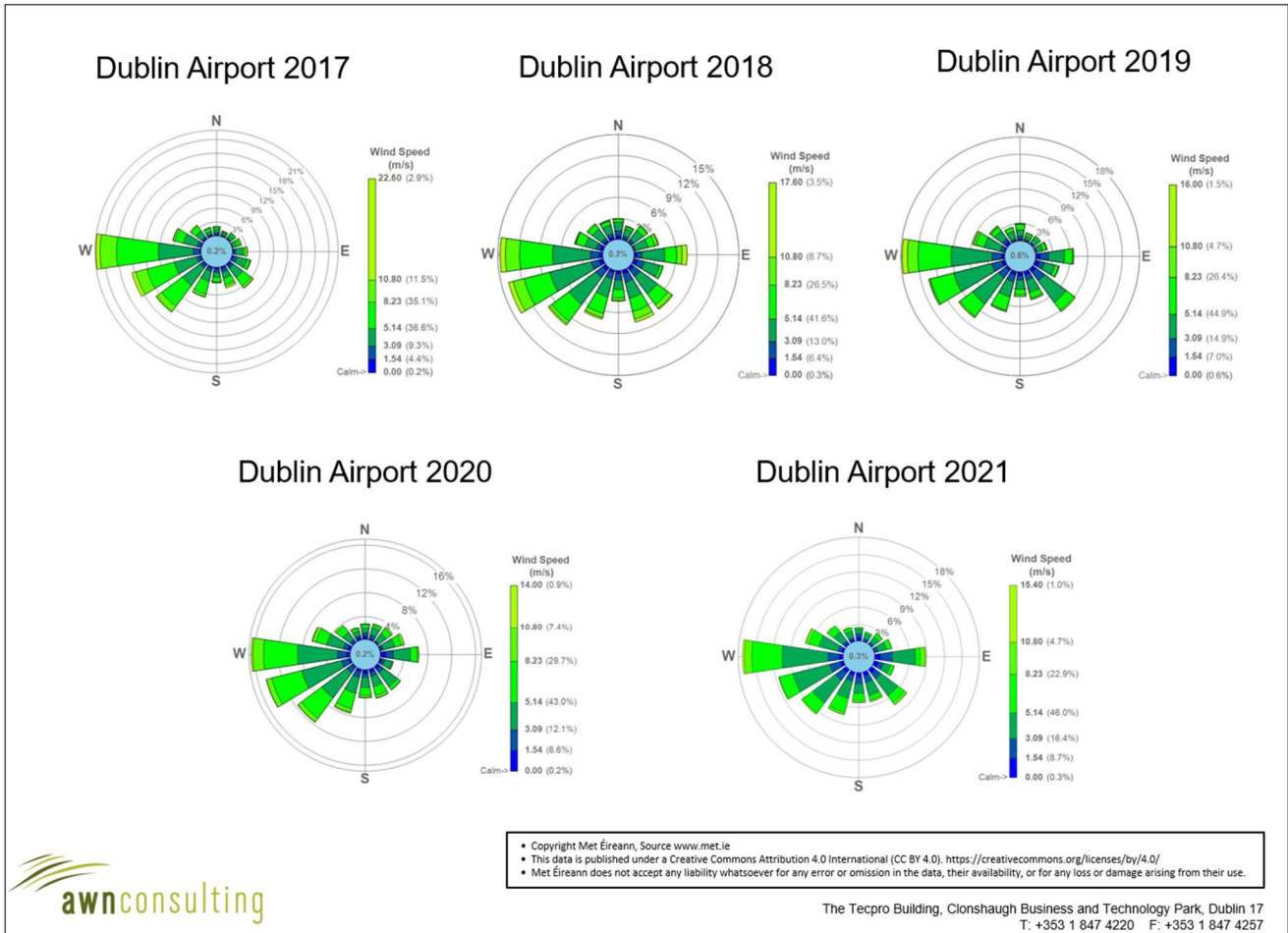


Figure 6-2 – Dublin Airport Windroses 2017 – 2021

### 6.3.2. Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality in Ireland is “Air Quality In Ireland 2020” (EPA, 2020a). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2022).

As part of the implementation of the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2021). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development falls within both Zone A and Zone C (EPA, 2022). The long-term EPA monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). There are no monitoring sites with representative data in Zone C and as such representative data has been used from sites within Zone A only.

In 2020 the EPA reported (EPA, 2021a) that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA Air Quality in Ireland 2020 report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also

notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the baseline section and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

With regard to NO<sub>2</sub>, continuous monitoring data from the EPA (EPA, 2021a) at suburban Zone A locations in Ballyfermot, Dun Laoghaire, Swords and Rathmines show that current levels of NO<sub>2</sub> are below both the annual and 1-hour limit values, with annual average levels ranging from 15 – 22 µg/m<sup>3</sup> in 2019 (see Table 6-3). Sufficient data is available for all stations to observe the long-term trend since 2015 (EPA, 2021a) (see Table 6-3), with results ranging from 13 – 22 µg/m<sup>3</sup> and few exceedances of the one-hour limit value. The station in Dún Laoghaire is approximately 9 km north of the proposed development site and monitored background concentrations would be representative of the site location. Concentrations of NO<sub>2</sub> at the Dún Laoghaire site over the period 2015 – 2019 ranged from 15 - 19 µg/m<sup>3</sup>. Based on the above information, a conservative estimate of the background NO<sub>2</sub> concentration in the region of the proposed development is 19 µg/m<sup>3</sup>.

**Table 6-3 – Trends in Zone A Air Quality – Nitrogen Dioxide (NO<sub>2</sub>)**

Station	Averaging Period <sup>Notes 1, 2</sup>			Year				
				2015	2016	2017	2018	2019
Rathmines	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )			18	20	17	20	22
	Max 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )			106	102	116	138	183
Dún Laoghaire	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )			16	19	17	19	15
	Max 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )			103	142	153	135	104
Swords	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )			13	16	14	16	15
	Max 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )			170	206	107	112	108
Ballyfermot	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )			16	17	17	17	20
	Max 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )			142	127	148	217	124

Note 1 Annual average limit value - 40 µg/m<sup>3</sup> (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 1-hour limit value - 200 µg/m<sup>3</sup> as a 99.8<sup>th</sup>%ile, i.e. not to be exceeded >18 times per year (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Continuous PM<sub>10</sub> monitoring carried out at the Zone A locations of Tallaght, Rathmines, Phoenix Park and Dún Laoghaire showed 2015 – 2019 annual mean concentrations ranging from 9 – 15 µg/m<sup>3</sup> (Table 6-4), with at most 9 exceedances (in Rathmines) of the 24-hour limit value of 50µg/m<sup>3</sup> (35 exceedances are permitted per year). The most representative location is Dún Laoghaire which had an average annual mean concentration of 12.7µg/m<sup>3</sup> over the five year period. Based on the EPA data (Table 6-4) a conservative estimate of the current background PM<sub>10</sub> concentration in the region of the proposed development is 13µg/m<sup>3</sup>.

**Table 6-4 – Trends in Zone A Air Quality – PM<sub>10</sub>**

Station	Averaging Period <sup>Notes 1, 2</sup>			Year				
				2015	2016	2017	2018	2019
Tallaght	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )			14	14	11.8	15	12
	24-hr Mean > 50 µg/m <sup>3</sup> (days)			4	0	2	1	3
Rathmines	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )			15	15	13	15	15
	24-hr Mean > 50 µg/m <sup>3</sup> (days)			5	3	5	2	9
Phoenix Park	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )			12	11	9	11	11
	24-hr Mean > 50 µg/m <sup>3</sup> (days)			2	0	1	0	2

Dún Laoghaire	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )	13	13	12	13	12
	24-hr Mean > 50 µg/m <sup>3</sup> (days)	3	0	2	0	2

Note 1 Annual average limit value - 40µg/m<sup>3</sup> (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 24-hour limit value - 50µg/m<sup>3</sup> 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).

Continuous PM<sub>2.5</sub> monitoring carried out at the Zone A location of Rathmines showed PM<sub>2.5</sub>/PM<sub>10</sub> 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<sub>2.5</sub> concentration in the region of the proposed development of 9.1 µg/m<sup>3</sup>.

Background concentrations for the Opening and Design Years have been calculated for the local air quality assessment. 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).

### 6.3.3. Climate Baseline

Anthropogenic emissions of greenhouse gases (GHGs) in Ireland included in the European Union’s Effort Sharing Regulation (ESR) (EU 2018/842) are outlined in the most recent review by the EPA which details provisional emissions up to 2021 (EPA, 2022b). The greenhouse gas emission inventory for 2021 is the first of ten years over which compliance with targets set in the ESR will be assessed. This Regulation sets 2030 targets for emissions outside of the Emissions Trading Scheme (known as ESR emissions) and annual binding national limits for the period 2021-2030. Ireland’s target is to reduce ESR emissions by 30% by 2030 compared with 2005 levels, with a number of flexibilities available to assist in achieving this. Ireland’s ESR emissions annual limit for 2021 is 43.48 Mt CO<sub>2</sub>eq. Ireland’s provisional 2021 GHG ESR emissions are 46.19 Mt CO<sub>2</sub>eq, this is 2.71 Mt CO<sub>2</sub>eq more than the annual limit for 2021 (EPA, 2022b). Agriculture continues to be the largest contributor to overall emissions at 37.5% of the total. Transport, energy industries and the residential sector are the next largest contributors, at 17.7%, 16.7% and 11.4%, respectively. GHG emissions for 2021 are estimated to be 4.7% higher than emissions in 2020, this is due to a gradual lifting of covid restrictions and an increase in the use of coal and less renewables within electricity generation. Ireland’s GHG emissions have increased by 11.4% from 1990 – 2021.

Provisional National total emissions (including LULUCF) for 2021 are 69.29 Mt CO<sub>2</sub>eq, these have used 23.5% of the 295 Mt CO<sub>2</sub>eq Carbon Budget for the five-year period 2021-2025. This leaves 76.5% of the budget available for the succeeding four years, requiring an 8.4% average annual emissions reduction from 2022-2025 to stay within budget.

The EPA 2022 GHG Emissions Projections Report for 2021 – 2040 (EPA, 2022c) provides an assessment of Ireland’s total projected greenhouse gas (GHG) emissions from 2021 to 2040, using the latest inventory data for 2020 and provides an assessment of Ireland’s progress towards achieving its National ambitions under the Climate Action and Low Carbon Development (Amendment) Act 2021 (Government of Ireland, 2021) and EU emission reduction targets for 2030 as set out under the EU Effort Sharing Regulation (ESR) 2018/842. Two scenarios are assessed – a “*With Existing Measures*” (WEM) scenario, which is a projection of future emissions based on the measures currently implemented and actions committed to by Government, and a “*With Additional Measures*” (WAM) scenario, which is the projection of future emissions based on the measures outlined in the latest Government plans at the time projections are compiled. This includes all policies and measures included in the WEM scenario, plus those included in government plans but not yet implemented.

The EPA report states under the “*With Existing Measures*” scenario, the projections indicate that Ireland will cumulatively exceed its ESR emissions allocation by 52.3 Mt CO<sub>2</sub>eq over the 2021-2030 period even with full use of the flexibilities available. Under the “*With Additional Measures scenario*”, the projections indicate that Ireland can achieve compliance under the ESR over the 2021-2030 period using both flexibilities but only with full implementation of the 2021 Climate Action Plan. Both projected scenarios indicate that implementation of all climate plans and policies, plus further new measures, are needed for Ireland to meet the 51 per cent emissions reduction target and put the country on track for climate neutrality by 2050 (EPA, 2022c).

### 6.3.4. Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document ‘*Guidance on the Assessment of Dust from Demolition and Construction*’ (2014) prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their

time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity. In terms of receptor sensitivity to dust soiling, it is estimated that there are 2 high sensitivity residential properties to the west of the main works area within 0-20m of the proposed development site. There are also 2 no. schools within 20m of the proposed development, for the purpose of this assessment they are also considered high sensitivity receptors. Based on the IAQM criteria outlined in Table 6-5, the worst case sensitivity of the area to dust soiling is considered to be **medium**.

**Table 6-5 - Sensitivity of the Area to Dust Soiling Effects on People and Property**

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	<b>Medium</b>	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM<sub>10</sub> concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM<sub>10</sub> concentration in the vicinity of the proposed development is 13 µg/m<sup>3</sup> (see Section 6.3.2) and there are 2 high sensitivity receptors located within 0-20m of the proposed development site. Based on the IAQM criteria outlined in Table 6-6, the worst-case sensitivity of the area to human health is considered to be **low**.

**Table 6-6 - Sensitivity of the Area to Human Health Impacts**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentration	Number Of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m <sup>3</sup>	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	<b>Low</b>	Low	Low	Low	Low
Medium	< 24 µg/m <sup>3</sup>	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m <sup>3</sup>	>1	Low	Low	Low	Low	Low

## 6.4. Potential Impacts on Air Quality & Climate during Construction Phase

### 6.4.1. 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<sub>10</sub>/PM<sub>2.5</sub> 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 6-7). The closest high sensitivity receptors (residential properties) to the site are approximately 20m away from the proposed development and it has been established that the area is of medium sensitivity to dust soiling (Section 6.3.4). In the absence of mitigation there is the potential for short-term, direct, 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 6-7). The closest sensitive ecological site is over 1km from the proposed development. As a result, significant impacts as a result of dust soiling of sensitive vegetation are not predicted at this distance.

**Table 6-7 – 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 <sub>10</sub>	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 6.2.2. It can therefore be determined that the construction stage traffic will have an imperceptible, neutral, localised, direct and short-term impact on air quality.

### 6.4.2. Climate

There is the potential for a number of greenhouse gas emissions to discharge to the atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO<sub>2</sub> and N<sub>2</sub>O 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 have a significant effect on climate. Therefore, the impact on climate is considered to be direct, imperceptible, neutral and short term.

### 6.4.3. Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM<sub>10</sub> and PM<sub>2.5</sub> emissions. As per Table 6-7, PM<sub>10</sub> emissions can occur within 25m of the site for a development of this scale, however, the surrounding area is of low sensitivity to dust related human health effects (Section 6.3.4). Therefore, in the absence of mitigation there is the potential for imperceptible, direct, negative, short-term impacts to human health as a result of the proposed development.

## 6.5. Potential Impacts on Air Quality & Climate during Operational Phase

### 6.5.1. 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<sub>2</sub> emissions for the opening and design years was predicted at the nearest sensitive receptor 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 1 no. high sensitivity receptor (R1) (see Figure 6-1).

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<sub>2</sub> in the opening year 2024 are shown in Table 6-8 and for design year 2039 are shown in Table 6-9. The annual average concentration is in compliance with the limit value at the modelled receptors in 2024 and 2039. Concentrations of NO<sub>2</sub> are at most 58% of the annual limit value in 2024 and at most 56% in 2039 for the do-something scenario. In addition, the

hourly limit value for NO<sub>2</sub> is 200 µg/m<sup>3</sup> 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<sub>2</sub> concentration is not predicted to be exceeded in any modelled year (Table 6-10).

The impact of the proposed development on annual mean NO<sub>2</sub> concentrations can be assessed relative to “Do Nothing (DN)” levels. Relative to baseline levels, there is predicted to be a small increase in NO<sub>2</sub> concentrations at the receptor (R1) for the opening year of 2024 and design year 2039. Concentrations will increase by at most 0.85 µg/m<sup>3</sup> in 2024 at receptor R1, and by 0.83 µg/m<sup>3</sup> in 2039. Using the assessment criteria outlined in Appendix 6.2, Table A6.2.1 and Table A6.2.2 the impact of the proposed development in terms of NO<sub>2</sub> is considered negligible at the high sensitivity receptor chosen. Therefore, the overall impact of NO<sub>2</sub> concentrations as a result of the proposed development is long-term, direct, negative and imperceptible.

Concentrations of PM<sub>10</sub> were modelled for the baseline year of 2020. The modelling showed that concentrations were in compliance with the annual limit value of 40 µg/m<sup>3</sup> 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 0.45 µg/m<sup>3</sup> excluding background concentrations. When a background concentration of 13 µg/m<sup>3</sup> is included, the overall impact is 33.6% of the annual limit value at the worst case receptor (R1).

The impact of the proposed development on ambient air quality in the operational stage is considered long-term, direct, localised, negative and imperceptible.

**Table 6-8 – Predicted Annual Mean NO<sub>2</sub> Concentrations – Opening Year 2024 (µg/m<sup>3</sup>)**

Receptor	Impact Opening Year 2024				
	DN	DS	DS-DN	Magnitude	Description
R1	22.2	23.1	0.85	Small Increase	Negligible

Note 1 Based on UK Highways Agency IAN technique for predicting future NO<sub>2</sub> concentrations

**Table 6-9 – Predicted Annual Mean NO<sub>2</sub> Concentrations – Design Year 2039 (µg/m<sup>3</sup>)**

Receptor	Impact Opening Year 2039				
	DN	DS	DS-DN	Magnitude	Description
R1	21.6	22.5	0.83	Small Increase	Negligible

Note 1 Based on UK Highways Agency IAN technique for predicting future NO<sub>2</sub> concentrations

**Table 6-10 – Predicted 99.8<sup>th</sup> percentile of Daily Maximum 1-hour NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>)**

Receptor	Opening Year 2024		Design Year 2039	
	DN	DS	DN	DS
R1	77.8	80.7	75.7	78.6

## 6.5.2. Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. 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 direct and imperceptible.

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development. The predicted concentrations of CO<sub>2</sub> for the future years of 2024 and 2039 are detailed in Table 6-11. 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<sub>2</sub> emissions by 0.00008% of the EU 2024 target. In 2039 CO<sub>2</sub> emissions will increase by 0.0001% of the 2030 target. Therefore, the climate impact of the proposed development is considered direct, negative, long-term and imperceptible.



**Table 6-11 – Climate Impact Assessment**

Year	Scenario	CO <sub>2</sub>
		(tonnes/annum)
2024	Do Nothing	158
	Do Something	190
2039	Do Nothing	167
	Do Something	200
Increment in 2024		31.8 Tonnes
Increment in 2039		33.7 Tonnes
Emission Ceiling (kilo Tonnes) 2024		<b>40,113</b> <sup>Note 1</sup>
Emission Ceiling (kilo Tonnes) 2030		<b>33,381</b> <sup>Note 1</sup>
Impact in 2024 (%)		0.00008 %
Impact in 2039 (%)		0.0001 %

Note 1 Target under *Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013*

The proposed development has been designed to reduce the impact to climate where possible during operation. Details of measures incorporated into the design of the development are included within the Building Lifecycle Report prepared and submitted with this planning application. The development will be Nearly Zero Energy Building (NZEB) compliant in accordance with the Part L 2021 requirements as appropriate. Each building will have a Building Energy Rating (BER) that will comply with the Part L requirements with a BER of A1 being targeted for the residential units. Building materials with a high durability and low future maintenance requirement will be chosen where possible to reduce the need for replacement and significant maintenance in the future which will in turn reduce the embodied carbon of the development during operation.

The following measures will be incorporated into the proposed development to achieve a more energy efficient (i.e. less carbon intensive) design, full details are provided within the Building Lifecycle Report:

- High performance U-values;
- Improved air tightness;
- Improved thermal transmittance and thermal bridging;
- Use of natural daylight where possible and energy efficient light fittings such as LEDs throughout with presence detection in circulation areas and locally controlled in apartments;
- Use of natural ventilation where possible or high efficiency mechanical ventilation such as heat recovery ventilation (MVHR); and,
- Air source heat pumps along with PV / solar thermal array on the roof will be used as part of the renewable energy technologies.

Due to the location of the proposed development, in close proximity to Bray town centre, there are a number of alternative sustainable travel options to reduce the requirement for occupants to need personal motor cars and, thus, reduce travel-related GHG emissions. The proposed development is in close proximity to a number of bus routes and a train and DART line. It is also proposed to incorporate bicycle parking spaces within the proposed development to promote the use of sustainable transport. Overall, the incorporated design measures will reduce the operational phase impact of the proposed development on climate.

### 6.5.3. Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. Air dispersion modelling of traffic emissions has shown that predicted pollutant concentrations are in compliance with the ambient air quality standards (Table 6-1) which are 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, direct and imperceptible.

## 6.6. Mitigation Measures

### 6.6.1. Construction Stage

#### 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 6.3. These measures have been incorporated into the Outline 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; and,
- 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.

#### 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 proposed development. Construction vehicles, generators etc., may give rise to some CO<sub>2</sub> and N<sub>2</sub>O emissions. However, due to short-term nature of these works, the impact on climate will not be significant. Nevertheless, below are some Site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further;

- 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 (to minimise the embodied carbon footprint of the site).

### 6.6.2. Operational Stage

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 in Section 6.5.2 and within the Building Lifecycle Report prepared in support of this planning application. The impact of the proposed development on air quality and climate is predicted to be direct and imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

## 6.7. Residual Impacts

### 6.7.1. Construction Stage

### **Air Quality**

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan (Section 6.7 and Appendix 6.3). Provided the dust minimisation measures outlined in the plan are adhered to, the predicted residual air quality impacts during the construction phase are short-term, negative, direct, localised and imperceptible at nearby receptors identified in Section 6.3.4 of this report.

### **Climate**

According to the IAQM guidance (2014), site traffic, plant and machinery are unlikely to make a significant impact on climate during the construction phase. Therefore, the predicted residual impact on climate of the construction phase is considered to be direct, imperceptible, neutral and short-term.

### **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, direct, short-term, localised and imperceptible with respect to human health.

## **6.7.2. Operational Stage**

### **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<sub>2</sub> at nearby sensitive receptors as a result of the proposed development will be imperceptible. Therefore, the operational phase impact to air quality is direct, long-term, localised, negative and imperceptible.

### **Climate**

Modelling of operational phase CO<sub>2</sub> 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<sub>2</sub> 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, direct, negative and imperceptible. In addition, the proposed development has been designed to reduce the impact to climate where possible during operation.

### **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, direct, negative and imperceptible.

## **6.7.3. 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.

## **6.7.4. Do-Noting Impact**

In the Do Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc) see Section 6.3 for the overall baseline conditions in the area.

## **6.8. Monitoring Requirements**

### **6.8.1. Construction Stage**

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located

approximately 2m above ground level. The TA Luft limit value is 350 mg/(m<sup>2</sup>\*day) during the monitoring period between 28 - 32 days.

### 6.8.2. Operational Stage

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

## 6.9. Difficulties Encountered

There were no difficulties encountered when compiling this chapter.

## 6.10. Interaction with other Environmental Attributes

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is negative, direct, short-term, localised and imperceptible in the construction stage and long-term, direct, negative and imperceptible with respect to population and human health in the 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 impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils 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.

No other significant interactions with air quality and climate have been identified.

## 7. Noise & Vibration

### 7.1. Introduction

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.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure its minimal impact on the receiving noise climate.

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter and included in the references section. In addition to specific noise guidance documents, the following guidelines were considered and consulted for the purposes of this chapter:

- European Commission, Guidance on the preparation of the Environmental Impact Assessment Report (2017); and,
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)

### 7.2. Methodology

The following methodology has been prepared based on the requirements of the relevant guidance documents as outlined above and on our experience of preparing the noise & vibration assessments for similar developments. The following approach has been used for this assessment:

- Baseline noise monitoring has been undertaken at the development site in order to characterise the existing noise environment;
- A review of the most applicable standards and guidelines has been reviewed in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Predictive calculations relating to construction phase impacts have been undertaken at the nearest sensitive locations to the development site;
- Potential inward noise impacts to the proposed development during the operational phase have been assessed;
- Potential noise impacts associated with the operational phase of the development at the most sensitive locations surrounding the proposed development have been determined and assessed, and;
- A schedule of mitigation measures has been included to reduce, where necessary, identified potential outward impacts relating to noise and vibration from the proposed development.

#### 7.2.1. Construction Phase – Noise

*BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2*

There is no published statutory Irish guidance relating to the maximum permissible noise and vibration levels that may be generated during the construction phase of a project. It is common practice to use BS 5228:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2* with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from Part One of this standard: Noise.

The approach adopted on this assessment calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise impact is associated with the construction activities. Note that, in accordance with the BS5228 guidance, this assessment criterion is only applicable to residential receptors.

The closest neighbouring noise sensitive properties to the proposed development are the residential dwellings on Corke Abbey Road and the Colaiste Raithin School that bounds the west of the site. Figure 7-1 identifies the closest noise sensitive receptors to the proposed development.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 7-1 sets out the values which, when exceeded, signify a potential significant effect at the facades of residential receptors.

**Table 7-1 - Example Threshold of Potential Significant Effect at Dwellings**

Assessment category and threshold value period (L <sub>Aeq</sub> )	Threshold value, in decibels (dB)		
	Category A	Category B	Category C
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends <sup>D</sup>	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

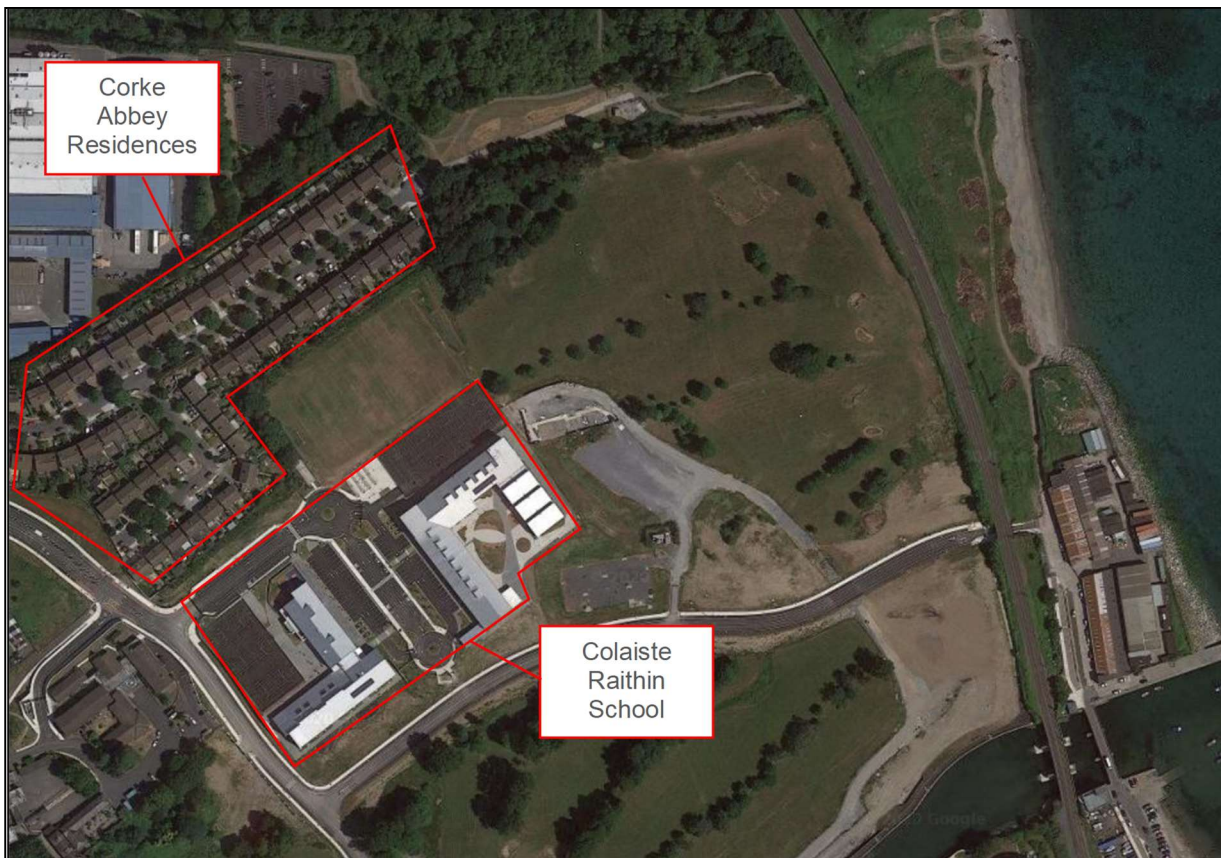
Note A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

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.

Taking the above into account it is considered appropriate to adopt a construction noise limit of 65 dB L<sub>Aeq</sub> Monday to Friday 08:00 to 18:00hrs and Saturday 08:00 to 14:00hrs. This limit is also considered appropriate for the local school.



**Figure 7-1 – Identified Noise Sensitive Receptors**

## 7.2.2. Construction Phase – Vibration

In terms of vibration, *British Standard BS 5228-2:2009+A1:2014 Part 2: Vibration* recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak particle velocity (PPV) (in frequency range of predominant pulse) of 15 mm/s at 4Hz increasing to 20 mm/s at 15Hz and 50 mm/s at 40Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking the above into consideration the vibration criteria in Table 7-2 are recommended.

**Table 7-2 - Vibration Thresholds during Construction**

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:-

Less than 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

## 7.2.3. Operational Phase – Additional Vehicular Activity on Public Roads

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

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, guidance is offered by Design Manual for Roads and Bridges, 2019 where Table 7-3 provides a summary of the likely impact associated with any particular change in traffic noise level.

**Table 7-3 - Likely Impact Associated with Change in Traffic Noise Level**

Long Term Noise Change (dB $L_{A10,18hr}$ or $L_{night}$ )	DMRB Magnitude of Impact
Greater than or equal to 10.0	Major
5.0 to 9.9	Moderate
3.0 to 4.9	Minor
Less than 3.0	Negligible

## 7.2.4. Operational Phase – Mechanical Plant and Services

Once a development of this nature becomes fully operational, a variety of electrical and mechanical plant will be required to service the development. Most of this plant will be capable of generating noise to some degree. Some of this plant may operate 24 hours a day, and hence would be most noticeable during quiet periods (i.e. overnight). Noisy plant with a direct line-of-sight to noise sensitive properties would potentially have the greatest impact. Plant contained within plantrooms has the least potential for impact once consideration is given to appropriate design of the space.

The most appropriate standard used to set operational noise limits relating to fixed item of plant to noise sensitive areas is BS 4142: 2014+A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. This standard describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background noise level (i.e. the  $L_{A90,T}$  level measured in the absence of plant items) to the rating level ( $L_{Ar,T}$ ) of the various plant items, when operational. Where noise emissions are found to be tonal, impulsive in nature or irregular enough to attract attention, BS 4142 also advises that a penalty be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal noise characteristics outlined in BS 4142 recommends the application of a 2 dB penalty for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

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

“ambient noise level, $L_{Aeq,T}$ ”	is the noise level produced by all sources including the sources of concern, i.e. the residual noise level plus the specific noise of mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
“residual noise level, $L_{Aeq,T}$ ”	is the noise level produced by all sources excluding the sources of concern, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
“specific noise level, $L_{Aeq,T}$ ”	is the sound level associated with the sources of concern, i.e. noise emissions solely from the mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
“rating level, $L_{Ar,T}$ ”	is the specific sound level plus any adjustments for the characteristic features of the sound (e.g. tonal, impulsive or irregular components);
“background noise level, $L_{A90,T}$ ”	is the sound pressure level of the residual noise that is exceeded for 90% of the time period T.

If the rated plant noise level is +10 dB or more above the pre-existing background noise level then this is likely to be an indication of a significant adverse impact, depending on context. A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

## 7.2.5. Operational Phase – Inward Noise Assessment

### Noise Action Plans (NAP)

The Dún Laoghaire-Rathdown Noise Action Plan (NAP) 2018 – 2023 indicates that guidance within the *ProPG Planning and Noise: Professional Practice Guidance on Planning and Noise* document should be referred to for inward noise impact assessments:

*“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 that in the interim that Action Planning Authorities should examine the planning policy guidance notes issued in England titled, ‘ProPG Planning and Noise: Professional Practice Guidance on Planning and Noise’. This has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.”*

The Wicklow Noise Action Plan (NAP) 2018 – 2023 also refers to the *ProPG Planning and Noise: Professional Practice Guidance on Planning and Noise* document as follows:

*“The EPA considers that the May 2017 Professional Practice Guidance (ProPG) Planning and noise policy and guidance note, developed by the UK Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH), contains suitable guidance that could be equally valid in Ireland when used for detailed planning assessments or for the purposes of informing policy decisions. As the IOA is well established in Ireland, the ProPG guidance note could offer some degree of standardisation if it was to be considered by Irish planners & developers.*

*In the absence of national planning guidance to address the issue of noise, the EPA promotes the concept that all Local Authorities are encouraged to follow the same basic approach to help avoid significant discrepancies until such time as specific noise guidance is produced for Ireland.”*

Hence, ProPG criterion has been adopted for inward noise assessment.

### Professional Guidance on Planning & Noise (ProPG)



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

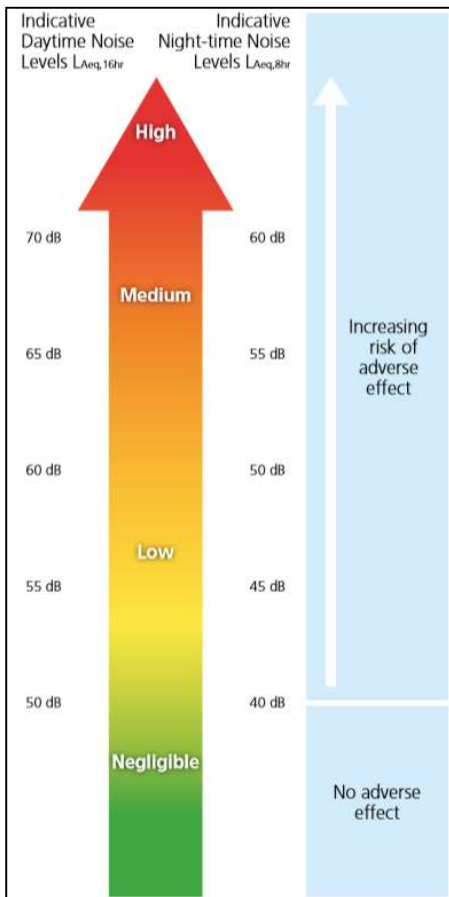
The ProPG outlines a systematic risk based 2 stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- 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” which include:
  - Element 1 - Good Acoustic Design Process;
  - Element 2 - Noise Level Guidelines;
  - Element 3 - External Amenity Area Noise Assessment; and,
  - Element 4 - Other Relevant Issues.

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as negligible, low, medium or high risk based on the pre-existing noise environment. Figure 7-2 presents the basis of the initial noise risk assessment, it provides appropriate risk categories for a range of continuous noise levels, either measured and/or predicted on site.

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

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233 (2014). The recommended indoor ambient noise levels are set out in Table 7-4 and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur.



**Figure 7-2 - ProPG Stage 1 - Initial Noise Risk Assessment**

**Table 7-4 - ProPG Internal Noise Level Guidelines**

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

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

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

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

*“The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB  $L_{Aeq, 16hr}$ .”*

### 7.2.6. Operational Phase – Inward Vibration Assessment

Guidance relating to human response to vibration is contained within BS 6472 Guide to evaluation of human exposure to vibration in buildings (2008): Part 1 - Vibration sources other than blasting.

BS 6472 uses the Vibration Dose Value (VDV) which is measured or forecast over the day or night-time periods in terms of  $m/s^{-1.75}$ . The VDV parameter takes into account how people respond to vibration in terms of frequency content, vibration magnitude and the number of vibration events during an assessment period.

The following Table, as set out in the standard (BS 6472), details the values of VDV where various comments from occupiers are possible. The standard notes that the values are applicable for both vertical and horizontal vibration with the appropriate weighting applied. The values in Table 7-5 have been adopted for this assessment.

**Table 7-5 - VDV ( $m/s^{-1.75}$ ) above which various degrees of adverse comment may be expected in residential buildings.**

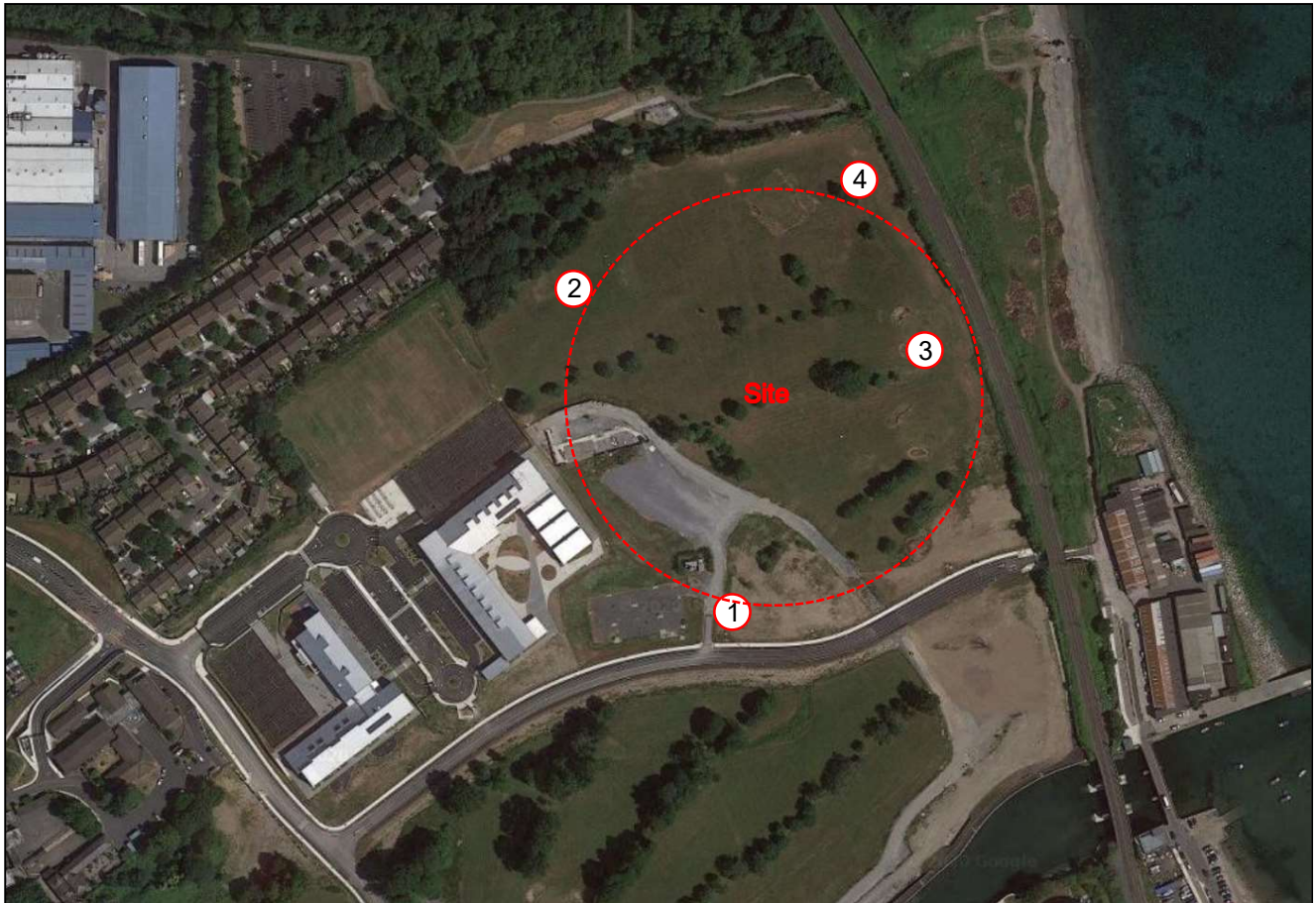
Building Type	Low probability of adverse comment	Adverse comment possible	Adverse comment probable
Residential building – Day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential building – Night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

### 7.3. Receiving Environment

An environmental noise survey was conducted at the development site as part of the assessment. The noise survey was conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with *ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise*. Specific details are set out below.

#### 7.3.1. Measurement Locations

- The following four measurement locations were selected as shown in Figure 7-3;
- **Location 1** located on the site of the proposed development at the boundary closest to the neighbouring school and road;
- **Location 2** located at the north-east of the site, closest to the neighbouring dwellings;
- **Location 3** located on the site of the proposed development adjacent to the rail line; and,
- **Location 4** located on the site of the proposed development adjacent to the rail line.



**Figure 7-3 – Measurement Locations**

### 7.3.2. Survey Periods

- Noise measurements were conducted at Locations 1 – 3 over the course of the following survey period: 11:00hrs to 14:45hrs on 15th December 2020.
- Noise measurements were conducted at Location 4 over the course of the following survey period: 13:30hrs to 14:35hrs on 20th July 2020.

The weather during the survey periods were dry and calm.

### 7.3.3. Instrumentation

The attended noise measurements were performed using a Brüel & Kjær Type 2250 Precision Sound Level Analyser and a RION NL-52. Before and after the survey the measurement apparatus was check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

### 7.3.4. Procedure

Attended noise measurements were conducted with the microphone at a height of 1.5m above ground level. 3no. 15 minute intervals were measured at Locations 1 and 2. At Location 3, 1.5 hrs of logged data at 1 minute intervals was recorded. This was to get an overall measurement of the rail noise impacting on the site, and also to capture noise data at an adequately granular interval so that sound exposure level (SEL) measurements of the train passbys can be derived from the data. At Location 4 SEL measurements were undertaken to capture the noise emissions of train passbys. The results were saved to the instrument memory for later analysis where appropriate. Survey personnel noted all primary noise sources contributing to noise build-up during setup and collection.

### 7.3.5. Measurement Parameters

The noise survey results are presented in terms of the following parameters:

- L<sub>Aeq</sub>** 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<sub>Amax</sub>** is the instantaneous maximum sound level measured during the sample period.
- L<sub>AF90</sub>** is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
- L<sub>AE</sub>** Sound Exposure Level is the A weighted equivalent sound level which, when maintained for one second, contains the same quantity of sound energy as the actual time varying level of one noise event.

The “A” suffix denotes the fact that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to  $2 \times 10^{-5}$  Pa.

### 7.3.6. Noise Results

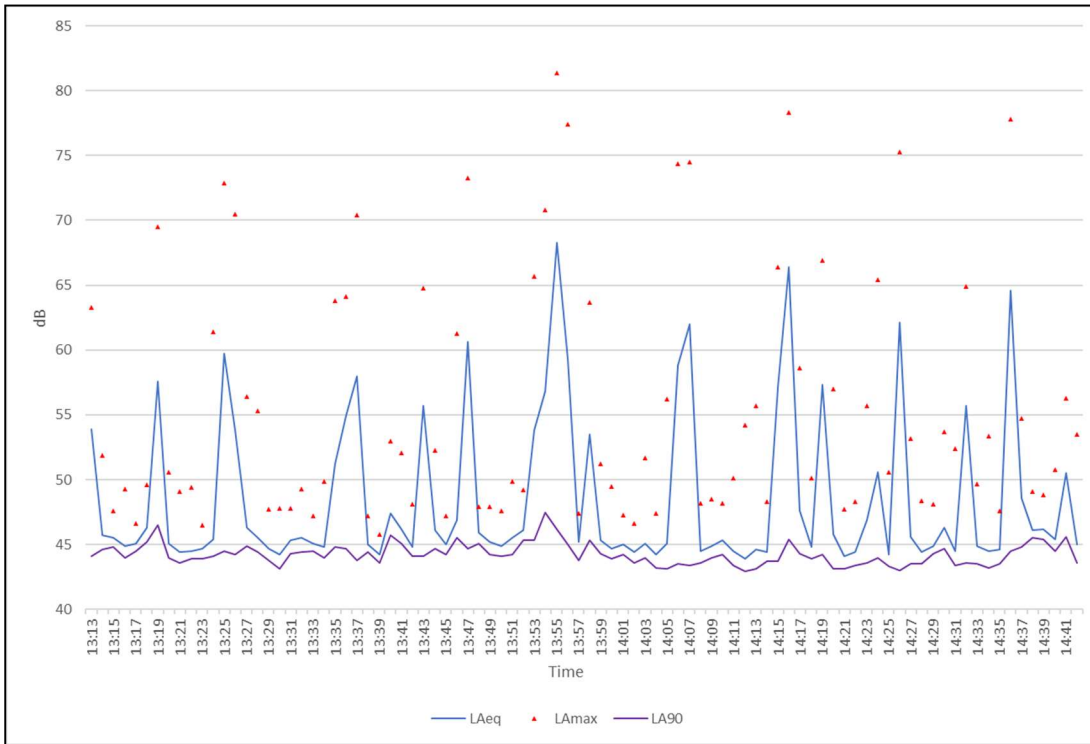
#### Measurement Locations 1 & 2

**Table 7-6 – Measured Noise Levels at Locations 1 and 2**

Location	Time	Measured Noise Levels (dB re. $2 \times 10^{-5}$ Pa)			
		L <sub>Aeq</sub>	L <sub>AFmax</sub>	L <sub>AF10</sub>	L <sub>AF90</sub>
1	11:09	50	64	51	47
	11:51	49	68	51	47
	12:29	50	68	51	47
2	11:32	48	62	50	45
	12:10	48	65	50	46
	12:49	48	71	49	46

At Locations 1 and 2 it was noted that the local noise environment comprised of sporadic train movements and distant road traffic. It was also noted that some reverse alarms and impact noises were audible from a forklift truck in operation nearby.

Measurement Locations 3 and 4



**Figure 7-4 – Measured Noise Levels at Location 3**

The overall average noise level measured at Location 3 was 55 dB  $L_{Aeq}$ . The local noise environment was dominated by train movements. Distant road traffic was also noted and some reverse alarms and impact noises were audible from a forklift truck in operation nearby.

In addition, Table 7-7 presents the measured SELs for train passbys at Locations 3 and 4.

**Table 7-7 – Measured Sound Exposure Levels of Train Passbys**

Location	Sound Exposure Measured Noise levels, (dB re 2 x 10 <sup>-5</sup> Pa)		
	Lowest	Highest	Logarithmic Average
3	68	86	79
4	75	88	83

The logarithmic averaged SEL for train passby's at Locations 3 and 4 were calculated to be 79 dB and 83 dB, respectively.

**7.3.6.1. Noise Measurement Calculations**

For the purpose of the inward noise assessment continuous equivalent noise levels have been calculated at Locations 3 and 4 through capture of rail noise with the previously defined  $L_{AE}$  parameter, by using the following equation:

$$L_{Aeq,T} = L_{AE} + 10 \times \text{Log}_{10}(N) - 10 \times \text{Log}_{10}(T)$$

Where: N is the number of events occurring during the period T (in seconds) (i.e. the number of train passbys)

The number of events 'N' has been derived from published timetables by Irish Rail. From these timetables we have derived train movements and noise predictions as presented in Table 7-8. Note that the worst one hour period has been used to calculate the night-time noise level.

**Table 7-8 – Calculated Continuous Equivalent Noise Levels**

Period	N° of Event Occurrences	Calculated Equivalent Continuous Sound Level	
		Location 3	Location 4
Daytime Period (07:00 to 23:00 hours)	223	55 dB LAeq, 16 hr	59 dB LAeq, 16 hr
Night-time Period (23:00 to 07:00 hours)	7	52 dB LAeq, 1 hr	56 dB LAeq, 1 hr

It is noted that the calculated daytime noise level at Location 3 correlates well with the measured equivalent continuous noise level noise level at Location 3, this validates our assessment approach and confirms that the SEL measurements and calculations provide an accurate representation of the noise impact from passing trains.

#### 7.3.6.2. Vibration Results

Measurement of vibration dose value was undertaken at Location 4 during rail passbys, the location was selected as a representation of vibration from train passbys impacting on the façade of the proposed development building. The results are summarised in Table 7-9. The day and night VDV values are calculated taking account of the maximum VDV measured and number of passing trains over day and night-time periods as taken from Irish Rail timetable information.

**Table 7-9 – Measured VDV**

Location	VDV (m/s <sup>-1.75</sup> )		
	Lowest	Highest	Average
4	0.01	0.06	0.03

## 7.4. Potential Noise Impacts during Construction Phase

### 7.4.1. Noise

It is noted that the construction programme will create typical construction activity related noise on site. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators.

The proposed general construction hours are 08:00 to 18:00hrs Monday to Friday and 08:00 to 14:00hrs on Saturdays.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise.

Typical noise levels are predicted using guidance set out in BS5228-1: 2009+A1: 2014. Table 7-10 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme at a standard reference distance of 10 metres from the various plant items as well as predicted activity noise levels at various distances. The predictions assume a standard 2.4m hoarding surrounding the site. Note that piling is expected to occur at a minimum distance of 70m from the nearby receptors.

**Table 7-10 – Construction Noise Predictions**

Phase	Item of Plant (Ref. BS5228-1:2009+A1:2014)	BS5228 Item Noise Level at 10m distance (dB L <sub>Aeq,1hr</sub> )	Predicted Construction Noise Level at 20m Distance (dB L <sub>Aeq,12 hr</sub> )	Predicted Construction Noise Level at 35m Distance (dB L <sub>Aeq,12 hr</sub> )	Predicted Construction Noise Level at 45m Distance (dB L <sub>Aeq,12 hr</sub> )
Site Preparation	Wheeled Loader Lorry (D3 1)	75	61	56	54
	Track Excavator (C2.22)	72	58	53	51
	Dozer (C2.13)	78	64	59	57
	Dump Truck (C4.2)	78	64	59	57
<b>Site Preparation Total (logarithmic summation)</b>			<b>68</b>	<b>64</b>	<b>61</b>
Foundations	Tracked Excavator (C3.24)	74	60	55	53
	Concrete Pump (C3.25)	78	64	59	57
	Compressor (D7 6)	77	63	58	56
	Poker Vibrator (C4 33)	78	64	59	57
	Large Rotary Bored Piling Rig (C3.14) (@ 60m only)	83	58	58	58
<b>Foundations Total (logarithmic summation)</b>			<b>69</b>	<b>65</b>	<b>64</b>
General Construction	Hand tools	81	67	62	60
	Tower Crane (C4.48)	76	62	57	55
	Pneumatic Circular Saw (D7.79)	75	61	56	54
	Internal fit – out	70	56	51	49
<b>General Construction Total (logarithmic summation)</b>			<b>69</b>	<b>64</b>	<b>62</b>
Landscaping	Dozer (C2.13)	78	64	59	57
	Dump Truck (C4.2)	78	64	59	57
	Surfacing (D8.25)	68	54	49	47
<b>Landscaping Total (logarithmic summation)</b>			<b>67</b>	<b>62</b>	<b>60</b>

Considering the residential dwellings on Corke Abbey Road and the Colaiste Raithin School situated to the west of the proposed development, the following impacts are predicted:

- When construction works are within 35m of the receptors it is expected that a potentially significant impact will occur.
- At distances greater than 45m from the identified receptors, no significant noise effects are anticipated across the site during the construction phase of the development.



### 7.4.2. Vibration

The main potential source of vibration during the construction programme is associated with piling (if required) and excavation works.

In order to assess potential vibration impacts at the closest sensitive buildings to the site works, a range of typical levels of vibration during augured piling have been determined through reference to published empirical data within BS 5228 – Part 2. The following vibration magnitudes associated with rotary bored piling using a 600mm pile diameter for bored piling into soft ground over rock are summarised below:

- 0.54mm/s at a distance of 5m, for auguring;
- 0.22mm/s at a distance of 5m, for twisting in casing;
- 0.42mm/s at a distance of 5m, for spinning off, and;
- 0.43mm/s at a distance of 5m, for boring with rock auger.

Considering the low vibration levels at very close distances to augured piling rigs, vibration levels at the nearest receptors (ca. 70m from the activity) are not expected to pose any significance in terms of cosmetic or structural damage. At further distances from the works vibration magnitudes will dissipate further resulting in lower vibration levels to those noted above and hence are orders of magnitude below the limit values in Table 7-2.

Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Table 7-2 during all activities. Mitigation and management of these works are discussed in Section 7.7.

## 7.5. Potential Noise Impacts during Operational Phase

### 7.5.1. Additional Vehicular Traffic on Public Roads

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the development. Traffic flow data in terms of the annual average daily traffic (AADT) figures has been assessed and the calculated change in noise levels during these two periods are summarised in Table 7-11. Note that the change in noise levels calculated takes into account the entirety of the masterplan and hence can be considered a cumulative assessment. Road link locations are presented in Figure 7-4.

The results of the predictions indicate that the impact from increased traffic will be neutral, imperceptible and permanent.

**Table 7-11 - Calculated change in traffic noise levels for Do Something scenario for years 2024, 2029 and 2039**

Route	Change in Noise Levels (dB)		
	2024	2029	2039
A	+0.1	+0.2	+0.2
B	+0.1	+0.3	+0.3
C	+0.1	+0.1	+0.1
D	0.0	+0.3	+0.3
E	0.0	+0.9	+0.9
F	+0.1	+0.2	+0.2



Figure 7-5 - Route References

### 7.5.2. Mechanical and Electrical Plant

Once operational, there will be building services plant items required to serve the development. These items of plant will be designed and located so that there is no negative impact on sensitive receivers within the development itself or on nearby sensitive receptors. The cumulative operational noise level from building services plant at the nearest noise sensitive locations external to the development will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods provided in Table 7-12 below. The criteria has been selected so that the noise from items of plant does not exceed background noise levels during the day. An estimation of 10 dB difference between day and night has been used to determine night time noise levels. As per BS4142 these noise levels would be “an indication of the specific sound source having a low impact”.

Table 7-12- Proposed Noise Criteria for Plant Noise

Day, dB L <sub>Aeq,1hr</sub>	Night, dB L <sub>Aeq,15min</sub>
45	35

### 7.5.3. Inward Noise Assessment (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 7-2 presents the basis of the initial noise risk assessment. It provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

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 a 3D computer noise model of the development site has been developed to predict the noise levels across the entire site in order to investigate the initial noise risk. Noise levels measured on site will be used to validate the model.

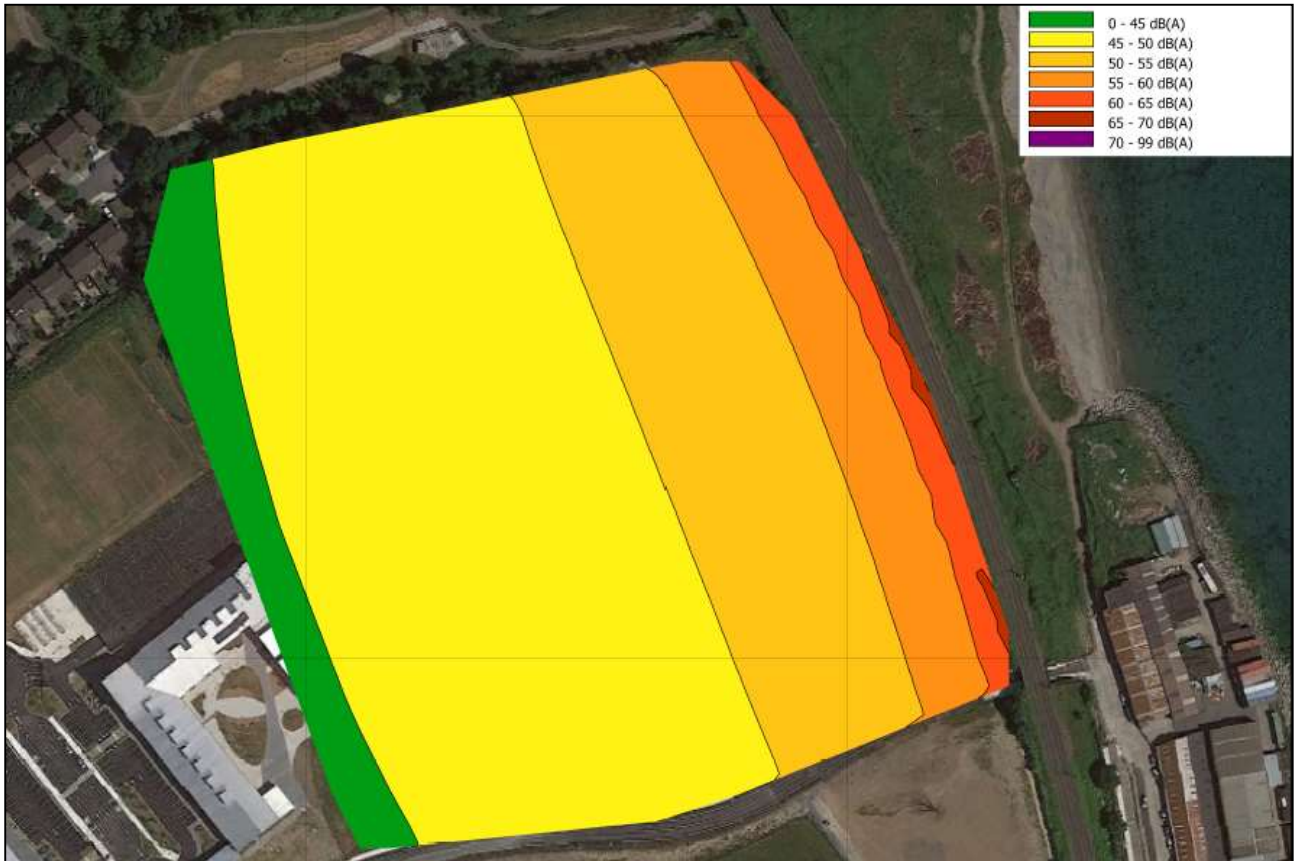
Model Validation Noise levels recorded or calculated from the baseline noise survey were used to calibrate the noise model. It is considered that a strong correlation in respect of predicted noise levels has been achieved. Noise levels are calculated over daytime periods, (07:00 to 19:00 hrs) and night-time periods (23:00 to 07:00 hrs). Table 7-13 details the results of the noise model predictions and compares them to the measured values at the survey location.

**Table 7-13 – Noise Model Validation**

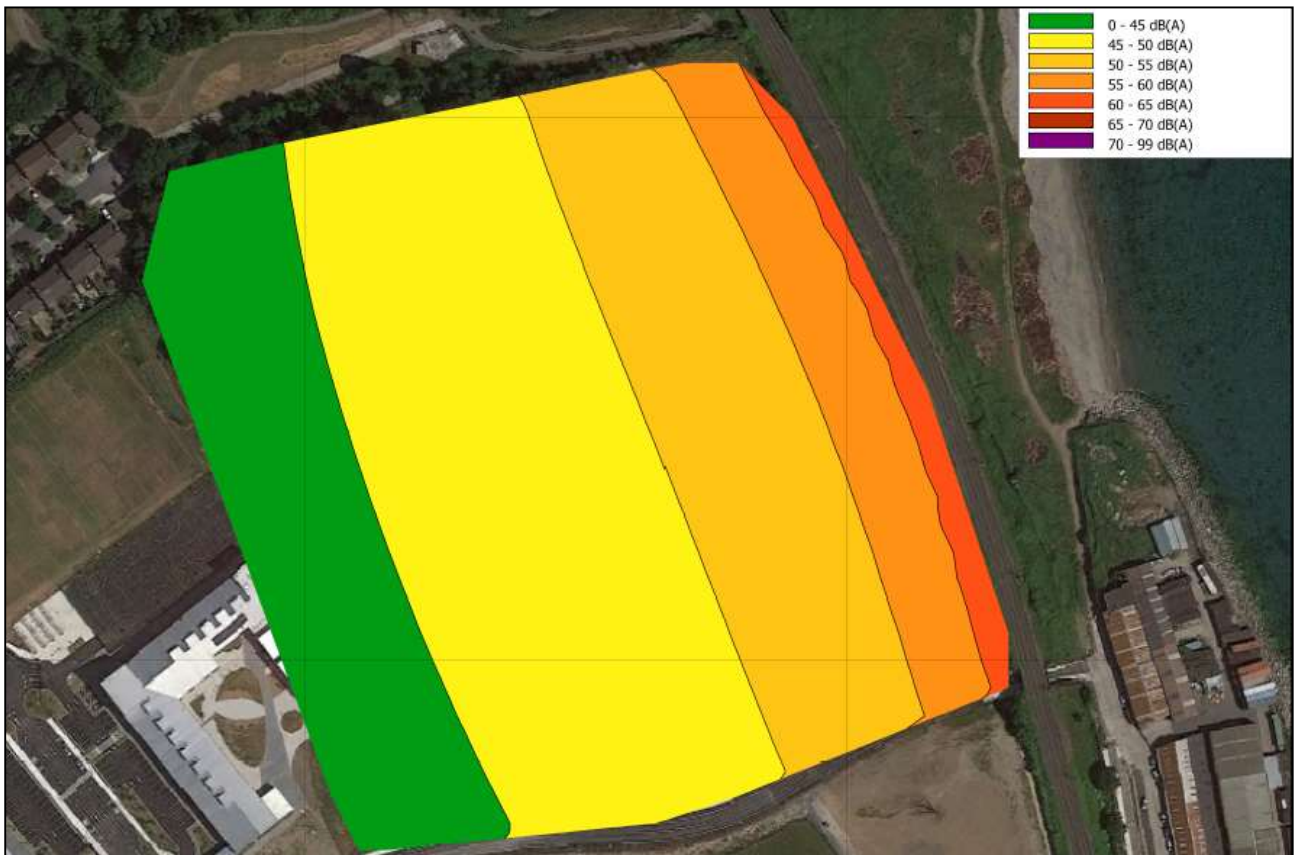
Location	Period	Measured or Calculated (dB LAeq)	Predicted in Model (dB LAeq)
1	Day	50	48
2	Day	48	47
3	Day	55	56
	Night	52	53
4	Day	59	59
	Night	56	56

Noise Model Output

For the purpose of the initial noise risk assessment across the development site the noise model has been used to prepare noise contour maps for both daytime and night-time periods at 4m and 10m height above ground, this is to give an indication of expected noise levels at various levels of the proposed development. These maps are presented in Figure 7-6 to Figure 7-9.



**Figure 7-6 – Daytime Predicted Noise Levels at 4m Above Ground**



**Figure 7-7 – Daytime Predicted Noise Levels at 10m Above Ground**

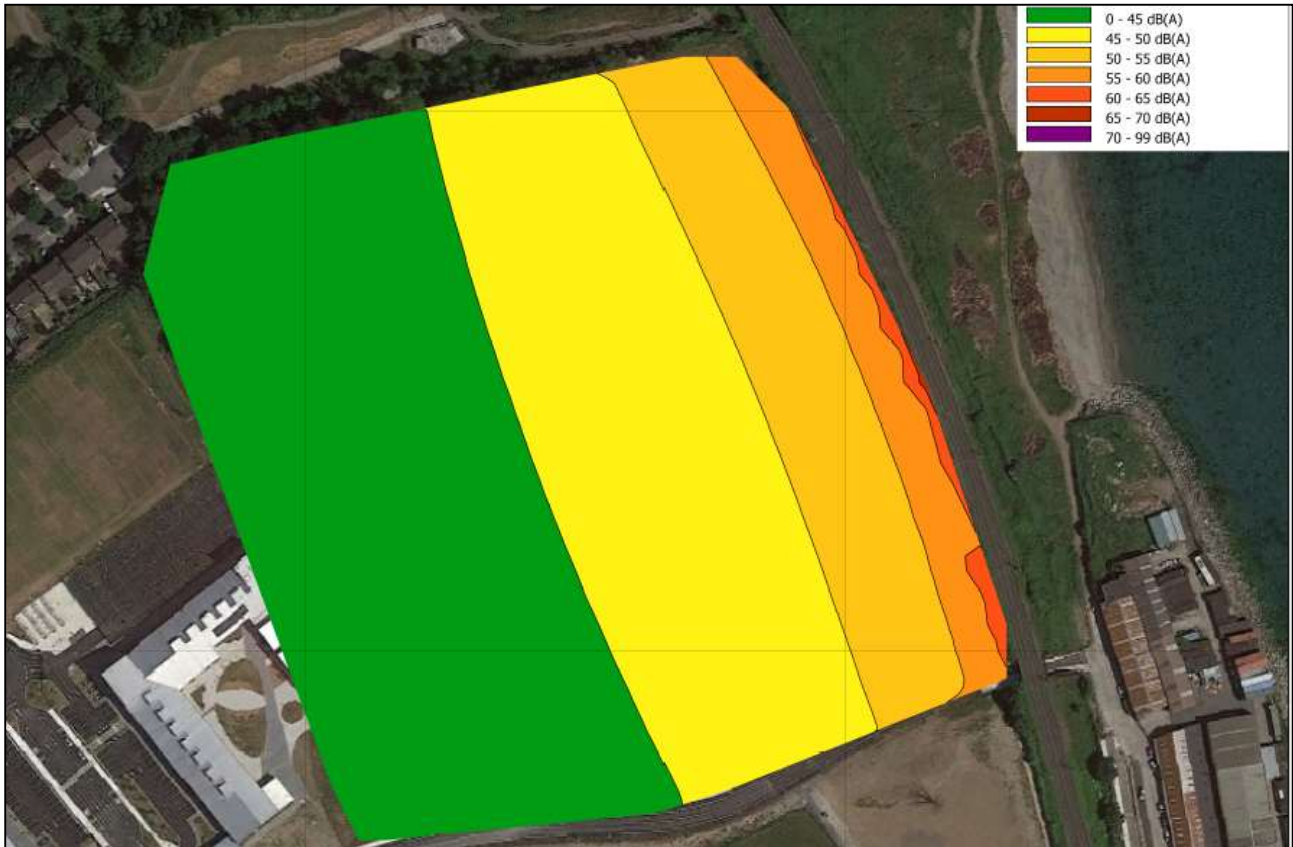


Figure 7-8 – Night-time Predicted Noise Levels at 4m Above Ground



Figure 7-9 – Night-time Predicted Noise Levels at 10m Above Ground

## ProPG Stage 1 - Noise Risk Assessment Conclusion

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

ProPG states the following with respect to negligible to medium risks:

*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 Negligible 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.

It should be noted that ProPG states the following with regard to how the site noise risk assessment is to be used,

*“2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design.”*

Therefore, following the guidance contained in ProPG this does not preclude residential development on sites that are identified as having medium 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 suitably 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.

Note that in addition to the noise from rail pass-by's in the future there is the potential for noise from the proposed Bray sustainable transport bridge (ref PRR 21/869) which when operational may hold public transport such as buses and the LUAS. Future noise emissions from this development have been taken into account in the application of mitigation measures, however, given the limited detail available on traffic movements for the development it is not possible to derive a future noise level through calculation. Instead a conservative estimate has been made and a mitigation level applied to account for a potentially busy transport route.

### **7.5.3.1. Acoustic Design Strategy (Part 1)**

#### Façade Noise Levels

Noise levels have been predicted across the site during day and night-time periods with the proposed buildings in place.

Where façade noise levels are less than 55 dB  $L_{Aeq,16hr}$  during the day and 50 dB  $L_{Aeq,8hr}$  at night it is possible to achieve reasonable internal noise levels while also ventilating the dwellings with open windows. Therefore, for those properties where the façade noise levels are less than 55 dB  $L_{Aeq,16hr}$  during the day and 50 dB  $L_{Aeq,8hr}$  at night no further mitigation is required.

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

Red highlighting in Figure 7-10 identifies facades where the noise levels are higher and where mitigation in the form of enhanced glazing and ventilation will be required. These affected facades face on to either the rail track to the east, or the proposed future Bray sustainable transport bridge to the south. The specification of this enhanced façade is discussed in Section 7.7.2.2. Note that any façade that is not highlighted has been predicted to fall below 55 dB  $L_{Aeq,16hr}$  during the day and 50 dB  $L_{Aeq,8hr}$  at night, therefore mitigation is not required for these facades.



**Figure 7-10 - Facades Requiring Enhanced Acoustic Specification (Highlighted in Red)**

External Noise Levels

Balcony areas for Block A and B that face onto the rail tracks are expected to exceed the recommended noise levels for external areas, however, the ProPG document allows for the impact of higher than desirable external noise levels to be offset through assessment of a hierarchy of measures including “a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings” or “a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)”.

In this instance each block has communal external areas specific to the block (see blue areas on Figure 7-10) residents that have been modelled and are predicted to meet the external noise thresholds. All other external areas other than those previously stated are predicted to meet the external noise thresholds. It is considered that the objective of achieving suitable external noise levels is achieved within the overall site.

Inward Vibration Assessment

Table 7-14 presents the calculated VDV for day and night-time when taking account of the maximum and average measured VDV. The results using the maximum VDV indicate that there is a low probability of adverse comment from train passbys. The results when using the average VDV indicate that vibration levels will be below the value where a low probability of adverse comment would be expected as defined within BS 6472-1 (2008). The results suggest that vibration mitigation measures are not necessary based upon a review of measured and calculated VDV values.

Whilst vibration levels may be perceptible at low levels during passing of commuter trains, the overall vibration dose value at the location of the building is deemed to be a level whereby an adverse comment would not be expected, based on the measured specific rail pass by data.

**Table 7-14 – Predicted Vibration Levels During Operational Phase**

Period	N° of Occurrences of Event	Calculated VDV	
		Using Highest Measured Value	Using Average Measured Value
Daytime Period (07:00 to 23:00 hours)	223	0.23	0.12
Night-time Period (23:00 to 07:00 hours)	7	0.1	0.05

**7.6. Do Nothing Impact**

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations and across the development site itself will remain largely unchanged. The noise levels measured/noted during the baseline studies are considered representative of the Do-Nothing scenario. The Do-Nothing scenario is therefore considered to have a neutral impact.

**7.7. Mitigation Measures**

**7.7.1. Construction Phase**

With regard to construction activities, best practice control measures from construction sites within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2 will be used to control noise and vibration impacts. The implementation of all best practice noise and vibration control methods will ensure potential impacts to nearby residential noise sensitive locations are not significant. This will be particularly important during excavation and foundation construction which are likely to be the activities to have the highest potential noise and vibration impact.

Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;



- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise;
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures;
- Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted; and,
- Monitoring levels of noise and vibration during critical periods and at sensitive locations (i.e. at the boundary between the development site and the school and residential buildings).
- Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These will include: Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of good quality site hoarding to the site perimeters adjacent to sensitive receptors which will act as a noise barrier to general construction activity at ground level;
- Erection of barriers as necessary around items such as generators or high duty compressors, and;
- Situate any noisy plant as far away from sensitive properties as permitted by site constraints.

## 7.7.2. Operational Phase

### 7.7.2.1. Operational Phase – Mechanical and Electrical Plant

As part of the detailed design of the development, plant items with appropriate noise and vibration ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers, anti-vibration mounts etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.

### 7.7.2.2. Operational Phase – Inward Noise (Acoustic Design Strategy Part 2)

As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. blockwork or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal.

In this instance the facades highlighted in Figure 7-10 will be provided with upgraded acoustic glazing and ventilation that achieves the minimum sound insulation performance as set out in Table 7-15 and Table 7-16. Other facades in the development have no minimum requirement for sound insulation.

The sound insulation specifications are expressed in the following units:

**R<sub>w</sub>** Weighted Sound Reduction Index – This is the value of the sound insulation performance of a partition or element measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature typically presents sound insulation data in terms of the R<sub>w</sub> parameter.

**D<sub>n,e,w</sub>** Weighted element-normalized level difference. This is the value of sound insulation performance of a ventilator measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature for acoustic ventilators typically presents sound insulation data in terms of the D<sub>n,e,w</sub> parameter.

**Table 7-15 - Sound Insulation Performance Requirements for Upgraded Acoustic Glazing, SRI (dB)**

SRI (dB) per Octave Band Centre Frequency (Hz)	dB R <sub>w</sub>
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125	250	500	1k	2k	4k	
26	27	34	40	38	46	38

**Table 7-16 - Sound Insulation Performance Requirements for Upgraded Acoustic Ventilation, SRI (dB)**

SRI (dB) per Octave Band Centre Frequency (Hz)						dB $D_{n,e,w}$
125	250	500	1k	2k	4k	
31	33	42	43	39	44	42

The overall  $R_w$  and  $D_{n,e}$  outlined above are provided for information purposes only. The over-riding requirements are the octave band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same or greater level of sound insulation performance as that set out in Table 7-15 and Table 7-16. It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the detailed design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

## 7.8. Residual Impacts

### 7.8.1. Construction Noise

When construction works are undertaken within 35m of the receptors it is predicted that a negative, temporary and potentially significant impact may occur. It should be noted that this would be a worst case scenario where all items of plant are in operation within 35m of the identified receptors. Section 7.7.1 outlines the measures that will be implemented on site by the appointed contractor in order to mitigate construction noise impacts such that significant impacts are avoided.

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
Negative	Moderate	Temporary

When construction works are undertaken at a distance of 35m or more from the receptors the impact is predicted as negative, temporary and slight to moderate.

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
Negative	Slight to Moderate	Temporary

### 7.8.2. Construction Vibration

Construction vibration impacts are as follows:

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
Negative	Not Significant	Temporary

### 7.8.3. Additional Vehicular Traffic

All routes are predicted to be as follows:

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
Neutral	Imperceptible	Permanent

### 7.8.4. Mechanical and Electrical Plant

The impacts are predicted as follows:

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
Negative	Not Significant	Permanent

### 7.8.5. Inward Noise Impact

The impacts are predicted as follows:

<i>Quality</i>	<i>Significance</i>	<i>Duration</i>
Neutral	Not Significant	Permanent

## 7.9. Monitoring Requirements

There is a requirement to ensure that construction activities operate within the noise and vibration limits set out within this EIAR. There is also a requirement to undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded. Noise monitoring shall be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. It will be a requirement of the appointed contractor to undertake such noise monitoring during the relevant phases of the construction program.

Vibration monitoring shall be conducted in accordance with BS 6472 for human disturbance and BS ISO 4866:2010 for building damage. It will be a requirement of the appointed contractor to undertake such vibration monitoring during the relevant phases of the construction program.

## 7.10. Difficulties Encountered

There were no difficulties encountered during the preparation of this Noise and Vibration Chapter.

## 8. Traffic

### 8.1. Introduction

This chapter of the EIAR reviews the current receiving environment in terms of existing road traffic characteristics and quantifies the associated baseline scenario whilst undertaking an assessment of the proposed development to identify its likely effects on the traffic environment.

The Site is associated with the planning application for the proposed Coastal Quarter Development which constitutes Phase 1A of the greater Harbour Point Masterplan Development. It should be noted that this planning application is a revised application following a recent submission to An Bord Pleanála (Ref: ABP-311181-21). Permission was granted for the development with the exception of Block A and Block B. From a traffic and transportation perspective, based on recent consideration by An Bord Pleanála, the traffic chapter was found to be robust and determined to be fit for purpose. Ultimately the Bord determined that there were no grounds for refusal based on traffic, transportation or roads. This traffic chapter is therefore a modified version of the traffic chapter that was submitted with the previous planning application with updates to reflect relatively minor modifications to the traffic and transport characteristics of the proposed development. The characteristics of the Coastal Quarter Development as well as the full Harbour Point Masterplan Development inclusive of the future Phase 2 Riverside Quarter (where relevant) are addressed in this assessment.

The Coastal Quarter development lands are bounded to the west by the R761 Road, to the east by the main line rail DART line, to the south by the Dargle River and to the north by Corke Abbey residential development and Corke Abbey Valley Park.

The overall Coastal Quarter Development presents as a development wherein residents will be facilitated with a lifestyle that is based predominantly on active travel and travel by public transport whilst minimising dependency on car travel. This opportunity is based on multi-faceted characteristics of the site location and opportunities created for travel choice and preclusion of the need to travel by car in terms of direct and adjacent proximity to existing and future services.

The Site is proposed to be developed in alignment with several future public transport initiatives/projects. The major projects include:

- Luas Green Line Extension to Bray with associated transport bridge;
- BusConnects – Core Bus Corridor: Corridor 13 Bray to UCD; and,
- Greater Dublin Area (GDA) Cycle Network Plan.

The future Luas extension, as set out in the Greater Dublin Area Transport Strategy 2022-2042, is anticipated to run through the future development and terminate at the Bray DART Station via a proposed Transport Bridge. Although this extension is not anticipated to be developed until 2040, the masterplan for the development lands takes cognisance of the provision of the Luas extension and its interface with the development.

The NTA are currently developing the BusConnects Scheme, Corridor 13 Bray to UCD and City Centre. As the R761 lies on BusConnects Route 13 Bray to the City Centre, a full upgrade of the carriageway and associated junctions will be provided along the R761. The development plan takes cognisance of these upgrades for all future design scenarios.

In January 2021, the National Remote Work Strategy was published by the Department of Enterprise Trade and Employment which lays out the long-term strategy to promote home and remote working for public sector and private sector employees. The strategy mandates that 20% of the public sector workforce move to home and remote working in 2021. Furthermore, the strategy notes that more than 25% of the private sector workers in Ireland have the ability to work remotely.

Therefore, in addition to the significant opportunities to travel to work by active travel and public transport modes, residents of the Coastal Quarter development will avail of the home and remote working opportunities, including flexible working opportunities, as promoted by the National Remote Work Strategy. This change in work practice will minimise overall work trips and optimise flexible working opportunities that will enable residents to avoid travel to work and will also facilitate residents to commute to their place of employment outside of the peak traffic and travel periods.

In overall terms, the Coastal Quarter Development will be fully consistent with the National Planning Framework objective of compact growth in a location that will optimise the residents' opportunities to travel by active travel and public transport modes and fully consistent with the overall objectives of the NTA Greater Dublin Area Transport Strategy.

## 8.2. Methodology

The assessment methodology for the traffic and transport impact is consistent with the Transport Infrastructure Ireland's (TII) Traffic and Transport Assessments Guidelines. The methodology is summarised as follows:

- **Baseline Transportation Review:** Undertake a review of current planning policies and objectives, existing public transport services, walking and cycling network and existing and roads infrastructure;
- **Baseline Traffic Flow Review:** Undertake site visits to review current traffic conditions and to make observations on same. Identify key junctions where traffic count survey information is required;
- **Future Transport Infrastructure Review:** Undertake a review of current transport policies, plans and strategy to identify future short, medium and long term transport proposals which may have a material impact on the travel behaviour associated with the proposed development;
- **Development Proposals Review:** Review the proposed development in terms of provision for access by walking, cycling, public transport and car;
- **Transport Characteristics Review:** Undertake an assessment of the likely modal share, trip generation, assignment and distribution having regard to existing and potential future traffic patterns on the local road network;
- **Identification of Local Road Network Proposals:** Identify proposed junction works on the local road network in terms of new junctions, improvements for pedestrians, cyclists and traffic at existing junctions;
- **Assessment of Road Impact – Operational Phase:** Undertake an assessment of the key junctions during the operational base year, opening year, opening year plus five and opening year plus fifteen assessment years for both 'without development' and 'with development' scenarios in order to determine future operation and any necessary mitigation measures required; and,
- **Assessment of Road Impact – Construction Phase:** Undertake an assessment of the potential traffic generation during the construction phase and assess the percentage traffic impact likely to occur and to identify any appropriate mitigation.

As requested at the Stage 1 S247 consultation meeting, and as undertaken during the previous consultation noted above, a Scoping Document was issued to both Wicklow County Council and Dún Laoghaire Rathdown County Council (DLRCC) in December 2020. The content of this Scoping Document is based on feedback from both Wicklow County Council and Dún Laoghaire Rathdown County Council through pre-application meetings and communications. This all remains relevant for this planning application. The Scoping Document is contained within the Traffic and Transport Assessment report as contained within Appendix 8 of this EIAR.

The responses to the comments received from ABP, DLRCC and WCC in respect to the pre-application consultation ref ABP-308291-20, on part of the subject site for the permitted development (ref ABP-311181-21), remain relevant to this planning application. These have been fully addressed as part of this planning submission comprising of 586 no. residential units in a mix of apartments, duplexes and houses within the same site boundary.

A table which references the items raised has been prepared to include responses to these items. The responses made are concise but refer to appropriate section within this TTA and or reference the appropriate engineering drawing. This table is contained within Appendix F 'Record of Consultation' of this TTA report. The TTA report as contained within Appendix 8 of this EIAR.

## 8.3. Receiving Environment

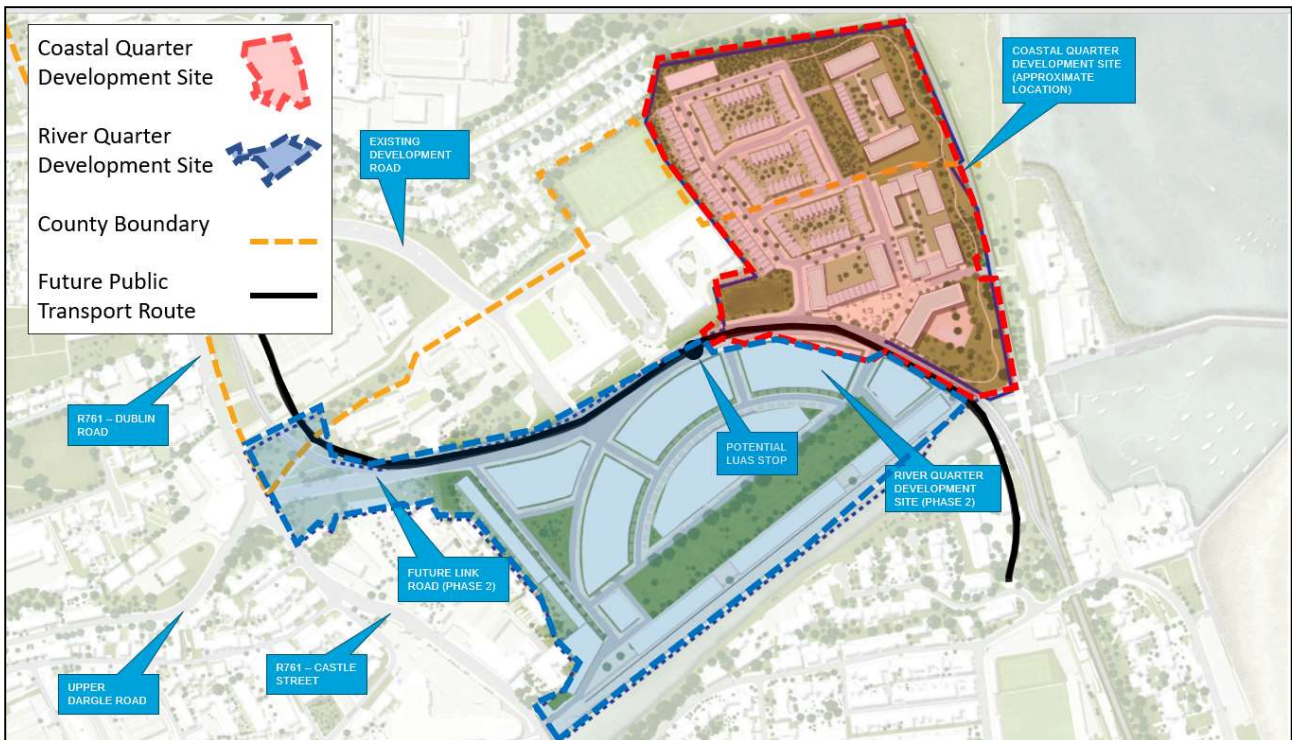
### 8.3.1. Development Location

The Harbour Point development site is bounded to the west by the R761 Road, to the east by the main line rail DART line, to the south by the Dargle River and to the north by Corke Abbey residential development and Corke Abbey Valley Park. The Coastal Quarter site location is shown in Figure 8-1 below.



**Figure 8-1 - Coastal Quarter Site Location**

The location of the Coastal Quarter in the context of the greater Harbour Point Masterplan Development is shown in Figure 8-2 below.



**Figure 8-2 - Harbour Point Masterplan Development Layout**

## 8.3.2. Pedestrian and Cycling Facilities

### 8.3.2.1. Current

The current pedestrian facilities are shown in Figure 8-3 below which include the following:

- Existing connection to Bray Dart Station and Bray Promenade via Rail Underpass;
- Existing connection to Bray Town Centre via Riverwalk along Dargle River and via Development Roads;
- Existing connections to R761 via existing road network;
- Existing provision along the R761 Dublin Road;
- Existing connection between 'The Green' and 'Corke Abbey' north of the proposed development site; and,
- Existing connection from broader masterplan lands to the existing greenway route along the River Dargle and towards the town centre.

It should be noted that, with reference to the existing connection via the rail underpass, the applicant can confirm that Irish Rail and Wicklow County Council have concluded a License Agreement allowing Wicklow County Council to continue to operate the underpass for pedestrian and cycle access on a 24 hour basis, along with installing appropriate and approved vehicle barriers on both approaches. The underpass is part of the BG1 National Cycle Route which runs along the existing Dargle Flood Defence Wall to the underpass, connecting to the future Route 14/N5 East Coast Trail which will be upgraded in conjunction with WCC. This cycle route runs externally along the perimeter of the proposed development.

The proposed development does not propose to do any works to the underpass but rather facilitates connectivity to it as an alternative route to the River Walk which also provides high quality pedestrian and cyclist access to Bray Town Centre.



Figure 8-3 - Existing Pedestrian & Cyclist Connections

### 8.3.2.2. Future

The existing and future pedestrian & cyclist connections are shown, in addition to the existing connections, in Figure 8-4 below. The connections include the following:

- 2 no. pedestrian and cycle connections to the north into Existing Corke Abbey Valley Park Lands & adjacent Woodbrook Glen Residential Development to be provided as part of development;
- Enhanced pedestrian and cycle connectivity to the River Dargle on the south will be provided by way of upgrading the existing WCC owned footpath such that it is integrated into the proposed Coastal Gardens. This will provide a high quality, continuous and seamless connection from north to south, through the proposed development. The upgrade portion, including removal of the existing fence and upgrading the existing street lighting will be done in collaboration and with agreement from WCC;
- Wicklow County Council (WCC) is undertaking Part 8 approval procedures to carry out the design and construction of the Bray Sustainable Transport Bridge (Ref. PRR 21/869). Part 8 planning has been granted and is currently under judicial review;
- Proposed Pedestrian & Cyclist Improvements on Castle Street Bridge (Fran O’Toole Bridge), provision of pedestrian and cycle footbridges either side of the existing bridge, to be provided by WCC;
- Improved pedestrian and cyclist facilities along the R761 Dublin Road provided as part of BusConnects - Core Corridor 13 Scheme;
- East Coast Greenway Scheme Greater Dublin Cycle Network route N5 – incorporated within WCC and DLRCC development plans; and
- Completion of Strand Road Cycle Scheme at Marine Terrace under the NTA Stimulus Programme 2020.



**Figure 8-4 - Existing & Future Pedestrian & Cyclist Connections**

Cycling routes associated with the Greater Dublin Cycle Network Plan (NTA, 2011) are illustrated in Figure 8-5 below.



The scheme plans to provide cycling infrastructure on routes associated with the development. The routes are as follows:

- Route B1 – BusConnects Core Corridor 13 Scheme will provide the facilities associated with this route;
- Route BG1 – the facilities associated with the section of greenway route have been implemented along the river front as part of the completed Dargle flood relief scheme;
- Route 14/N5 – East Coast Greenway Scheme will provide the facilities associated with this route; and
- Route N5/W11 – Stand Road Cycle Scheme provides the facilities associated with this route (the final short section of this route is proposed to be implemented in 2021).



**Figure 8-5 - Greater Dublin Cycle Network Plan Cycle Routes (Sheet 20)**

### 8.3.3. Public Transport

#### 8.3.3.1. Current

The current public transport services associated with the Site are shown in Figure 8-6 below.



**Figure 8-6 - Current Public Transport Provision**

Both the Bray Dart Station and the nearest bus stops on Dublin road are within 800m from the development site, this equates to a walking time within 10 minutes along safe and secure walking routes. The bus services in Table 8-1 serve the proposed development site, these operate along the Dublin Road adjacent the development.

**Table 8-1 - Existing Bus Services**

Bus Service	Route	Frequency (Mon-Friday)
45a	Dún Laoghaire Rail Station to Kilmacanogue	15-20min
45b	Kilmacanogue - Dún Laoghaire Rail Station	15-20min
84	Blackrock to Newcastle	25-35mins
84a	Blackrock to Bray	25-35mins
145	Heuston Rail Station to Ballywaltrim	10mins
155	IKEA (Ballymun) Towards Bray Rail Station	20mins
184	Newcastle Hospital to Bray Rail Station	30mins

In addition to the existing bus services noted above, the development is also served by the existing rail services shown in Table 8-2 below.

**Table 8-2 - Existing Rail Services**

Rail Service	Route	Frequency (Mon-Friday)
Dart	Malahide to Greystones / Howth to Greystones	5-10mins
Commuter / Intercity Services	Dublin to Rosslare	10 services

The existing transport services detailed above provide a high level of service and capacity to serve the development.

**8.3.3.2. Future**

The future public transport services associated with the proposed development are shown in Figure 8-7 below. The details of each service are listed below:

- **Public Transport Bridge:** Wicklow County Council (WCC) is undertaking Part 8 approval procedures to carry out the design and construction of the Bray Sustainable Transport Bridge (Ref. PRR 21/869). Part 8 planning has been granted and is currently under judicial review.

The layout of the Coastal Quarter and the proposed bridge has been coordinated with Wicklow County Council. A number of meetings have been held between Wicklow County Council and representatives of the former Golf Club Lands including pre-planning meetings in relation to the SHD planning application (Ref ABP 308291-20). While the subject scheme has been designed to the existing road network (refer to drawing 5214419-ATK-01-ZZ-DR-CE-104 for further detail), it can also be adapted to the above referenced scheme should it be granted permission in the future.

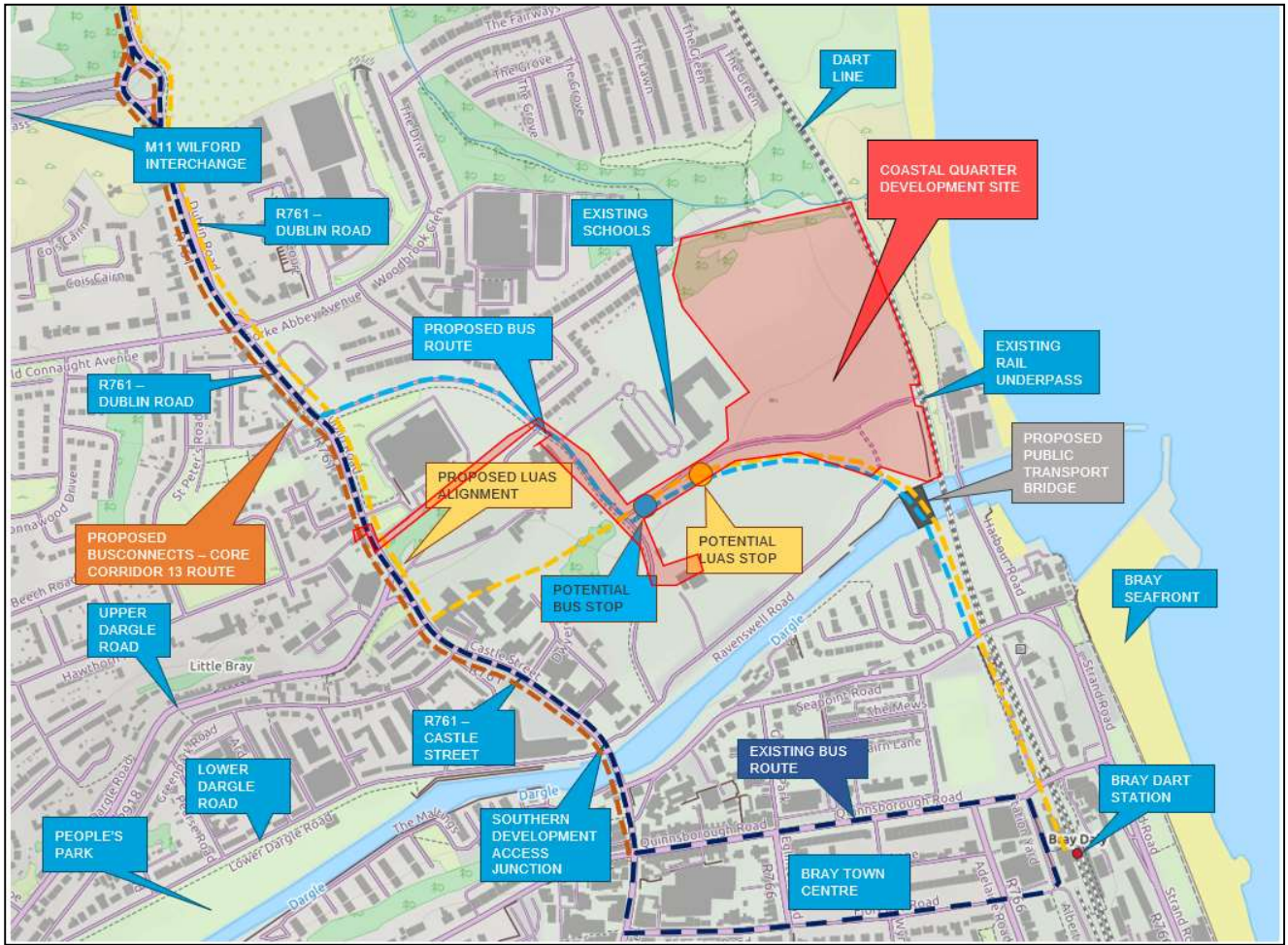
This is in line with the requirements of Road Objectives R05 of the Bray Municipal District Local Area Plan. Whilst this bridge will provide for improved connectivity to the site it is not required to serve the proposed development which will have appropriate access to the DART station via both the existing rail underpass and Riverwalk along with appropriate access to existing bus services along Dublin Road. The indicative location of future bus stop is detailed on Figure 8-7;

- **Luas Route Extension:** The future Luas proposals, as set out in the Greater Dublin Area Transport Strategy, include the extension of Luas Green line to Bray. This line is not proposed to be developed until after 2035 but it is anticipated that the alignment will be adjacent the R761, before heading into the development lands and finally the Bray Dart Station via the proposed Public Transport bridge (Part 8 – Bray Sustainable Transport Bridge, Planning Reference PRR 21/869).

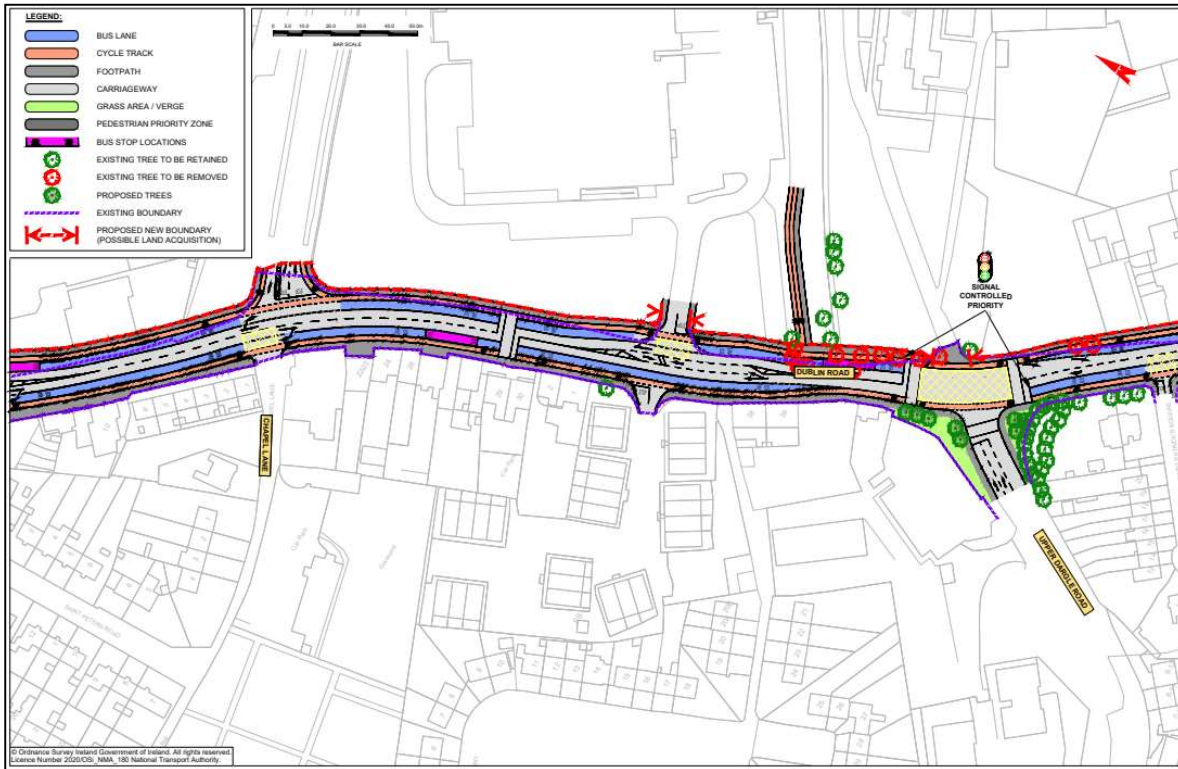
The proposals for the Phase 2 Riverside Quarter of the full Masterplan Development will include for the provision for the potential of LUAS Stop within the development lands (with an indicative location detailed on Figure 8-7). The masterplan for the development lands takes cognisance of the provision of the Luas extension and its interface with the development and locations of LUAS stops.

- **BusConnects – Core Bus Extension:** The NTA are currently developing the BusConnects Scheme, which includes the Corridor 13 Bray to UCD and City Centre. As the R761 lies on BusConnects Route 13 Bray to the City Centre, a full upgrade of the carriageway and associated junctions will be provided along the R761. The BusConnects Route 13 layouts adjacent the site are shown in Figure 8-8 and Figure 8-9 while the typical cross-section is shown in Figure 8-10.

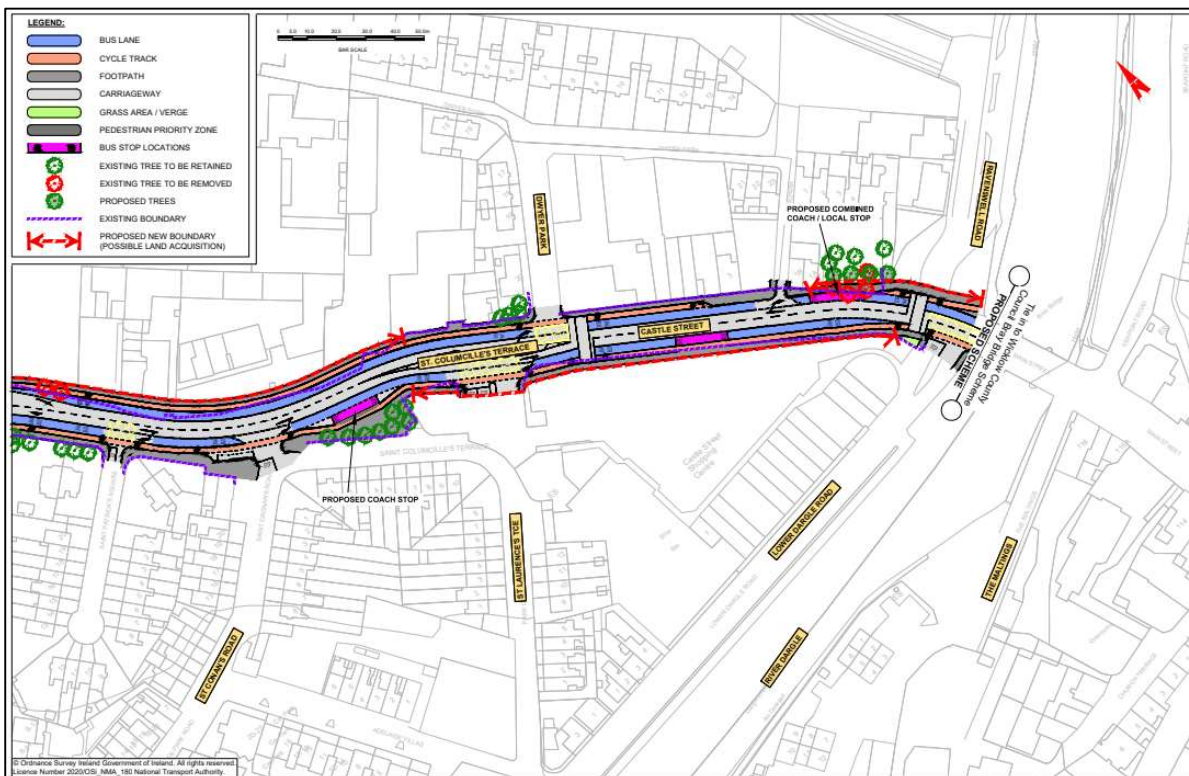
The BusConnects project also includes redesigning the existing bus network in order to provide an improved bus network. The proposed network improvements are shown in Figure 8-11 and Figure 8-12.



**Figure 8-7 - Future Public Transport Provision**



**Figure 8-8 - BusConnects Route 13 (busconnects.ie - Core Bus Corridor 13 Bray to City Centre – Information Brochure Map 53)**



**Figure 8-9 - BusConnects Route 13 (busconnects.ie - Core Bus Corridor 13 Bray to City Centre – Information Brochure Map 54)**

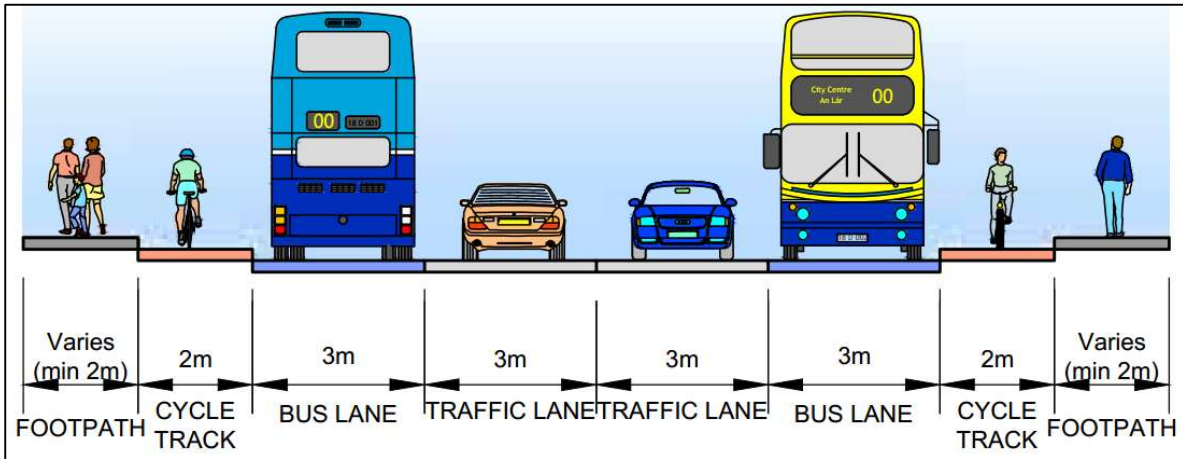


Figure 8-10 - BusConnects Typical Cross Section (busconnects.ie - Core Bus Corridor 13 Bray to City Centre – Information Brochure)

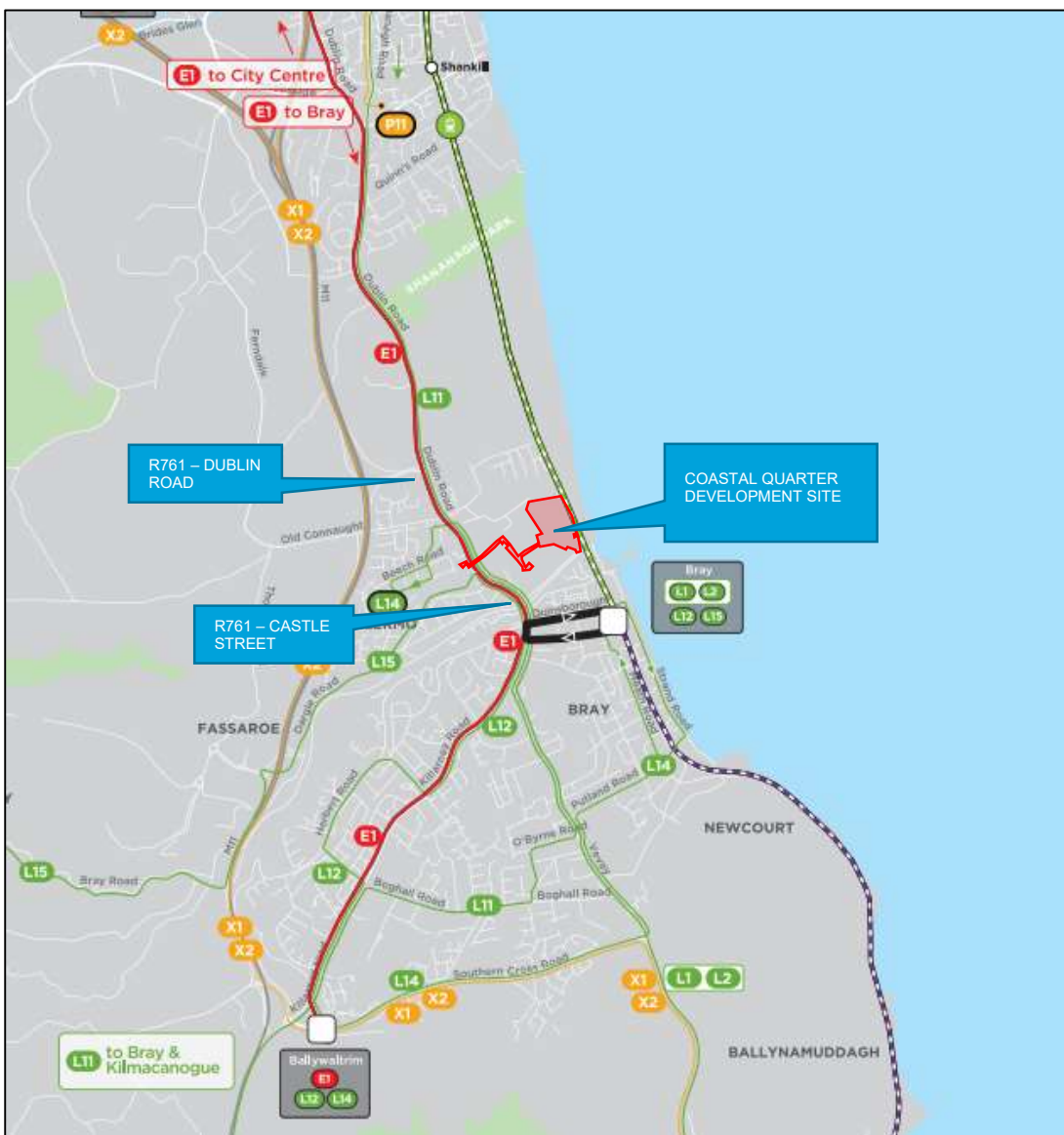


Figure 8-11 - BusConnects Bus Network Map - Bray (busconnects.ie – busconnects final summary report)

	Route	From	Via	To	How Often*	
<b>Spine and Branch Routes (all via City Centre)</b>	<b>E1</b>	<b>Bray</b>	Shankill - N - Stillorgan Rd - Donnybrook - City Centre (O'Connell St - St Stephen's Green) - Phibsborough - St Mobhi Rd - Glasnevin - Ballymun	<b>Balbutcher Lane</b>	Every 10-15 mins	
	Spines are very frequent routes made up of individual bus services timetabled to work together along a corridor. At the end of the corridor, the individual services branch out to serve different areas. E.g. where bus services A1, A2, A3 and A4 join together that forms the A-Spine.					
<b>Other City Bound Routes</b>	<b>11</b>	<b>Belarmine</b>	Sandyford Village - Dundrum Rd - Milltown - Ranelagh - Merrion Sq	<b>Mountjoy Sq</b>	Every 60 mins	
	<b>12</b>	<b>Enniskerry</b>	Stepaside - Belarmine - Sandyford Village - Dundrum Rd - Milltown - Ranelagh - Merrion Sq	<b>Mountjoy Sq</b>	Every 60 mins	
	<b>98</b>	<b>Loughinstown Park</b>	Sallynoggin - Dun Laoghaire - Blackrock - Merrion Rd - Ballsbridge - City Centre (Merrion Sq)	<b>Mountjoy Sq</b>	Every 60 mins	
	<b>198</b>	<b>Glencullen</b>	Blackglan Rd - Sandyford Rd - Balally	<b>Dundrum Luas</b>	Every 120 mins	
<b>Local Routes</b>	<b>201</b>	<b>Bray Station</b>	Greystones - Kilcoole - Newcastle - Newtownmountkennedy - Kilpedder - Glenview (Loop Service)	<b>Bray Station</b>	Every 40 mins	
	<b>202</b>	<b>Bray Station</b>	Greystones - Kilcoole - Newcastle - Newtownmountkennedy - Kilpedder - Glenview (Loop Service)	<b>Bray Station</b>	Every 40 mins	
	<b>211</b>	<b>Kilmacanogue</b>	Killarney Rd - Boghall Rd - Bray - Shankill - Shanganagh Rd - Sallynoggin	<b>Dun Laoghaire</b>	Every 20 mins	
	<b>212</b>	<b>Bray Station</b>	Killamey Rd - Herbert Rd	<b>Southern Cross</b>	Every 10-15 mins	
	<b>213</b>	<b>Kiltiernan</b>	Stepaside - Sandyford Ind Est - Stillorgan - Nutley Lane - St Vincent's Hospital - Sydney Parade - Sandymount	<b>Ringsend Bus Garage</b>	Every 60 mins	
	<b>214</b>	<b>Palermo</b>	Bray Main St - Putland Rd	<b>Southern Cross</b>	Every 30 mins	
	<b>215</b>	<b>Bray Station</b>	Upper Dargle Rd - M - Enniskerry	<b>Shop River</b>	Every 60 mins	
	<b>222</b>	<b>Bride s Glen Luas</b>	Wyatville Rd - Churchview Rd - Sallynoggin	<b>Dun Laoghaire</b>	Every 10-15 mins	
	<b>226</b>	<b>Kiltiernan</b>	Glenamuck Rd - Carrickmines - Cornelscourt Hill Rd - Deansgrange Rd - Benamore Rd - Carysfort Ave	<b>Blackrock</b>	Every 30 mins	
	Local services provide important connections within local areas, linking to local retail centres and to onward transport connections (e.g. to Rail and Luas, or Spine routes).					
	<b>For clarity, Peak Only services are also illustrated on a separate map available on the BusConnects website.</b>					
	<b>Peak-time Routes</b>	<b>301</b>	<b>Kilcoole</b>	Charlesland - Greystones - Bray Southern Cross - N - UCD - St Stephen's Green	<b>Townsend St</b>	Peak - Only
<b>302</b>		<b>Newcastle</b>	Kilcoole - Charlesland - Greystones - Bray Southern Cross - Cherrywood - UCD - St Stephen's Green	<b>Townsend St</b>	Peak - Only	
<b>311</b>		<b>Shankill</b>	Ballybrack - Baker's Corner - Stillorgan - UCD - St Stephen's Green	<b>Townsend St</b>	Peak - Only	
<b>313</b>		<b>Kiltiernan</b>	Stepaside - Sandyford Ind Est - Stillorgan	<b>UCD</b>	Peak - Only	
Peak-time services operate during the peak travel periods, generally weekday mornings and evenings.						

\*Midday frequency shown in table. Services may be more frequent in peak hours. Less frequent at weekends/evenings.

**Figure 8-12 - BusConnects Bus Network Proposals - Bray ( busconnects.ie – busconnects final summary report)**

### 8.3.4. Road Network

#### 8.3.4.1. Existing

The proposed development accesses onto existing development roads providing access to the wider street network, the R761 Dublin and R761 Castle Street. The existing development road onto the R761 Dublin Road to the north provides access to Junction 5 of the N11 / M11. The existing development road onto the R761 Castle Street to the south provides access to Bray Town Centre and the N11 road via the Lower Dargle Road & Upper Dargle Road. These road connections are detailed in Figure 8-13 below.



**Figure 8-13 - Local Road Network**

A description of the key roads is provided in the following sections:

### 8.3.5. Existing Northern Development Road

The existing northern development access road is in full ownership of the Applicant. Please refer to Atkins Drawing 5214419-ATK-ZZ-ZZ-SK-SD-2001 for information on its status. This development road consists of the elements below:

- two traffic lanes
- hatched median with traffic islands
- northbound / westbound bus lane (terminated at the school access junction)
- raised adjacent cycle paths both sides
- footpath both sides

A typical cross-section of the road is shown in Figure 8-14 below.





**Figure 8-14 - Existing Northern Development Road**

### 8.3.6. Existing Southern Development Road

The existing southern development access road is in full ownership of the Applicant. Refer to Atkins Drawing 5214419-ATK-ZZ-ZZ-SK-SD-2001 for information on its status. This development road consists of the following elements:

- two traffic lanes;
- raised adjacent cycle paths both sides; and
- footpath on the western side.

A typical cross-section of the road is shown in Figure 8-15 below.



**Figure 8-15 - Existing Southern Development Road**

### 8.3.7. Existing Eastern Development Road

The existing eastern development access road is in full ownership of the Applicant. Please refer to Atkins Drawing 5214419-ATK-ZZ-ZZ-SK-SD-2001 for information on its status. This development road consists of the elements below:

- two traffic lanes
- raised adjacent cycle paths both sides
- footpath on the northern side

A typical cross-section of the road is shown in Figure 8-16 below.



**Figure 8-16 – Existing Eastern Development Road**

### 8.3.8. R761 Dublin Road

The R761 Dublin Road consists of the following elements:

- two traffic lanes;
- wide central hatched median with turning lane pockets at major junctions;
- on-road cycle lanes both sides; and
- footpath on both sides.

A typical cross-section of the road is shown in Figure 8-17 below.



**Figure 8-17 - R761 Dublin Road**

### 8.3.9. R761 Castle Street

The R761 Dublin Road consists of the elements below:

- two traffic lanes
- bus lane on one side southbound
- on-road cycle lane on one side northbound
- footpath on both sides

A typical cross-section of the road is shown in Figure 8-18 below.



**Figure 8-18 - R761 Castle Street**

### 8.3.9.1. Future

The existing and proposed road network is shown in Figure 8-19 below and consists of the following elements:

- The proposed BusConnects Core Corridor 13 scheme upgrade of the R761 and associated junctions to facilitate a widened road corridor incorporating improved bus, cycle and pedestrian facilities as detailed in Section 8.3.3.2;
- A new connection to Bray Dart Station will be provided via the proposed Public Transport Bridge (Part 8 – Bray Sustainable Transport Bridge, Planning Reference PRR 21/869). Part 8 planning has been granted and is currently under judicial review. This is in line with the requirements of Road Objectives R05 of the Bray Municipal District Local Area Plan and will cater for public transport bus and Luas services together with pedestrians and cyclists;
- Improvements for pedestrians & cyclists are proposed on Castle Street Bridge as per the requirement of Transport Objective R10 of the Bray Municipal District Local Area Plan as detailed in Section 8.3.3.2. As outlined previously, these consist of new pedestrian and cyclists bridges on both sides of the existing bridge and the provision of southbound bus lane across the bridge; and,
- As part of the Masterplan for the full Harbour Point Masterplan a further development road (shown in dashed purple below) linkage is proposed at the existing traffic signal-controlled junction of the Upper Dargle Road. This is in line with the requirements of Road Objectives R05 of the Bray Municipal District Local Area Plan. This link will further improve permeability of pedestrians, cyclists to and through the development and general traffic onto the local road network.

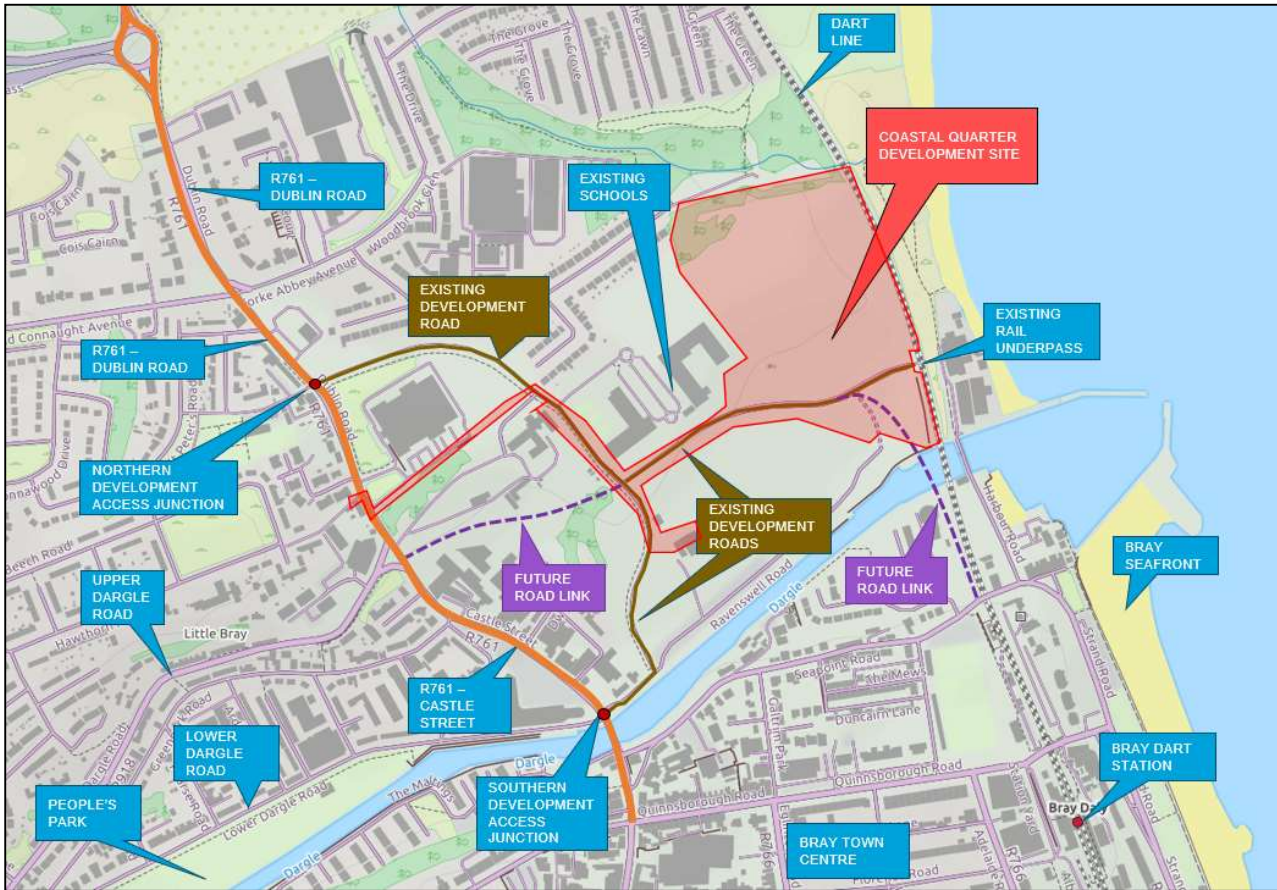


Figure 8-19 - Existing & Future Road Provision

## 8.4. Proposed Development

As mentioned previously, the Coastal Quarter Development constitutes Phase 1 of the greater Harbour Point Masterplan Development. The Coastal Quarter Development comprises a mix of residential units, childcare facility, cafe, retail unit and mixed use commercial space. The following sections provide a detailed description of the transport-related infrastructure provision which is expected to support the proposed Coastal Quarter development.

### 8.4.1. Car Parking

#### 8.4.1.1. Residential House & Duplex Units Car Parking

The determination of car parking provision for the non-apartment residential units were based on a combination of the rates found in the “Dún Laoghaire-Rathdown County Development Plan” and the “Wicklow County Development Plan”. The car parking rates associated with each development plan are shown in Figure 8-20 and Figure 8-21 for the respective Dún Laoghaire (2022 – 2028) and Wicklow Development Plans (2016 – 2022).

Land Use		Zone 1 MTC Areas and Blackrock	Zone 2 Near Public Transport	Zone 3 Remainder of County (non-rural)	Zone 4 Rural
<b>Houses:</b>	<b>Criterion</b>	<b>Maximum</b>	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>
House 1 bed	unit	1	1	1	Case by case
House 2 bed	unit	1	1	1	Case by case
House 3 bed or more	unit	1	2	2	Case by case
<b>Apartments and Sheltered Housing:</b>					
Apt 1 bed	unit	1	1	1*	Case by Case
Apt 2 bed	unit	1	1	1*	Case by Case
Apt 3 bed +	unit	1	2	2*	Case by Case

Figure 8-20 - DLRCC Residential Car Parking Requirements

**Car parking**

- 2 off street car parking spaces shall normally be required for all dwelling units over 2 bedrooms in size. For every 5 residential units provided with only 1 space, 1 visitor space shall be provided. Parking for non-

**Figure 8-21 – Wicklow County Development Plan Residential Car Parking Requirements**

Given the site’s location within the developed urban area and direct proximity to both DART and bus public transport services, Bray town centre, schools, retail, leisure amenities etc. the car parking proposal to be applied to the house and duplex units is outlined below:

- 1 resident space for 2 Bed Units;
- 1.5 resident spaces for 3 Bed Units;
- 2 resident spaces for 4 Bed Units; and,
- 1 visitor space per 10 units

This parking proposal is below the maximum requirements of both the Dún Laoghaire-Rathdown County Development Plan and Wicklow County Development Plan requirements and is in accordance with both councils’ policies to promote the reduction of car use in new developments in close proximity to public transport services and proximity to Town Centre. The parking proposal for the house and duplex units is detailed Table 8-3 below.

**Table 8-3 - House & Duplex Units Car Parking Proposal**

Unit Type	No of Units	Resident Parking Ratio	Resident Parking Requirement	Visitor Parking Ratio	Visitor Parking Requirement
2 Bed Houses	13	1 per unit	13	1 per 10 units	1
3 Bed Houses	51	1.5 per unit	77	1 per 10 units	5
4 Bed House	12	2 per unit	24	1 per 10 units	1
2 Bed Duplex	26	1 per unit	26	1 per 10 units	3
3 Bed Duplex	26	1.5 per unit	39	1 per 10 units	3
<b>Total</b>	<b>128</b>	<b>Total Resident Requirement</b>	<b>179</b>	<b>Total Visitor Requirement</b>	<b>13</b>

A total of 192 no. parking spaces are therefore required for the house and duplex units (including visitor parking). A total of 189 no. will be provided with 179 no. assigned to the residents and a further 13 no. for the visitors. Allocation of these spaces is as shown on Atkins drawings 5214419-ATK-01-ZZ-DR-CE-0119 and 5214419-ATK-01-ZZ-DR-CE-0120.

**8.4.1.2. Apartment Units Car Parking**

The car parking requirements from Section 4.21 of the Design Standards for New Apartments (DHLGH 2018) for all three location classifications are summarised as follows:

**Peripheral and/or Less Accessible Urban Locations:**

*“As a benchmark guideline for apartments in relatively peripheral or less accessible urban locations, one car parking space per unit, together with an element of visitor parking, such as one space for every 3-4 apartments, should generally be required.”*

**Intermediate Urban Locations:**

*“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.”*

**Central and/or Accessible Urban Locations:**

*“In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such rail and bus stations located in close proximity.*

*These locations are most likely to be in cities, especially in or adjacent to (i.e. within 15 minutes walking distance of) city centres or centrally located employment locations. This includes 10 minutes walking distance of DART, commuter rail or Luas stops or within 5 minutes walking distance of high frequency (min 10 minute peak hour frequency) bus services.”*

Given the development site characteristics noted in Section 8.3 the development site would be classified as an intermediate urban location with central location characteristics. Whilst a specific standard for intermediate locations is not stated, the range of provision extends from 1 car space per unit for residential and 1 car space per 3-4 units for visitor in peripheral locations to potentially zero provision in a central location.

The car parking provision for apartments is considered an appropriate provision which is well below the potential one space per unit provision in peripheral locations, but which also affords the residents a reasonable and balanced potential to avail of car ownership whilst not necessarily availing of travel by car for day to day trip purposes. The car parking proposal to be applied to the apartment units is outlined below:

- A range of 0.72 to 0.65 per unit for residential parking; and
- 1 visitor space per 20 units.

This parking proposal is in accordance with both councils’ policies to promote the reduction of car use in new developments near public transport services. The parking proposal for the apartment units is detailed Table 8-4 below. It should be noted that Block A is proposed to be a Buy to Rent (BTR) scheme, enabling more pro-active management of car parking, thus justifying a reduced car parking provision.

**Table 8-4 - Apartment Units Car Parking Proposal**

Apartment Unit	No of Apartment Units	Resident Parking Ratio	Resident Parking Requirement	Visitor Parking Ratio	Visitor Parking Requirement
Block A Undercroft	162	0.72 per unit	117	1 per 20 units	8
Block B Undercroft & Basement	190	0.62 per unit	118	1 per 20 units	10
Block C Undercroft	80	0.6 per unit	48	1 per 20 units	4
Block D Undercroft	26	0.6 per unit	16	1 per 20 units	1
<b>Total</b>	<b>458</b>	<b>Total Resident Requirement</b>	<b>299</b>	<b>Total Visitor Requirement</b>	<b>23</b>

A total of 322 no. parking spaces are therefore required for the apartment units. A total of 322 no. will be provided with 299 no. to be assigned to residents and 23 no. for visitors. Allocation of these spaces is as shown on Atkins drawings 5213890-ATK-01-ZZ-DR-CE-0119 and 5193890-ATK-01-ZZ-DR-CE-0120.

**8.4.1.3. Non-Residential Uses**

The non-residential uses are located within the Wicklow County Council area and parking is to be provided in accordance with the Wicklow County Council development plan. In line with the residential parking provision, the non-residential uses parking provision are below or aligned with the maximum rate for the Non-Residential Uses as detailed in Table 5-1 of the Wicklow County Council Development Plan. Table 8-5 below details the WCC maximum rate and the development provision. The development provision is set out in the context of the local catchment of both the creche and retail units and therefore a very strong potential for short distance trips to be made on foot.

**Table 8-5 - Non-Residential Use Car Parking Proposal**

Non-Residential Use	Area/Details	WCC Maximum Car Parking Rate Table 7.1	WCC Maximum Parking Requirement	Development Proposed Parking Rate	Development Parking Proposal
Commercial (Juice Bar/Gym)	512m <sup>2</sup>	5/100m <sup>2</sup> floor area	13	1/100m <sup>2</sup> floor area	5
Convenience Store (Block C)	249m <sup>2</sup>	4/100m <sup>2</sup> floor area	10	2/100m <sup>2</sup> floor area	5
Cafe	195m <sup>2</sup>	4/100m <sup>2</sup> floor area	8	2/100m <sup>2</sup> floor area	4
Creche (16 Staff & 80 Children)	627m <sup>2</sup>	0.5 spaces per staff member + 1 car parking space per 10 children	16 (8 for staff + 8 for set-down)	0.5 spaces per staff member + 1 car parking space per 20 children	12 (8 for staff + 4 for set-down)
<b>Total</b>			<b>47 (39 + 8 Set down)</b>		<b>26 (22 + 4 Set down)</b>

The non-residential uses will be accommodated with 26 no. spaces to be located in a combination of Block B and Surface parking spaces around Block C. A total of 2 no. dedicated set-down spaces will be provided on street adjacent the Creche with the adjacent visitor spaces utilised to allow for the remaining 2 no. set-down spaces. This will allow for a dual use of parking spaces throughout the day, avoiding an over provision of parking.

#### 8.4.1.4. Car Parking Allocation

The location of car parking is detailed in Table 8-6 below. Allocation of these spaces is as shown on Atkins drawings 5214419-ATK-01-ZZ-DR-CE-0119 and 5214419-ATK-01-ZZ-DR-CE-0120.

**Table 8-6 - Development Car Parking Provision**

Parking Location	Total Car Parking Provision	Resident Car Parking	Visitor	Commercial	Staff	Set-down / Club Car
At Grade (on-street & In-Curtilage)	223	182	14	4 – Café 5 – Retail 5 – Juice Bar / Gym	0	8 - set down 4 - creche set down 2 - car share
Block A Undercroft	125	117	8		0	0
Block B Undercroft & Basement	165	143	14		8	0
Block C Undercroft	23	23			0	0
Block D Undercroft	13	13			0	0
<b>Total</b>	<b>549</b>	<b>478</b>	<b>36</b>	<b>14</b>	<b>8</b>	<b>14</b>

Notes:

*At Grade - 4 spaces are to be allocated to serve Block D (3 no. for residents and 1 no visitor bay)*

*Block B - 29 spaces are to be allocated to serve Block C, of which, 25 are resident spaces while 4 are visitor*

*Block B: All creche staff parking (8 no. in total) to be in basement*

*Creche: 4 no. set-down spaces for creche (1 no. space is shared with visitor spaces).*

*Set-down / Club Car: 2 no. car club space, other 8 no. spaces are general set-down spaces.*

#### 8.4.1.5. Accessible Parking

The Dún Laoghaire-Rathdown County Development Plan notes that 4% of the total number of spaces is to be suitable for use by disabled persons. The Development Design Standards of the Wicklow County Development Plan notes that 5% of the total number of spaces is to be suitable for use by disabled persons.

The development will provide disabled parking at a rate of 4% as detailed in Table 8-7 below.

**Table 8-7 - Disable Parking Proposal**

Parking Location	Total Car Parking Provision	Accessible Parking (>4%)
On-Street & On Curtilage	223	9
Block A Undercroft	125	6
Block B Undercroft	165	7
Block C Undercroft	23	1
Block D Undercroft	13	1
<b>Total</b>	<b>549</b>	<b>24</b>

#### 8.4.1.6. Electric Vehicle (EV) Charging

The DLRCC Development Plan requires for electric charging points to be provided according to the following:

- Installation of external recharging point for electric vehicles in each dwelling;
- Installation of 1 charging point for every 10 car parking spaces and the installation of ducting for all parking spaces within the property.

The Wicklow County Development Plan (2016 – 2022) requires that 10% of all residential car parking spaces are capable of accommodating E-Charging. The draft Wicklow County Development Plan (2022 – 2028) states that a minimum of one car parking space per five car parking spaces should be equipped with one fully functional EV charging point. Ducting for every parking space is also required.

With all requirements considered, it is proposed that a minimum of 10% of all spaces will be delivered as EV Charging upfront and, in addition, all remaining spaces will be provided with the infrastructure to enable E-Charging in the future.

A total of 223 no. surface car parking spaces have been proposed, of which 113 no. are in-curtilage and 110 no. are on-street. In addition, there are 330 no. under croft spaces proposed.

The proposed E-Charging provision is shown in Table 8-8 below. It should be noted that all of the on-curtilage parking is fully served by EV ducting to be activated by the owner.

**Table 8-8 - EV Parking Proposal**

Parking Location	Total Car Parking Provision	EV Parking
On-Street & On Curtilage	223	20
Block A Undercroft	125	25
Block B Undercroft & Basement	165	13
Block C Undercroft	23	5
Block D Undercroft	13	3
<b>Total</b>	<b>549</b>	<b>66</b>



Allocation of these spaces is as shown on Atkins drawings 5214419-ATK-01-ZZ-DR-CE-0119 and 5214419-ATK-01-ZZ-DR-CE-0120.

#### 8.4.1.7. Car Club Scheme and Set Down

A Car Club scheme is a sustainable service which allows multiple people to use the same vehicle at different times. The scheme reduces car ownership, car dependency, congestion, noise and air pollution as well as frees up land which would otherwise be used for additional parking spaces. Most Car Club users only use a car when necessary and walk and use public transport more often than car owners. The addition of Car Club vehicles in the proposed Coastal Quarter development would allow residents to have access to pay-as-you-go driving, in close proximity to their homes, which will increase usership of the service.

It is proposed to provide 2 no. Car Club spaces within the proposed Coastal Quarter development. Based on the uptake of the scheme, there is potential to provide additional car sharing spaces. In overall terms car sharing spaces can replace up to 15 no. traditional car parking spaces. Allocation of these spaces is as shown on Atkins drawings 5214419-ATK-01-ZZ-DR-CE-0119 and 5214419-ATK-01-ZZ-DR-CE-0120.

#### 8.4.1.8. Motorcycle Spaces

Motorcycle parking is provided within the apartment under-croft areas in line with the DLR Development Plan at 4 spaces per 100 car parking spaces. As such a total of 24 no. motorcycle spaces are provided as follows:

- Block A – 12 no. spaces
- Block B – 10 no. spaces
- Block C – 2 no. spaces
- Block D – no spaces

Allocation of these spaces is as shown on Atkins drawings 5214419-ATK-01-ZZ-DR-CE-0119 and 5214419-ATK-01-ZZ-DR-CE-0120.

### 8.4.2. Bicycle Parking

#### 8.4.2.1. House & Duplex Units

Similarly, to the car parking provision, the determination of bicycle parking for the non-apartment residential units have been based on a combination of the rates found in the Dún Laoghaire-Rathdown County Development Plan and the Wicklow County Development Plan.

Dún Laoghaire-Rathdown Standards for Cycle Parking and associated Cycling Facilities for New Developments (DLRCC, 2015) details the cycle parking requirement which is shown in Figure 8-22.

Section 7 of Volume 3 - Appendix 1 - Development Design Standards of the Wicklow County Development Plan noted below notes the residential dwelling parking requirements in Figure 8-23 below.

Bicycle parking for the House & Duplex Units is provided on curtilage as secure bike stores to the front of the units. It is proposed to provide bicycle stores that facilitate 2 bicycles per unit. This equates to 256 no. bicycle storage spaces. This is considered to be a sufficient provision to cater for resident bicycles and also allows for the accommodation of visitor bicycles to the units.

Table 4.1 Cycle parking for residential development		
Residential Development type	1 short stay (visitor) parking space per: (Minimum of 2 spaces)	1 long stay parking space per: (Minimum of 2 spaces)
Apartments, Flats, Sheltered housing	5 units	1 unit
Houses - 2 bed dwelling	5 units	1 unit
Houses - 3+ bed dwelling	5 units	1 unit
Sheltered housing	5 units	1 unit
Student Accommodation	5 bedrooms	2 bedrooms

The following should be noted when providing cycle parking for residential areas:

- **Private houses:** Cycle parking should preferably be provided within the footprint of the dwelling but should not require the bike to be brought through the house. Where no private or communal garage is provided, bikes should be stored in private garages, a shed in the garden or secure communal cycle parking compounds. Wall bars or rings are acceptable at the front of a house for short term parking.

Figure 8-22 - DLRCC Residential Bicycle Parking Requirements

Bicycle parking standards Table 7.2	
Type of Development	Cycle Parking Standard
Residential units	1 space per bedroom + 1 visitor space per 2 units

Figure 8-23 - Wicklow County Development Plan Residential Bicycle Parking Requirements

8.4.2.2. Apartment Units

The apartment buildings will have secure residents bike storage rooms in the individual building undercrofts. All bike storage areas in undercrofts and the basement of Block B can be reached from at grade either by ramp or entrances from grade. Each apartment block has been designed to have high quality and immediately accessible bike parking adjacent to entrances.

Bicycle Parking requirements from Section 4.17 of the Design Standards for New Apartments is detailed below in Figure 8-24.

- **Location** – cycle storage facilities should be directly accessible from the public road or from a shared private area that gives direct access to the public road avoiding unnecessarily long access routes with poor passive security or, slopes that can become hazardous in winter weather.
- **Quantity** – a general minimum standard of 1 cycle storage space per bedroom shall be applied. For studio units, at least 1 cycle storage space shall be provided. Visitor cycle parking shall also be provided at a standard of 1 space per 2 residential units. Any deviation from these standards shall be at the discretion of the planning authority and shall be justified with respect to factors such as location, quality of facilities proposed, flexibility for future enhancement/enlargement, etc.

Figure 8-24 - Apartment Guidelines Bicycle Parking Requirements

The minimum bicycle parking rates within the Design Standards for New Apartments of 1 no. bicycle space per bedroom for residential and 1 no. bicycle space per 2 no. units for visitor is to be provided. The bicycle parking proposal for the apartment units is detailed in Table 8-9 below.

**Table 8-9 - Apartment Units Bicycle Parking Proposal**

Apartment Unit	No of Apartment Units	Resident Parking Ratio	Resident Parking Requirement (no.)	Visitor Parking Ratio	Visitor Parking Requirement (no.)
Block A	162 (79 no. one bed 76 no. two bed & 7 no three bed)	1 per bedroom	252	1 per 2 units	81
Block B	190 (94 no. one bed, 86 no. two bed & 10 no 3 bed)	1 per bedroom	296	1 per 2 units	95
Block C	80 (45 no. one bed, 31 two bed & 4no. three bed)	1 per bedroom	119	1 per 2 units	40
Block D	26 (20no. one bed & 6no. two bed)	1 per bedroom	32	1 per 2 units	13
<b>Total</b>	<b>458</b>	<b>Total Resident Requirement</b>	<b>699</b>	<b>Total Visitor Requirement</b>	<b>229</b>

A total of 928 no. bicycle parking spaces are required for the apartment units with 699 no. for residents and 229 no. for visitors. The following provision is proposed.

**Table 8-10 - Apartment Units Bicycle Parking Proposal**

Apartment Unit	Resident (located within curtilage of Apartment Blocks)	Visitor (located within Under-croft of Apartment Blocks)	Visitor (located at convenient locations adjacent Apartment Blocks))	Total Visitor
Block A	277	58	23	81
Block B	326	48	47	85
Block C	126	20	44	64
Block D	62	8	6	14
<b>Total</b>	<b>791</b>	<b>134</b>	<b>120</b>	<b>254</b>

In total 1,045 no. resident spaces have been provided for, 791 no. of these within accessible and secure locations within the under croft allocated for residents, and 254 no. allocated for visitors, 134 no. of which are located within the under croft and 120 no. of which are located at convenient locations outside the apartment blocks. The allocation of these spaces is as shown on Atkins drawings 5214419-ATK-01-ZZ-DR-CE-0119 and 5214419-ATK-01-ZZ-DR-CE-0120.

#### 8.4.2.3. Non-residential Bicycle Parking

The non-residential uses are located within the Wicklow County Council area and bicycle parking is to be provided in accordance with the requirement for Non-Residential Uses as detailed in Table 7.2 of the Wicklow County Council development plan. Table 8-11 below details the WCC maximum rate and the development provision.

**Table 8-11 - Non-Residential Use Bicycle Parking Proposal**

Non-Residential Use	Area/Details	WCC Minimum Bicycle Parking Rate Table 7.2	WCC Minimum Bicycle Parking Requirement (no.)	Development Proposed Bicycle Parking Rate	Development Bicycle Parking Proposal (no.)
Commercial	512m2	20% of employee numbers subject to minimum of 10 bicycle places or one bike space for every car space, whichever is the greatest.	-	1 per parking space	5
Creche	627m2 (16 Staff & 80 Children)	None provided	-	1 per 4 Staff and 1 per 10 children	4 for staff + 8 for drop off
Convenience Store	249m2	1 space for every 10 car spaces	1	1 space for every 10 car spaces	1
Cafe	195m2	1 space for every 10 car spaces	1	1 space for every 10 car spaces	1

The non-residential uses will be provided with 19 no. cycle parking spaces. 4 no. staff spaces and 8 no. set-down spaces will be provided for the creche. As the development will provide visitor cycling parking for the apartment residential units this can also be utilised for the creche drop-off cycle parking and as additional cycle parking for non-residential uses.

### 8.4.3. Mobility Hub at the Orchard Site

It is proposed that a mobility hub be considered around the orchard area. The intention of the mobility hub is to provide residents, employees and visitors with a suite of different mobility options aimed at discouraging the use of the private cars where possible. The hub is anticipated to include the following:

- Bike rental;
- Secure bike parking (for both regular and cargo bikes);
- EV charging for electric bikes;
- Car Share (the two Car Club spaces are proposed to be located in this area).

The location of the car sharing sites are shown on Atkins drawings 5214419-ATK-01-ZZ-DR-CE-0119 and 5214419-ATK-01-ZZ-DR-CE-0120.

### 8.4.4. Emergency Vehicle Access

In accordance with Sections 8.2.4.15 of Dún Laoghaire-Rathdown County Development Plan, an additional access for emergency use is required to be provided for developments of over 300 units on a case-by-case basis. The development is served by two vehicle access points onto the Eastern Development Road with a further fire tender access via the open space adjacent the DART Line as indicated on Figure 8-25 below. Therefore, the development provides appropriate emergency access.

The character of the development access roads connecting the development to the R761, as detailed in Section 8.3.4, illustrates there are two existing access routes on to the Dublin Road via the Northern Development Road and Southern Development Road. In addition, the Eastern Development Road facilitates emergency vehicles to mount the kerb and traverse the footpath and cycle path in the unlikely event that the main carriageway of this road is blocked. The use of the footpath and cycle track provision by vehicles mounting the kerb will act as the primary emergency access route.



**Figure 8-25 - Emergency Access**

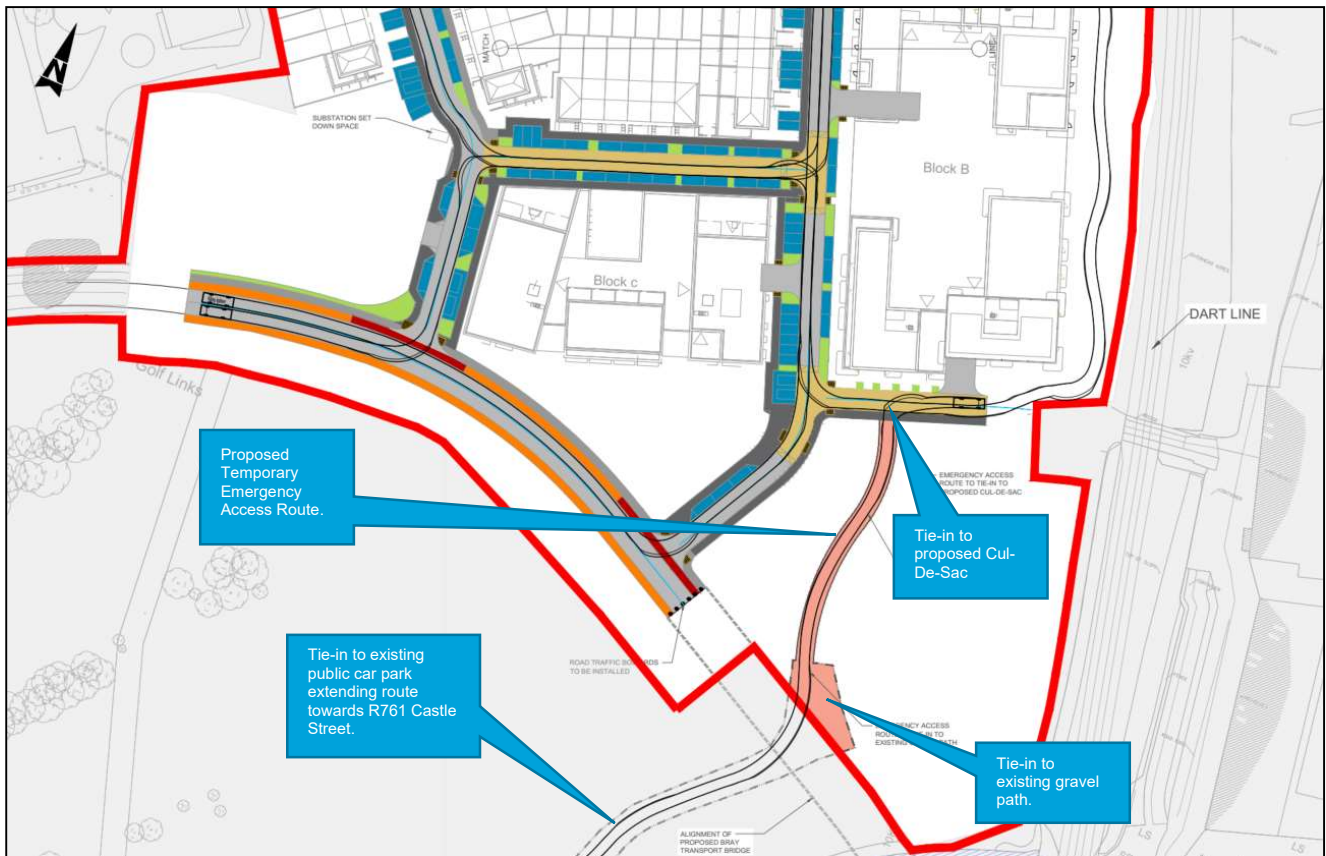
However, in the rare event that the primary access route may be potentially impassable a further secondary emergency access point has been provided. This proposed secondary emergency access point is provided towards the south of the site and connects via a vehicle crossover with the Cul-De-Sac adjacent Apartment Block B and will route through the open space provision south of this, before tying in with the existing gravel path which ultimately leads to the public car park and onto the R761 Castle Street.

The emergency access road which routes through the open space provision will be of reinforced grass construction and will in part overlap with the paths proposed within the open space. The landscape scheme has been designed to accommodate the emergency access and road levels can be accommodated by the existing ground levels so as not to raise levels in this flood zone area.

This proposed secondary emergency access road will intersect with the alignment of the future public transport road. The need for this secondary emergency access route will be replaced either once the street network of the River Quarter (Phase 2 of the Harbour Point Masterplan) is built along with the street connection out towards the Upper Dargle Road / Dublin Road Junction or once the public transport bridge (Part 8 – Bray Sustainable

Transport Bridge, Planning Reference PRR 21/869) and road connecting into the Eastern Development Road is built, whichever occurs first.

Figure 8-26 below, extract taken from Drawing 5214419-ATK-01-ZZ-DR-CE-0108 illustrates the route of the proposed temporary secondary emergency access route.



**Figure 8-26 – Temporary Secondary Emergency Access**

It should be noted that the proposed secondary emergency access road is located within the in 1000-year (0.1% AEP) fluvial flood extents. Discussion on this and its acceptability is outlined in Section 8.1.4 of the accompanying Flood Risk Assessment (5214419DG0019).

The internal road design incorporates appropriate access on all streets for fire tender and ambulance access and incorporates the fire tender route via the open space as per Figure 8-25 adjacent to Block A and Block B apartment units. This is illustrated on the fire tender vehicle auto-tracking layouts contained within the engineering drawings and the surfacing of the route is appropriately treated as detailed by Park Hood Landscape Architects.

### 8.4.5. Service Vehicles

Refuse collection and deliveries will be facilitated through the design of the streets to a design vehicle refuse truck. This is illustrated on the refuse vehicle auto-tracking layouts contained within the engineering drawings.

Deliveries and refuse servicing the houses, duplex units and the Block D apartment units will be appropriately accommodated by parking on street which will carry low traffic volumes and wherein there is adequate space for other traffic to pass a delivery vehicle.

Deliveries and refuse vehicles servicing the Block A, Block B and Block C apartment units will be appropriately accommodated within the bays provided adjacent these units.

### 8.4.6. Existing Underground Irish Water Foul Storage Tank Access

The Orchard is designed as communal amenity space for the development. Access to the existing underground Irish Water foul storage tank will be via the access point to the Orchard Car Park off the proposed development access road. This access will incorporate a drop-down barrier which will be controlled by the management company and will be accessible on a 24 hour daily basis. Vehicle tracking for this car park has been undertaken

to ensure that the standard 18m<sup>3</sup> tanker used by Irish Water can be facilitated. All existing manhole lids and vented access point cover lids that are proposed to be trafficked shall be adequately designed at detailed design stage to be suitable for vehicle trafficking. Vehicle swept paths have been undertaken with a similar sized vehicle with a three axle wheelbase of 4.3m (+1.3). Figure 8-27 below from drawing 5214419-ATK-01-ZZ-DR-CE-0126 demonstrates this clearly.

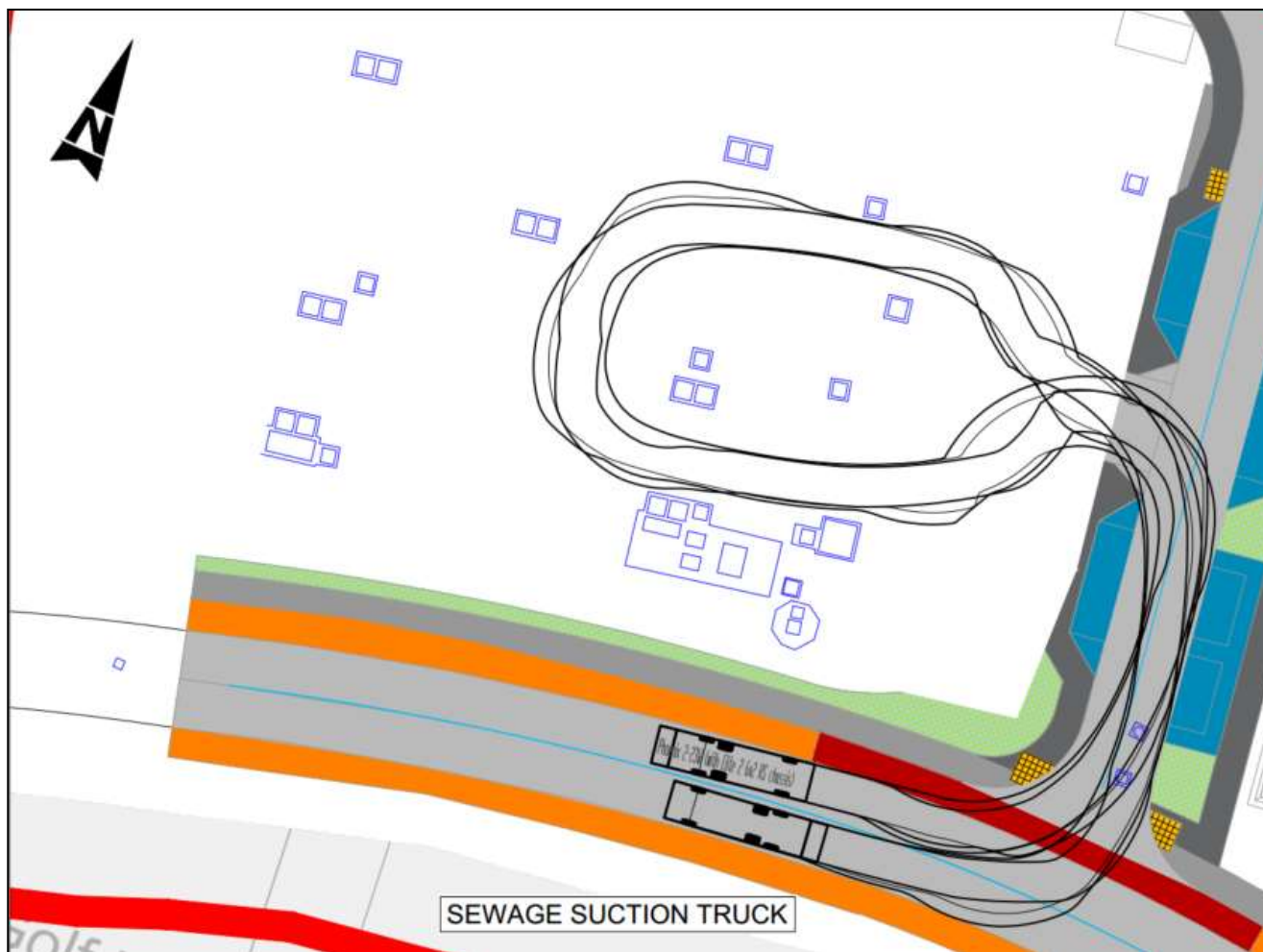


Figure 8-27 – Existing Underground Irish Water Foul Storage Tank Access

## 8.5. Potential Traffic Impacts on the Local Road Network during Construction Phase

This section of the Chapter deals with the traffic impacts of construction of the proposed development. As such this section will provide an overview of the construction duration, the anticipated construction traffic generation and a non-exhaustive list of key construction traffic management measures.

### 8.5.1. Construction Traffic Generation

The overall traffic generation for the construction phase of the proposed development has been devised with the anticipated volumes of excavation of the site from the Contractor. For the purpose of this assessment, the following assumptions have been applied:

#### 8.5.1.1. Heavy Goods Vehicles

- The primary construction activities (i.e. excavation and construction) will take place over ca. 48 months during which the majority of HGV movements will occur;
- The greatest number of HGV movements will occur during the enabling and excavation works stage;

- The enabling and excavation works stage is assumed to take place over a period of time in the range of 10 – 12 months. A period of 10 months has been utilised to represent a worst case scenario from a traffic perspective;
- The anticipated volume of material to be moved (imported and exported) during the enabling and excavation works is ca. 79,511 m<sup>3</sup> which is made up of the following
  - Topsoil to be Exported: ca. 3569 m<sup>3</sup>
  - Topsoil to be reused on site: ca. 10685 m<sup>3</sup> (400mm deep topsoil)
  - Subsoil Exported: ca. 37630 m<sup>3</sup>
  - Imported Material: ca. 27,627 m<sup>3</sup>
- A bulking factor of 10% has been applied to the above excavation volume;
- It is envisaged that the works required to implement the development shall only be carried out between the hours of;
  - Monday to Friday: 08h00 to 18h00;
  - Saturday: 08h00 to 14h00;
  - Sunday and Public Holidays: No activity on site;
- It is assumed that there will be 20 working days in each month. As such, the total material required to be moved each day over a period of 10 months will be ca. 340m<sup>3</sup>;
- It is assumed that a Rigid HGV carries up to 20 tonnes in terms of payload and an articulated vehicle can carry up to 30 tonnes payload. However, for the purpose of a robust assessment the lower 20 tonne payload has been used in this assessment. A combination of both is envisaged to be utilised by the contactor. Taking into account a typical soil bulk density of 1.3 this would equate to ca. 15m<sup>3</sup> per load,

#### 8.5.1.2. Site Operatives

- An average peak level of site operatives has been assumed to be in the order of 300;
- An average occupancy level of 3 operatives per vehicle is assumed;
- It is assumed that 20% of site operatives will utilise public transport;
- It is assumed that the average peak level of site operatives will coincide with the peak level of HGV movements during the enabling and excavation works. In reality this will not occur as the enabling / excavation works will occur during the first year of the 3 year construction period, whilst the peak level of site operatives will occur during the third year. However, for the purpose of assessment, this scenario has been considered to represent a robust assessment of the potential construction impacts;
- As such, the average number of two-way LGV vehicle movements per day will be 80; and,
- It is assumed that in the order of 80% of these trips will arrive to the site between the hours of 07h00 and 08h00, with the remaining 20% arriving during the period 08h00 to 09h00. In terms of departures it is assumed that 30% will depart during 16h00 and 17h00, 20% between 17h00 – 18h00hrs and 50% between 18h00 – 19h00hrs.

The profiles have been quantified against the peak daily number of site operative and HGV traffic and are presented in Table 8-12 below.

**Table 8-12 - Anticipated Hourly Profile of Movements during the Day**

Peak Hour	HGV Movements (two way)	Site Operative Movements	Total Movements
07h00 - 08h00	-	64	64
08h00 - 09h00	4	16	20
09h00 - 10h00	4	-	4
10h00 - 11h00	4	-	4
11h00 - 12h00	4	-	4



12h00 - 13h00	4	-	4
13h00 - 14h00	4	-	4
14h00 - 15h00	4	-	4
15h00 - 16h00	4	-	4
16h00 - 17h00	4	24	28
17h00 - 18h00	4	16	20
18h00 - 19h00	-	40	40
Total	40	160	260

The above construction traffic volumes have been reviewed with the baseline flows on the adjacent road network and the resulting percentage impact is shown in Table 8-13 below.

**Table 8-13 - Percentage Impact during the Construction Phase of the proposed development**

Junction	Peak Period	Opening Year	Site Operative Traffic During Peak Hour	HGV Traffic During Peak Hour	Total Two Way Flow	% Impact
R761 Dublin Road	AM (08h00 – 09h00)	1396	16	4	20	1.4%
	PM (17h00 – 18h00)	1348	16	4	20	1.5%

The above table demonstrates that the increase in construction traffic volumes associated with the site is below 5% during the AM peak hour and PM peak hours of the adjacent road network. 5% is the threshold level noted within TII’s Traffic and Transport Assessment Guidance (2014) as being the point where a sensitive road network should be subject to detailed assessment.

It is therefore considered that the level of traffic impact during the construction stage is of an acceptable level in the short term. It should be noted that HGV movements can be managed so as not to occur during the background traffic peak period, particularly the AM school drop off period. This will be further addressed in the Construction Stage Traffic Management Plan and associated liaison with the Planning Authority. In terms of assessment, assuming that the school drop off period for the adjacent primary schools is between 08:00-09:00 hours this would result in no HGV movements during the AM peak hour and thus the percentage traffic impact would be lower. Assuming that the school pick up times of the adjacent primary schools occur between 13:00-14:00 it is not considered that this would impact of the HGV movements during the PM peak period.

The above reported impacts represent a short term slight negative impact due to construction traffic. The inclusion of HGV traffic in the assessment provides a more robust analysis, further reinforcing the slight impact of the construction traffic on the surrounding road network.

### 8.5.2. Construction Haul Routes

To access the proposed development, HGV’s travelling from the north will utilise Junction 5 of the M11 (the Wilford Interchange) via the Wilford Roundabout and travel south along the R761 before accessing Northern Access route to the proposed development and onto the Eastern Access Route and entering the proposed development. HGV’s leaving the site to travel to the north will utilise the same route. HGV’s attending the site from the south will also utilise Junction 5 of the M11 (the Wilford Interchange) but this time via Old Connaught Avenue and then travel south along the R761 before accessing Northern Access route to the proposed development and onto the Eastern Access Route and entering the proposed development. HGV’s leaving the site to travel to the south will utilise the same route as those vehicles travelling to the north but will take the correct southbound lane of the Wilford Interchange. These routes are illustrated in Figure 8-28 below.

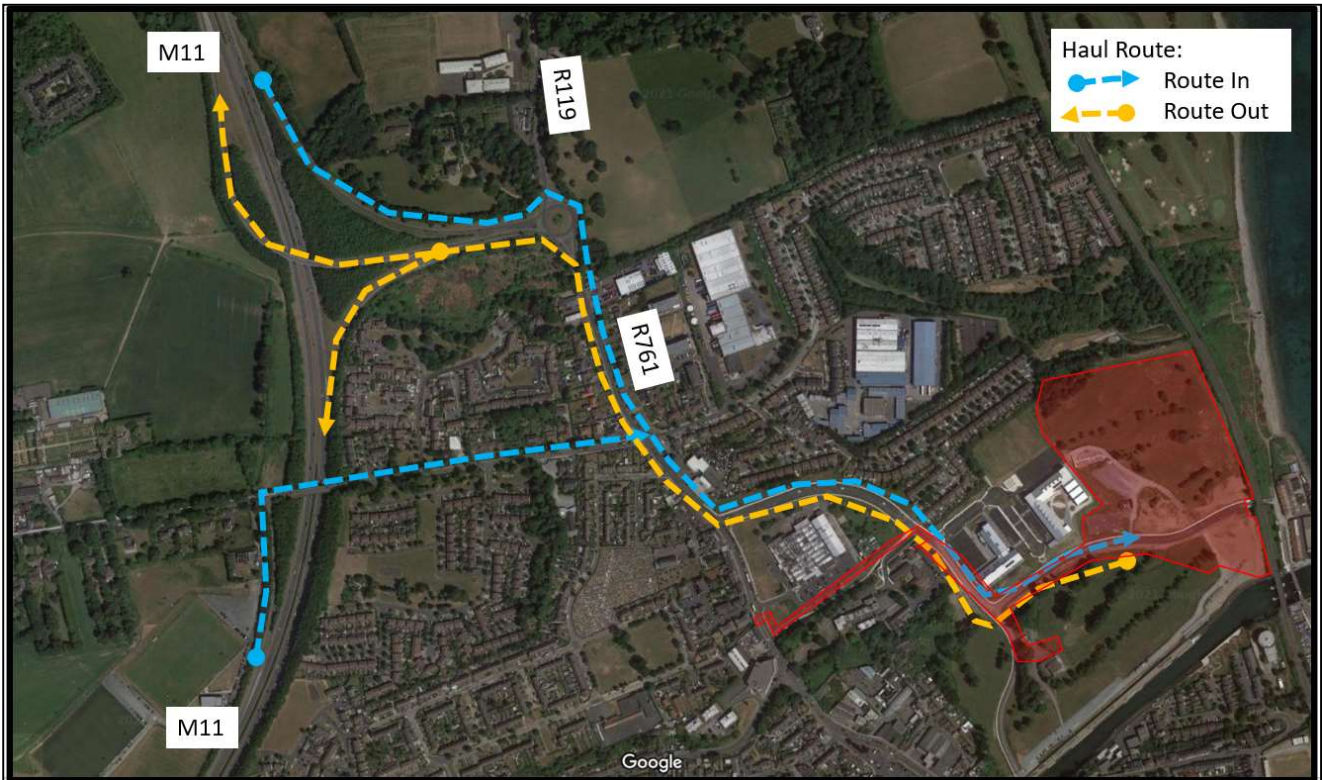


Figure 8-28 – Construction Haul Routes

## 8.6. Potential Traffic Impacts on the Local Road Network during Operational Phase

### 8.6.1. Assessment years and Traffic Growth

The following assessment years are identified to inform the Traffic and Transport Assessment in line with the TII guidelines.

- Opening Year 2024
- Opening Year +5 2029
- Opening Year +15 2039

The annual traffic growth for traffic counter TMU M11 010.0 N on the adjacent N11 for the periods of 2018 to 2022 is shown in Table 8-14. This data was used to assess general growth in traffic over the last five years.

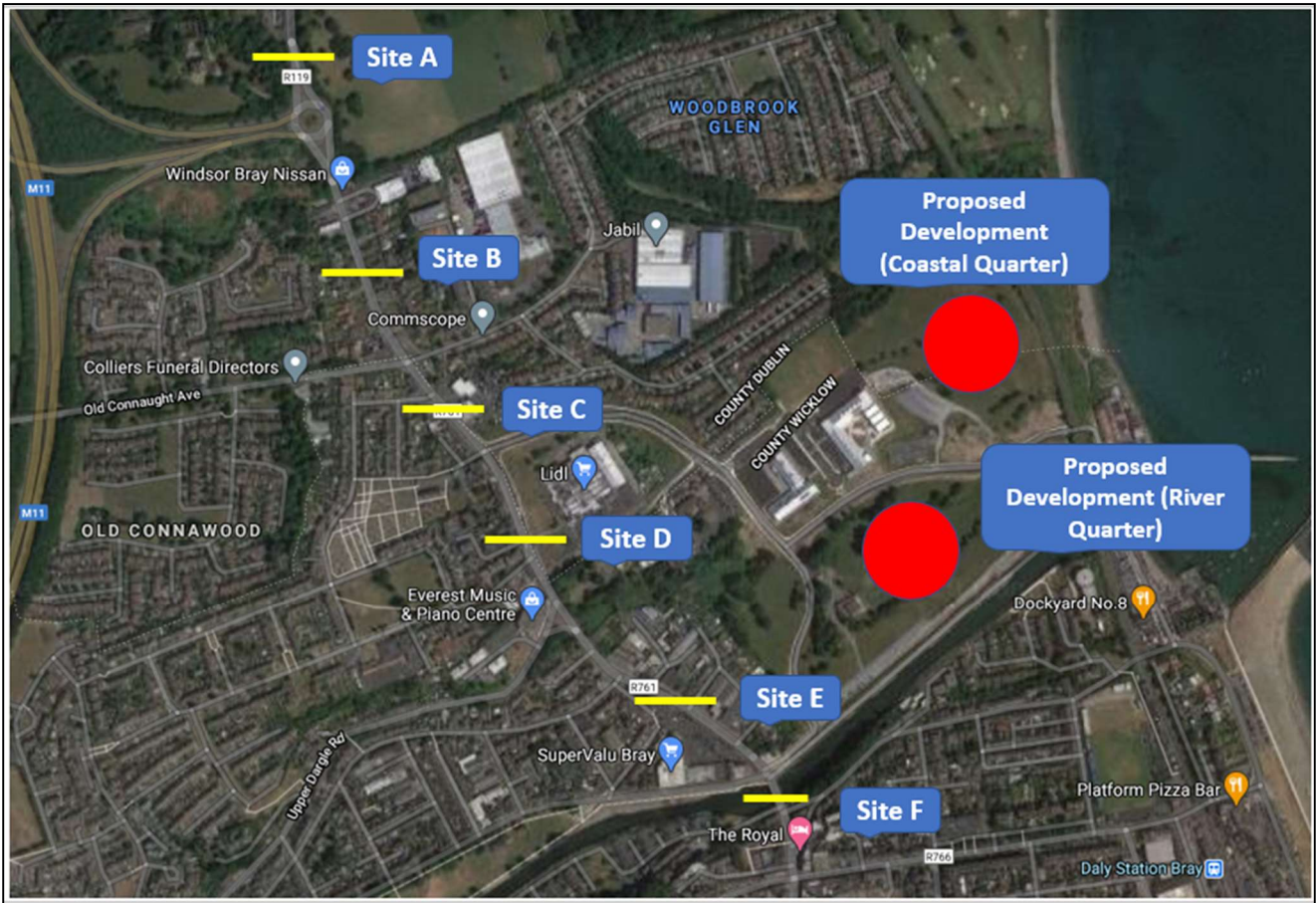
Table 8-14 – N11 Counter TMU M11 015 Growth Percentage

Year	AADT	% Growth from Pervious Year
2018	77400	-
2019	78145	+1.0%
2020	53975	-30.9%
2021	64819	+20.0%
2022	75987	+17.2%

The N11 traffic data indicates 20% and 17% increase in traffic flow in the period 2020 to 2021 and 2021 to 2022. The recovery from the impact of Covid19 has resulted in an increase in traffic volumes on the road network.

Based on the surveyed junction turning counts AADT figures have also been calculated utilising the methodology outlined within TII PAG Unit 16.1 – Expansion Factors for Short Period Traffic Counts (PE-PAG-02039). Future

traffic growth and proposed development traffic generation has been taken account for the future design years. Figure 8-29 below illustrates the location where AADT calculations have been performed.



**Figure 8-29 - AADT Site Location Map**

Junction turning counts were undertaken at the relevant junctions in the vicinity of the site on the 29th May 2019 of which 5 no. of these counts will be utilised for the traffic assessment of this development. In addition to the junction turning counts noted above, several Automatic Traffic Counts (ATC) were also undertaken in 2019. These 2019 counts were undertaken prior to the Covid19 impacts. The traffic surveys are provided in Appendix B.

Additional junction turning counts at 3 no. junctions were carried out on the 22nd October 2020, along with 4 no. ATCs that aligned with the 2019 locations. These traffic counts were then compared in order to determine the total reduction in traffic as a result of the Covid19 measures. It was found that the 2020 traffic counts were approximately 15% lower than pre-covid19 levels. As a result, the 2020 traffic counts were all adjusted by 15% in order to account for Covid19.

Site A, Site B and Site D are based on 2019 Junction Traffic Count (JTC), Site C, Site E, and Site F are based on adjusted 2020 Junction Turning Count (JTC) surveys. Table 8-15 below details the resultant AADT volumes.

**Table 8-15 - AADT Volumes as per JTC Counts**

Scenarios	AADT Volumes					
	Site A	Site B	Site C	Site D	Site E	Site F
2020 Base Year	5195	8802	7775	7738	6706	9892
2024 Opening Year without Development	5195	8802	7775	7738	6706	9892

2024 Opening Year with Phase 1 Development	5281	9023	8048	7738	6706	10046
2024 Opening Year with Full Phase Development	5441	9438	8047	8289	8264	10407
2029 Opening Year without Development	5195	8802	7775	7738	6706	9892
2029 Opening Year with Full Phase Development	5441	9438	8047	8289	8264	10407
2039 Opening Year without Development	5195	8802	7775	7738	6706	9892
2039 Opening Year with Full Phase Development	5441	9438	8047	8289	8264	10407

### 8.6.2. Total Person Trip Rates

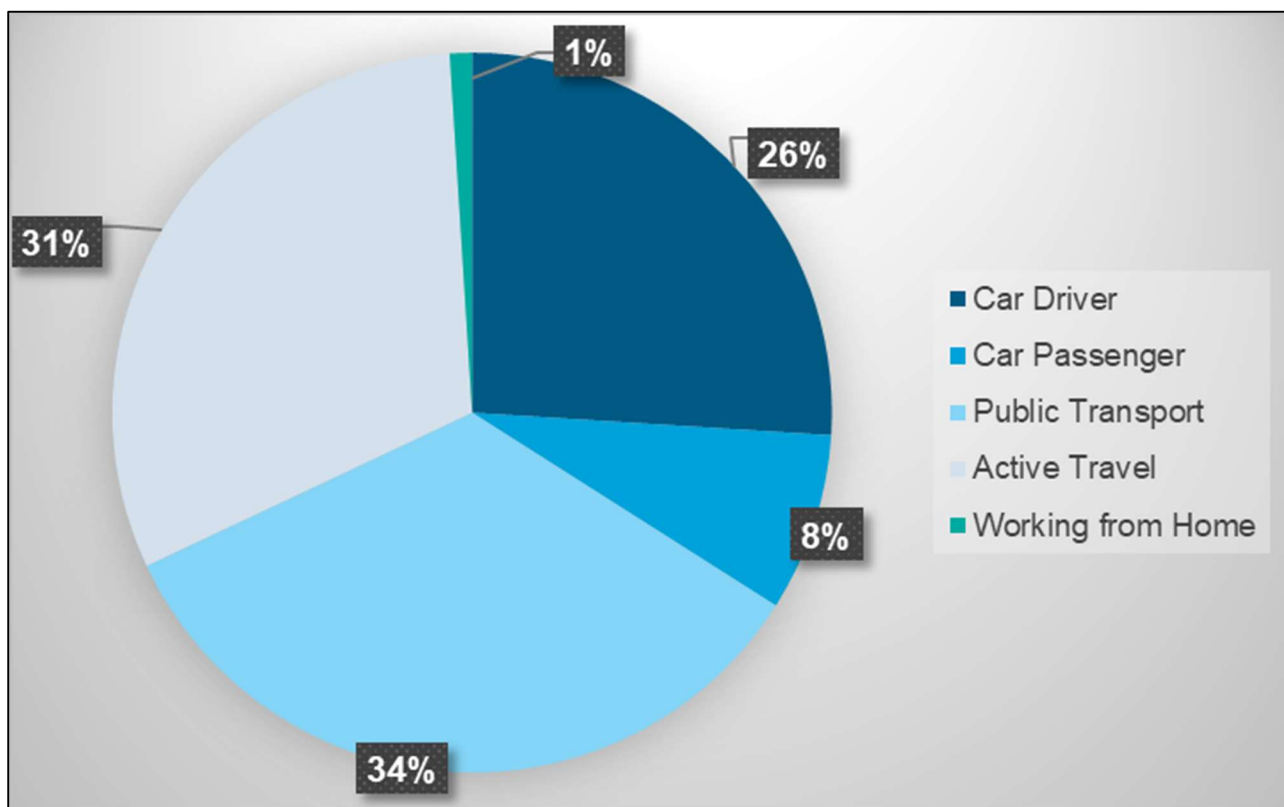
A trip rate estimation exercise has been undertaken using TRICS (Trip Rate Information Computer System) to determine total person trip rates for the residential elements of the development. The total person trip rates estimated from the TRICS database are summarised in Table 8-16 below with further details contained within the full Traffic and Transportation Assessment being submitted as part of planning.

**Table 8-16 - Total Person Trip Rates**

Use	Units	Period	Arrivals	Departures
Houses & Duplex	Per Unit	AM	0.200	0.765
		PM	0.615	0.282
Apartments	Per Unit	AM	0.106	0.552
		PM	0.368	0.177

### 8.6.3. Mode Share

The existing mode share for the development site has been taken from the CSO Census 2016 'Small Areas' data from the area which best represented the proposed site. The mode share for this area is shown in Figure 8-30 below.



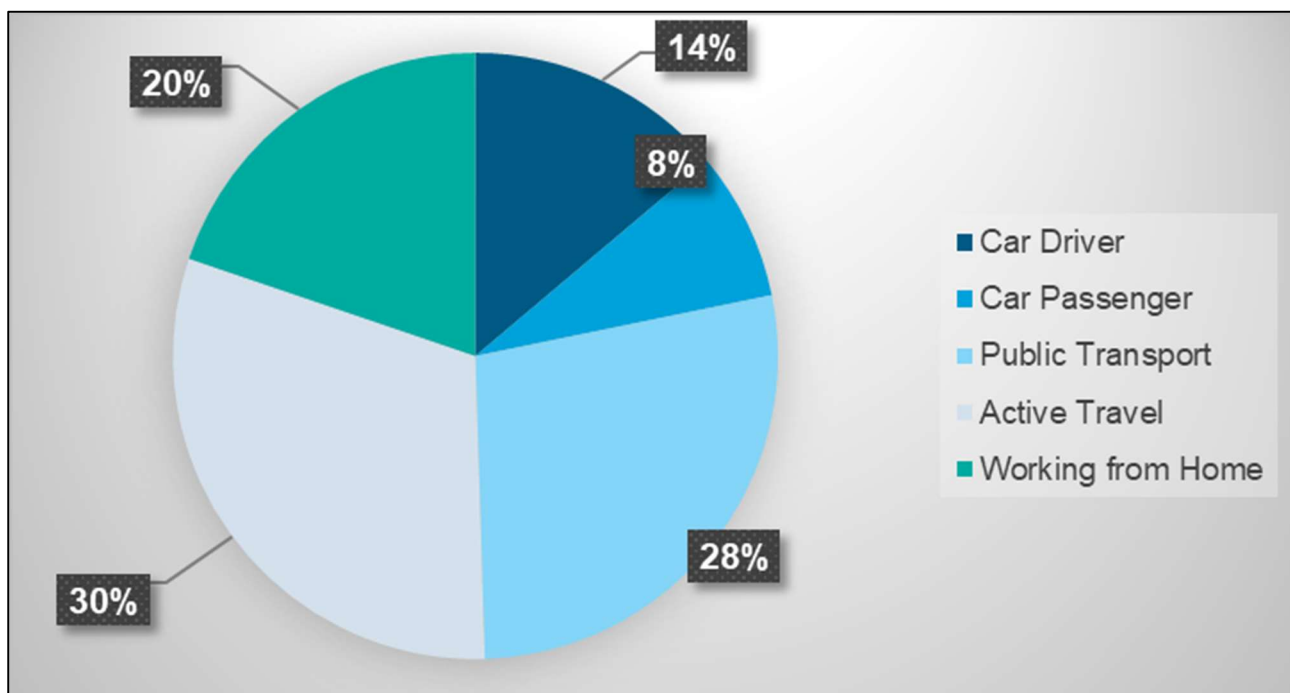
**Figure 8-30 - 'Small Area' Ref: Sa2017\_257081012 Mode Share - CSO (2016)**

The proposed development will deliver similar active travel mode shares as detailed in Figure 8-30 through delivery of pedestrian and cyclists' facilities and connections to public transport and Bray Town.

In January 2021 the National Remote Work Strategy was published by the Department of Enterprise Trade and Employment which sets out the long-term strategy to promote home and remote working for public sector and private sector employees. The strategy mandates that 20% of the public sector workforce to move to home and remote working in 2021. The strategy notes that the Regional Working Analysis study carried out in 2020 shows that more than 25% of the private sector workers in Ireland can work remotely. As a result, legislation was drafted in Q3 of 2021 to provide employees the right to request remote work to ensure that work from home opportunities are available to employees after the removal of Covid-19 restrictions.

Therefore, it can be reasonably assumed that the remote working patterns that have developed from the Covid-19 restrictions will continue to be a substantial level in the post Covid-19 scenario. Indeed, it can be reasonably assumed that this will be the case regardless of any legislative provisions given the ability of organisations, both public and private, to adapt to remote working and the clear benefits that maintaining a remote working capability will bring to both employees and employers. In overall terms this longer-term change in working patterns will help achieve a longer-term fundamental change in travel behaviour by reducing the need to travel to work daily.

The residents of the Harbour Point development will avail of the home and remote working opportunities including flexible working opportunities as promoted by the National Remote Work Strategy. The estimated opening year mode share for the site based on the increase in working from home is detailed in Figure 8-31 below.



**Figure 8-31 - Proposed Development Opening Year Mode Share**

The work from home percentage has been applied based on 20% of both the public and private sector workforce moving to home and remote working. The increase in the work from home percentage has been incorporated as a reduction of car driver and public transport mode shares. Furthermore, the National Remote Work Strategy also promotes flexible working allowing employees the opportunity to avoid peak time travel. Therefore, the application of the 20% work from home percentage is appropriate as it allows for both home working on any given day also a flexible working approach that will facilitate employees travelling to work to do so outside of normal peak hour periods.

Furthermore, the NTA have published a note on the Alternative Future Scenario for Travel Demand (November 2020). This note sets out the approach adopted by the NTA to assess the potential legacy that the Covid-19 pandemic will have on travel demand and travel patterns into the future. The note outlines the following alternative trip rate adjustments for commuter and school related trips:

- Blue Collar Workers – no change
- White Collar Workers – 25% reduction
- Education Primary Level – no change
- Education Secondary Level – 10 % reduction
- Education Tertiary Level – 25% reduction

The above adjustments correlate well to the 20% mode share reduction applied on the basis of the remote work strategy and gives further evidential support to the continued shift in behaviour and travel patterns experienced over the past year and its ongoing maintenance into the future.

#### 8.6.4. Vehicle Trip rates

The car driver percentage from the Development Opening Year Mode Share has been applied to the above person trip rates (Table 8-16) to determine the vehicle trip rate for the Coastal Quarter development as detailed in Table 8-17.

In terms of the assessment the impact of the full development of the Harbour Point Masterplan, creche, restaurant & café and local shops will predominantly serve the residents and therefore will have minimal additional traffic impact on the adjacent road and street network. Office and retail uses will contribute to additional trip generation. The vehicle trip rates for the office and retail uses are detailed in Table 8-17 below.

**Table 8-17 - Total Vehicle Trip Rates**

Use	Units	Period	Arrivals	Departures
Houses & Duplex	Per Unit	AM	0.028	0.107
		PM	0.086	0.039
Apartments	Per Unit	AM	0.015	0.073
		PM	0.052	0.025
Office	Per 100m <sup>2</sup>	AM	0.370	0.026
		PM	0.032	0.320
Retail	Per 100m <sup>2</sup>	AM	0.421	0.178
		PM	0.320	0.451

### 8.6.5. Public Transport Trip rates

The public transport percentage from the Coastal Quarter Development Opening Year Mode Share (Figure 8-31) has been applied to the person trip rates to determine the public transport trips for the Coastal Quarter development as detailed in Table 8-18.

**Table 8-18 - Coastal Quarter Public Transport Trip Generation**

Development Type	No.	Period	Person Trip Rate		Person Trip Generation	
			Arrival	Departure	Arrival	Departure
Houses & Duplex	128 units	AM	0.060	0.229	8	30
		PM	0.175	0.085	23	11
Apartments	463 units	AM	0.032	0.157	15	73
		PM	0.110	0.053	51	25
<b>Total</b>				<b>AM</b>	<b>23</b>	<b>103</b>
				<b>PM</b>	<b>74</b>	<b>36</b>

The anticipated public transport trip generation by the proposed Coastal Quarter development during the network peaks is estimated to be 126 people during the AM peak hour and 110 people during the PM peak.

A similar exercise has been undertaken for the full residential element of the Harbour Point Masterplan as follows.

**Table 8-19 - Coastal Quarter Public Transport Trip Generation**

Development Type	No.	Period	Person Trip Rate		Person Trip Generation	
			Arrival	Departure	Arrival	Departure
Houses & Duplex	358 units	AM	0.060	0.229	21	82
		PM	0.175	0.085	63	30
Apartments	879 units	AM	0.032	0.157	28	138
		PM	0.110	0.053	97	47
<b>Total</b>				<b>AM</b>	<b>50</b>	<b>220</b>
				<b>PM</b>	<b>159</b>	<b>77</b>

The anticipated public transport trip generation by the proposed Harbour Point masterplan (residential only) development during the network peaks is estimated to be 270 people during the AM peak hour and 236 people during the PM peak.

Based on the public transport services noted in Section 8.3.3 the peak hour capacity of the services is detailed in Table 8-20 below.

**Table 8-20 - Public Transport Capacity**

Public Transport Type	Period	No. of Services	Capacity
Dart & Rail	AM (08h00-09h00)	9	10080
	PM (17h00-18h00)	8	8960
Bus Services	AM (08h00-09h00)	21	1554
	PM (17h00-18h00)	20	1480
<b>Total</b>	<b>AM</b>	<b>30</b>	<b>11635</b>
	<b>PM</b>	<b>28</b>	<b>10440</b>

The public transport trip generation of the Coastal Quarter development constitutes less than 1% of the public transport capacity and can be readily accommodated within the existing public transport services.

The public transport trip generation of the Harbour Point Masterplan residential element constitutes less than 2.5% of the public transport capacity and can be readily accommodated within the existing public transport services.

### 8.6.6. Traffic Generation

The traffic generation volumes, considering the trip rates and modal splits presented in the previous sections are detailed in Table 8-21 for the Coastal Quarter Development and Table 8-22 for the full build out of the Harbour Point Masterplan Development.

**Table 8-21 - Coastal Quarter Development Traffic Generation**

Development Type	No./Area	Period	Vehicle Trip Rate		Units	Vehicle Trip Generation	
			Arrival	Departure		Arrival	Departure
House & Duplex Units	128 units	AM	0.028	0.107	Per Unit	4	14
		PM	0.086	0.039		11	5
Apartment Units	463 units	AM	0.015	0.073	Per Unit	7	33
		PM	0.052	0.025		23	11
Commercial	512m <sup>2</sup>	AM	0.370	0.026	Per 100m <sup>2</sup>	2	0
		PM	0.032	0.320		0	2
<b>Total</b>					<b>AM</b>	<b>13</b>	<b>48</b>
					<b>PM</b>	<b>35</b>	<b>18</b>



**Table 8-22 - Harbour Point Development Masterplan Development Traffic Generation**

Development Type	No./Area	Period	Vehicle Trip Rate		Units	Vehicle Trip Generation	
			Arrival	Departure		Arrival	Departure
House & Duplex Units	358 units	AM	0.028	0.107	Per Unit	10	38
		PM	0.086	0.039		31	14
Apartment Units	879 units	AM	0.015	0.073	Per Unit	13	64
		PM	0.052	0.025		46	11
Office	5000m <sup>2</sup>	AM	0.370	0.026	Per 100m <sup>2</sup>	19	2
		PM	0.032	0.320		1	16
Retail	12000m <sup>2</sup>	AM	0.421	0.178	Per 100m <sup>2</sup>	51	2
		PM	0.320	0.451		38	54
<b>Total</b>					<b>AM</b>	<b>93</b>	<b>74</b>
					<b>PM</b>	<b>116</b>	<b>95</b>

### 8.6.7. Trip Distribution & Assignment

The trip distribution of vehicles originating and terminating at the proposed development has been based on the distribution of traffic arriving and departing the local road network as defined by the traffic survey locations agreed as part of the Traffic and Transport Assessment scoping exercise. In terms of traffic assignment at junctions, these have been applied logically through manual assignment according to existing travel patterns.

### 8.6.8. Traffic Impact – Coastal Quarter

In order to appropriately assess the traffic impact of the Coastal Quarter development the required modelling scenarios to be tested are based in the first instance on the assumption of growth in background traffic and in the second instance on the assumed period for the full build out of the Coastal Quarter development. Given that the growth in background traffic has been estimated to be a ‘no growth’ scenario then the base year assessment of the relevant junctions based on the 2019 and 2020 traffic surveys also acts as the future year ‘without development’ scenario.

In terms of the build out period for the Coastal Quarter this is assumed to begin in the opening year of 2024 and be completed by 2029, the ‘Opening Year +5’ scenario. Therefore, the only ‘with development scenario’ that needs to be tested, mindful of the ‘no growth’ scenario in background traffic, is the ‘Opening Year +5’. The scenarios are shown in Table 8-23 below.

**Table 8-23 - Proposed development Scenarios**

Scenario	Development
Base Year	No development
Opening +5 Year with development 2029	Full build out of Coastal Quarter Development

An initial assessment was undertaken to quantify the additional traffic from the development that will be distributed onto the local road network and the potentially impacted junctions. In order to determine what level of increase is considered above threshold, reference is made to the TII Traffic and Transport Assessment Guidelines (May 2014). This document outlines the following thresholds:

- Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road; and,
- Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.

In the context of the urban road environment in the vicinity of the development it was considered appropriate to apply the 5% threshold. Junctions which are predicted to be impacted by an increase in traffic in excess of 5%, due to development traffic, were considered for further detailed junction assessment and modelling.

The traffic increase resulting from the proposed development was compared to the base year existing traffic volumes at each junction and the percentage increases are presented in the table below. The assessment was carried out in relation to the traffic generation of the proposed Phase 1 Coastal Quarter.

**Table 8-24 - Percentage Traffic Increase**

Ref:	Description	Period	Development Traffic	Existing Traffic	Average Traffic Increase
Junction 1	Wilford Roundabout	AM	92	1998	4.1%
		PM	68	1950	
Junction 2	Junction of R761 Dublin Road, Old Connaught Avenue & Corke Abbey Avenue	AM	121	2069	5.5%
		PM	99	1939	
Junction 3	Junction of R761 Dublin Road & Development Access Road	AM	121	1771	6.7%
		PM	99	1461	
Junction 4	Junction of R761 Castle Street & Upper Dargle Road	AM	85	1408	5.6%
		PM	81	1559	
Junction 5	Junction of R761 Castle Street, Lower Dargle Road & Ravenswell Road	AM	89	1871	5.9%
		PM	112	1583	
Junction 6	Junction of R761 Castle Street, The Maltings & Seapoint Road	AM	79	1913	5.0%
		PM	95	1581	
Junction 7	Junction of R761 Castle Street, Herbert Road & Quinsborough Road	AM	58	1353	4.7%
		PM	72	1397	
Junction 8	Junction of R761 Main Street, Killarney Road & Vevay Road	AM	40	1092	4.3%
		PM	51	1007	

The junctions wherein the increase in traffic due the full Coastal Quarter development **does not** exceed 5% are summarised as follows:

- Junction 1: Wilford Roundabout;
- Junction 6: Junction of R761 Castle Street, The Maltings & Seapoint Road;
- Junction 7: Junction of R761 Castle Street, Herbert Road & Quinsborough Road; and,
- Junction 8: Junction of R761 Main Street, Killarney Road & Vevay Road;

The junctions wherein the increase in traffic due the full Coastal Quarter development does exceed 5% are summarised as follows;

- Junction 2: Junction of R761 Dublin Road, Old Connaught Avenue & Corke Abbey Avenue;
- Junction 3: Junction of R761 Dublin Road & Development Access Road;
- Junction 4: Junction of R761 Castle Street & Upper Dargle Road; and,
- Junction 5: Junction of R761 Castle Street, Lower Dargle Road & Ravenswell Road.

A junction assessment was then carried out for Junctions 2, 3, 4 and 5 which included sensitivity analyses for different development access usage scenarios as well as modal share. The location of these junction relative to the proposed development is as illustrated in Figure 8-32 below.



**Figure 8-32 - Coastal Quarter Junction Assessment Location**

**Table 8-25 – Operational Traffic Impact**

Assessment Year	Junction 2		Junction 3		Junction 4		Junction 5	
	AM	PM	AM	PM	AM	PM	AM	PM
2020 – Existing Traffic	106.9%	82.3%	29%	10%	66.9%	66.8%	82%	52%
2029 – Junction Assessment	111.9%	83.3%	45%	14%	66.9%	66.8%	86%	58%
2029 – Sensitivity 1: Castle Street Closure	111.9%	83.3%	55%	16%	76.4%	69.4%	76%	54%
2029 – Sensitivity 2: Mode Share	111.3%	83.7%	52%	17%	66.9	66.8%	88%	60%

Based on the above results, it is anticipated that the impact of the Coastal Quarter on the existing road network will be modest and well within the carrying capacity of existing infrastructure, inclusive of the existing public transport network.

It should be noted that, the AM peak degree of saturation (DOS) associated with Junction 2, the R761 Dublin Road, Old Connaught Avenue and Corke Abbey Avenue, is operating above its theoretical capacity of 90%

indicating that the main capacity issues associated with the junction relate to the background traffic on the network and not the traffic generated by the proposed development.

Although junction 2 is expected to operate over capacity, the Opening Year + 5 “Do Something” scenario indicates that the maximum degree of saturation increases on the arms is only 5% above that of the existing traffic scenario. Given the urban nature of this junction, it is not unexpected that this junction is at or slightly over capacity at certain periods of the day. The increase in degree of saturation therefore represents a marginal impact on the junction due to the proposed development.

Thus, the above reported impact represents a long term slight negative effect.

For details on the operational traffic assessment, including junction capacity assessment results, refer to Appendix 8.1.

## 8.7. Mitigation Measures

### 8.7.1. Construction Stage

The following mitigation measure shall apply during the construction stage:

- All construction activities will be managed and directed by a Construction Traffic Management Plan (CTMP). The details of the CTMP will be agreed with the roads department of the Local Authority in advance of construction activities commencing on-site.

Below is a list of proposed traffic management measures to be adopted during the construction works by the Contractor. Note that this is not an exhaustive list, and it will be the appointed contractor’s responsibility to prepare a detailed Construction Traffic Management Plan to be approved with the Planning Authority prior to commencement of construction.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access;
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes;
- Restriction of HGV movements during drop off and pick up times associated with the adjacent schools;
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the Site;
- Parking of Site vehicles will be managed, and will not be permitted on public roads, unless proposed within that designated area that is subject to traffic management measures;
- A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public road leading away from the construction Site;
- On Site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site, to avoid any potential for debris on the local roads;
- All vehicles will be suitably serviced and maintained to avoid leaks or spillage of oil, petrol or diesel. Spill kits will be available on Site. All scheduled maintenance carried out off Site will not be carried out on the public highway; and,
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footway. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users and mobility impaired persons.
- HGV movements will be managed so as not to occur during the background traffic peak period, particularly the AM school drop off period.

The above mitigation measures will minimise any significant environmental degradation or safety concerns in the vicinity of the proposed works, due to the presence of construction traffic. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

## 8.7.2. Operational Stage

The proposed development is consistent with all national, regional and local policies. In particular, those policies and objectives aligned with active and sustainable travel and transportation. Specific mitigation measures proposed include the following:

- Implementation of the public transport bridge (Part 8 – Bray Sustainable Transport Bridge, Planning Reference PRR 21/869) by Wicklow County Council which will link both bus and future Luas services to the Bray DART station. This bridge will improve connectivity to the Site and facilitate the future extension of the Luas to the Bray DART Station;
- The Riverside Quarter includes for the provision of LUAS Stop(s) within the development lands which are expected to decrease dependence on private vehicles;
- The overall Harbour Point Masterplan for the development lands takes cognisance of the provision of the Luas extension and its interface with the development and locations of LUAS stops;
- The proposed BusConnects – Core Bus Corridor Route 13 has been included in the development plans which will further decrease private vehicle usage in the future;
- The development takes cognisance of the NTA’s plans to redesign the bus network and provide a more efficient network with high frequency spines, new orbital routes and increased bus services;
- The development is adjacent and accessible to Routes B1 and 14 /N5 Greater Dublin Area Cycle Network Plan;
- Demand Management is also underpinned by the co-location of residential, education, local retail and leisure and amenity facilities; and,
- The propensity for car ownership and car use is managed through measures that include reduced residential parking provision and increased cycle parking provision in line the ‘Design Standards for New Apartments’. The provision of car club parking spaces will facilitate a lower level of car ownership.

The above mitigation measures will provide alternatives to the private car for making trips and are envisaged to promote low car ownership which will in turn ensure that the level of traffic generation and thus the traffic impact on the local road network is mitigated.

## 8.8. Do Nothing

In the absence of the proposed development (Phase 1 Coastal Quarter), the operational performance of the existing junctions on the surrounding road network will remain unchanged from the base year as a result of the “no growth” expectation. Table 8-26 below outlines the resultant capacity of the relevant local road network.

**Table 8-26 – Do Nothing Scenario**

Assessment Year	Junction 2		Junction 3		Junction 4		Junction 5	
	AM	PM	AM	PM	AM	AM	PM	AM
2020 – Existing Traffic	106.9%	82.3%	29%	10.0%	66.9%	66.8%	82%	52%
2029 – Junction Assessment	106.9%	82.3%	29%	10.0%	66.9%	66.8%	82%	52%
2039 – Junction Assessment	106.9%	82.3%	29%	10.0%	66.9%	66.8%	82%	52%

As can be seen from the above table, the local road network with no development is expected to operate to a satisfactory level during all assessment years.

It should however be noted that, the AM peak degree of saturation (DOS) associated with Junction 2, the R761 Dublin Road, Old Connaught Avenue and Corke Abbey Avenue, is operating above its theoretical capacity of 90% indicating that the main capacity issues associated with the junction relate to the background traffic on the network and not the traffic generated by the proposed development.

## 8.9. Residual Impacts

### 8.9.1. Construction Stage

There will be a slight negative impact due to construction traffic. However, this impact will be short term. This will be mitigated by the introduction of a Construction Traffic Management Plan (CTMP). The CTMP will manage these potential impacts but they will remain as a short term slight negative impact on the adjacent local and strategic road network.

### 8.9.2. Operational Stage

During the operation of the proposed development (Opening Year) there will be a long term not significant negative impact due to increased traffic flows. This will be mitigated by the transportation characteristics integrated into the development as previously noted.

Additionally, during operation there will be an increase in pedestrian and cyclist movements, due to the developments proximate location to the district centre and its services, amenities and public transport facilities, and the upgrade of the crossing link from the proposed development to the town centre. This will positively impact the proposed development and will assist in reducing dependency on car travel.

## 8.10. Monitoring Requirements

Not applicable for this Chapter.

## 9. Land, Soils & Geology

### 9.1. Introduction

This chapter describes the type of land, soils and geology likely to be encountered beneath and in the general area of the proposed development. It also addresses the potential impact of the proposed development on land, soils and geology together with the mitigation measures that will be employed to eliminate or reduce any potential impacts. The proposed development comprises the construction of 586no. residential units (comprising a mix of apartments, duplexes and houses) in addition to a crèche facility, café and 1no. commercial unit (incorporating a gym and a juice bar) and all associated infrastructure and ancillary works on an 8.81ha parcel of land within the former Golf Course lands to the north of Bray Town Centre. A detailed description of the proposed development is presented in Chapter 2 - Project Description.

### 9.2. Study Assessment and Methodology

The following scope of works were undertaken by Atkins in order to complete the land, soils and geology assessment presented in this chapter;

- Desk-based study including review of available historical information;
- Site Walkover Survey by an experienced Geo-environmental Scientist; and,
- Site attendance during the Ground Investigation, undertaken for geo-technical and environmental assessment purposes.

This assessment has been completed in accordance with relevant best practice guidance from the Institute of Geologists of Ireland (IGI), '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*' (IGI, 2013). The IGI guidance document is an updated version of the 2002 guidelines, '*Geology in Environmental Impact Statements, A Guide*' (IGI, 2002), which was revised to take account of legislative changes, and the operational experience developed by geoscientists in the production of relevant environmental assessments. This assessment has also been prepared with regard to the guidelines prepared by the Environmental Protection Agency (EPA) outlined in '*Revised Guidelines on the Information to be contained in Environmental Impact Statements*' published in 2015, '*Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements)*' published in 2015, and also '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' published in May 2022.

The desk-based study involved reviewing information from the following sources: -

- GSI Datasets Public Viewer and Groundwater web-mapping (consulted 12/08/2022);
- Ordnance Survey web-mapping to assess the surface topography and landforms (consulted 12/08/2022);
- EPA Public Viewer and webmapping (consulted 12/08/2022);
- Google Maps Aerial photography (consulted 12/08/2022);
- Bing Maps Aerial photography (consulted 12/08/2022);
- Dún Laoghaire-Rathdown County Council and Wicklow County Council Planning Maps (consulted 12/08/2022);
- Dún Laoghaire-Rathdown County Council County Development Plan 2016-2022 (DLRCC, 2016);
- Dún Laoghaire-Rathdown County Council County Development Plan 2022-2028 (DLRCC, 2022);
- Wicklow County Development Plan 2016 – 2022 (WCC, 2016);
- Draft Wicklow County Development Plan 2022-2028 (WCC, 2022);
- Bray Municipal District Local Area Plan 2018-2024 (WCC, 2017);
- 'Tier 2 Environmental Risk Assessment - Historic Landfill At Bray Harbour, Co. Dublin, December 2016 Report prepared by Fehily Timoney & Co. (2016);
- 'Remediation Option Appraisal - Historic Landfill At Bray Harbour, Co. Dublin, March 2017' Report prepared by Fehily Timoney & Co. (2017); and,
- Site specific soils and bedrock data obtained during the Ground Investigation and documented in a final factual report entitled '*Harbour Point Bray Ground Investigation Report – Factual*' prepared by IGSL Ltd. (2021).

The ground investigation for the proposed development was carried out by IGSL Ltd. (IGSL) between August and September 2020 in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007), BS 5930:2015, and BS 1377 (Parts 1 to 9) (IGSL, 2021). Areas investigated included both onsite locations and one offsite location (ROH04 – located within the general masterplan lands). The following scope of work was completed:

- Trial Pits with in-situ dynamic cone penetrometer testing (10No.);
- Cable Percussion Boreholes (23No.);
- Rotary Core / Rotary Openhole Boreholes (19No.);
- Window Sample Boreholes (10No.);
- Soakaway Tests (to BRE Digest 365) (3No.);
- Groundwater Monitoring / Data Logger installation;
- Ground Gas Monitoring;
- Environmental Soil sampling and laboratory analysis; and,
- Surveying of Exploratory Hole Locations.

The trial pits (TP201 to TP205, TP207 to TP211) were excavated using a JCB 3CX to depths of between 2.3 and 3.0metres below ground level (mbgl). Soakaway testing was also carried out at 3no. locations in accordance with BRE Digest 365. Window sample boreholes (WS01A/B to WS05A/B) were drilled using a Dando Terrier rig to a maximum depth of 5mbgl, 9no. of which were subsequently converted to either shallow groundwater monitoring wells, or ground gas monitoring locations. Cable percussive boreholes (BH201 to BH208, BH210 to BH219, BH221 to BH224) were drilled using a Dando 2000 drilling rig to a maximum depth of 14.5mbgl. 19no. Rotary boreholes were drilled using a using a tracked Comacchio GEO 305 and GEO 405 rig to a maximum depth of ca. 29mbgl. 3no. Rotary openhole boreholes (ROH01, ROH02 & ROH04) were subsequently converted to groundwater monitoring wells for environmental monitoring purposes. Exploratory locations are presented in Figure 9-1 and 9-2.

Gas level measurements were taken in accordance with CIRIA C665:2007 and performed using a calibrated GA5000 gas monitor. Both steady state and peak gas results were recorded during each of the 6no. monitoring events undertaken. The flow rate measurements recorded by the GA5000 were logged after the initial gas quantification readings were taken. During the gas monitoring, the Geotech GA5000 portable gas analyser was used as per the guidelines whilst conforming to the on-screen notifications (IGSL, 2021).

Representative environmental soil samples were collected in accordance with relevant best practice standards (BS10175 – 2011) from selected window sample boreholes, trial pits and boreholes across the Site. Soil samples were taken at regular depth intervals. 20no. soil samples (to a maximum depth of 3mbgl) were subsequently scheduled for laboratory analysis for a comprehensive suite of parameters. All soil samples were stored in chilled cooler boxes, prior to dispatch to a UKAS accredited laboratory.

Full details of the ground investigation are presented in the '*Harbour Point Bray Ground Investigation Report – Factual*' prepared by IGSL (2021) and presented in Appendix 9.1. The Ground Investigation was designed to ensure that all potential onsite and offsite sources of contamination were assessed in terms of potential contamination risks to human health and environmental receptors, as detailed further below.

No difficulties were encountered during the data collection and assessment stages of this land, soils and geology assessment.

## 9.3. Receiving Environment

This section provides a description of the land, soils and geology in the general region of the proposed development and also takes account of the current and historic uses of the proposed development (hereafter referred to as the Site).

### 9.3.1. Site Development

A review of historic maps (including available 6-inch historic maps (1829-41), 25-inch historic maps (1897-1913), Cassini 6-inch historic maps (1830-1930) and aerial photographs (1995 to 2012) from the Ordnance Survey of Ireland) (OSI, 2022) and current aerial photography (Bing Maps, 2022) confirms that land use at the Site has generally been transformed over the years from agricultural land to a former golf course. The surrounding lands have developed considerably since the early nineteenth century. A detailed summary of land use both in relation to the Site and surrounding lands is presented in Table 9-1.

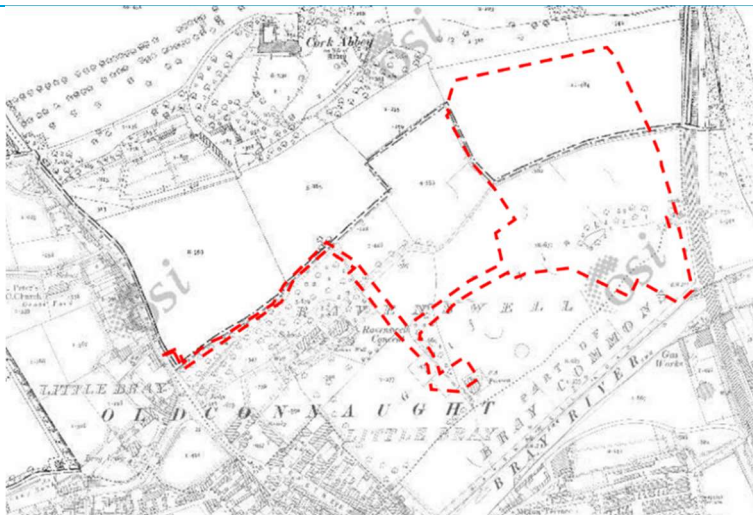


**Table 9-1 – Historic Land Use Development - Summary**



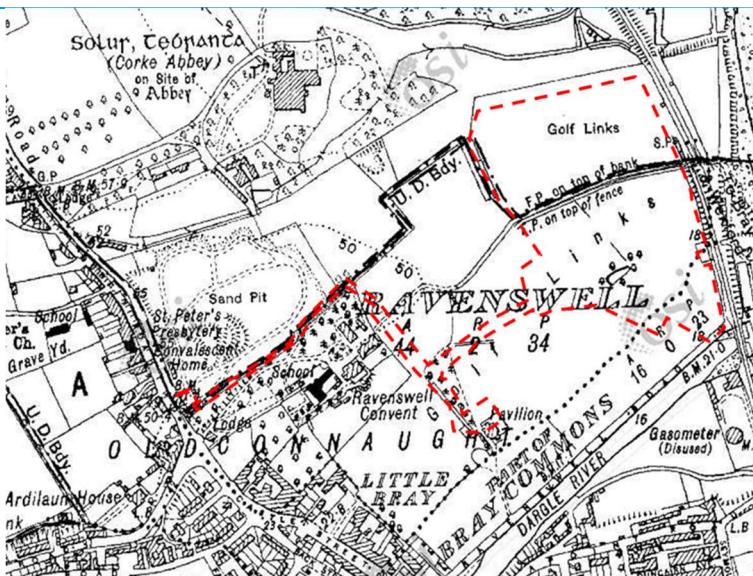
**1837-1842 6 Inch BW (OSI, 2022)**

The Site and the surrounding area is generally undeveloped and comprises agricultural land use. A bank is shown bisecting the Site on an east west axis. A gravel pit is shown ca. 120m south-west of the Site. The village of Little Bray is shown to the southeast of the Site.



**1888-1913 Historic Map 25 Inch (OSI, 2022).**

The Site continues to be used for agricultural use, but significant changes in the surrounding area are noted, including construction of the Dublin & South-eastern Railway line, construction of Bray harbour to the southeast and significant expansion of Bray town to the southwest of the Site. A gasometer is located on the opposite bank of the River Dargle. Changes to the coastline are also noted.



**6 Inch Cassini Maps 1830-1930 (OSI, 2022)**

The Site is now developed into a golf links. The Dublin & South-eastern Railway has been realigned immediately along the eastern boundary of the Site. The gasometer to the south of the Site appears to be disused.



**Aerial Map 1995 (OSI, 2022).**

The 1995 aerial map shows the Site continuing to be used as a golf links. Development of the surrounding area includes mixed residential and commercial buildings to the north and east of the Site as well as the current medical plant building located ca. 200m to the northeast of the Site.



**Aerial Map 2000 (OSI, 2022).**

No significant changes are noted between the 1995 and the 2000 aerial photography.



**Aerial Map 2005 (OSI, 2022).**

According to the Bray Golf Club, the location of the golf links was moved in 2003<sup>37</sup>. The 2005 aerial photography indicates that the maintenance of the Site was no longer as stringent as when it was an active golf course and sand banks are becoming overgrown.

<sup>37</sup> Infrastructure Statement – Atkins Document Reference; 5193890DG0041



Aerial Map 2012 (OSI, 2022).

No significant changes are noted between the 2005 and the 2012 aerial photography.



Current Aerial Map (Bing, 2022)

All sand banks within the former golf links Site are now completely overgrown.

A new school campus has been constructed in Ravenswell immediately west of the Site.

### 9.3.2. Current Site Setting and Topography

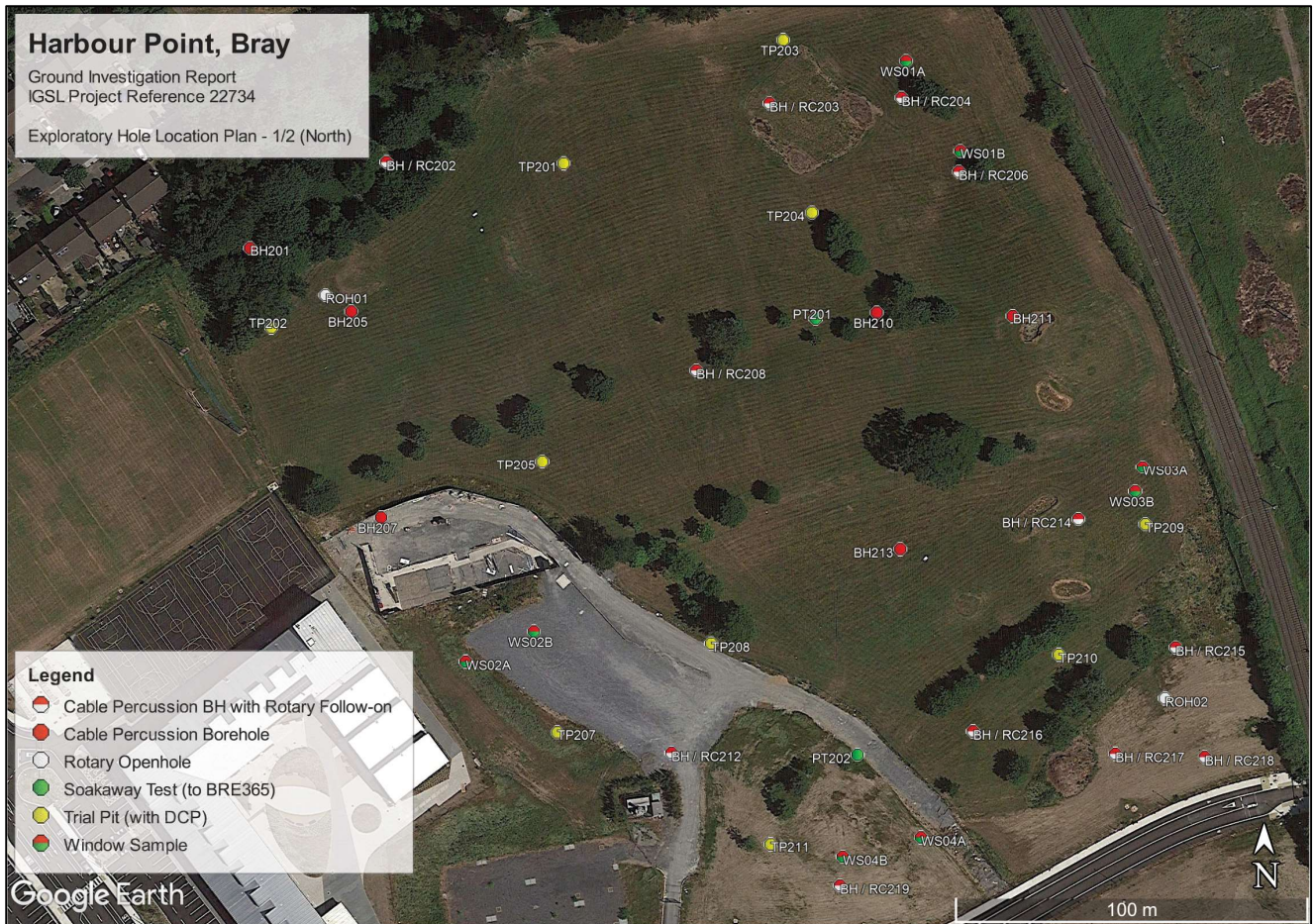
A Site walkover survey was carried out on 26<sup>th</sup> March 2020. The topography of the Site generally falls from north to south with a localised high ridge running in an east-west direction across the centre of the Site. The Site is bounded to the north by trees (and the Corke Abbey residential estate to the northwest), leading down to the Rathmichael Stream. The south of the Site is bounded generally by a new access road, and/ or masterplan lands. The Dublin-Rosslare railway line runs along the eastern boundary of the Site with the new Ravenswell school campus recently constructed just beyond the main western boundary of the Site.

The Site is mainly grassed, as a result of its former use as a golf course. The southern section of the Site appears to be a former hardstanding / gravel surfaced area which has become overgrown. There is an existing underground Irish Water foul storage tank located in the western portion of the Site, which is used as an emergency overflow tank by Irish Water. A minor amount of waste C&D material was observed in a localised area within the southern portion of the Site. One monitoring well / former borehole was identified in the north-western portion of the Site. The (assumed) base of the well was measured to be 7.84mbgl, while the groundwater level was measured to be 7.49mbgl. The well condition and integrity below ground is unknown. Therefore, this monitoring point has not been included as part of this assessment. The Site is currently fenced off to members of the public; however, there are access points along the existing fence and the Site is a popular spot for local dog walkers and members of the local community. Findings from the Site walkover informed the ground investigation design.

The topography of the Site falls from ca. 11.8meters above ordnance datum (mOD) in the north-western portion of the Site to ca. 2.1mOD in the south-eastern portion of the Site. Based on EPA ground elevation contours, the land topography in the wider area is generally within 0mOD to 20mOD but increases up to ca. 280mOD toward the west of the study area in the Wicklow Mountains and to ca. 210mOD toward the southeast of the study area toward the Greystones to Bray Cliffs.

### 9.3.3. Ground Investigation

All exploratory locations completed during the Ground Investigation are presented in Figure 9-1 and Figure 9-2 below. Refer also to Appendix 9.1 (see Appendix 13 of the IGSL, 2021 report).



**Figure 9-1 Ground Investigation Locations (including Environmental Sampling and Gas/Groundwater Monitoring Locations) Map 1 of 2 (IGSL, 2021).**



**Figure 9-2 Ground Investigation Locations (including Environmental Sampling and Gas/Groundwater Monitoring Locations) Map 2 of 2 (IGSL, 2021).**

### 9.3.4. Soils

Based on the Teagasc soils database available on the GSI public data viewer, the dominant soil type underlying the Site and surrounding area is made ground. Alluvium is present along the banks of the River Dargle. The Site itself is generally underlain by made ground with alluvium (associated with the River Dargle) present in the southern portion of the Site. Refer to Figure 9-3.

According to the GSI public data viewer (GSI, 2022), the primary superficial / quaternary sediments underlying the vicinity of the Site include:

- Urban (made ground);
- Gravels derived from Limestones (GLs) are located within the northern portion of the Site; and,
- Alluvium is located within the southern portion of the Site and immediately north of the Site.

Refer to Figure 9-4.

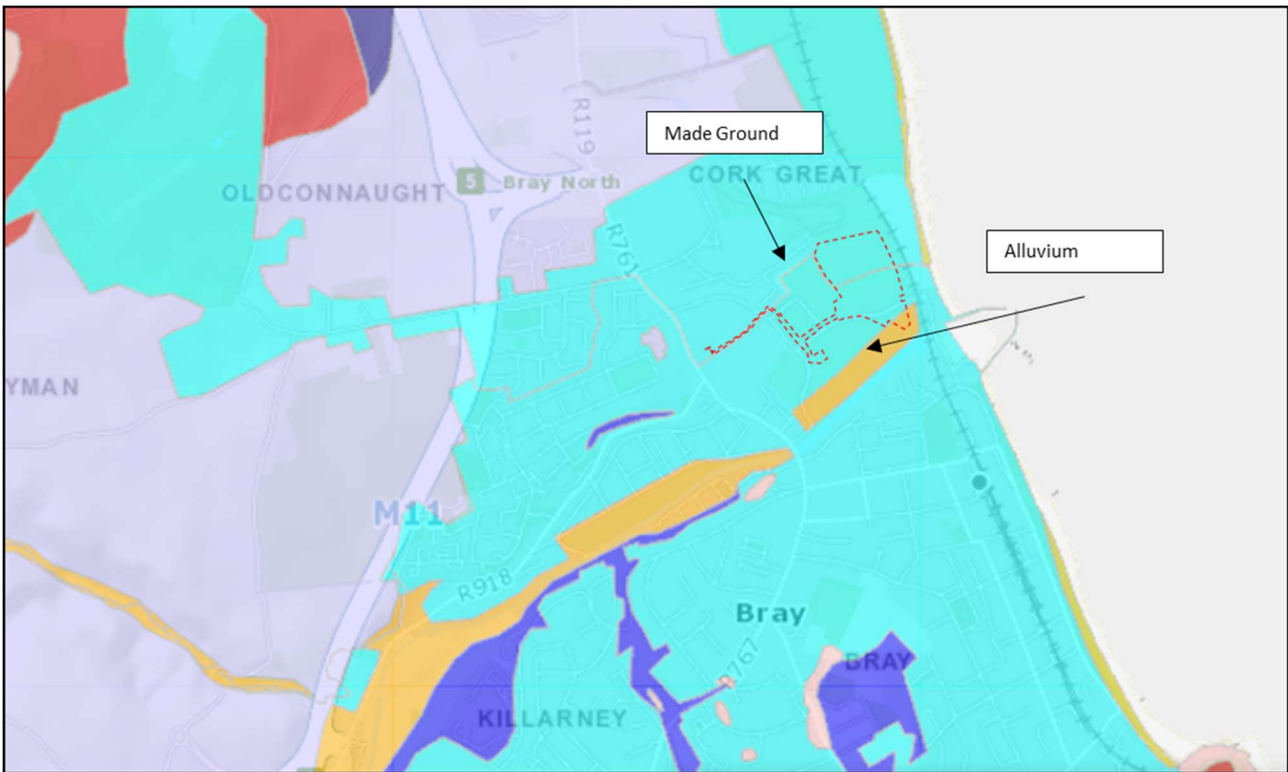


Figure 9-3 – Teagasc Soil Maps (GSI, 2022)

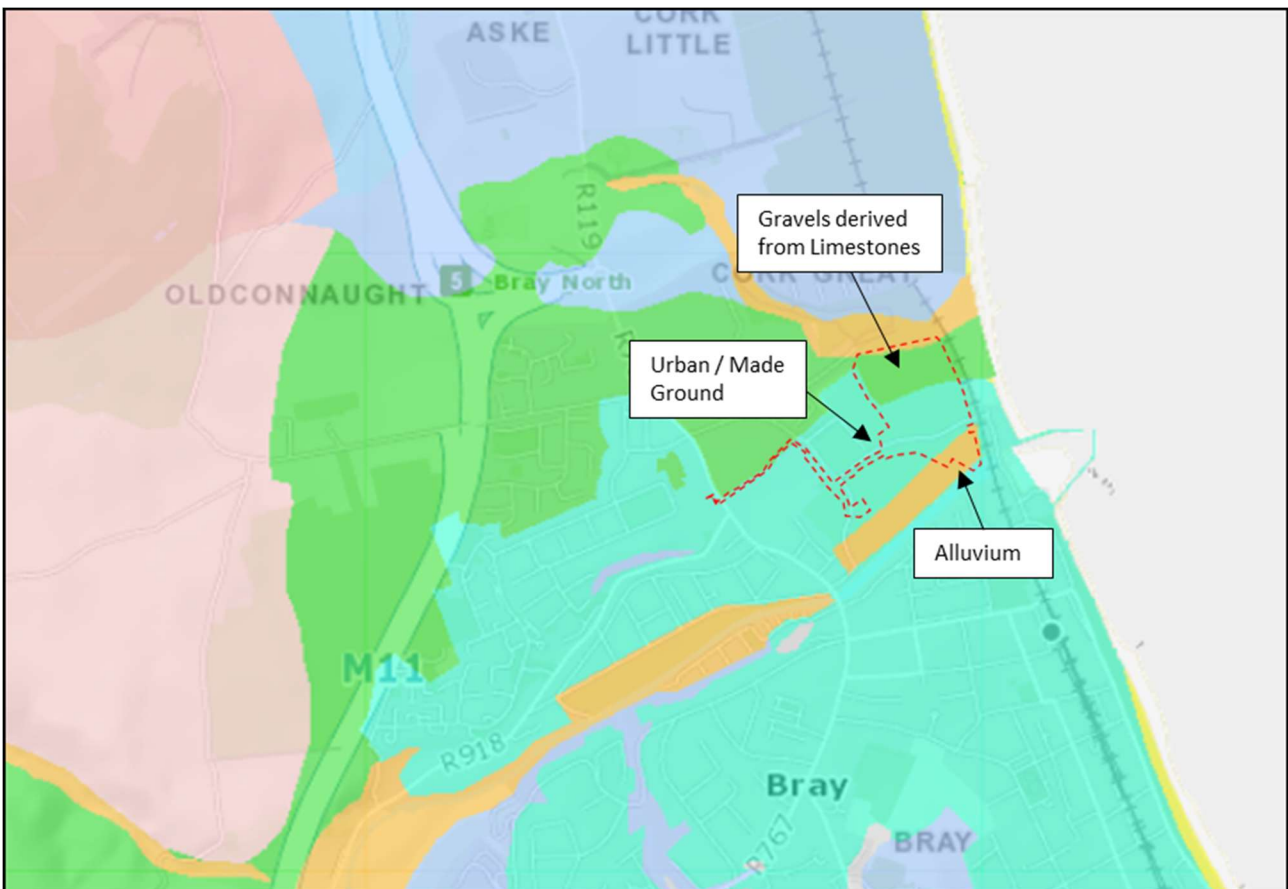


Figure 9-4 – Superficial / Quaternary Deposits (GSI, 2022)

The regional soil descriptions were verified by the ground investigation. Site specific soils records, as observed during the ground investigation (IGSL, 2021) are summarised as follows;

- Topsoil was encountered at most locations across the Site and ranged from ca. 0.1 to 0.3mbgl.
- Made Ground was encountered at various locations across the Site to a maximum depth of 2.3mbgl at TP211. Made ground beneath the Site generally comprised reworked soil or gravel fill material; however rare to occasional inclusions of red bricks, wood and plastic were identified at 4no. locations (TP211, BH219, WS04B and WS05B).
- Till encountered across the Site has been described primarily as firm to very stiff, brown, sandy Silt / Clay with occasional cobbles.
- This is generally underlain by loose to dense grey sandy gravel / gravelly sand, to a maximum depth of 13.8mbgl, beneath which very soft peaty silt / clay was identified within localised areas to a maximum depth of 13.3mbgl. This material was further underlain by gravelly clay and gravel to a maximum depth of 23.8mbgl.

Ground investigation records confirm that no visual or olfactory evidence of soil contamination was encountered at any of the exploratory locations across the Site, with the exception of WS04A, located in the southern portion of the Site, where a 'hydrocarbon odour' was noted in a single thin layer of damp native sand (from 2.45mbgl to 2.80mbgl).

#### 9.3.4.1. Soil Quality / Contaminated Land

On a regional scale there are currently two EPA licenced facilities within the vicinity or the Site, as follows;

- Starrus Eco Holdings, Integrated Waste Management Facility (W0053-03) is located ca. 2km southwest of the Site; and,
- Nypro Limited, Corke Abbey, Bray, Co. Dublin – a licensed industrial Site with an active IPPC license number P0567-02. This Site is located ca. 0.14km northwest of the Site.

There is also a historic landfill located immediately to the east and down gradient of the Site, known as the former Bray Municipal Landfill. This landfill has been the subject of a phased environmental risk assessment process. A site investigation, Tier 2 Environmental Risk Assessment (Fehily Timoney & Co., 2016)<sup>38</sup> and Remediation Option Appraisal (Fehily Timoney & Co., 2017)<sup>39</sup> have been carried out on the historic landfill Site to fully assess the current ground conditions and potential risk that the former landfill could pose to human health and environmental receptors in the vicinity. The findings of this phased risk assessment process are summarised in the Remediation Option Appraisal report (Fehily Timoney & Co., 2017) presented in Appendix 9.2. Key points are summarised as follows:

- A Tier 1 assessment was completed followed by a Tier 2 assessment which comprised a Site investigation and geophysical assessment. The Site investigation comprised the drilling of six boreholes across the Site and subsequent landfill gas and groundwater monitoring;
- The Site investigation identified that the thickness of the waste was up to 8.7m in the northern portion of the historic landfill Site. The geophysical assessment indicated a volume of waste of ca. 104,028m<sup>3</sup>;
- Following the Site investigation, a Tier 2 risk assessment was undertaken to determine the level of risk to human health and environmental receptors;
- Soil samples retrieved during the Site investigation were analysed for a broad range of contaminants, with the results screened against the CIEH / LQM and Dutch List assessment criteria. No exceedances were noted and therefore no significant risk to current Site users was identified;
- One round of gas monitoring detected carbon dioxide concentrations (max 10.0% v/v). No methane was detected;
- Leachate and groundwater sampling at two locations returned several elevated concentrations of ammoniacal nitrogen, potassium and Total Petroleum Hydrocarbons (TPH). However, given the low permeability of the underlying natural clayey silt, the risk to deeper groundwater and sea water receptor was considered low;
- Additional gas monitoring and groundwater monitoring was recommended to be undertaken on the historic landfill Site to fully determine the risk;

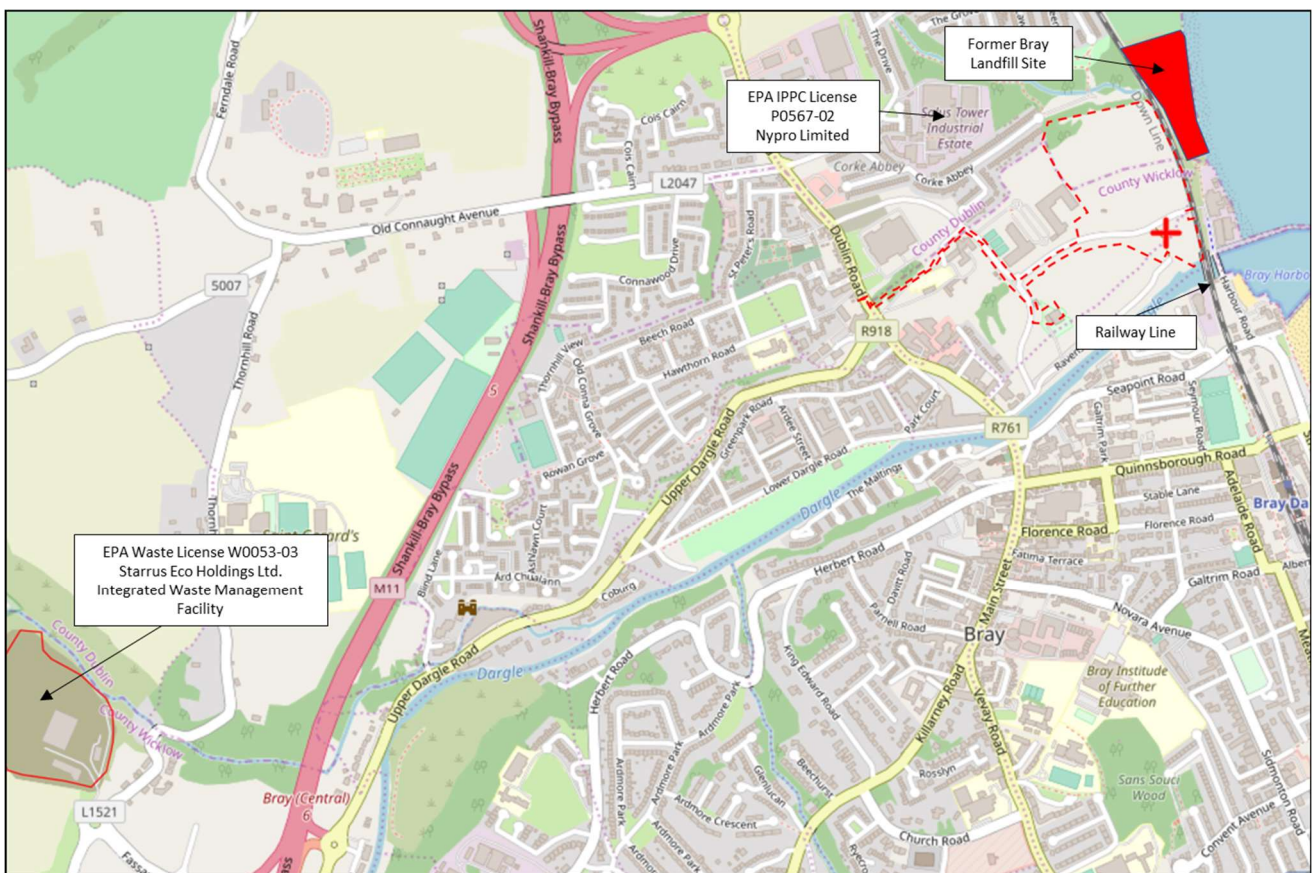
<sup>38</sup> [https://www.dlrco.ie/sites/default/files/atoms/files/tier\\_2\\_risk\\_assessment\\_bray\\_historic\\_landfill\\_co\\_wicklow.pdf](https://www.dlrco.ie/sites/default/files/atoms/files/tier_2_risk_assessment_bray_historic_landfill_co_wicklow.pdf)

<sup>39</sup> [https://www.dlrco.ie/sites/default/files/atoms/files/teir\\_3\\_remediation\\_option\\_appraisal\\_historic\\_landfill\\_at\\_bray\\_harbour\\_co\\_dublin.pdf](https://www.dlrco.ie/sites/default/files/atoms/files/teir_3_remediation_option_appraisal_historic_landfill_at_bray_harbour_co_dublin.pdf)

- The Tier 2 assessment identified the historic landfill Site as having a low risk classification (Class C) in accordance with the risk based methodology adopted from the EPAs CoP: Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007);
- The waste material within the landfill was determined not to present a risk, if left undisturbed; and,
- However, given that the historic landfill Site is subject to coastal erosion and this was exposing and eroding waste material with particular reference to the finding of small sporadic pieces of asbestos, Fehily Timoney developed a remediation option appraisal for the historic landfill Site. This included a review of the National Coastal Strategy and DLRCC coastal strategy and assessed the remediation options in the context of CIRIA Guidance (C718).

The Remediation Option Appraisal report (Fehily Timoney & Co., 2017) concluded that ‘The landfill Site has been identified as having a high risk from coastal erosion and cliff instability with landfill material also at risk of being eroded and transported down shore. The Tier 2 assessment indicated that a potential moderate risk exists to users of the adjacent Site (foreshore / beach), in the absence of mitigation measures due to ACM being exposed during coastal erosion. Methods of long-term coastal protection possibly applicable to the Site include rock armour revetment and stabilising cliff by regrading or riprap rock armour revetment protection with launching apron. A further assessment is required to determine the viability of these options which would include modelling the potential impacts these options may have to coastal erosion and sediment transportation in the coastal environment. It is recommended that DLRCC, WCC and Woodbrook Golf Club undertake some remedial measures in the interim. This includes a resumption of the inspection and surveillance programme by DLRCC / WCC / Woodbrook Golf Club. Any ACM material identified should be removed through a clean-up operation. Furthermore, the removal of the receptors from the Site could be achieved through the installation of temporary barrier fence and signage however further consultation may be required to determine its feasibility’ (Fehily Timoney & Co., 2017).

Therefore, the former landfill represents a potential offsite source of contamination (via. gas migration). It is noted however that any of the proposed long term coastal protection measures and short term (interim) remedial measures outlined above would not impact on the proposed development (during the construction or operational phases). Another potential offsite source of contamination is the railway line located immediately east of the Site. All identified potential offsite contamination sources are presented in Figure 9-5.



**Figure 9-5 - Potential Offsite Sources of Ground Contamination (EPA, 2022)**



During the desk based review, and Site walkover survey, several potential onsite sources of contamination were also identified (a subsurface tank of unknown use adjacent to the northern Site boundary, a minor amount of waste C&D material in a localised area within the southern portion, along with the existing underground Irish Water foul storage tank in the western portion, and underground foul sewer pipes running along the eastern Site boundary which comprise the main pipeline from Bray to Shanganagh WWTP).

Accordingly, as a due diligence exercise, 20no. representative environmental soil samples were collected during the ground investigation at representative locations across the Site and analysed for a comprehensive suite of analytical parameters by a UKAS accredited laboratory (including asbestos containing material, heavy metals, key indicator parameters, petroleum hydrocarbons, polyaromatic hydrocarbons (PAHs), Volatile Organic Compounds (VOCs including tentatively identified compounds (TICs)), Semi Volatile Organic Compounds (SVOCs including TICs), Polychlorinated Biphenyls (PCBs) and the full Rilita Waste Acceptance Criteria (WAC) soil disposal suite). All soil analytical results were subsequently evaluated and assessed with respect to the following;

- Current or future impacts to the receiving environment;
- Current or future impacts to human health; and,
- Waste soil classification for offsite disposal (as required).

**Risk of Potential Current or future impacts to the receiving environment** - Based on the soils analytical data presented in Table 1(a) of Appendix 9.3, no contaminants of potential concern with regards to environmental risk have been identified within the soils and made ground beneath the Site. Results are summarised as follows:

- No detection of asbestos containing material was identified within any of the 20no. samples analysed;
- No detection of PCBs, VOCs (including TICs) or SVOCs (including TICs) with the exception of PAHs, were identified within any of the 20no. samples analysed;
- None of the 20no. samples analysed showed any significantly elevated heavy metal or indicator parameter concentrations;
- Low level concentrations of Total PAHs (17no.) ranging from 0.26mg/kg to 1.8mg/kg were detected in 6no. of the 20no. samples analysed; however, these low level detections are not considered to pose a risk to the receiving environment;
- No detection of Total petroleum hydrocarbon (TPH) concentrations were identified in 19no. of the 20no. samples analysed;
- A TPH concentration of 71mg/kg was reported at a single location (WS05A, at a depth of 0.2 to 1mbgl). However, this concentration is not significantly elevated and a deeper sample taken in the vicinity of this location (WS05B, at a depth of 2 to 3mbgl) showed no detection of TPH; and,
- Despite the single reported observation of a hydrocarbon odour in a thin layer of damp native sand (at WS04A) there is no evidence of laterally or vertically extensive hydrocarbon contamination in this area, based on the soils analytical results.

**Risk of Potential Current or future impacts to Human Health** - Based on the soils analytical data presented in Table 1(a) of Appendix 9.3, one contaminant of potential concern (naturally occurring Barium) with regards to human health risk has been identified within the soils and made ground beneath the Site. Results are summarised as follows:

- All soils analytical results were screened against the relevant Generic Assessment Criteria for human health risk assessment (ATRISKSOIL values for residential land-use with consumption of home-grown vegetables). Analytical laboratory reports are presented in Appendix 9.1 (see Appendix 10 of the IGSL, 2021 report). Tabulated and screened soils data is presented in Table 1(a) of Appendix 9.3;
- Of the comprehensive list of parameters analysed, only one parameter was identified to be present in the native soils and made ground beneath the Site, at a level above the relevant human health Generic Assessment Criteria (GAC) values (for residential land-use with consumption of homegrown produce);
- 8no. of the 20no. samples analysed (to a maximum depth of 1mbgl) exceeded the relevant GAC of 56.8mg/kg for Barium. Exceedances were reported at the following locations: WS01B, WS03A, WS05A, TP203, TP205, TP208, TP209 and TP211;
- However, of these locations, only 2no. locations (TP205 and TP208) occur within the proposed footprint of the housing and duplex units in the upper 1m (where consumption of homegrown produce could occur). Refer to Table 1(a) of Appendix 9.3;

- Barium is a naturally occurring trace element in Ireland. According to Teagasc and the EPA (2007), typical background concentrations in soil were previously determined to be ca. 100mg/ kg and based on a geochemical review undertaken by Teagasc and EPA (2007), typical background concentrations can range from 6.6mg/kg to 1,297mg/kg in Irish soils. Therefore, the source of Barium in soils and made ground beneath the Site is considered likely to be naturally occurring soils;
- Barium concentrations for the 8no. soil samples were subsequently screened against the relevant human health GAC values (for residential land-use without consumption of homegrown produce).<sup>40</sup> All 8no. samples were below the relevant GAC of 1,340mg/kg for Barium. Refer to Table 1(b) of Appendix 9.3;
- Therefore, based on the screened analytical results, soils / made ground at all 20no. soil sampling locations across the Site are suitable (from an environmental and human health perspective) for reuse as required during the development of onsite future land use which will not provide for the possibility of growing your own / consumption of homegrown produce in gardens. The native soils / made ground beneath the Site is suitable for onsite reuse as required during the construction of the proposed apartment blocks, 1no. mixed use commercial unit, retail unit, creche, café) infrastructure (including roads and utilities / services), communal gardens, public open spaces and any other land use where consumption of homegrown produce is not likely to occur; and,
- Soils / made ground within the proposed footprint of the housing and duplex units (where consumption of homegrown produce could potentially occur) is suitable (from an environmental and human health perspective) for reuse as required during the development of these residential units - with the exception of two localised hotspot areas (TP205 and TP208) where a potential human health risk has been identified via. potential ingestion of naturally occurring Barium.

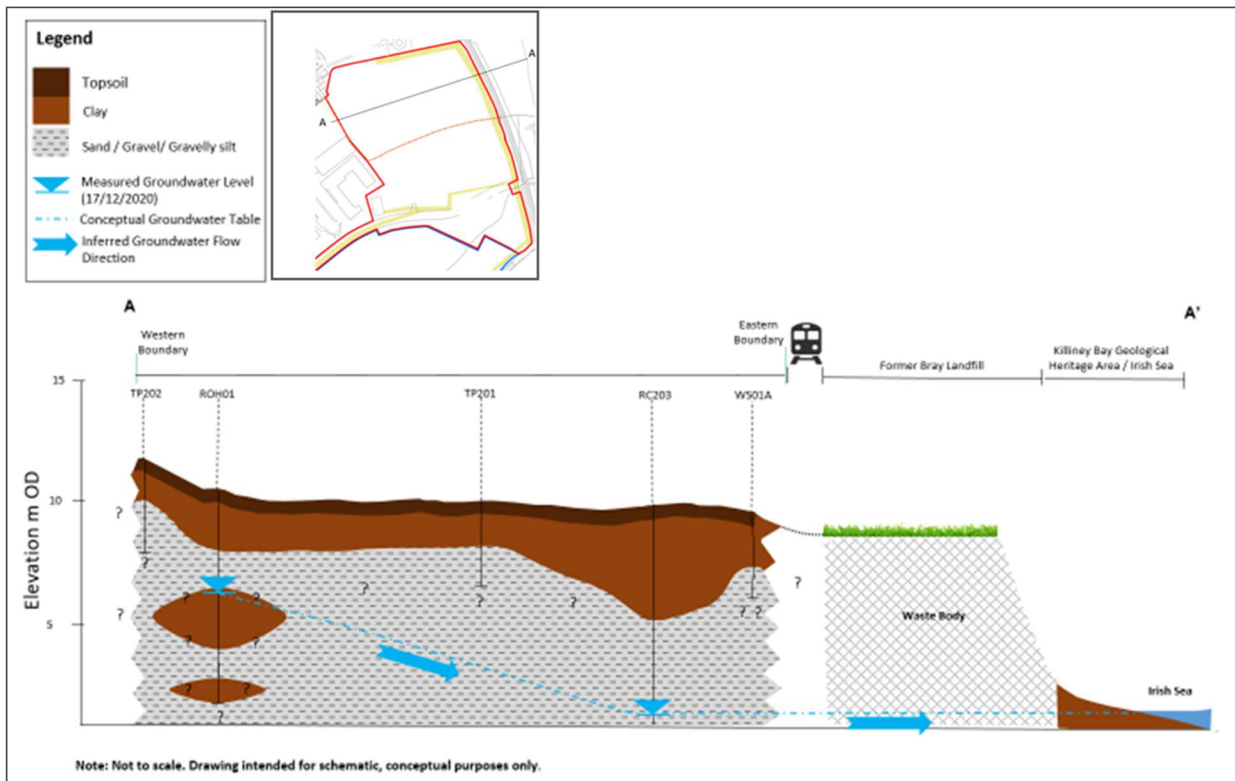
**Waste soil classification for offsite disposal (as required)** – Based on the laboratory analytical data presented in Appendix 9.1 (see Appendix 10 of the IGSL, 2021 report) and waste classification (via. Atkins CATWaste tool) outputs presented in Appendix 9.4, soil beneath the Site, if removed offsite for disposal, would be classified as non-hazardous (EWC Code - 17 05 04). The majority of soil should be suitable for disposal as inert material to an appropriate local authority permitted / EPA licenced waste facility (subject to acceptance by the facility) - with the exception of soils in the vicinity of TP209 (0.5mbgl). Soils in this localised area would be suitable for disposal as non-hazardous material to an appropriate EPA licenced waste facility (subject to acceptance by the facility). Results are summarised as follows:

- Of the 20no. samples analysed for asbestos containing material (ACM), no ACM or asbestos was detected;
- Atkins Categorised Waste (CATWaste) tool was used to analyse all 20no. samples. These results are presented in Appendix 9.4. The results indicate that all 20no. samples would be classified as non-hazardous, and could be transported for offsite disposal (if required) under the following EWC Code - 17 05 04 (soil and stones other than those mentioned in 17 05 03\*);
- Analytical results (along with relevant WAC screening values for inert, non-hazardous and hazardous soils) are presented in Appendix 9.1 (see Appendix 10 of the IGSL, 2021 report). Of the 20no. soil samples analysed, only 1no. exceeded the relevant inert soil WAC screening values (with respect to Total Organic Carbon (TOC)); TP209 (0.5mbgl); and,
- For the purposes of offsite disposal, 19no. soil samples are suitable for disposal as inert material to an appropriate local authority permitted / EPA licenced waste facility (subject to acceptance by the facility). 1no. soil sample (TP209, 0.5mbgl) is suitable for disposal as non-hazardous material to an appropriate EPA licenced waste facility (subject to acceptance by the facility).

### Site-specific Soil Quality – Summary of Baseline Conditions

The extensive ground investigation across the Site verified the results of the historical mapping review, namely that the Site has been used historically for agricultural purposes, prior to being developed into a golf course. Refer to Figure 9-6 for a schematic / conceptual cross section (A-A') showing summary ground conditions.

<sup>40</sup> Note that as ATRISKSIL values for residential land-use without consumption (of home-grown vegetables) are either greater or equal to the relevant values for residential land-use with consumption (of home-grown vegetables) only the relevant exceedances (i.e. barium concentrations in 8no. soil samples) have been screened in Table 1(b), Appendix 9.3. None of the other soil sample results presented in Table 1(a) exceed the relevant values for residential land-use without consumption (of home-grown vegetables).



**Figure 9-6 – Schematic / Conceptual Cross section A-A' showing Summary Ground Conditions**

All potential onsite and offsite contamination sources have been fully evaluated. No contaminants of potential concern with regards to environmental risk have been identified within the soils and made ground beneath the Site. None of the previously identified potential onsite or offsite contamination sources, including the former Bray Landfill, have resulted in any impacts to the soil (and accordingly bedrock) beneath the Site, or are likely to impact the proposed development.

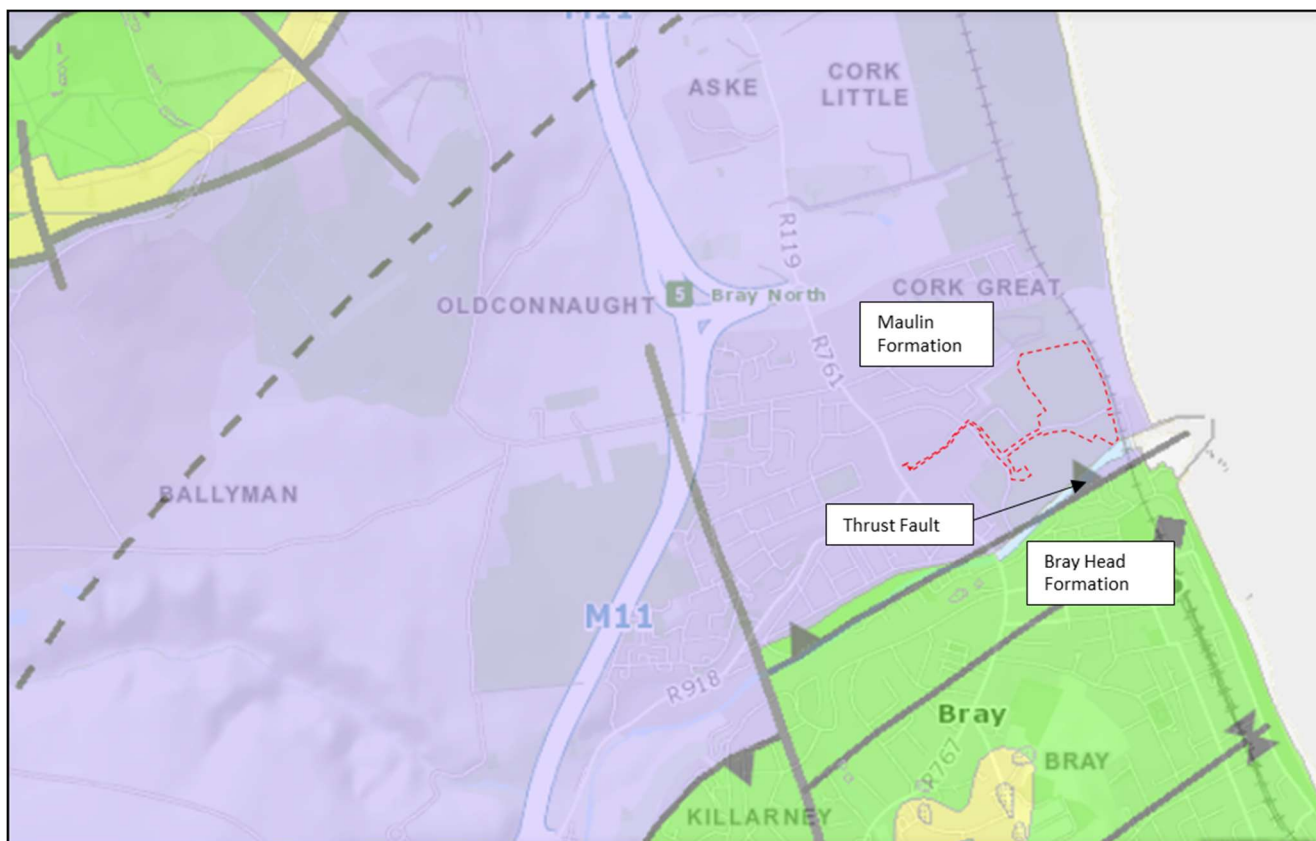
However, the following onsite source (without mitigation) could pose a potential risk to the proposed development during the operational phase:

- Onsite soils / made ground at two localised hotspot areas (TP205 and TP208) within the proposed footprint of the housing and duplex units contain elevated levels of naturally occurring Barium. The soils in these localised areas could pose a potential human health risk and are not suitable for reuse within the gardens of the housing and duplex units (where consumption of homegrown produce could occur).

Baseline ground gas conditions beneath the Site have been evaluated separately in Section 9.3.6. Geo-hazards.

### 9.3.5. Bedrock Geology

The GSI bedrock geology 100k map identifies the underlying bedrock of the Site as the Maulin Formation, which is made up of slate, phyllite and schist and described as blue grey slates and phyllites (with siltstone laminae) as presented on Figure 9-7 below. To the south of the River Dargle lies the Bray Head Formation made up of greywacke and quartzite. There are no bedrock outcrops mapped within the Site. The structural geology mapping (GSI, 2022) shows that a thrust fault (orientated northeast to southwest) generally separates the Bray Head Formation from the Maulin Formation.



**Figure 9-7 – Bedrock Geology (GSI, 2022)**

There are no karst features mapped within the Site or its environs and based on the regional geology, karst features would not be expected to be encountered beneath the Site or surrounding lands.

The regional geological descriptions were verified by the results of the ground investigation. Site specific bedrock records, as observed during the ground investigation (IGSL, 2021), were relatively consistent and are summarised as follows;

- Medium strong to locally weak, medium to thinly bedded, (foliated), dark blueish grey, fine-grained, interbedded and interlaminated Mudstone / siltstone bedrock was encountered at depths of between 21mbgl and 25.7mbgl.

Ground investigation records confirm that no visual or olfactory evidence of bedrock contamination was encountered at any of the exploratory locations across the Site. Killiney Bay geological heritage area is located ca. 30m east of the Site as shown in Figure 9-8 below. The geological heritage area is described by the GSI (2022) as a '5km long coastal section which exposes a succession of several units of glacial till.' It is considered 'a particularly impressive exposure into deep till with many sedimentological characteristics exposed' (GSI, 2022). The proposed development will not have any impact on Killiney Bay geological heritage area.

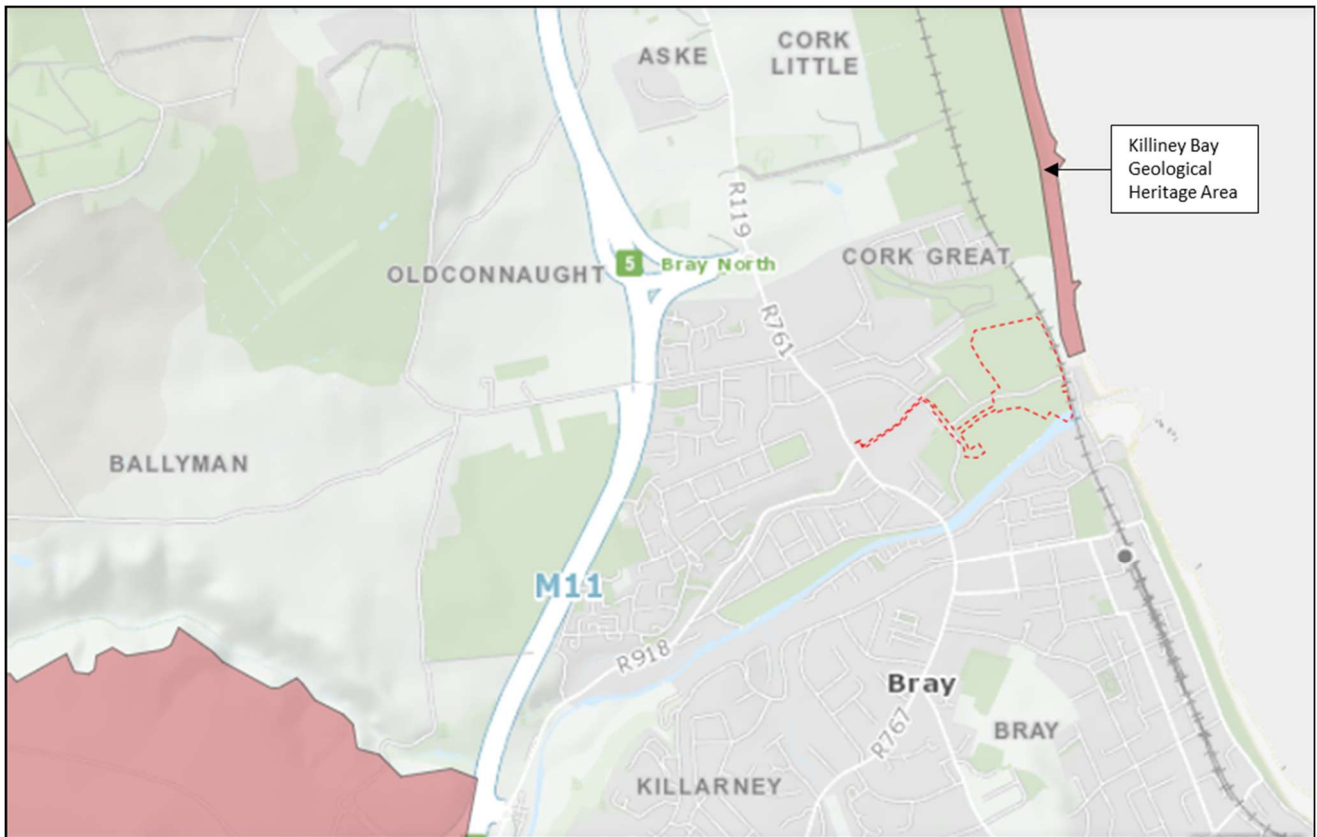
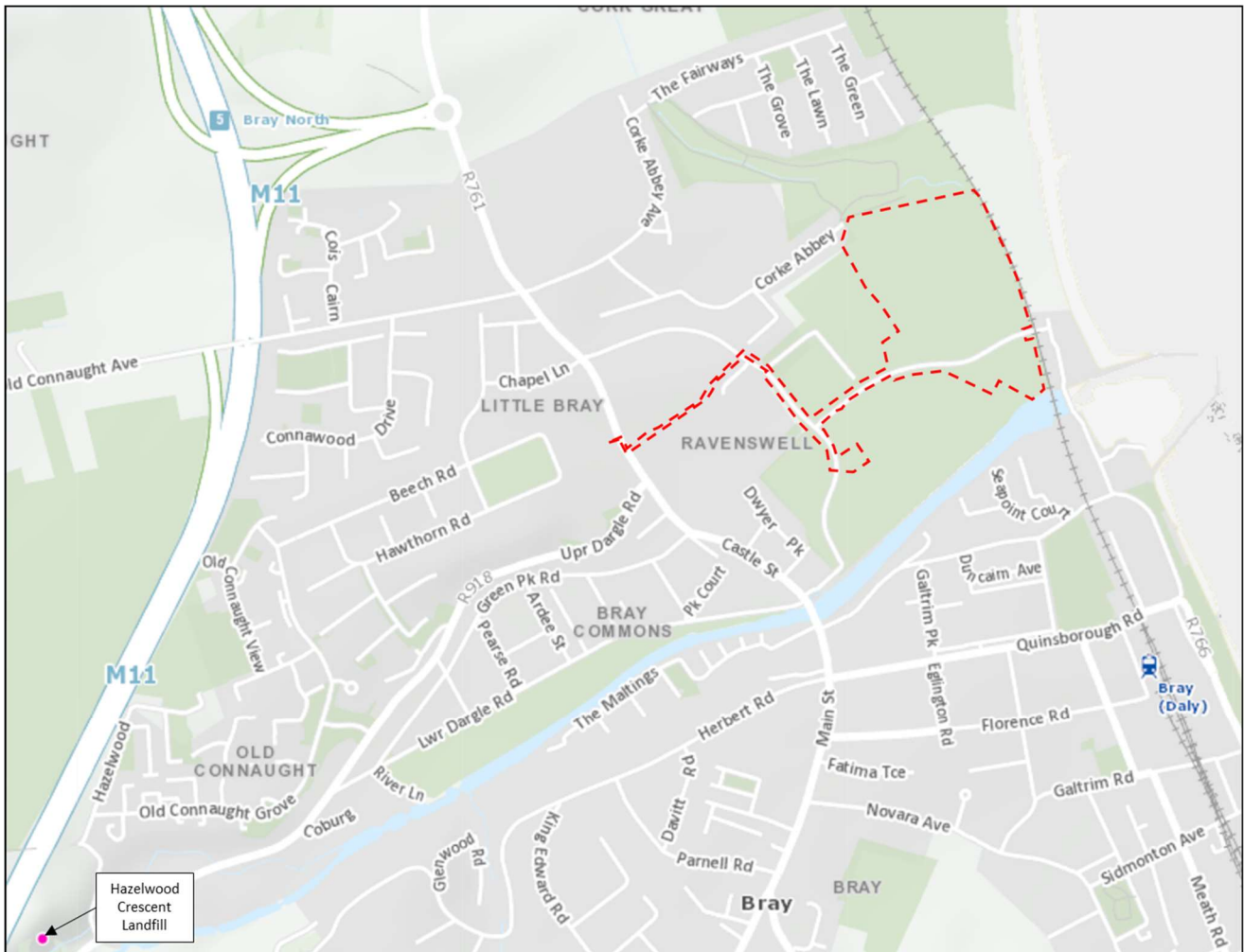


Figure 9-8 – Geological Heritage Areas (GSI, 2022)

### 9.3.6. Geo-hazards

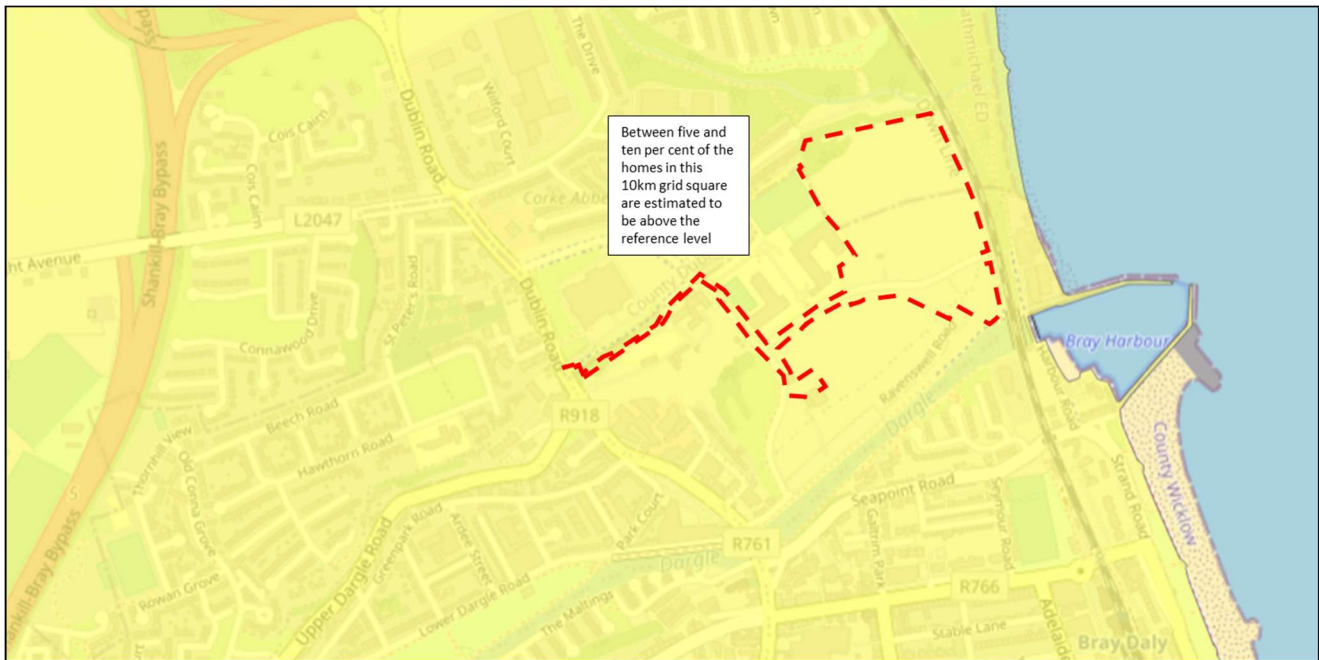
No landslide susceptibility issues are reported within the vicinity of the Site (GSI, 2022). Landslide susceptibility is 'unclassified' for the majority of the Site with 'low (inferred)' landslide susceptibility within the northern and southern sections of the Site. The closest reported landslide event is located ca. 1.3km southwest of the Site at Hazelwood Crescent Landfill (refer to Figure 9-9 below).



**Figure 9-9 – Landslide Susceptibility (GSI, 2022)**

There are no mines or mineral occurrences within the vicinity of the Site. A disused sand and gravel pit is located ca. 2km west of the Site.

Available EPA radon maps shows that between five and ten per cent of the homes within the 10km grid square where the Site is located, have radon concentrations in excess of the national Reference Level of 200 becquerel per cubic metre (Bq/m<sup>3</sup>) as shown in Figure 9-10 (EPA, 2022). However, in accordance with relevant building regulations, a radon barrier will be installed beneath all buildings to be constructed as part of the proposed development. Therefore, radon will not have any impact on the proposed development.



**Figure 9-10 – Regional Radon Levels (EPA, 2022)**

Ground gas sampling was carried out at 10no. representative boreholes<sup>41</sup> across the Site (BH207, WS01A, WS01B, WS02A, WS02B, WS03A, WS03B, WS04A, WS04B, and WS05A) as shown on Figure 9-1 and Figure 9-2. 6no. gas monitoring events were carried out between October and December 2020. Tabulated and screened gas monitoring data (including CH<sub>4</sub> (%), CO<sub>2</sub> (%), O<sub>2</sub> (%), CO (%), H<sub>2</sub>S (%), Balance (%), Barometric Pressure (mb) and Gas Flow (l/hr)) is presented in Table 1 of Appendix 9.5. The gas monitoring results were classified according to the Characteristic Situations outlined in CIRIA C665 (2007) documentation ‘Assessing Risks Posed by Hazardous Ground Gases to Buildings’. Based on the results of the gas monitoring programme, the majority of the Site is deemed to be at ‘very low risk’ (Characteristic Situation (CS)1) with respect to ground gases, with three separate localised areas (WS03A, WS04A, and WS04B) which have been deemed to be ‘at low risk’ (CS2), with respect to ground gas, due to elevated concentrations of carbon dioxide. According to CIRIA C665 the typical sources of gases associated with CS1 is ‘Natural soils with low organic content, typically made ground’ and CS2 is ‘Natural soils with high organic content, typically made ground’ (CIRIA 665, 2007).

Refer to tabulated and screened ground gas monitoring results presented in Table 1 of Appendix 9.5. The boreholes (WS03A, WS04A, and WS04B) where elevated concentrations of carbon dioxide were observed (within made ground) are located in the southern and western portions of the Site, in the vicinity of proposed apartment blocks B and C.

Accordingly, based on all available evidence, soils or bedrock beneath the Site are not considered to pose an unacceptable risk to environmental receptors or third-party sites. Potential localised risks to human health and infrastructure warrant further consideration as part of this impact assessment.

## 9.4. Potential Impacts of the proposed development

### 9.4.1. Construction Phase

#### 9.4.1.1. Land (Including Land Take)

The current zoning for the Site within the Dún Laoghaire-Rathdown County Council Area is as follows:

- Objective A ‘To provide residential development and improve residential amenity while protecting the existing residential amenities’;

<sup>41</sup> It is noted that ground gas monitoring was also carried out at 6no. rotary boreholes; however these were installed for groundwater monitoring purposes only and so would not be considered suitably representative gas monitoring locations. Therefore these monitoring results have not been considered further as part of this assessment (notwithstanding this, recorded gas levels are not elevated at these locations).

- Local Objective 119 ‘To provide a permeability link between Green Area/Linear Park between Corke Abbey and Woodbrook Glen and any development on the Former Bray Golf Club lands to allow access towards Bray Harbour.’
- Objective F ‘To preserve and provide for open space with ancillary active recreational amenities’ (DLRCC County Development Plan 2022-2028 (DLRCC 2022)).
- Local Objective 110 ‘To upgrade and enhance the linear park at Woodbrook Glen/Corke Abbey.’

The area within Wicklow County Council is zoned as follows:

- Mixed Use with an objective ‘to provide for mixed use development’; and,
- New Residential with an objective ‘to protect, provide and improve residential amenities in a high density format’ (Bray Municipal District Local Area Plan 2018-2014 (WCC 2017)).

The impact on land take at the ca. 8.81ha. Site is likely to have a slight negative impact on the environment of the area. This will be a permanent impact. However, the proposed development is in a zoned residential area with existing housing and commercial land use within the immediate vicinity of the Site.

#### 9.4.1.2. Soils and Geology

Activities during construction will primarily comprise stripping of topsoil across the Site, excavation of subsoil and pouring of foundations for the residential and commercial units, installation of the storm water (including 2no. attenuation tanks) and foul water drainage works, watermains and laying of cable ducts, and piling as required.

Tracked excavators will likely be sufficient to excavate soils for subsequent relocation to facilitate construction works. The extent of the excavation for the housing and duplexes is likely to be a maximum depth of 1m. The extent of the excavation for the apartment blocks, and commercial units will range from 1m depth to a likely maximum depth of 4m in the western portion of the Site. The extent of excavation for service / utility trenches will vary; however, the general depth will be in the region of 1m, with a maximum depth of 2m for the proposed stormwater attenuation tanks. The maximum anticipated depth of excavation across the Site is therefore anticipated to be 4mbgl. All excavations are anticipated to encounter sandy silt / clay and/or gravel, with localised areas of made ground in the south and east. No rock breaking will be required.

The total volume of soil requiring excavation for the proposed development is expected to be ca. 51,900m<sup>3</sup>. It is provisionally estimated that ca. 10,700m<sup>3</sup> of stripped topsoil will be reused onsite for landscaping purposes. Based on preliminary engineering calculations it is anticipated that ca. 41,200m<sup>3</sup> of excess soil comprising topsoil (ca. 3,600m<sup>3</sup>) and subsoil (native soil and made ground, ca. 37,600m<sup>3</sup>) will require offsite disposal. All such material will be removed and disposed of offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended).

It is anticipated that ca. 27,600m<sup>3</sup> of suitable engineering grade fill material (subbase / capping/building hardcore) will need to be imported to the Site.

Piling will be required in the southern and eastern portions of the Site, due to poor ground conditions, primarily to facilitate the foundations for apartment blocks A, B and C, and also stormwater infrastructure. Piling may be carried out via. Bored Piles, Continuous Flight Auger (CFA) Piles or Driven Piles. A brief description of the typical methodology for each piling type is provided as follows:

- Bored piles are carried out where the removal of spoil forms a hole for a reinforced concrete pile which is poured in situ. They are drilled using buckets and/or augers driven by percussion boring which involves a cutting tool which is dropped using a winch to cut out a cylinder of earth. The operation is repeated until the hole has been sunk to the required depth. At the required depth, concrete is poured using a tremie pipe method and the reinforcement is lowered into the concrete. As the concrete reaches the hole’s upper level, the temporary casing is withdrawn.
- CFA piles are a type of bored pile where boring and pouring takes place simultaneously. A hollow stemmed auger is screwed into the ground by the piling rig and upon reaching the required depth, concrete is pumped through the hollow stem of the auger whilst it is slowly extracted. Positive pressure in the concrete being pumped into the ground is maintained throughout the placement as this prevents the hole from collapse. Extracted material brought to the surface is removed and the shaft is left full of concrete into which steel reinforcement can be placed.
- For driven piles, a pile hammer is used to drive piles into the ground by either impact hammering, vibrating or pushing it into the ground to an agreed set or refusal. Where there are variations in the subsurface conditions, pile lengths may have to be cut-off and the excess disposed of off-site.



The specific methodology will be determined during the detailed design / pre-construction phase. For the purposes of this assessment all piling scenarios have been considered. Piling to a maximum depth of 14m is anticipated, with a conservative assumption of the installation of 1no. piles per day. Groundwater control would be required (for any bored piles) (this will be further assessed in Chapter 10 – Water). All piles are anticipated to encounter sandy silt / clay (with localised areas of made ground) and/or gravel and potentially peat. Soil disposal (albeit for minimal volumes) may be required (for bored piles and possibly for driven piles). All such material will be removed and disposed offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended).

During the construction phase of the development, the following potential impacts on soils and bedrock could occur and have been assessed accordingly;

- Stripping of topsoil may result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff;
- Soils beneath the proposed development may become unnecessarily compacted by machinery during construction;
- Topsoil and subsoil may become rutted and deterioration of the topsoil layer and any exposed subsoil layers may result in erosion and generation of sediment laden runoff;
- Dust generation can also occur during extended dry weather periods as a result of construction traffic;
- Soils and bedrock may be at risk of becoming contaminated through Site construction activity; in particular the risk of spillages and leakage of any fuel oils and paint. Potential human health risks to construction workers could also occur associated with any such spillages and leakage; and,
- Temporary onsite groundwater and gas monitoring wells could provide a conduit for potential contamination of soils and bedrock through Site construction activity; in particular the risk of spillages and leakage of any fuel oils and paint.

These are likely to result in moderate negative impacts on receiving soils and/or bedrock; however, any impacts are considered to be short-term and localised. Furthermore, mitigation measures will be implemented during the Construction Phase to reduce and/or avoid these potential impacts, and to address any potential waste soil management issues.

#### 9.4.1.3. Ground Stability

There is no evidence of significant historic landslides and there are no known karst features within the proposed development boundary. Industry standard health and safety practices will be implemented during the construction phase to address any potential ground stability issues associated with excavation, trenching and piling works. Therefore, no significant negative impact, associated with ground stability, is likely.

#### 9.4.2. Operational Stage

The impact on land take is likely to have a slight negative permanent impact on the environment of the area; however, this change is consistent with existing and emerging trends.

During the operational phase of the development, the following potential soil associated impacts (via. human health and infrastructure) could occur and have been assessed accordingly;

- Native topsoil and subsoil (upper 1m) at two localised hotspots (TP205, TP208) within the proposed footprint of the housing and duplex units is unsuitable for reuse in residential gardens within this area (due to a potential human health risk via. ingestion of marginally elevated levels of naturally occurring Barium within the soil);
- Soils beneath the proposed footprint of apartment blocks B and C, in the southern and western portion of the Site, could pose a potential ground gas issue due to elevated levels of carbon dioxide within localised pockets of made ground (reused soil) in this area, and have been deemed to be 'at low risk', with respect to ground gases.

These are likely to result in moderate negative permanent impacts on human health and infrastructure, associated with the current soil conditions beneath localised portions of the Site. Therefore, mitigation measures will be required at the Detailed Design and Construction Stages of the proposed development to address these potential impacts during the Operational Stage.

The development will have an imperceptible, permanent impact on localised portions of bedrock during the operational phase. The operational stage of the residential development consists of the typical activities in a residential area and will not involve further disturbance to the topsoil, subsoils and geology of the area.

## 9.5. Mitigation Measures

### 9.5.1. Construction Phase

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and will be located so as not to necessitate double handling.

Soil beneath the proposed footprint of all housing and duplex units is suitable (from a human health and environmental perspective) for reuse within the proposed residential gardens, with the exception of two localised hotspots (TP205 and TP208). The extent of these hotspot areas (from ground level to 1mbgl) is estimated to be 10m x 10m, centred around each of the following locations:

- TP205 Hotspot - Grid Reference: 726,442.09 E, 719,477.12 N; and,
- TP208 Hotspot - Grid Reference: 726,491.25 E, 719,426.98 N.

This material (ca. 200m<sup>3</sup>) should be removed for reuse elsewhere onsite, or for offsite disposal to a suitably licenced / permitted waste facility. These soils can be replaced if needed by soils from elsewhere beneath the proposed footprint of all housing and duplex units, or from the north-western portion of the Site (e.g., excavated material from Block D), or via suitable imported uncontaminated soil / topsoil. Any subsoil or topsoil removed from a 10mx10m area surrounding the location of WS01B, WS03A, WS05A, TP203, TP209 and TP211 shall not be reused in the location of the houses or duplexes or any other location where there is a likelihood of home grown produce being grown. The Contractor, in consultation with the Client and the Engineer, will be responsible for ensuring that the two localised soil hotspots (TP205 and TP208) are removed and replaced with suitable material as required.

The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations. The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. The Contractor will be responsible for ensuring these measures are fully implemented.

The excavation of material will be minimised as much as possible to reduce the impact on soils and geology. Any surplus material, or materials which are deemed not suitable for onsite reuse will be classified in accordance with the EPA Guidance Document '*Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous*' (2015). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed, transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation.

The minor amount of waste C&D material observed in a localised area within the southern portion of the Site will also be removed from site and disposed of in accordance with all relevant waste management legislation. A Resource and Waste Management Plan has been generated for the Site (Document Ref: 5214419DG0011(Atkins, 2022)). It will be the Contractors responsibility to ensure that a project specific Detailed Waste Management Plan is fully implemented onsite for the duration of the project.

Based on CIRIA 665 guidance, gas protection measures would be required in the vicinity of proposed apartment blocks B and C, based on this part of the Site being CS2. The typical scope of protective measures for residential buildings (not low rise traditional housing), such as apartment blocks B and C (for CS2) is as follows (CIRIA 665, 2007):

- **Option a)** - Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200g damp proof membrane (DPM) and underfloor venting; or;
- **Option b)** - Beam and block or pre-cast concrete and 2000g DPM / reinforced gas membrane and underfloor venting; and,
- All joints and penetrations sealed.

Gas protection measures (based on the above scope) for apartment blocks B and C will be incorporated into the Detailed Design Stage of the proposed development; and will be installed by experienced and trained specialists and will be subject to inspection and certification, during the Construction Stage. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented and verified.

Further mitigation measures for the prevention of soil / bedrock contamination during construction are proposed below. The Contractor will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Chapter 10 - Water are also applicable to the protection of soils and geology during the construction phase:

- In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1, and the historic well located in the north-eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, 'Good practice for decommissioning redundant boreholes and wells' (UK Environment Agency, 2012);
- Earthworks / piling plant and vehicles delivering construction materials to Site will be confined to predetermined haul routes around the Site for each phase of the proposed development;
- The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any Site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the Site;
- Dust suppression measures (e.g., dampening down) will be implemented as necessary during dry periods;
- All excavated materials / piling arisings will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m;
- A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site;
- The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the proposed development in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001) which are also detailed in Chapter 10 – Water; and,
- Specifically, regarding pollution control measures, the following will be adhered to;
  - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
  - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
  - Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of;
  - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area;
  - All plant and machinery will be serviced before being mobilised to Site;
  - No plant maintenance will be completed on Site, any broken-down plant will be removed from Site to be fixed;
  - Refuelling will be completed in a controlled manner using drip trays at all times;
  - Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water;
  - Fuel containers will be stored within a secondary containment system, e.g., bunds for static tanks or a drip tray for mobile stores;
  - Containers and bunding for storage of hydrocarbons and other chemicals will have a holding capacity of 110% of the volume to be stored;
  - Ancillary equipment such as hoses and pipes will be contained within the bund;

- Taps, nozzles or valves will be fitted with a lock system;
- Fuel and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- Drip-trays will be used for fixed or mobile plant such as pumps and generators to retain oil leaks and spills;
- Only designated trained operators will be authorised to refuel plant on Site;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment;
- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of soils and bedrock becoming contaminated through Site activity; and,
- The highest standards of Site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the Site and surrounding environment during construction. A named person will be given the task of overseeing the pollution prevention measures agreed for the Site to ensure that they are operating safely and effectively.

The above mitigation measures will be incorporated (as required) during Detailed Design Stage and will form part of a site-specific Construction Environmental Management Plan (CEMP) which will be implemented during the Construction Stage (including initial Site preparatory / enabling works).

### 9.5.2. Operational Phase

Taking account of the relevant mitigation measures to be implemented during the Detailed Design Stage and Construction Stage (specifically the installation of an appropriate ground gas membrane beneath apartment blocks B and C, and the removal of two localised soil hotspots from the proposed footprints of the housing and duplex units and associated gardens), no further mitigation measures will be required during the operational phase.

## 9.6. Monitoring Requirements

### 9.6.1. Construction Phase

A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site.

### 9.6.2. Operational Phase

No monitoring will be required during the operational phase.

## 9.7. Residual Impacts

### 9.7.1. Construction Phase

The impact on land take is likely to have a slight negative permanent impact on the environment of the area; however, this change is consistent with existing and emerging trends.

Implementation of the measures outlined above will ensure that potential moderate impacts of the proposed development on soils and the geological environment do not occur during the construction phase, and that any residual impacts (with the exception of offsite soil removal) will be slight negative and short term in duration.

The primary residual impact is the potential removal of ca. 41,200m<sup>3</sup> of excess topsoil and subsoil (native soil and made ground) for offsite disposal (via. excavation and piling). However, based on available soils analytical data, this material would likely be classified as non-hazardous (EWC Code - 17 05 04). The majority of soil is likely to be suitable for disposal as inert material to an appropriate local authority permitted / EPA licenced waste facility, with the exception of localised soils in the vicinity of TP209 (0.5m) which would be suitable for disposal as non-hazardous material to an appropriate EPA licenced waste facility. The relevant local authority registered, permitted and /or EPA licenced waste facilities will be operated and managed according to the relevant conditions

of their waste permits or EPA waste licences. The Contractor will ensure that all waste soils are classified correctly (as per relevant EPA (2015) Guidance) and managed, transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation. The residual impact with respect to offsite soil removal is therefore likely to be slight negative and permanent.

### 9.7.2. Operational Phase

The impact on land take is likely to have a slight negative permanent impact on the environment of the area; however, this change is consistent with existing and emerging trends.

Implementation of the measures outlined previously during the Detailed Design and Construction Stages (specifically the installation of an appropriate ground gas membrane beneath apartment blocks B and C, and the removal of two localised soil hotspots from the proposed footprints of the housing and duplex units and associated gardens) will ensure that potential moderate negative permanent impacts on human health and infrastructure do not occur during the operational phase. Accordingly, no predicted residual impacts with regards to soils or geology will arise during the operational phase.

### 9.7.3. Land, Soils and Geology and Human Health

Potential human health risks associated with quality impacts to soils arising from the proposed development during the Construction Phase have been identified as follows;

- Potential risk to receptors (i.e., construction workers) through direct contact, ingestion or inhalation with any soils which may potentially contain hydrocarbon concentrations from Site activities (potential minor leaks and spills of fuels, oils and paint). However, this risk will be addressed by implementation of the mitigation measures outlined previously; and,
- Potential risk to receptors during the operational phase (i.e., residents) through ingestion of marginally elevated levels of naturally occurring Barium in the event that residential gardens at two localised hotspots within the proposed footprint of the housing and duplex units are used to grow produce which are subsequently consumed. However, this risk will be fully addressed by implementation of the mitigation measures outlined previously.

Taking account of the baseline environmental setting and the proposed mitigation measures during the Construction Phase, no human health risks associated with exposure to contaminants (via. direct contact, ingestion or inhalation) resulting from the proposed development are anticipated.

## 9.8. 'Do Nothing Scenario'

The Site is currently the location of a disused golf course and is informally used as public open space. The do-nothing scenario will have a neutral and imperceptible effect on the Site with regards to land, soils and geology.

## 9.9. Reinstatement

All temporary construction compounds and Site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings. All construction waste and / or scrapped building materials are to be removed from Site on completion of the construction phase. Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from Site and disposed of at an appropriately licenced waste facility.

# 10. Water

## 10.1. Introduction

This chapter describes the existing surface water and groundwater regime likely to be encountered beneath and in the general vicinity of the proposed development. It also addresses the potential impact of the proposed development on hydrology (i.e. surface water) and hydrogeology (i.e. groundwater) together with the mitigation measures that will be employed to eliminate or reduce any potential impacts. A detailed description of the proposed residential development (hereafter referred to as the Site) is presented in Chapter 2 – Project Description of the EIAR.

## 10.2. Study Assessment and Methodology

The following scope of works was undertaken by Atkins in order to complete this assessment: -

- Desk-based study including review of available historical information;
- Site Walkover Survey carried out by an experienced Hydrogeologist on the 26<sup>th</sup> March 2020;
- Site attendance during the Ground Investigation, undertaken for geo-technical and environmental assessment purposes; and,
- Surface water sampling carried out by an experienced Hydrogeologist on the 3<sup>rd</sup> September 2020.

The purpose of the desk-based task was to characterise the current hydrological and hydrogeological setting of the Site. Relevant background information was compiled, specifically from the following data sources;

- Bing Maps Aerial photography (consulted 12/08/2022);
- Dún Laoghaire-Rathdown County Council and Wicklow County Council Planning Maps (consulted 12/08/2022);
- Dún Laoghaire-Rathdown County Council County Development Plan 2022-2028 (DLRCC 2022);
- Bray Municipal District Local Area Plan 2018-2024 (WCC 2017);
- Environmental Protection Agency (EPA) web mapping (consulted 12/08/2022);
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater web mapping (consulted 12/08/2022)
- GSI '*Wicklow GWB: Summary of Initial Characterisation*' (GSI, 2004);
- Google Maps Aerial photography (consulted 12/08/2022);
- Office of Public Works National Flood Hazard mapping web Site (consulted 12/08/2022);
- Ordnance Survey of Ireland (OSI) web mapping (consulted 12/08/2022);
- National Parks and Wildlife Service (NPWS) Map Viewer (consulted 12/08/2022);
- Water Framework Directive (WFD) Ireland web mapping (consulted 12/08/2022);
- '*Remediation Option Appraisal - Historic Landfill At Bray Harbour, Co. Dublin, March 2017*' Report prepared by Fehily Timoney & Co. (2017); and,
- Site specific soils, bedrock and groundwater monitoring data obtained during the Ground Investigation and documented in a final factual report entitled '*Harbour Point Bray Ground Investigation Report – Factual*' prepared by IGSL Ltd. (2021).

The ground investigation for the proposed development was carried out by IGSL Ltd. (IGSL) between August and September 2020 in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007), BS 5930:2015, and BS 1377 (Parts 1 to 9) (IGSL, 2021). Areas investigated included onsite locations and one offsite location (ROH04 – located within the general masterplan lands). The full scope of ground investigation works completed is detailed in Chapter 9 – Land, Soils and Geology (exploratory locations are presented in Figure 9-1 and 9-2). Full details of the ground investigation are presented in the '*Harbour Point Bray Ground Investigation Report – Factual*' prepared by IGSL (2021) and presented in Appendix 9.1.

The Ground Investigation was designed to ensure that all potential onsite and offsite sources of contamination were assessed in terms of potential contamination risks to human health and environmental receptors.

Representative environmental groundwater samples were collected by IGSL in accordance with relevant best practice standards (BS10175 – 2011) from 1no. window sample borehole (converted to a shallow perched water

monitoring well, WS04B) and 3no. rotary boreholes (converted to groundwater monitoring wells, ROH01, ROH02 and ROH04). All 4no. groundwater samples (for the 2no. sampling events completed) were subsequently scheduled for laboratory analysis for a comprehensive suite of parameters. All groundwater samples were stored in chilled cooler boxes, prior to dispatch to a UKAS accredited laboratory. 2no. groundwater sampling events were carried out on 8<sup>th</sup> and 13<sup>th</sup> of November 2020.

Baseline perched water and groundwater level monitoring was also carried out by IGSL. 6no. perched water and groundwater level monitoring events were carried out between 2<sup>nd</sup> October and 17<sup>th</sup> December 2020. In addition, continuous groundwater level monitoring (at hourly intervals) was conducted at 7no. monitoring locations from 6<sup>th</sup> October to 12<sup>th</sup> December 2020 (IGSL, 2021).

Representative environmental surface water samples were collected by Atkins on 3<sup>rd</sup> September 2020 in accordance with relevant best practice standards (BS10175 – 2011) from key monitoring locations on the River Dargle, upstream and downstream of the Site. The 2no. surface water samples were subsequently scheduled for laboratory analysis for a comprehensive suite of parameters. All surface water samples were stored in chilled cooler boxes, prior to dispatch to a UKAS accredited laboratory.

The information obtained during the walkover survey, the ground investigation and the surface water sampling was supplemented by data gathered during the desk-based review of all available relevant site-specific and regional data. This assessment has been completed in accordance with relevant best practice guidance from the Institute of Geologists of Ireland (IGI), '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*' (IGI, 2013). This assessment has also been prepared with regard to the guidelines prepared by the Environmental Protection Agency (EPA) outlined in '*Revised Guidelines on the Information to be contained in Environmental Impact Statements*' published in 2015, '*Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements)*' published in 2015, and also '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*' published in May 2022.

Separately, a Flood Risk Assessment (FRA) has been prepared by Atkins (2022) (Doc. Ref: 5214419DG0019) in accordance with the following guidance document; '*The Planning System and Flood Risk Management – Guidelines for Planning Authorities*' DOEHLG 2009, and comprised the following key phases: -

- **Stage 1: Flood Risk Identification** - to identify whether there may be any flooding or surface water management issues related to the proposed development that may warrant further investigation;
- **Stage 2: Initial Flood Risk Assessment** - to confirm sources of flooding that may affect the proposed development, to appraise the adequacy of existing information and to scope the extent of the risk of flooding; and,
- **Stage 3 Detailed flood risk assessment** – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

No difficulties were encountered during the data collection and assessment stages of this Water Impact Assessment.

## 10.3. Receiving Environment

### 10.3.1. Site Development

A review of historic maps (including available 6-inch historic maps (1829-41), 25-inch historic maps (1897-1913), Cassini 6-inch historic maps 1830-1930 and aerial photographs (1995 to 2012) from the Ordnance Survey of Ireland) (OSI 2021) and current aerial photography (Bing Maps, 2022) confirms that land use at the Site has generally been transformed over the years from agricultural land to a former golf course. The surrounding lands have developed considerably since the early nineteenth century. A detailed summary of land use both in relation to the Site and surrounding lands is presented in Chapter 9 – Land, Soils and Geology.

### 10.3.2. Current Site Setting and Topography

A site walkover survey was carried out on 26<sup>th</sup> March 2020. The topography of the Site generally falls from north to south with a localised high ridge running in an east-west direction across the centre of the Site. The site is bounded to the north by trees (and the Corke Abbey residential estate to the north west), leading down to the Rathmichael Stream, located north of the site boundary and which is culverted beneath the railway tracks. The south of the Site is bounded generally by an access road, the River Dargle, and/ or masterplan lands. The Dublin-Rosslare railway line runs along the eastern boundary of the Site with the new Ravenswell school campus (recently constructed) located just beyond the main western boundary of the Site.

The Site is mainly grassed, as a result of its former use as a golf course. The southern section of the Site appears to be a former hardstanding / gravel surfaced area which has become overgrown. There is an existing underground Irish Water foul storage tank located in the western portion of the Site, which is used as an emergency overflow tank by Irish Water. One monitoring well / former borehole was identified in the north eastern portion of the Site. The (assumed) base of the well was measured to be 7.84 mbgl, while the groundwater level was measured to be 7.49 mbgl. The well condition and integrity below ground is unknown. Therefore this monitoring point has not been included as part of this assessment. The Site is currently fenced off to members of the public; however there are access points along the existing fence and the Site is a popular spot for local dog walkers and members of the local community. Findings from the Site walkover survey informed the ground investigation design.

The topography of the Site falls from ca. 11.8 meters above ordnance datum (mOD) in the north western portion of the Site to ca. 2.1 mOD in the south eastern portion of the Site. Based on EPA ground elevation contours, the land topography in the wider area is generally within 0mOD to 20mOD, but increases up to ca. 280mOD toward the west of the study area in the Wicklow Mountains and to ca. 210mOD toward the south east of the study area toward the Greystones to Bray Cliffs.

### 10.3.2.1. Potential Contamination Sources

Bray Municipal Landfill is a former landfill site located to the north-east and east of the proposed development site (refer to Figure 9-5 in Chapter 9 – Land, Soils and Geology) and is subject to ongoing coastal erosion. A Tier 2 Environmental Risk Assessment (Fehily Timoney & Co., 2016) was carried out on the site to “confirm the type and depth of the waste and to assess potential groundwater contamination”. This assessment included ground investigation comprising a geophysical survey, boreholes, and geoenvironmental sampling of soil, groundwater, leachate and gas. A detailed summary of findings of this assessment, and proposed remedial strategy is presented in Chapter 9 – Land, Soils and Geology. The former landfill site has been categorised as ‘Class C – Low Risk’ which is described by the EPA as “not considered to pose a significant risk to environment or human health”. Given that the Site is located upgradient of the former landfill, the former landfill is not considered to be a potential offsite source of contamination (via. perched water / groundwater migration). The long term coastal protection measures and short term (interim) remedial measures proposed at the former landfill site (as summarised in Chapter 9 – Land, Soils and Geology) will not impact on the proposed development (during the construction or operational phases).

On a regional scale there are currently two EPA licenced facilities within the vicinity of the Site (refer to Figure 9-5 in Chapter 9 – Land, Soils and Geology) as follows;

- Starrus Eco Holdings, Integrated Waste Management Facility is located ca. 2 km south west of the Site; and,
- Nypro Limited, Corke Abbey, Bray, Co. Dublin – a licensed industrial Site with an active IPPC license number P0567-02. This Site is located ca. 0.14km north west of the Site.

Another potential offsite source of contamination is the railway line located immediately east of the Site (refer to Figure 9-5 in Chapter 9 – Land, Soils and Geology).

During the desk based review, and Site walkover survey, several potential onsite sources of contamination were also identified as follows:-

- A subsurface tank of unknown use adjacent to the northern Site boundary;
- A minor amount of waste C&D material in a localised area within the southern portion; and,
- The existing underground Irish Water foul storage tank in the western portion, and underground foul sewer pipes running along the eastern Site boundary which comprise the main pipeline from Bray to Shanganagh Wastewater Treatment Plant (WwTP).

## 10.4. Flood Risk

A Flood Risk Assessment (FRA) has been prepared by Atkins on behalf of Shankill Property Investments Ltd. as part of the supporting assessments required for this planning application. During the preparation of the FRA, Atkins engaged in a series of pre-application consultations with the relevant stakeholders including with ABP, Dun Laoghaire Rathdown County Council (DLRCC) and Wicklow County Council (WCC).

The findings of the Stage 1 Flood Risk Identification indicated that potential flooding mechanisms associated with groundwater or pluvial sources, or potential blockages of existing infrastructure could be screened out for the proposed development. However the Stage 1 Flood Risk Identification did identify that the southern area of the proposed development is potentially susceptible to both tidal/coastal flood events, and fluvial flood events from the River Dargle. The report determined that there was insufficient quantitative information, collated as part of the screening exercise, available to complete an appropriate assessment of the fluvial and tidal/coastal flood risk to



the site. Therefore a more detailed and robust analysis of the fluvial flooding and Coastal/Tidal regime at and in the vicinity of the proposed development would be required.

Accordingly, on behalf of Atkins, IE Consulting Ltd. completed an overview of the fluvial and tidal/coastal flood risk from the River Dargle on the proposed development. A hydraulic model was developed of the River Dargle, in the context of both the proposed development; and the wider Harbour Point Masterplan development. In relation to the proposed development, the model was developed to assess the fluvial and coastal/tidal flood risk based on the proposed scheme design submitted as part of this planning application. In relation to the wider Harbour Point Masterplan lands, the model was developed using existing site conditions only, given that detailed design information for these lands (outside the subject of this planning application) is not yet available.

The details of the various model iterations and the final outputs are presented in the Flood Risk Assessment Report. Based on the detailed and robust analysis of the fluvial flooding and Coastal/Tidal regime the outcome of the modelling and subsequent analysis shows that there is no 'highly vulnerable' development proposed within the delineated Flood Zone 'B'. While the access road and Market Square area are proposed to be located in Flood Zone 'B', such land uses are deemed to be 'less vulnerable' development. Furthermore, as a mitigating (design) measure for the proposed 'less vulnerable' access road and Market Square being located within Flood Zone 'B' (where some flood water will be displaced) compensatory storage has been provided within the proposed open space (park) area of the proposed development. Therefore the proposed development does not pose an increased flood risk to surrounding people or property outside of the applicant's landholding.

A copy of the Flood Risk Assessment Report prepared by Atkins (2022) (document ref.: 5214419DG0019) is presented in Appendix 10.1.

Key conclusions presented in the detailed technical report (Atkins, 2022) are summarised as follows:

- *'In accordance with the planning guidelines, flood risk identification was carried out as required to identify if there are any flooding or surface water management issues related to the proposed development site that may warrant further investigation.*
- *Following the flood risk identification, it was determined that the primary flood risks identified for the proposed development site are both fluvial and tidal/coastal flooding. It was considered that insufficient quantitative information was available as part of the screening exercise and therefore a detailed and robust analysis of the fluvial flooding and tidal/coastal regime at and in the vicinity of the proposed development site was required.*
- *A detailed hydrological analysis was undertaken of the River Dargle in order to identify the predicted 1 in 100 year (1% AEP) and 1 in 1000 year (0.1% AEP) flood events in the vicinity of the proposed development site. In addition, the predicted 1 in 200 year (0.5% AEP) and 1 in 1000 year (0.1% AEP) tidal flood levels have been analysed in the vicinity of the site.*
- *This detailed analysis of the Fluvial and Tidal/Coastal flooding was carried out as outlined above and it was determined that no 'highly vulnerable' development is proposed within the delineated Flood Zone 'B'. The proposed open space (park) area within the south of the Coastal Quarter Development site shall flood during the fluvial 1 in 100 year and 1 in 1000 year event along with the tidal 1 in 200 year and 1 in 1000 year flood events. This open space area is however deemed 'water compatible' in line with the guidance outlined by the Dept. of the Environments guidelines for planning authorities 'The Planning System and Flood Risk Management' and therefore may flood in these low frequency storm events.*
- *The proposed 'less vulnerable' main access road and Market Square area are proposed to be located within the footprint of Flood Zone B, however the limited volume of displaced flood water resultant from this will be catered for within the proposed southern open space (park) area within the Coastal Quarter Development.*
- *Due to the location of the proposed development adjacent to and partially within a flood zone a Justification Test was carried out in line with the criteria outlined by the Dept. of the Environments guidelines for planning authorities 'The Planning System and Flood Risk Management'. This Justification Test satisfied the required criteria and therefore determined that there is no residual risk of flooding to the proposed Coastal Quarter Development except for that which is planned (during the fluvial 1 in 100 year and 1 in 1000 year event along with the tidal 1 in 200 year and 1 in 1000 year flood events) within the south of the subject site in the open space area.*
- *In addition, the proposed development does not pose an increased flood risk to people or the surrounding property outside of the applicant's landholding.*
- *In summary, the development as proposed shall not result in an adverse impact to the existing hydrological regime of the area nor increase flood risk to areas outside of the landowners' holdings, nor create unacceptable levels of flood risk within the proposed development and is therefore considered to be appropriate from a flood risk perspective.*

In addition, the potential cumulative impacts with regards to flood risk from the proposed development, particularly in the context of the proposed Harbour Point Masterplan, were reviewed by IE Consulting Ltd. Refer to the technical note presented in Appendix 10.4 (IE Consulting Ltd., 2022). Potential cumulative impacts are assessed in detail in Chapter 13 - Cumulative Impacts.

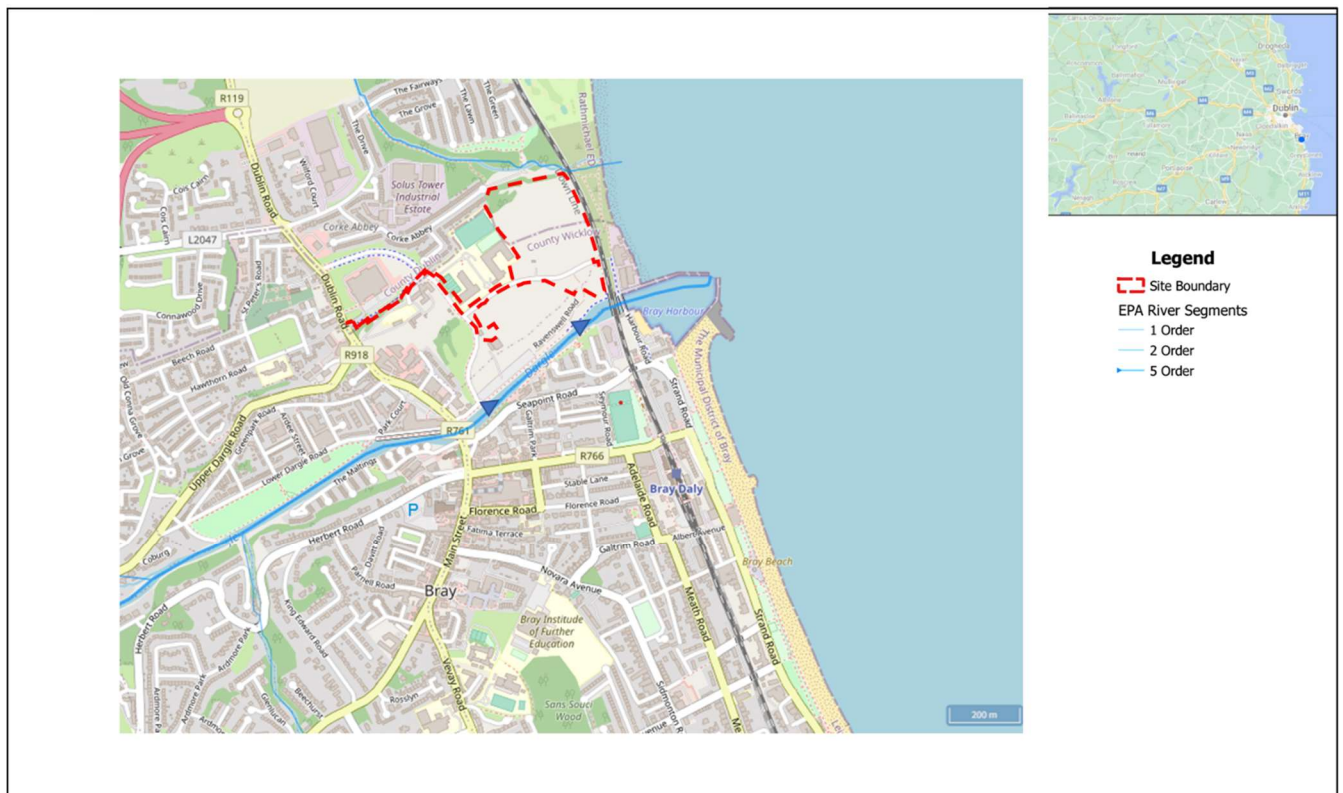
**10.4.1.1. Drainage Design and Climate Change**

Drainage infrastructure beneath the proposed development and associated attenuation areas have been designed to take account of potential changes in rainfall run-off rates associated with climate change (i.e. 1 in 100-year 6-hour storm event including 20% for climate change and 10% for urban creep).

The Finished Floor Levels (FFL) of the proposed units within the Coastal Quarter development have been set at a minimum level of 6.10mOD. A freeboard of 2.131m above the peak 0.1% AEP flood level has been provided which is significantly higher than the minimum freeboard requirement of 500mm. The level of flood protection also provided by the recently constructed River Dargle Flood Defence Scheme mitigates the level of flood risk to people, property and the urban environment (Atkins, 2022). Therefore all habitable dwellings together with the proposed crèche will be protected from flood risk in both the current climate and future climate scenarios. Accordingly, the potential impact of climate change on the proposed development with regards to drainage design is imperceptible.

**10.4.2. Hydrology**

There are no reported surface water features within the proposed development, and none were identified during the Site walkover survey. There are two rivers located in the general vicinity of the proposed development. The Rathmichael Stream is located immediately north of the proposed development and flows in an easterly direction prior to discharge to the Irish Sea. The River Dargle is located immediately south of the proposed development, and also flows in an easterly direction prior to discharge to the Irish Sea. Bray harbour is located ca. 0.5km south east of the Site and is an important amenity for the local population. The proposed development is located ca. 90m from the Irish Sea. Hydrological Features in the general vicinity of the Site are presented in Figure 10-1.



**Figure 10-1 – Hydrological Features in the general vicinity of the Site (Source: EPA, 2022)**

Killiney Bay geological heritage area is located ca. 30m east of the Site, as detailed further in Chapter 9 - Land, Soils and Geology. The geological heritage area is described by the GSI (2022) as a '5km long coastal section which exposes a succession of several units of glacial till.' It is considered 'a particularly impressive exposure into deep till with many sedimentological characteristics exposed' (GSI, 2022). The proposed development will not have

any impact on Killiney Bay geological heritage area. As detailed previously in Chapter 4 – Biodiversity, the nearest European site is Bray Head Special Area of Conservation (SAC) which is located along the coastline ca. 1.7km south of the project site. Hydrological connectivity exists from the proposed development site to coastal and marine SACs/ Special Protected Areas (SPAs) via the Dargle River and the Irish Sea. The closest European sites with connectivity via the Irish Sea are: Bray Head SAC (ca. 1.7km), Rockabill to Dalkey Island SAC (ca. 4.1km) and Dalkey Islands SPA (ca. 6.4km). Given the dilution factor the Irish Sea would present, this hydrological connectivity is not considered a viable pathway through which any of the European sites could be impacted. As such it is considered there is no viable indirect connectivity through surface water features, drains or any other vectors from the development site to any European site.

**10.4.2.1. Surface Water Quality**

The EPA maintains a database of surface water features including rivers and lakes as well as water quality and risk status in accordance with the Water Framework Directive (WFD). The purpose of the WFD is to protect and enhance all waters including rivers, lakes, estuaries, coastal waters and groundwater as well as water dependent wildlife and habitats. This involves improving or maintaining current water quality status with the aim of achieving ‘Good’ status for all waters; and mitigating against the risk of a decline in the water body quality status. The site is located within the Dargle WFD sub-catchment of the Ovoca-Vartry WFD surface water catchment.

Both the Rathmichael Stream (north of the proposed development) and the River Dargle (south of the proposed development) have been assigned ‘Good’ surface water quality status by the EPA, for the 2013 to 2018 monitoring period (EPA, 2022), as presented in Figure 10-2. Both surface water courses are ‘not at risk’ of failing to meet the relevant WFD objectives for these surface waterbodies by 2027 (EPA, 2022). The Irish Sea (east of the proposed development) has been assigned ‘High’ coastal water quality status for the 2013 to 2018 monitoring period (EPA, 2022), and is ‘not at risk’ of failing to meet the relevant WFD objectives for this coastal waterbody by 2027 (EPA, 2022). The EPA produces an annual report which sets out bathing water quality at Ireland’s beaches during the summer bathing water season. Based on the latest available report and supporting data, the water quality status of Bray South Promenade during the 2021 summer bathing water season was reported to be ‘Good’<sup>42</sup> (EPA, 2022).



**Figure 10-2 – Regional Surface Water Quality in the general vicinity of the Site (Source: EPA, 2022)**

<sup>42</sup> <https://www.epa.ie/publications/monitoring--assessment/freshwater-marine/Bathing-water-quality-in-Ireland-in-2021.pdf>

In order to establish baseline surface water quality at key locations along the River Dargle (upstream and downstream of the southern site boundary), 2no. surface water samples were collected on the 3<sup>rd</sup> September 2020. Surface water sample locations are presented in Figure 10-3. Surface water analytical results were screened where relevant against the following Generic Assessment Criteria (GAC):

- Surface Water Regulations, S.I. No. 272 of 2009, as amended (S.I. No. 327 of 2012, S.I. No. 386 of 2015, S.I. No. 77 of 2019 and S.I. No. 659/2021).

Tabulated and screened surface water analytical results are presented in Table 1 of Appendix 10.2. Laboratory reports are presented in Appendix 10.3. In summary, baseline surface water quality in the River Dargle, upstream and downstream of the proposed development is generally good as evidenced by surface water analytical results, presented in Appendix 10.2 There was no detection of petroleum hydrocarbons, polyaromatic hydrocarbons (PAHs), Hexavalent Chromium, Total Dissolved Chromium III, Ammoniacal Nitrogen as N, Total Ammonia as N, Total Cyanide, Ortho Phosphate as P, Total Phosphorus as P, Nitrite as NO<sub>2</sub>, Fluoride, Total Phenols, Benzene, Toluene, Ethylbenzene, m/p/o-Xylene, or Methyl Tertiary Butyl Ether, in either sample analysed.

All parameters analysed for both samples (including dissolved metals) were either below the relevant laboratory limit of detection, or below the relevant GAC (where available). Total Coliforms (including Faecal Coliforms) and E.coli were detected in both the upstream (SW01) and downstream (SW02) samples. Faecal Coliform counts of 870 cfu/100ml and 900 cfu/100ml were detected in SW01 and SW02 respectively, while E.coli was also detected at 727 MPN/100ml and 866 MPN/100ml at these respective locations. Elevated concentrations of ammonium, nitrate, phosphate and faecal coliforms in surface water are typical indicators of anthropogenic pollution. However, nitrate was not detected at elevated concentrations in either sample (SW01, SW02), and baseline levels for ammonium and phosphate do not exceed the relevant GAC. It is also noted that E.coli results at both sample locations are within the relevant inland water criteria (1000 MPN/100ml) used to classify bathing waters as 'good' in accordance with relevant water quality standards<sup>43</sup> (EPA, 2022).

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<sup>43</sup> [https://www.epa.ie/water/wm/bathing/bw\\_quality/](https://www.epa.ie/water/wm/bathing/bw_quality/)



Figure 10-3 – Surface Water Sample Locations along the River Dargle (Source: Google Mapping, 2021)

### 10.4.3. Hydrogeology

#### 10.4.3.1. Aquifer Characteristics

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor) and vulnerability (extreme, high, moderate or low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification is primarily based on the permeability and thickness of subsoils), as presented in Table 10-1.

Table 10-1 - Groundwater Vulnerability Rating Table (Source: GSI, 1999)

Vulnerability Rating	Hydrogeological Conditions				
	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)
<b>Extreme (E)</b>	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
<b>High (H)</b>	> 3.0m	3.0 - 10.0m	3.0 - 5.0m	> 3.0m	N/A
<b>Moderate (M)</b>	N/A	> 10.0m	5.0 - 10.0m	N/A	N/A
<b>Low (L)</b>	N/A	N/A	> 10.0m	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 m below ground surface.

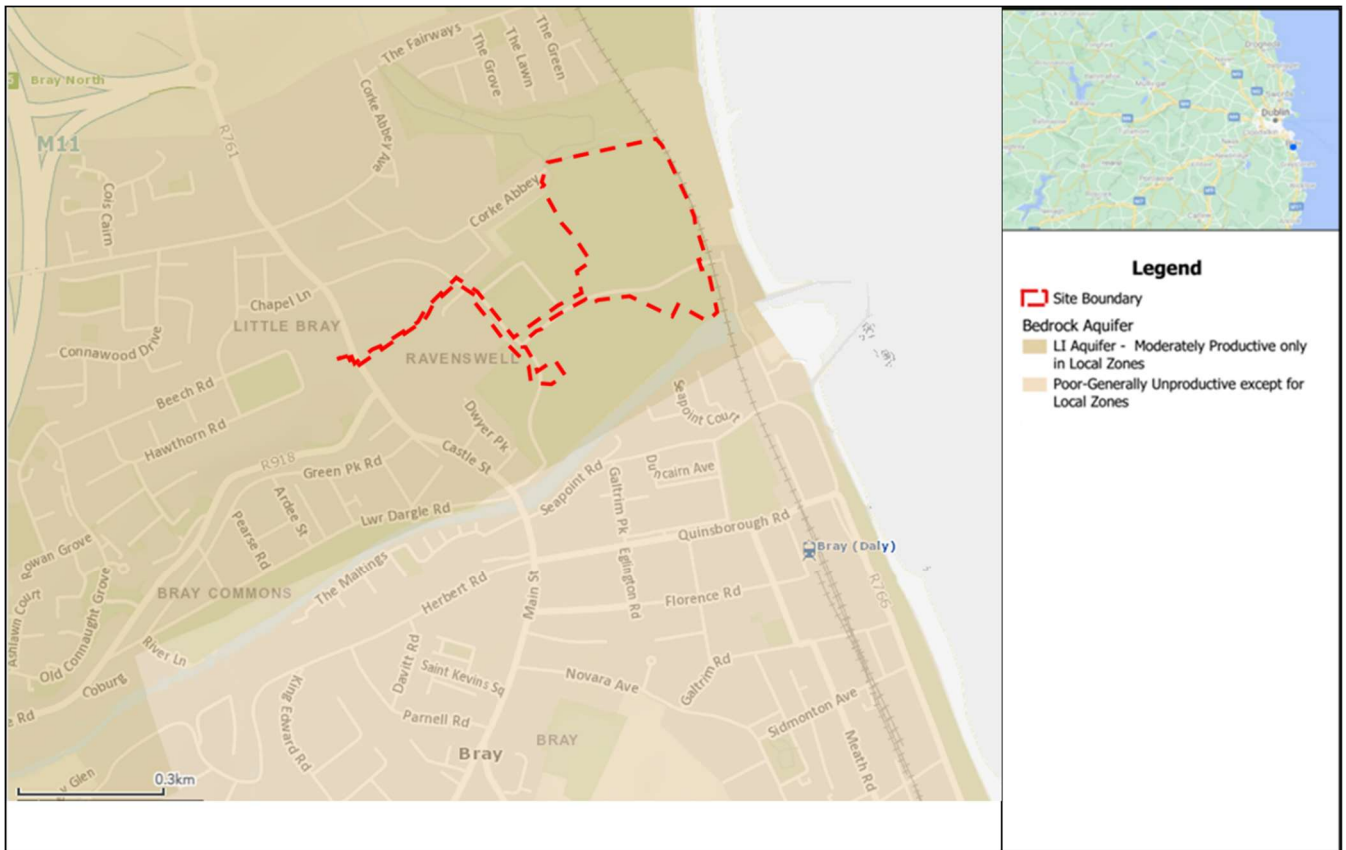
Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface. Groundwater vulnerability (in the bedrock aquifer) is predominantly Moderate (M) in the northern and central portions of the Site, and Low (L) in the southern portion of the Site, as presented in Figure 10-4 (GSI, 2022). Areas of Extreme (E) and Rock at or Near Surface or Karst (X) vulnerability are noted to be present offsite, to the south and southwest of the Site.

The GSI has devised a system for classifying bedrock aquifers and gravel aquifers in Ireland based on the size and hydrogeological characteristics of these aquifers. The three main classifications for bedrock aquifers are Regionally Important Aquifers (R), Locally Important Aquifers (L) and Poor Aquifers (P) (which are further subdivided based on the productivity of the aquifer). Gravel aquifers are classified as either Regionally Important (Rg) or Locally Important (Lg). Based on the GSI public data viewer (GSI, 2022) the bedrock aquifer (Maulin Formation) beneath the general vicinity of the Site is classified as a locally important aquifer (LI) – bedrock which is moderately productive only in local zones, as presented in Figure 10-5 (GSI, 2022). The Enniskerry Gravels are a locally important gravel aquifer located ca. 2km west of the Site.

The general vicinity of the Site is within the Wicklow Groundwater Body (GWB). The Groundwater Body (GWB) is the relevant management unit under the WFD. Groundwater bodies are subdivisions of large geographical areas of aquifers so that they can be effectively managed in order to protect the groundwater and linked surface waters (GSI, 2021). According to the 'Wicklow GWB: Summary of Initial Characterisation' document (GSI, 2004), the majority of groundwater flow in this GWB will occur in the top few metres of the bedrock aquifer, along a weathered zone in a lateral direction towards rivers and springs. The dominant recharge process will be diffuse recharge from water percolating through the overlying tills and into the aquifer. Groundwater will discharge directly to the sea along the coast. The GWB will also discharge to the over lying streams and rivers as baseflow (GSI, 2004). There are no karst features within a 10km radius of the proposed development (GSI 2022). Based on the geological setting of the receiving environment, there is no potential for karst features (such as fractures or epikarst) to be present beneath the Site. Accordingly, the potential for karst connectivity, and groundwater flow via. conduit pathways does not warrant consideration as part of this assessment.



Figure 10-4 - Regional Groundwater Vulnerability Rating (Source: GSI, 2022)



**Figure 10-5 - Regional Aquifer Classification (Bedrock Aquifer) (Source: GSI, 2022)**

**10.4.3.2. Groundwater Recharge**

Recharge is the amount of rainfall which infiltrates to ground and replenishes groundwater levels in the bedrock and gravel aquifers. It is dependent on the following key factors: effective rainfall (i.e. total rainfall less evaporation and surface water run-off), transpiration (i.e. uptake by vegetation) and aquifer characteristics (i.e. how easily the aquifer can accept water and store it). Additionally, not all effective rainfall will contribute to recharge due to impermeable materials in urbanised areas and associated drainage and water management infrastructure. The average recharge rate to the locally important bedrock aquifer beneath the general vicinity of the Site is reported to be ca. 82mm/yr (GSI, 2022).

**10.4.3.3. Groundwater Levels and Flow Direction**

4no. perched water monitoring wells (WS01B to WS04B<sup>44</sup>) were installed to a maximum depth of 5m across the Site within shallow subsoils. 3no. groundwater monitoring wells (ROH01, ROH02 and ROH04) were installed to a maximum depth of 13m within saturated estuarine deposits (gravelly silt / silt). 6no. monitoring events were undertaken between October and December 2020. Groundwater and perched water level monitoring results are presented in Table 2 of Appendix 10.2. Exploratory locations are presented in Figure 10-6 and Figure 10-7.

<sup>44</sup> 5no. shallow gas monitoring wells were installed at locations WS01A to WS05A. These wells were also checked for any perched water during each water level monitoring event. Refer to Table 2 of Appendix 10.1. All gas monitoring locations were reported to be dry, with the exception of WS04A, where shallow perched water levels were similar to the adjacent perched water monitoring location WS04B.

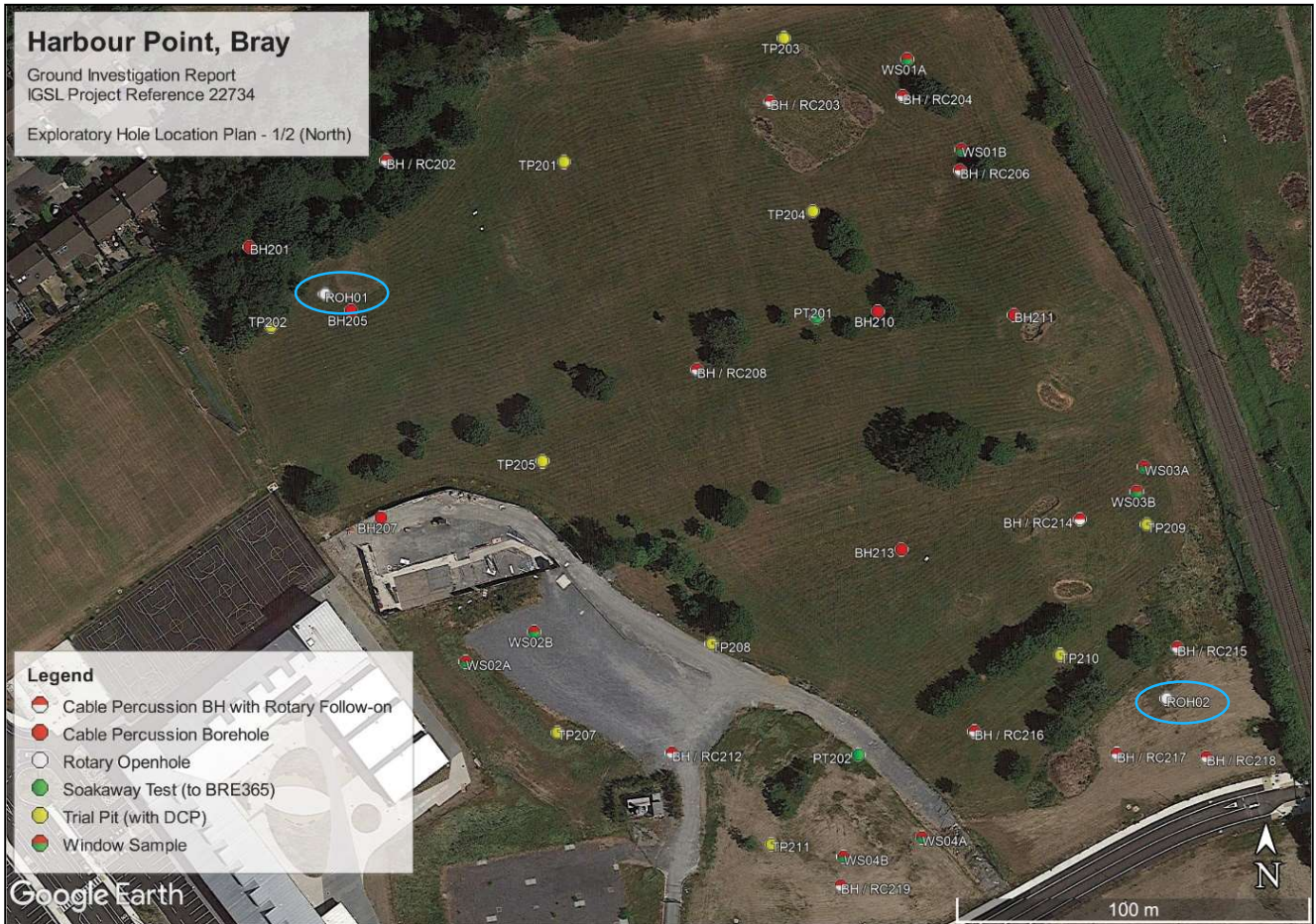


Figure 10-6 Perched Water & Groundwater Monitoring Well Location Map 1 of 2 (IGSL, 2021) (monitoring wells circled in blue)





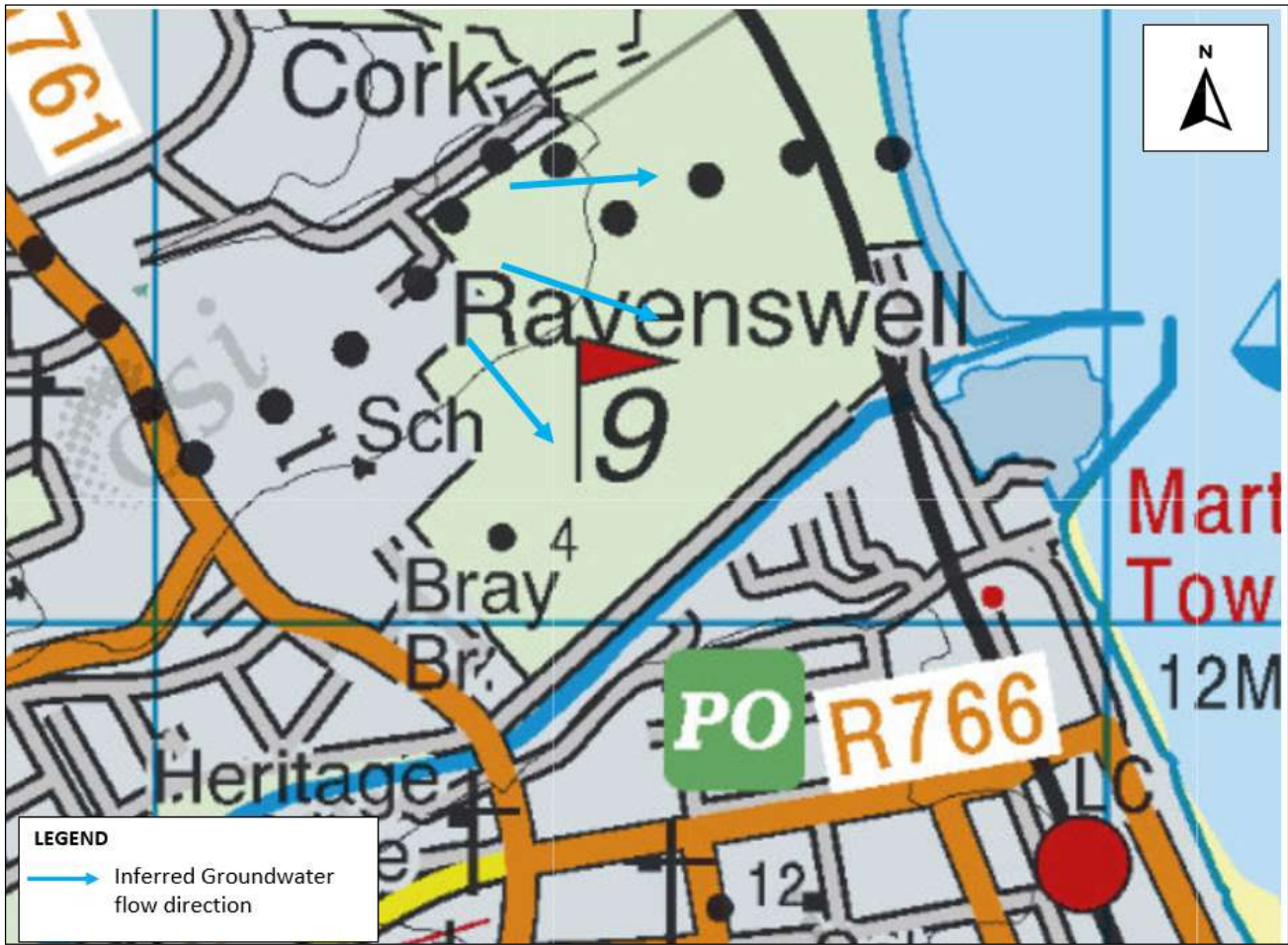
**Figure 10-7 Perched Water & Groundwater Monitoring Well Location Map 2 of 2 (IGSL, 2021) (monitoring wells circled in blue)**

Of the 4no. shallow perched water monitoring wells, all were reported to be effectively dry during each of the 6no. monitoring events, with the exception of WS04B where shallow perched water was measured during 5no. of the 6no. events. Perched water levels at this location ranged from 1.15 mbgl (6.31mOD) to 1.5 mbgl (5.96mOD).

Groundwater levels within the saturated estuarine deposits (gravelly silt / silt) at monitoring locations ROH01 (located in the north western portion of the Site), ROH02 (located in the south eastern portion of the Site) and ROH04 (located offsite, immediately south of the application boundary) are presented in Table 2 of Appendix 10.2. Measured groundwater levels during the monitoring period ranged from 4.49 mbgl (6.32mOD) to 4.98 mbgl (5.83mOD) at ROH01; 3.15 mbgl (1.32mOD) to 3.33 mbgl (1.14mOD) at ROH02; and 0.2 mbgl (1.23mOD) to 0.87 mbgl (0.56mOD) at ROH04.

Inferred groundwater flow is expected to follow topography in general easterly, southerly, and south easterly directions, towards the River Dargle (in the south) and the Irish Sea (in the east / south east), as presented in Figure 10-8.

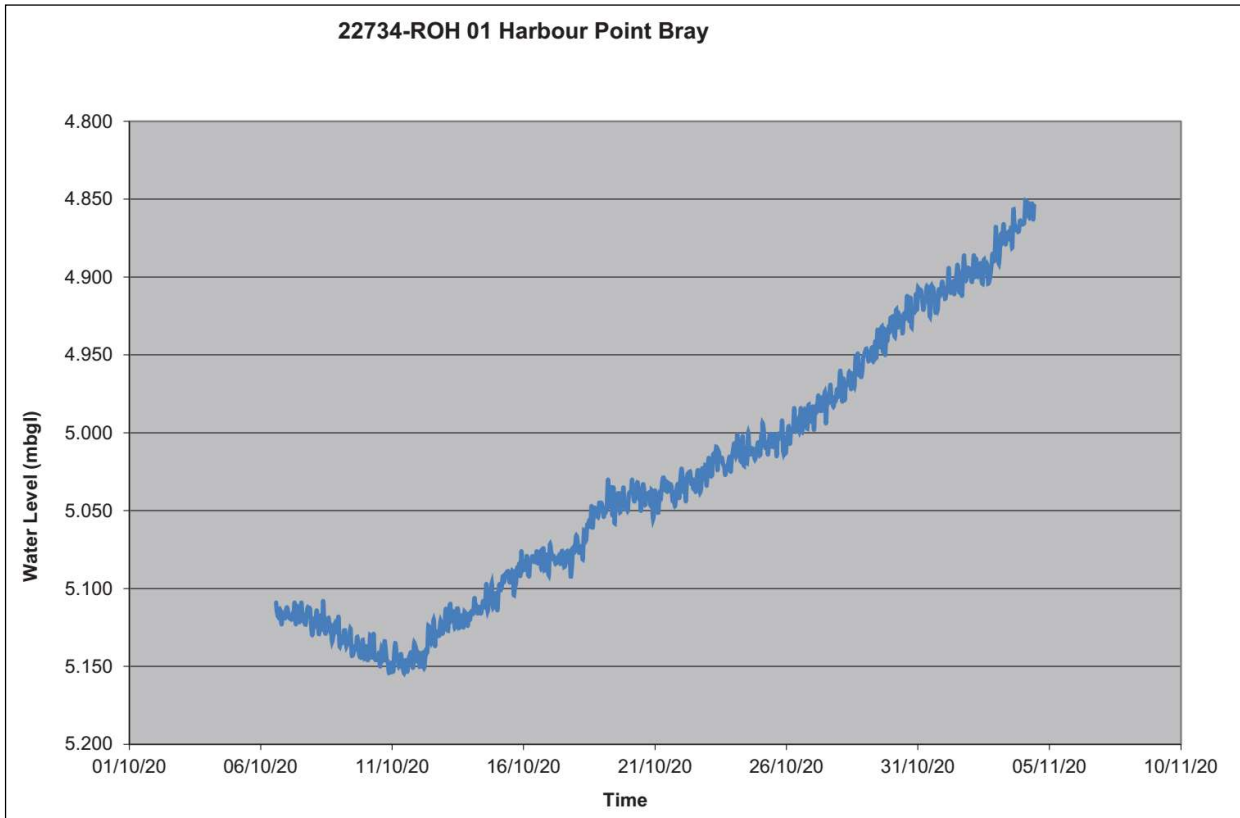
It is likely that effective rainfall percolates vertically and flows within the saturated estuarine silts, sands and gravels beneath the general vicinity of the Site. Shallow groundwater flowing beneath the proposed development is subsequently likely to discharge to the River Dargle in the south, and to the Irish Sea, in the east / south east.



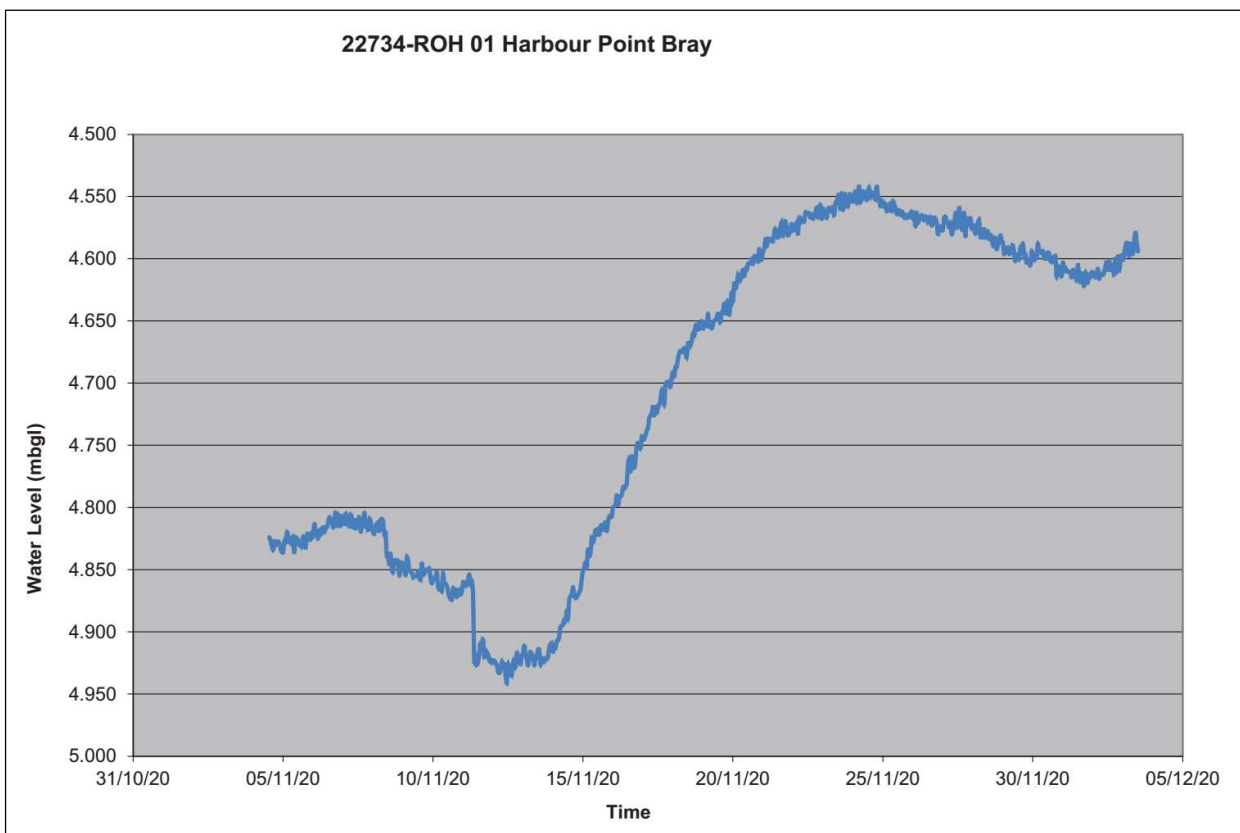
**Figure 10-8 - Inferred Groundwater Flow Direction (Source: GSI, 2021)**

Continuous groundwater level monitoring was carried out at selected monitoring locations between 6<sup>th</sup> October and 12<sup>th</sup> December 2020 (IGSL, 2021). For the purposes of this assessment the continuous groundwater monitoring data at monitoring wells, ROH01 (located in the north western portion of the Site), ROH02 (located in the south eastern portion of the Site) and ROH04 (located immediately south of the Site), have been evaluated.

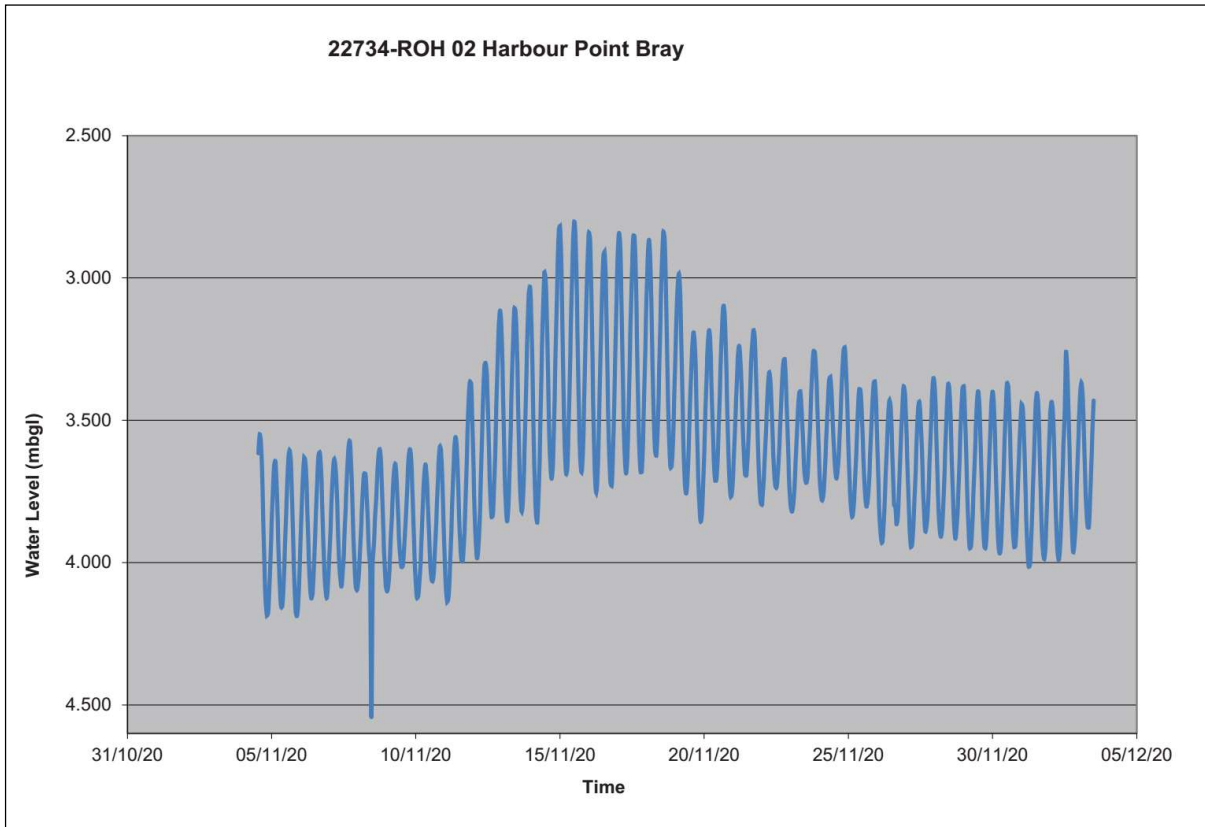
Groundwater levels at ROH02 and ROH04 show the greatest tidal influence, as expected, with tidal cycle ranges of ca. 0.55m and ca. 0.60m respectively recorded during the monitoring period. A minimal tidal influence (of ca. 0.02m) was recorded at ROH01, located in the north western portion of the Site. Refer to Graph 10.1 (a) (b) to Graph 10.3 (a) (b).



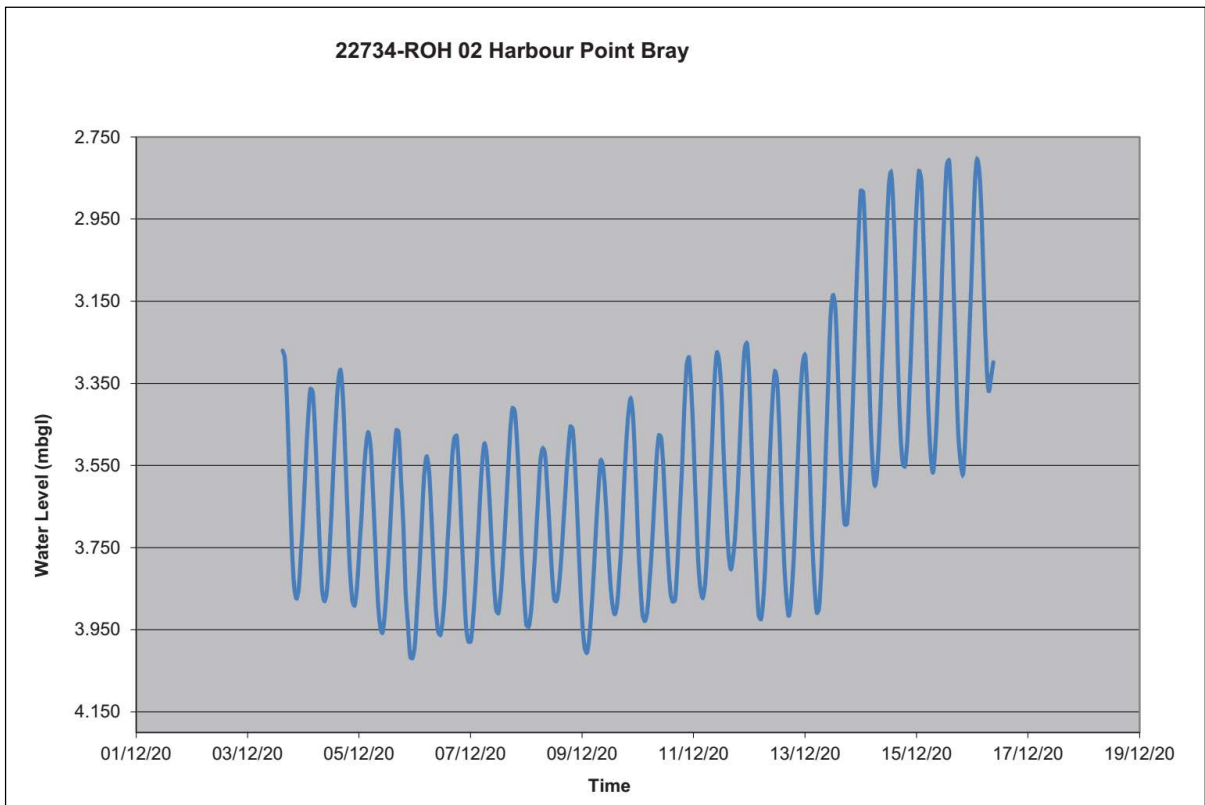
Graph 10-1 (a) ROH01 Hydrograph (October to November 2020)



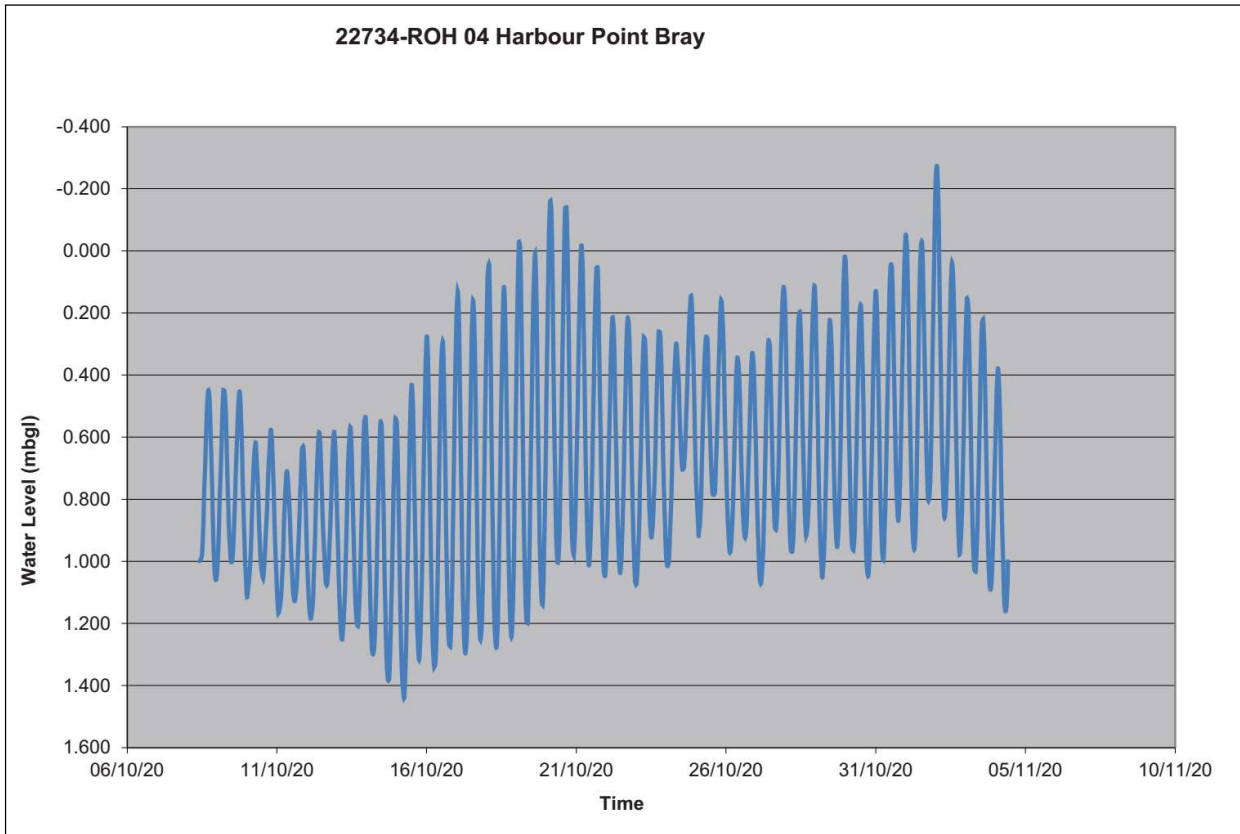
Graph 10-1 (b) ROH01 Hydrograph (November to December 2020)



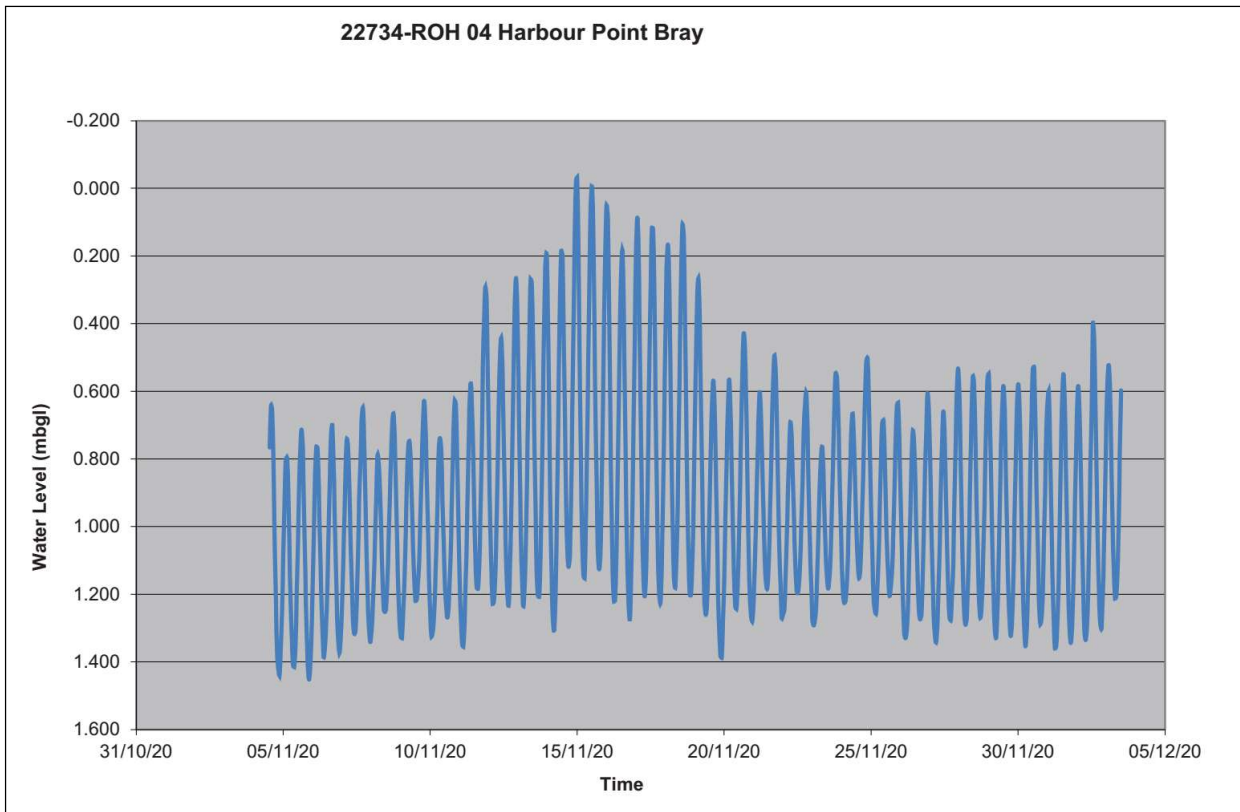
**Graph 10-2 (a) ROH02 Hydrograph (November to December 2020)**



**Graph 10-2 (b) ROH02 Hydrograph (December 2020)**



**Graph 10-3 (a) ROH04 Hydrograph (October to November 2020)**



**Graph 10-3 (b) ROH04 Hydrograph (November to December 2020)**

**10.4.3.4. Groundwater Use & Available Resource**

The GSI maintains a record of groundwater abstractions consisting of wells and springs, in addition to designated drinking water protection zones (referred to as Source Protection Areas). According to the GSI database, there are no group water scheme or public water supply abstraction points, or designated group water scheme or public water supply Source Protection Areas within the vicinity of the Site (GSI, 2022).

Based on the GSI database, there are 6no. wells and springs located within the general vicinity of the Site. The details of the 6no. abstraction wells are summarised in Table 10-2 and presented in Figure 10-9. Surface springs are also reported to be present within the general vicinity of the Site (albeit a location accuracy of 5km is noted) (GSI, 2022). Taking account of the findings of the site walkover survey, and the reported location accuracy of these wells and springs, no groundwater abstraction wells or springs are known to be present within the Site boundary.

**Table 10-2 - GSI Groundwater Abstractions Within Study Area (GSI, 2021)**

Abstraction ID	Abstraction Type	Location Accuracy (m)	Approximate Location (relative to the Site)	Depth (m)	Yield (m <sup>3</sup> /d)	Use
3221SWW029	Borehole	1000	Potential location overlaps with Site	60.9	30 - poor	Unknown
3221SWW070	Borehole	200	Potential location overlaps with Site	30.5	300 - good	Domestic use only
3221SWW069	Borehole	100	ca. 100m north west of the Site	15.2	300 – good (estimate)	Domestic use only
3221SWW027	Borehole	2000	South of Site	7.6	Unknown	Unknown
3221SWW026	Borehole	2000		5.6	Unknown	Unknown
3221SWW028	Borehole	2000		4.4	Unknown	Unknown



**Figure 10-9 - Registered Groundwater Wells in The Vicinity of the Site (Source: GSI, 2022)**

**10.4.3.5. Groundwater Quality**

The European Communities Environmental Objectives (Groundwater) Regulations, (S.I. 9 of 2010) came into effect on 27<sup>th</sup> January 2010. The aim of the Regulations is to achieve the environmental objectives established for groundwater by Article 4 (1) (b) of the Water Framework Directive (2000/60/EC). The 2010 Regulations set down groundwater quality standards for nitrate (50mg/L) and active substances in pesticides in Schedule 4 and also established threshold values for pollutants or indicators of pollutants in Schedule 5. Under these regulations the EPA shall also assign a status of 'Good' or 'Poor' to those bodies of groundwater where available data and knowledge allows.

The WFD water quality status for the Wicklow GWB is classified as 'Good' for the 2013 to 2018 monitoring period (EPA, 2022), as presented in Figure 10-10. The risk of failing to meet the relevant WFD objectives for this GWB by 2027 (EPA, 2022) is under 'review'. According to the GSI (2004), groundwater within the Maulin bedrock formation (which underlies the general vicinity of the Site) is generally of calcium bicarbonate type, and soft to moderately soft (20–80 mg/l CaCO<sub>3</sub>).



**Figure 10-10 – Regional Groundwater Quality in the general vicinity of the Site (Source: EPA, 2022)**

In order to establish site specific baseline perched water and groundwater quality, 4no. samples were collected on 8<sup>th</sup> November and again on 13<sup>th</sup> of November 2020 at monitoring well locations: WS04B, ROH01, ROH02 and ROH04 (locations are presented in Figure 10-6 and Figure 10-7).

Groundwater analytical results were screened against the following Generic Assessment Criteria (GAC):

- Groundwater Regulation Values (SI. No. 9 of 2010 as amended - SI. No. 366 of 2016); or, in the absence of an available Groundwater Regulation Value; and,
- Interim Guidelines Values (IGV) (EPA 2003).

Tabulated and screened perched water and groundwater analytical results are presented in Table 3 of Appendix 10.2. Laboratory reports are presented in Appendix 10.3. No contaminants of potential concern with regards to environmental risk have been identified within the perched water or groundwater beneath the Site.

Results are summarised as follows:

- No detection of Total petroleum hydrocarbon (TPH) concentrations were identified in any of the 8no. samples analysed.

- No detection of PAHs were identified within any of the 8no. samples analysed.
- No detection of VOCs (including TICs) or SVOCs (including TICs) were identified within any of the 8no. samples analysed.
- Chloride exceeded the relevant Lower Groundwater Regulation Value Threshold value (24 mg/l) in all 8no. samples; however this would be expected due to salinity effects associated with the Site setting.
- Fluoride marginally exceeded the relevant IGV (1mg/l) during the first monitoring event at perched water monitoring location WS04B; however was below the relevant GAC during the second monitoring event.
- Ammoniacal Nitrogen exceeded the relevant Lower Groundwater Regulation Threshold value (0.065 mg/l) in 6no. of the 8no. samples analysed and exceeded the Upper Groundwater Regulation Value Threshold value (0.175mg/l) in 4no. of the 8no. samples analysed (at monitoring locations WS04B and ROH04). The highest concentrations were detected at perched water monitoring location WS04B (2.7mg/l and 4.6mg/l) and ROH04 (1.5mg/l and 2.6mg/l), in the south western portion of the site. The source of these elevated concentrations are likely due to anthropogenic effects (i.e. sewage, or fertiliser application during the former use of the Site as a golf course). However effects are localised in the south western portion of the site and based on the surface water monitoring results downstream of the site (SW02), no impacts (in respect of ammoniacal nitrogen) are identified in the River Dargle (which is the likely groundwater discharge point in this portion of the Site).
- Nitrite exceeded the relevant Groundwater Regulation value (0.375mg/l) during both monitoring events at groundwater water monitoring location ROH01; however this monitoring well is located adjacent to the northern site boundary, and sample results for all other downgradient monitoring locations were below the relevant Groundwater Regulation value. Therefore this localised exceedance is likely due to offsite sources, upgradient of the Site.
- Similarly nitrate exceeded the relevant Groundwater Regulation value (37.5mg/l) during both monitoring events at groundwater water monitoring location ROH01; this localised exceedance is likely due to offsite sources, upgradient of the Site.
- Orthophosphate (as PO<sub>4</sub>) exceeded the relevant Groundwater Regulation value (0.107mg/l) in 3no. of the 8no. samples analysed; however concentrations (0.11 to 0.13 mg/l) only marginally exceeded the relevant Groundwater Regulation value.
- Concentrations of the following parameters: sulphate, potassium, dissolved arsenic and dissolved barium exceeded the relevant GAC during either one or both monitoring events at WS04B. The source of these elevated concentrations is likely due to anthropogenic effects (i.e. onsite fertiliser application during the former use of the Site as a golf course) and/or made ground/ soils. However effects are localised in perched water in the south western portion of the site. No exceedances of any of these parameters were detected during either monitoring event in groundwater downgradient of this location (at ROH04). In addition, based on the surface water monitoring results downstream of the site, no impacts (with respect to arsenic) are identified to the River Dargle (which is the likely groundwater discharge point in this portion of the Site).

All potential onsite and offsite contamination sources have been fully evaluated. No contaminants of potential concern with regards to environmental risk have been identified within the perched water or groundwater beneath the Site. None of the previously identified potential onsite or offsite contamination sources, including the former Bray Landfill, have resulted in significant impacts to groundwater beneath the Site, or are likely to impact the proposed development.

## 10.5. Potential Impact of the Proposed Development

### 10.5.1. Hydrogeological Conceptual Site Model

In addition to flood risk, the following criteria are typically applied when evaluating potential impacts to the water environment: -

- Impacts to surface water / groundwater quality; and,
- Impacts to surface water flows / groundwater resources.

In terms of surface water flows / groundwater resources, no significant impact is anticipated arising from the proposed development based on the following considerations: -

- There are no reported public supply wells within the vicinity of the Site. There are no known onsite abstraction wells. According to the GSI (2022) database, there are 6no. groundwater wells located within the general vicinity of the Site. However, due to the nature, scale and location of the proposed development, any offsite groundwater abstraction wells are unlikely to be impacted by the proposed development.



- There will be no significant change to rainfall recharge rates at the proposed development. Storm water generated from the proposed development will be conveyed through new storm water drainage networks which have been designed in accordance with the Greater Dublin Strategic Design Study and based on SuDS principles (CIRIA report C753 The SuDS Manual-v6). The drainage design was also informed as required by the following documents; Bray Municipal District Local Area Plan (LAP), Dún Laoghaire-Rathdown County Development Plan, 2022 – 2028, Dún Laoghaire-Rathdown Stormwater Management Policy, and Wicklow County Development Plan 2016-2022, and Draft Wicklow County Development Plan, 2022 – 2028 along with the proposed amendments to such plan. The proposed stormwater drainage design has been developed in consultation with the relevant authorities including both Dún Laoghaire-Rathdown County Council (DLRCC) and Wicklow County Council (WCC) Municipal services departments.
- Storm water generated from the proposed residential development will be conveyed through a proposed storm water network including SuDS and attenuated / managed on site prior to final discharge at greenfield run-off rates. The restricted discharge from the proposed site will be conveyed via. a new storm water sewer within the site before discharge to the receiving River Dargle. The proposed storm water discharge system has been designed to broadly follow the existing topographic levels and characteristics of the current natural drainage catchment regime. This will minimise any impacts to existing rainfall recharge rates at the Site (and accordingly groundwater levels beneath the Site, and surface water flows in the River Dargle) as a result of the proposed development.
- The maximum anticipated depth of excavation across the Site is anticipated to be 4 mbgl. All excavations are anticipated to encounter sandy silt / clay and/or gravel, with localised areas of made ground. No rock breaking will be required. Based on encountered site-specific geological records, measured groundwater levels, and continuous groundwater level monitoring data, some dewatering may be required during the construction phase (albeit in localised areas of the Site). However, given the fact that the Site is underlain by a locally important aquifer (LI) – bedrock which is moderately productive only in local zones, and taking account of the localised nature of potential dewatering, no groundwater level impacts to regional groundwater resources are anticipated. Similarly surface water level/ flow impacts are not anticipated.
- Piling will be required in the southern and eastern portions of the Site to a maximum depth of 14mbgl, due to poor ground conditions, primarily to facilitate the foundations for apartment block A, B and C, and also storm water infrastructure. Piling may be carried out via. Bored Piles, Continuous Flight Auger (CFA) Piles or Driven Piles, as discussed in detail in Chapter 9 – Land, Soils and Geology. However given the temporary and localised nature of the piling works, no groundwater level impacts are anticipated to regional groundwater resources. Similarly surface water level/ flow impacts are not anticipated.
- No onsite groundwater abstraction is proposed during the operational phase. Based on the proposed design, typical excavation depths and encountered ground conditions beneath the Site, permanent dewatering will not likely be required during the operational phase.

Therefore, given the nature of the proposed development there will be no impact to regional or local groundwater resources or surface water levels / flows in the receiving River Dargle. Accordingly, potential impacts on groundwater resources, groundwater levels or surface water levels/ flows do not warrant further consideration.

In assessing potential water quality impacts, the EPA advocates a ‘risk-based approach’, and states that ‘*the principal aim in dealing with contaminated land and groundwater related issues is to secure the protection of human health, water bodies (including groundwater) and the wider environment*’ (EPA, 2013). In accordance with this risk-based approach a preliminary Source-Pathway-Receptor (SPR) model has been derived for the Site.

The risk of any potential impacts to the closest European sites with connectivity via. the Irish Sea (i.e. Bray Head SAC, Rockabill to Dalkey Island SAC, and Dalkey Islands SPA) have been screened out, as detailed previously within this chapter (and also Chapter 4 – Biodiversity). Similarly the risk of any impacts to Killiney Bay geological heritage area (located ca. 30m east of the Site) have been screened out, as detailed previously within this chapter. Perched water (where encountered) within made ground beneath the Site is likely to be localised and based on site-specific geological and monitoring records, is not present laterally across the Site. Based on topographic levels in the northern portion of the Site, and inferred groundwater flow direction beneath the Site, the Rathmichael Stream, located immediately north of the Site is unlikely to be impacted by the proposed development, during the construction or operational phases.

Four key receptors (in terms of surface water /groundwater quality) have therefore been identified as follows;

- Shallow groundwater within estuarine deposits (sand, gravel, silt) beneath the Site;
- Bedrock aquifer beneath the Site (a locally important aquifer (LI) – bedrock which is moderately productive only in local zones);
- River Dargle located downgradient / south of the Site (via. groundwater pathway); and,

- Coastal Waters (Irish Sea) located downgradient / east of the Site (via. groundwater pathway).

The focus of this assessment will therefore be on potential groundwater quality and surface water quality impacts associated with the proposed development. A preliminary Hydrogeological Conceptual Site Model (CSM) has been derived for the Site (based on all available information obtained during the Site walkover survey, desk based literature review and site-specific geological and monitoring records). This model, presented in Figure 10-11 and Figure 10-12, represents the current conceptual understanding of surface water / groundwater processes and interactions in the vicinity of the Site. It should be noted that cross sections in Figure 10-11 and 10-12 are presented for schematic, conceptual purposes only and are not to scale.

Based on relevant IGI guidance (2013) the generic type of geological/hydrogeological environment into which the proposed development will be placed has been determined as *'Type A – Passive geological / hydrogeological environment'*, defined by the IGI as *'areas of thick low permeability subsoil, areas underlain by poor aquifers, recharge areas, historically stable geological environments.'*

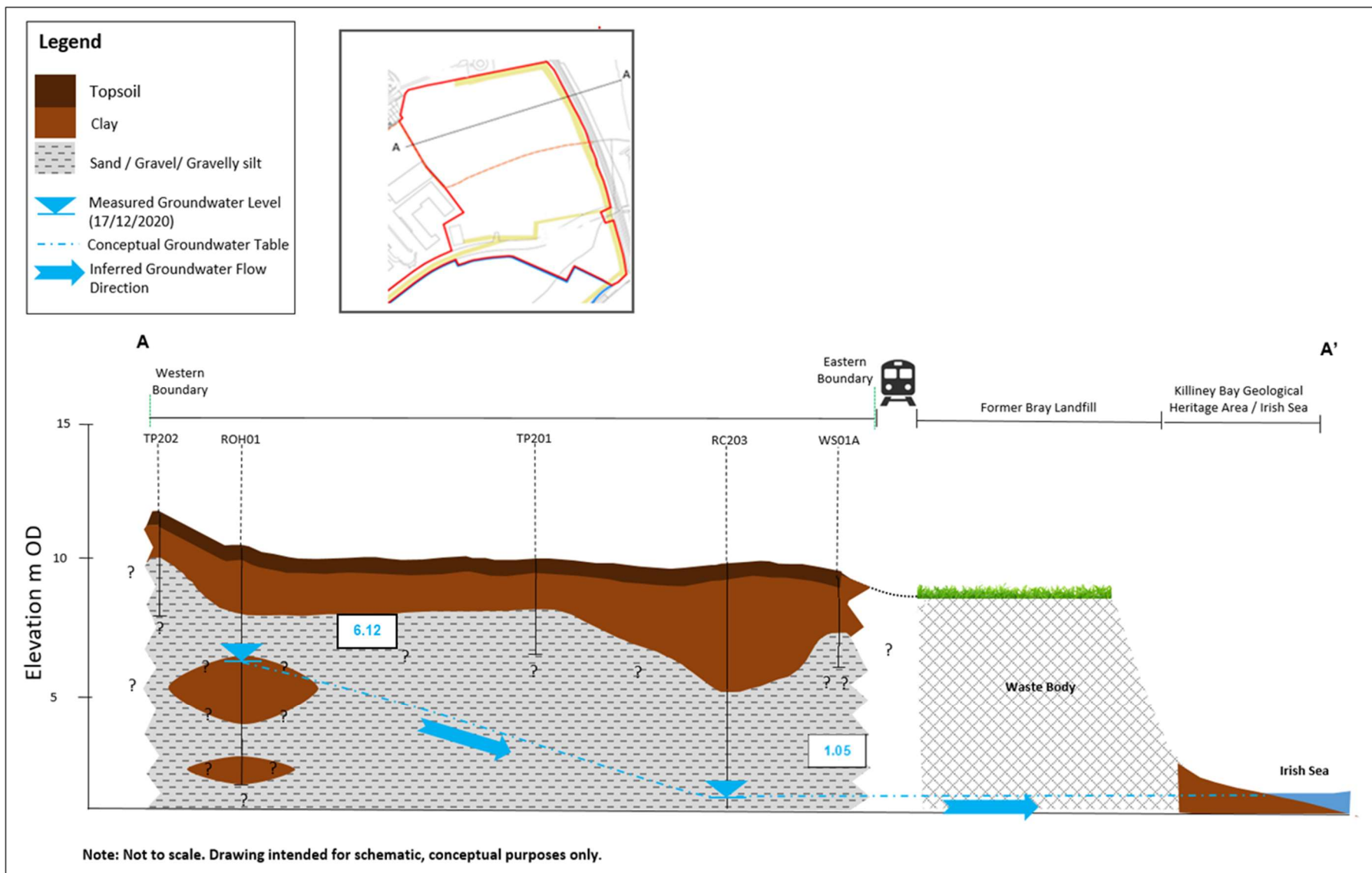


Figure 10-11 - Hydrogeological Conceptual Site Model – Section A – A'

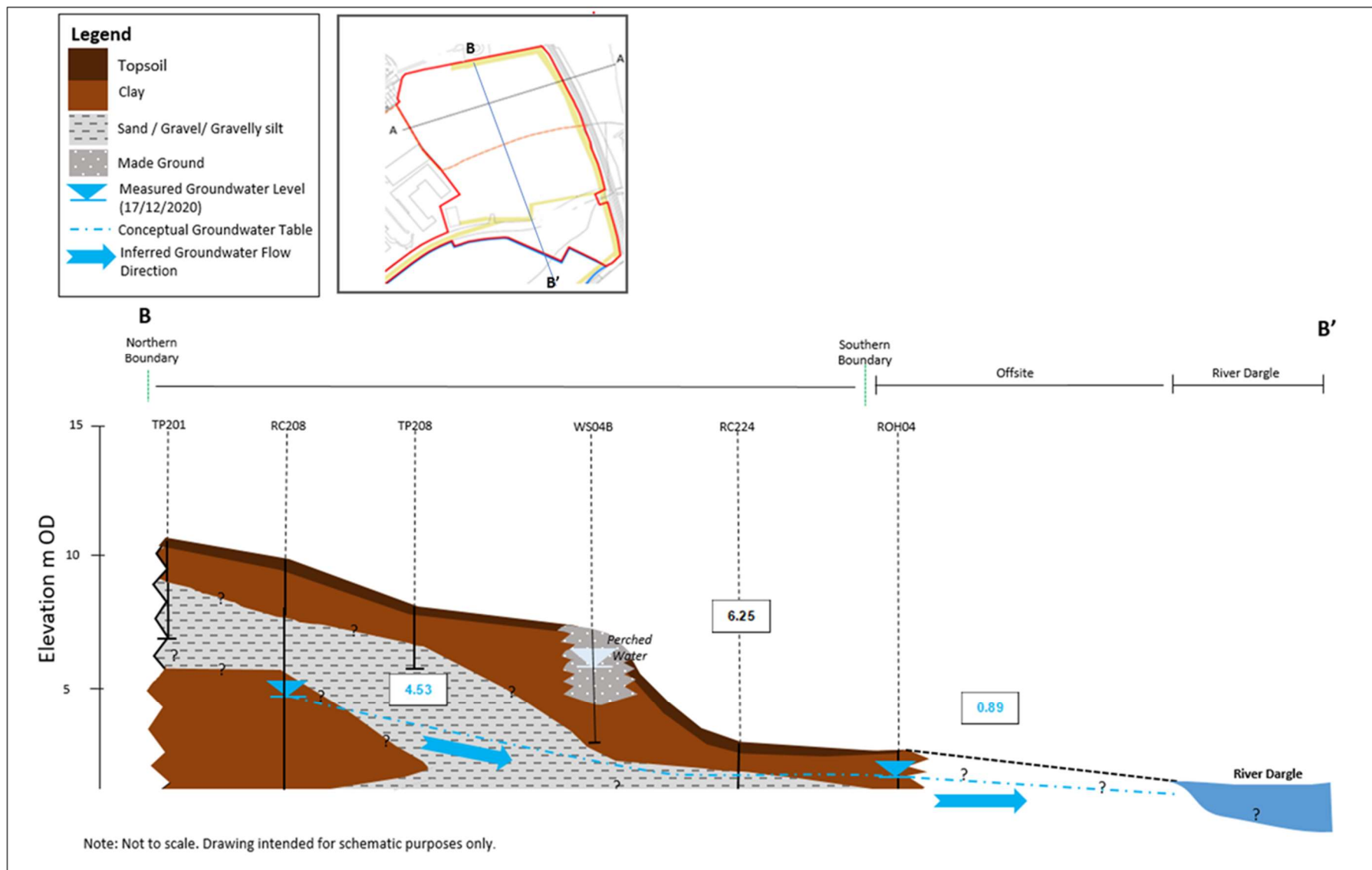


Figure 10-12 - Hydrogeological Conceptual Site Model – Section B – B'

## 10.5.2. Characteristics of the Proposed Development

The proposed development comprises the construction of 586no. residential units (comprising a mix of apartments, duplexes and houses) in addition to a crèche facility, café and 1no. commercial unit (*incorporating a gym and a juice bar*), and all associated infrastructure and ancillary works on an 8.81ha parcel of land within the former Golf Course lands to the north of Bray Town Centre. A detailed description of the proposed development is presented in Chapter 2 - Project Description.

### 10.5.2.1. Storm Water Drainage Design

Stormwater run-off will be collected from the roofs, pavements and other impermeable surfaces i.e. open space via a standard manhole and underground pipework system which will be primarily laid along the internal road network. SuDS have been incorporated into the drainage design to reduce run-off rates and to improve run-off quality. The SuDS design will include for permeable paving, swales, filter drains, green roofs and tree pits as well as 2no. onsite attenuation systems (tanks). The rate of flow will be controlled by the installation of a flow control device fitted to the discharge pipe from the attenuation systems. A Stormtech attenuation system will be located within the park/open space area within the centre of the site and a sealed underground concrete tank located in the landscaped area within the south eastern corner of the site.

The proposed drainage system (consisting of 225mm, 300mm, 375mm, 450mm, 525mm and 675mm diameter pipeline) has been designed based on 2no. separate catchment areas (Catchment A and B), summarised as follows: -

**Catchment A:** Storm water from Catchment A will be attenuated via an underground modular attenuation system with the flow controlled via a Vortex Control device. Based on a maximum discharge rate of 13.04l/s, a minimum tank volume of 988.9m<sup>3</sup> is required for 1 in 100-year 6-hour storm event including 20% for climate change and 10% for Urban creep (total 30%).

**Catchment B:** Storm water from Catchment B will be attenuated via an underground modular attenuation system with the flow controlled via a Vortex Control device. Based on a maximum discharge rate of 45.87l/s, a minimum tank volume of 1,100m<sup>3</sup> is required for 1 in 100-year 6-hour storm event including 20% for climate change and 10% for Urban creep (total 30%).

#### 10.5.2.1.1. SuDs Measures

The SuDS features to be used in the drainage network include modular permeable paving; swales; filter drains; tree pits and underground storage capacity with discharge to the River Dargle. For the eastern portion of the Site there are green roofs on the development units (apartments) and much of the rainfall for this side of the Site will be absorbed by these sedum and wildflower areas. For areas of soft landscaping, e.g. woodland mix planting, wildflower meadows, grassland areas and residential gardens, the rainfall will drain to ground mimicking nature and managing rainfall close to where it falls. The permeable paving similarly allows for localised management of rainfall where during low rainfall events surface water will infiltrate to ground. For larger rainfall events permeable paving will have an outlet to allow storm water to discharge into the proposed surface water network. The soft landscaping and drainage designs also includes for swales which will also minimise surface water runoff to the local network by allowing rainfall to be slowed and soaked to ground. The SuDs drainage design allows for opportunities for using runoff rainfall where it falls which will ultimately allow for greatly reduced surface water outfall to the River Dargle whilst also providing for watering of extensive areas of soft landscaping. The drainage design also includes for underground attenuation systems and flow controls to slow and manage surface water drainage before final outfall to the River Dargle which will ensure there is protection to the natural flow regimes of the watercourse.

### 10.5.2.2. Watermain Design

Proposed watermain services (100-225mm diameter pipeline), including firewater requirements for the development will be provided. The peak daily domestic water demand (including potable use) for the proposed development is calculated to be 2.75 l/s. Irish Water has confirmed that the existing water network has sufficient capacity to meet these peak operational water requirements. A full set of all proposed watermain service drawings are presented in Appendix 12.2 of this EIAR. Refer also to the Engineering Planning Report prepared by Atkins (2022) submitted as part of this planning application.

### 10.5.2.3. Foul Drainage Design

Proposed foul drainage services (maximum 225mm diameter pipeline) will be provided; all wastewater will discharge via gravity to the proposed Ravenswell section of the Irish Water Local Network Reinforcement Project Irish water has confirmed that the existing foul network has sufficient capacity to meet the combined wastewater discharge volumes of ca. 264,470 l/d from the proposed development, once operational. A full set of all proposed

drainage design drawings are presented in Appendix 12.2 of this EIAR. Refer also to the Engineering Planning Report prepared by Atkins (2022) submitted as part of this planning application. All foul drainage related works will be carried out in consultation with Irish Water and in accordance with all relevant Irish Water guidelines and any site-specific additional requirements.

### 10.5.3. Potential Impacts on Water during the Construction phase

There is potential for degradation in groundwater and surface water quality resulting from potential pollution caused by construction activities e.g. plant, fuel/ chemical spillage etc., particularly during excavations for the proposed residential units, creche, foul services, storm water drainage system, watermain services, attenuation tanks, and internal roads and during piling (as required). The maximum anticipated depth of onsite excavation will be approximately 4mbgl. The maximum anticipated depth of piling will be ca. 14m. During the construction phase of the proposed development, the following potential impacts on surface water or groundwater quality could occur: -

- Accidental spillages or leaks onsite in the vicinity of exposed groundwater / surface water pose a potential pollution risk as follows;
  - Groundwater levels beneath the proposed development lands range from approximately 0.2mbgl (ROH04) immediately south of the Site, to 4.98mbgl (ROH01) in the north-western portion of the Site. Therefore, shallow groundwater is likely to be encountered during any excavation works within the shallow estuarine deposits, specifically in the lower lying central and southern portions of the Site, and also during piling works. The shallow water table beneath the Site, particularly in any areas where it is intercepted, would be highly vulnerable to water quality impacts through accidental spillages or leaks of oils, fuels, paints or chemicals. This could result in likely moderate adverse temporary impacts directly to the quality of groundwater receptors (i.e. shallow groundwater zone, and bedrock aquifer), and likely slight adverse temporary impacts indirectly (via. groundwater migration) to the quality of surface water receptors (i.e. River Dargle), and also to receiving coastal waters (i.e. Irish Sea).
- General Site activities during the construction phase associated with cement handling and pouring, pose a potential pollution risk as follows;
  - Such general site activities could result in likely slight adverse temporary impacts (via. groundwater pathways) directly to groundwater quality beneath the Site (i.e. shallow groundwater zone, and bedrock aquifer) and indirectly to surface water quality in the River Dargle, or coastal water quality in the Irish Sea.
- Inadequate soil / storm water management during the construction phase, poses a risk of excess loadings of suspended solids to the River Dargle. This could result in likely moderate adverse temporary impacts directly to surface water quality in the River Dargle, or coastal water quality in the Irish Sea.
- Temporary dewatering will likely be required during excavation in the central and southern portions of the Site (where shallow groundwater levels are likely); this may result in excess loadings of suspended solids to a temporary discharge point (presumed to be a temporary onsite soakaway). This could result in likely temporary slight adverse impacts directly to groundwater quality beneath the Site (i.e. shallow groundwater zone, and bedrock aquifer), but would not impact surface water quality in the River Dargle, or coastal water quality in the Irish Sea.
- Temporary onsite groundwater and gas monitoring wells could provide a conduit for potential contamination of soils and bedrock through Site construction activity; in particular the risk of spillages and leakage of any fuel oils and paint. This could result in moderate adverse impacts on groundwater quality beneath the Site (i.e. shallow groundwater zone, and bedrock aquifer); however, any impacts are considered to be short-term and localised.
- Existing subsurface contaminants could pose a potential pollution risk. However, based on the results of the ground investigation and site-specific soils, perched water and groundwater analytical data discussed in detail within this chapter and Chapter 9 – Land, Soils and Geology, the potential for groundwater impacts via. excavation and piling, and subsequent mobilisation of any existing subsurface contaminants is negligible. The existing underground Irish Water foul storage tank currently located onsite is critical to Irish Water foul / waste water operations in the town of Bray, and as such all required protection measures will be put in place for the full duration of the construction phase to ensure the onsite holding tank is secure during the works. No groundwater or surface water impacts are expected as a result of current or historic land-use either at the Site or within adjacent lands.

Mitigation measures will be implemented during the construction phase to further reduce these potential impacts, and to address any potential water management issues; these are listed below in Section 10.5.

#### 10.5.4. Potential Impacts on Water during the Operational Phase

During the operational phase of the development, the following potential impacts on surface water or groundwater quality could occur:-

- Groundwater and surface water receptors (i.e. shallow groundwater zone, bedrock aquifer, and the River Dargle) could be at risk from occasional fuel / oil leaks along the access roads and paved areas. However given that the volumes arising from any such spills / leaks are likely to be very minor and taking account of the localised nature of such events, along with the fact that the Site is underlain by low permeability clay, the potential risk to the shallow groundwater zone, and underlying bedrock aquifer is negligible and does not warrant further consideration. The drainage design includes for underground attenuation to slow and manage surface water drainage before final outfall to the River Dargle which will ensure there is protection to the natural flow regimes of the watercourse. Taking account of likely dilution effects the potential risk to the River Dargle is negligible and does not warrant further consideration.
- Identified groundwater and surface water receptors could be at risk of quality impacts in the unlikely scenario of an unplanned event (traffic collision, emergency onsite fuel / oil spill, fire water arising from a property fire). The risk of such an event occurring is low given that the majority of traffic into and within the proposed development will be local residents / crèche users, and the proposed development will be designed, constructed and maintained in accordance with all relevant statutory building and fire safety requirements. Given the fact that the Site is underlain by low permeability clay and taking account of the proposed surface water drainage design, potential adverse impacts to groundwater or surface water receptors (i.e. shallow groundwater zone, bedrock aquifer, and the River Dargle) are negligible, and unlikely to occur, and do not warrant further consideration.
- Groundwater and surface water receptors are at risk of becoming contaminated through routine Site maintenance activity during the operational phase. Maintenance of the residential units, creche, commercial/ retail units, open space / amenity areas, car parking areas, access roads and paved areas, utilities, foul, watermain and storm water drainage system, and attenuation tanks may result in small quantities of lubricant oils, fuel and chemicals being brought to the Site. In the highly unlikely event of a spill this could result in slight adverse impacts directly to the quality of groundwater receptors, and (via. groundwater migration) to the surface water quality of the River Dargle. Mitigation measures will be implemented during the operational phase to avoid these potential impacts.

### 10.6. Mitigation Measures

The mitigation factors and measures for the control of pollution and protection of surface water and groundwater quality are described below.

#### 10.6.1. Construction Phase

With regard to groundwater and surface water quality impacts the following mitigation measures are proposed. The Contractor will be responsible for ensuring these measures are fully implemented:

- In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1, and the historic well located in the north eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, '*Good practice for decommissioning redundant boreholes and wells*' (UK Environment Agency, 2012);
- The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guidelines '*Control of Water Pollution from Construction Sites*' and '*Groundwater control - design and practice*' and CIRIA 2010 '*Environmental Good Practice on Site*' to minimise as far as possible the risk of pollution.
- All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 will be implemented onsite during the construction phase.
- Any groundwater temporarily dewatered during the excavation works for the proposed attenuation tanks and for building foundations in the central and southern portions of the Site, and during piling (as required), will be treated via. the installation of a temporary in-situ water treatment system;
  - This system should be designed and sized to ensure that all pumped groundwater water is treated via. a temporary attenuation pond, prior to discharge to a selected onsite location (via. a temporary soakaway).
  - The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location.

- The Contractor will be responsible for ensuring that the existing drainage network, specifically along the existing road, and as required elsewhere across the site, will be suitably protected (via. the use of physical barriers and / or the implementation a Site-specific water run-off management plan as required).
- In order to prevent any potential surface water / groundwater impacts via. release of hydrocarbon / chemical contaminants the following standard measures will be implemented:
  - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
  - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
- A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation;
  - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.
  - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.
  - All oil stored on Site for construction vehicles will be kept in a locked and bunded area;
  - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;
  - All Site vehicles used will be refuelled in bunded areas;
  - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and,
  - All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.
- In order to prevent any potential surface water / groundwater impacts via. release of cementitious materials the following measures will be implemented where poured concrete is being used on Site;
  - The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed groundwater, the River Dargle or the Irish Sea;
  - Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
  - Any spillages will be cleaned up and disposed of correctly;
  - Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
  - Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
  - Mixer washings and excess concrete will not be discharged directly into the drainage network, or any drainage ditches, surface water bodies or exposed groundwater; and,
  - Surplus concrete will be returned to batch plant after completion of a pour.
- Foul drainage from Site offices and Site compounds will be directed to the existing wastewater network or will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations.

The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further developed by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.



## 10.6.2. Operational Phase

With regard to groundwater and surface water quality impacts the following mitigation measures are proposed;

- All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 will be implemented onsite during the Detailed Design Stage and Construction Stage (specifically the installation of an appropriate ground gas membrane beneath apartment blocks B and C, and the removal of two localised soil hotspots from the proposed footprints of the housing and duplex units and associated gardens). The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented.
- All plant and equipment utilised onsite during maintenance works should be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented;
- Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented;
- In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented); and,
- A maintenance programme for the proposed surface water drainage system should be implemented. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented.

## 10.7. Monitoring Requirements

Regular checks and maintenance of the proposed surface water drainage system should be implemented, as recommended in the Stormwater Impact Assessment Report (Atkins, 2022) (document. ref.: 5214419DG0012) submitted as part of this planning application.

## 10.8. Residual Impacts

The development as proposed shall not result in an adverse impact to the existing hydrological regime of the area. The development will not increase flood risk to areas outside of the landowners' holdings, nor create unacceptable levels of flood risk within the proposed development. The proposed development is therefore considered to be appropriate from a flood risk perspective.

Taking account of the relevant mitigation measures, the residual impact to groundwater quality and surface water quality including receiving coastal waters (Irish Sea), resulting from potential pollution caused by Site activities e.g. plant, fuel/ chemical spillage etc. or associated with cement handling and pouring during the construction phase is slight adverse and short-term. The residual impact to surface water quality, including receiving coastal waters (Irish Sea), resulting from excess loadings of suspended solids, via. inadequate onsite soil / storm water management, during the construction phase is slight adverse and short-term, taking account of the relevant mitigation measures. Any dewatering as required in the central and southern portions of the Site during the construction phase, will be temporary and will pass through a temporary onsite attenuation pond prior to discharge to ground; therefore, dewatering will have no residual adverse impact on groundwater quality or surface including receiving coastal waters (Irish Sea). In summary, anticipated residual adverse impacts on surface water or groundwater will be short-term and slight adverse during the Construction Phase of the proposed development, given the mitigation measures proposed.

Taking account of the relevant mitigation measures, the residual impact to groundwater quality and surface water quality including receiving coastal waters (Irish Sea), resulting from occasional / routine Site maintenance works during the Operational Phase is slight adverse, temporary and is unlikely to occur. The residual impact to groundwater quality and surface water quality including receiving coastal waters (Irish Sea) resulting from occasional fuel / oil leaks along the access roads and paved areas during the operational phase is also slight adverse and temporary, taking account of the relevant mitigation measures. The residual impact to groundwater and surface water quality including receiving coastal waters (Irish Sea), resulting from unplanned events during the operational phase (traffic collision, emergency onsite fuel / oil spill, or fire water arising from a property fire),

taking account of the relevant mitigation measures, is slight adverse, temporary, and unlikely to occur. In summary, anticipated residual adverse impacts on surface water or groundwater will be temporary and slight adverse, given the mitigation measures proposed during the Operational Phase of the proposed development.

Therefore, taking account of proposed mitigation measures, no significant adverse impacts are anticipated to the receiving water environment arising from the proposed development during the construction or operational phases. On a regional scale, the proposed development will not affect the current 'Good' surface water quality status of both the Rathmicheal Stream and the River Dargle and will not affect the current *High* coastal water quality status of the Irish Sea, east of the proposed development, as required under the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (as amended 2012-2021). Similarly, the proposed development will not affect the current 'Good' groundwater quality status of the Wicklow Groundwater Body as required under the European Communities Environmental Objectives (Groundwater) Regulations, 2010, as amended 2016.

### 10.8.1. Water and Human Health

Taking account of the baseline environmental setting and proposed mitigation measures during both the construction and operational phases, any human health risks to onsite or offsite receptors as a result of groundwater or surface water impacts will be imperceptible. No human health risks associated with long term exposure to contaminants (via. surface water or groundwater pathways) resulting from the proposed development are anticipated.

## 10.9. 'Do Nothing Scenario'

If the proposed residential development is not undertaken the baseline water environment would remain unchanged. The 'do-nothing' scenario would result in neutral impacts with regards to hydrology and hydrogeology.

## 10.10. Reinstatement

All temporary construction compounds and Site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings. All construction waste and / or scrapped building materials are to be removed from Site on completion of the construction phase. Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from Site and disposed of at an appropriately licenced waste facility.

# 11. Cultural Heritage

## 11.1. Introduction

The chapter assesses the impacts of the proposed development as described in Chapter 2 on the known and potential cultural heritage resource concerning the integrity, continuity and context of same for future generations and based on this assessment it then identifies appropriate mitigation strategies. UNESCO define the term 'Cultural Heritage' as encompassing several aspects of tangible assets (immovable: archaeological sites and monuments, architectural heritage structures; movable: artefacts; and underwater: shipwrecks, submerged features) and intangible assets (e.g., folklore, oral tradition and language). Cultural heritage may also include properties that form repositories for objects of cultural heritage significance, such as museums, galleries and parks, or have notable associations with historical events or personages.

The recorded and potential cultural heritage resource within a study area that encompasses the proposed development lands within the former golf course and a surrounding area extending for 500m in all directions was assessed in order to compile a comprehensive cultural heritage baseline and context for the proposed development.

The chapter includes summaries of the results of an archaeo-geophysical survey undertaken by J.M. Leigh Surveys and a subsequent programme of archaeological test trenching under the direction of Mr Pdraig Dunne which were carried out to inform this assessment and followed a process of consultation with the National Monuments Service. Full copies of the reports on both phases of Site investigation are presented as Appendices 11.1 and 11.2.

## 11.2. Methodology

### 11.2.1. Introduction

This section commences with an outline of the criteria used to assess the nature of impacts on the known and potential elements of the cultural heritage resource within the study area. It then describes how the baseline information on this resource was established which, in summary, was by a combination of desktop research, Site inspections, a geophysical survey and a programme of archaeological test trenching which were undertaken to establish a cultural heritage context for the study area and to identify both known and potential features of cultural heritage significance likely to be affected by the proposed development.

### 11.2.2. Assessment Criteria

The methodology used for this assessment is based on Environmental Protection Agency (EPA) (2003) *Advice Notes on Current Practice in the preparation of Environmental Impact Statements* and EPA (2002) *Guidelines on the Information to be contained in Environmental Impact Statements*. However more recent (draft) guidance methods have also been utilised per EPA (2015) *Draft Advice Notes for Preparing an EIS* and (2022) *Guidelines for Information to be Contained in EIAR*, in accordance EIA requirements of codified EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended).

The following summation of the criteria applied to determine the nature of effects is provided in order to clearly and concisely outline the methodology specifically applied to the cultural heritage resource.

Assessment is achieved by a consideration of the duration, quality, type, value and magnitude of effect(s) on the cultural heritage resource:

#### **Duration of Effect**

The duration of effects is assessed based on the following criteria:

- Momentary (seconds to minutes);
- Brief < 1 day;
- Temporary <1 year;
- Short-term 1-7 years;
- Medium Term 7-15 years;
- Long Term 15-60 years;
- Permanent > 60 years; and,

- Reversible: Effects that can be undone, for example through remediation or restoration.

**Quality of Effect**

- The quality of an effect on the cultural heritage resource can be positive, neutral or negative.
- Positive: a change which improves the quality of the cultural heritage environment (e.g. increasing amenity value of a Site in terms of managed access, signage, presentation etc. or high-quality conservation/restoration and re-use of an otherwise vulnerable derelict structure);
- Neutral: no change or effects that are imperceptible, within the normal bounds of variation for the cultural heritage environment; and,
- Negative: a change which reduces the quality of the cultural heritage resource (e.g. visual intrusion on the setting of an asset, physical intrusion on features/setting of a Site).

**Type of Effect**

- The type of effect on the cultural heritage resource can be direct, indirect or no predicted effect.
- Direct: where a cultural heritage Site is physically located within the footprint of the proposed development, which will result in its complete or partial removal;
- Indirect: where a cultural heritage Site, or its setting, is located in close proximity to the footprint of the proposed development; and,
- No predicted effect: where the proposed development will not adversely or positively affect a cultural heritage Site.

**Significance of Effect**

The Significance of effect is based on an assessment largely of the Magnitude of the Impact (graded from High to Negligible, based on a consideration of character, duration, probability and consequences) and the Value of the heritage asset (graded from High to Negligible, based on a consideration of significance/sensitivity).

The Magnitude of Impact (degree of change, incorporating any mitigation measures) can be negative or positive, and is ranked without regard to the value of the asset according to the following scale: High; Medium; Low and Negligible. The assessment of magnitude has been informed by criteria published in the International Council on Monuments and Sites *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS, 2011) (Table 11-1).

**Table 11-1 - Magnitudes of Effect on Cultural Heritage Assets (after ICOMOS Guidelines 2011)**

Magnitude	Description
High	<p>Most or all key archaeological or architectural materials affected such that the resource is totally altered.</p> <p>Comprehensive changes to setting.</p> <p>Changes to most or all key historic landscape elements, parcels or components; extreme visual effects; fundamental changes to use or access; resulting in total change to historic landscape character unit.</p> <p>Major changes to areas that affect Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.</p>
Medium	<p>Changes to many key archaeological or historic building materials/elements such that the resource is clearly/significantly modified.</p> <p>Considerable changes to settings that affect the character of the archaeological asset.</p> <p>Changes to the setting of a historic building, such that it is significantly modified.</p> <p>Change to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, considerable changes to use or access, resulting in moderate changes to historic landscape character.</p> <p>Considerable changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.</p>
Low	<p>Changes to key archaeological materials/historic building elements, such that the resource is slightly altered/slightly different.</p>

Magnitude	Description
	<p>Slight changes to setting of an archaeological monument.</p> <p>Change to setting of a historic building, such that it is noticeably changed.</p> <p>Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; slight changes to use or access; resulting in limited change to historic landscape character.</p> <p>Changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.</p>
Negligible	<p>Very minor changes to key archaeological materials or setting.</p> <p>Slight changes to historic building elements or setting that hardly affect it.</p> <p>Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes to use or access; resulting in very small change to historic landscape character.</p> <p>Very minor changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.</p>

The evaluation of the Value of a heritage asset is largely based on its significance criteria, and should not be considered definitive, but rather an indicator which contributes to a wider judgment based on the individual circumstances of each feature. Generally, the more criteria that are evident for a given asset, the higher in scale its respective Value shall be. Criteria considered in addition to any legal designations include the condition/preservation; documentary/historical significance; group value; rarity; visibility in the landscape; fragility/vulnerability and amenity value. The Value of all known or potential assets that may be affected by the proposed project are ranked according to the following scale: High; Medium; Low and Negligible. The following table has been informed by the International Council on Monuments and Sites *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS, 2011, 14-17).

**Table 11-2 - Factors for assessing the Value of Cultural Heritage Assets**

Value	Asset Type
Very High	<p>Assets of International Significance including:</p> <p>World Heritage Sites (including Tentative List properties); and,</p> <p>Assets that can contribute significantly to acknowledged international research objectives.</p>
High	<p>Assets of National Significance including:</p> <p>Designated National Monuments (archaeological);</p> <p>Assets of significant quality and importance, including designated RMP sites;</p> <p>Archaeological Landscapes and Zones with significant inter-group value;</p> <p>Assets that can contribute significantly to acknowledged national research objectives;</p> <p>Protected Structures of national significance/National NIAH Grade Buildings; and,</p> <p>Conservation Areas containing significant buildings of importance, including group value.</p>
Medium	<p>Assets of Regional Significance including:</p> <p>Assets of good quality and importance, including designated RMP sites;</p> <p>Assets that can contribute significantly to acknowledged regional research objectives;</p> <p>Protected Structures and NIAH Buildings of regional significance;</p> <p>Other undesignated buildings that can be shown to have exceptional qualities in their fabric or historical associations;</p> <p>Undesignated assets with potential of national or regional importance (archaeological, potential 'new sites');</p> <p>Conservation Areas containing buildings that contribute significantly to its historic character; and,</p>

Value	Asset Type
	Historic townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Low	Assets of local importance including: Assets compromised by poor preservation and/or poor survival of contextual associations; Assets of limited value, but with potential to contribute to local research objectives; and, Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Negligible	Assets with very little or no surviving archaeological interest: Buildings of no architectural or historical note; buildings of an intrusive character.

The Significance of Effect can be described as Profound, Very Significant, Significant, Moderate, Slight, Not Significant or Imperceptible (Tables 11-3 and 11-4).

**Table 11-3 - Significance of Effects (per EPA Guidelines 2022)**

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

**Table 11-4 - Significance of Effects Matrix (after EPA Draft Guidelines 2017)**

<b>Magnitude of Impact</b>	<b>High</b>	Not Significant/ Slight	Moderate/ Significant	Significant/ Significant	Very Significant/ Profound
	<b>Medium</b>	Not Significant	Slight	Moderate/ Significant	Significant/ Very significant
	<b>Low</b>	Not Significant/ Imperceptible	Slight/ Not Significant	Slight	Moderate
	<b>Negligible</b>	Imperceptible	Not Significant/ Imperceptible	Not Significant/ Slight	Slight
		<b>Negligible</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
	<b>Value/Sensitivity of the Asset</b>				

### 11.2.3. Desktop Study

The desktop study sought to identify all recorded archaeological, architectural and other cultural heritage sites within the proposed development and also endeavoured to identify any hitherto unrecorded features or areas of cultural heritage significance. The collated information has provided an insight into the historical development of

the study area over time and assisted in an evaluation of the potential presence of unrecorded cultural heritage sites, including sub-surface archaeological features.

The *Sites and Monuments Record* (SMR) and the *Record of Monuments and Places* (RMP) for Counties Dublin and Wicklow, both published by the Archaeological Survey of Ireland, were the principal sources consulted for identifying known archaeological sites. The Record of Protected Structures (RPS) and the National Inventory of Architectural Heritage (NIAH), including its survey of historic gardens, were consulted to assess the designated architectural heritage resource.

The following presents an overview of the sources consulted as part of the desktop study:

- Dún Laoghaire-Rathdown County Development Plan 2022-2028 and the Wicklow County Development Plan 2022-2028: relevant sections of both of these publications were reviewed for the project assessment. They list the buildings and structures included in the Record of Protected Structures and also presents the Councils' policies and objectives designed for the protection of the archaeological and architectural heritage resources within those Counties. The Bray Municipal District Local Area Plan 2018-2024 was also reviewed;
- Archaeological Inventories of Counties Dublin and Wicklow: These publications present summary descriptions of the recorded archaeological sites within both counties and the relevant entries are presented within the chapter. In addition, the current national database (online) resources pertaining to same were accessed on the Historic Environment Map Viewer ([www.archaeology.ie](http://www.archaeology.ie)) and Heritage Maps (The Heritage Council) ([www.heritagemaps.ie](http://www.heritagemaps.ie)) in July 2022;
- UNESCO designated World Heritage Sites and Tentative List: There are two World Heritage Sites in Ireland and a number of other significant sites are included in a Tentative List (2010) that has been put forward by Ireland for consideration;
- National Inventory of Architectural Heritage (NIAH): Relevant current datasets were accessed in July 2022 via [www.buildingsofireland.ie](http://www.buildingsofireland.ie);
- Database of Irish Excavation Reports: This online database publishes summary accounts of licensed archaeological excavations carried out in Ireland (North and South) from 1970 to present. Summaries of the database entries for investigations carried out within in the study area are provided within the chapter and the full database entries are presented in Appendix 11.3. Current data was accessed via [www.excavations.ie](http://www.excavations.ie) in July 2022;
- Historical publications and cartographic sources: various published and unpublished sources and historical maps were consulted. Extracts from historical maps and other figures are presented within the chapter and the list of consulted publications is provided in Section 16 of the EIAR;
- Aerial and Satellite Imagery: available online imagery of the proposed development was consulted in order to determine if any traces of unrecorded, sub-surface archaeological sites were evident;
- Placenames Database of Ireland: this online database ([www.logainm.ie](http://www.logainm.ie)) provides a comprehensive management system for data, archival records and place names research conducted by the State and was reviewed in July 2022;
- Irish National Folklore Collection: transcribed material from the National Folklore Collection archive has been digitised and published at [www.duchas.ie](http://www.duchas.ie), which also publishes relevant images the Photographic Collection. The foundational collection - the Irish Folklore Commission Collection 1935-1970 - was inscribed into the UNESCO Memory of the World Register (2017) in recognition of its 'world significance' and 'outstanding universal value to culture'. The online collection was reviewed in July 2022; and,
- Online Planning Files: a review of relevant archaeological reports included in the online County Wicklow and Dún Laoghaire-Rathdown planning enquiry systems for permitted developments within the study area was undertaken. This included a review of the archaeological reports on the pre-development and construction phase Site investigations undertaken as part of the development of the adjacent school premises in recent years.

#### 11.2.4. Site Inspections

The proposed development was inspected by the authors on a number of occasions during 2020 and extracts from the photographic record are presented in Appendix 11.4. The study area was assessed in terms of historic landscape, existing land use, vegetation cover and known archaeological features, the built environment and the potential for the presence of unrecorded archaeological sites and undesigned architectural heritage structures.

### 11.2.5. Geophysical Survey

A programme of geophysical survey, which was licensed by the National Monuments Service, of the proposed development was carried out in October 2020 by J.M. Leigh Surveys. The results of these Site investigations are summarised within the chapter and a full copy of the geophysical survey report is presented as Appendix 11.1. A copy of a report detailing the results of this Site investigation was submitted to the National Monuments Service (NMS) in October 2020.

### 11.2.6. Archaeological Test Trenching

A programme of archaeological test trench excavations, which were licensed by the NMS, within the boundary of the proposed development was carried out in November 2020. The results of these Site investigations are summarised within the chapter and a full copy of the test trenching report is presented as Appendix 11.2. A copy of the report detailing the results of this Site investigation was submitted to the NMS in December 2020.

### 11.2.7. Statutory Consultations

A process of consultation with the National Monuments Service was undertaken by the authors during the compilation of this assessment. This included telephone conversations and email correspondence with Ms Maeve O'Callaghan (NMS Archaeologist) between August and October 2020 in order to scope the nature and extent of geophysical surveys and test trenching Site investigations required to determine the archaeological context of the proposed development and potential impacts on known and previously unrecorded elements of this resource. The NMS subsequently approved the geophysical and archaeological test trenching method statements submitted to their Licensing Section and issued statutory licences for both phases of investigations. The reports on the geophysical survey and test trenching investigations were submitted to the NMS in October and December 2020 respectively. The results of these Site investigations are summarised in Sections 11.3.8 and 11.3.9 of the chapter and full copies of the reports submitted to the NMS are presented as Appendices 11.1 and 11.2. No previously unrecorded archaeological sites were identified and the test trenching investigations demonstrated that the linear earthwork (DU026-124--/WI004-005-) within the proposed development is not archaeological in origin. The report recommended that archaeological monitoring of the construction phase should be carried out as a mitigation measure. The authors received an email from Ms O'Callaghan of the National Monuments Service on 14<sup>th</sup> April 2021 which confirmed that the National Monuments Service concurred with the findings of the archaeological test trenching investigations and the recommended mitigation measure (archaeological monitoring) presented in the submitted report.

### 11.2.8. Difficulties Encountered in Compiling Information

No difficulties were encountered in completing the desktop research, field surveys and site investigation works which were carried out to inform this cultural heritage assessment.

## 11.3. Receiving Environment

The management and protection of cultural heritage in Ireland is overseen by a number of state and local authorities under a framework of national laws and policies drafted in accordance with the provisions of various international conventions and treaties ratified by the Irish state. These include the Valetta Treaty (1995) (formally the European Convention on the Protection of the Archaeological Heritage, 1992) ratified by Ireland in 1997; the European Convention on the Protection of Architectural Heritage (Granada Convention, 1985), ratified by Ireland in 1997; and the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003, ratified by Ireland in 2015.

The national legal statutes and guidelines relevant to this assessment include:

- National Monuments Act (1930) (as amended);
- Heritage Act (1995);
- National Cultural Institutions Act (1997);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999);
- Planning and Development Act (2000);
- Architectural Heritage Protection: Guidelines for Planning Authorities (Department of Arts, Heritage, and the Gaeltacht, 2011); and
- Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands, 1999).



### 11.3.1. Archaeological Heritage

The following section presents a summary of the legal and policy frameworks designed to protect the Irish archaeological resource and further information is available in the *Framework and Principles for the Protection of the Archaeological Heritage* published by the Department of Arts, Heritage, Gaeltacht and the Islands (1999). The administration of national policy in relation to archaeological heritage management is the responsibility of the National Monuments Service (NMS) which is currently based in the Department of Department of Housing, Local Government and Heritage. The National Monuments Act of 1930, and its Amendments, are the primary means of ensuring the satisfactory protection of the archaeological resource. They include a number of provisions that are applied to secure the protection of archaeological monuments. These include the designations of nationally significant sites as National Monuments, the Register of Historic Monuments, the Record of Monuments and Places, the Sites and Monuments Record, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Section 2 of the National Monuments Act, 1930 defines a National Monument as ‘a monument or the remains of a monument, the preservation of which is a matter of national importance’. The State may acquire or assume guardianship of examples through agreement with landowners or under compulsory orders. The prior written consent of the Minister is required for any works at, or in proximity to, a National Monument in the ownership or guardianship of the State, the Minister or a local authority, or those which are subject to a Preservation Order. There are no National Monuments or archaeological sites with Preservation Orders located within the study area.

The National Monuments (Amendment) Act, 1994 established the Record of Monuments and Places (RMP), which is based on the earlier Register of Historic Monuments (RHM) and Sites and Monuments Record (SMR) and provides county-based lists of all known archaeological sites with accompanying maps. All recorded archaeological sites listed in the RMP receive statutory protection under the National Monuments Act 1994 and the NMS must be given two months’ notice in advance of any work proposed at their locations. There are nine recorded archaeological sites located within the study area and one of these, a linear earthwork (DU026-124--/WI004-005-), is located within the boundary of the proposed development. These recorded archaeological sites are listed in Table 11-5 and their published inventory descriptions are provided in Section 11.3.4.

The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO were also reviewed and none are located within the environs of the proposed development.

The *Dún Laoghaire-Rathdown County Development Plan 2022-2028* includes the following policies and objectives in relation to the protection of the archaeological resource:

*Policy Objective HER1: Protection of Archaeological Heritage It is a Policy Objective to protect archaeological sites, National Monuments (and their settings), which have been identified in the Record of Monuments and Places and, where feasible, appropriate and applicable to promote access to and signposting of such sites and monuments*

*Policy Objective HER2: Protection of Archaeological Material in Situ It is a Policy Objective to seek the preservation in situ (or where this is not possible or appropriate, as a minimum, preservation by record) of all archaeological monuments included in the Record of Monuments and Places, and of previously unknown sites, features and objects of archaeological interest that become revealed through development activity. In respect of decision making on development proposals affecting sites listed in the Record of Monuments and Places, the Council will have regard to the advice and/ or recommendations of the Department of Culture, Heritage and the Gaeltacht (DCHG).*

The Wicklow County Development Plan 2022-2028 includes the following policies and objectives in relation to the protection of the archaeological resource:

*CPO 8.1 To secure the preservation of all archaeological monuments included in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, and of sites, features and objects of archaeological interest generally. In the development management process, there will be a presumption of favour of preservation in-situ or, as a minimum, preservation by record. In securing such preservation the planning authority will have regard to the advice and recommendations of the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.*

*CPO 8.2 No development in the vicinity of a feature included in the Record of Monuments & Places (RMP) or any other site of archaeological interest will be permitted which seriously detracts from the setting of the feature or which is seriously injurious to its cultural or educational value.*

*CPO 8.8 To protect and promote the characteristics of historic towns in County Wicklow identified as zones of archaeological potential in the Record of Monuments and Places (RMP), ensuring that cognisance is given in relevant development proposals to retaining existing street layout, historic building lines and traditional plot widths where these derive from medieval or earlier origins.*

### 11.3.2. Architectural Heritage

The following presents a summary of the legal and policy frameworks designed to protect the Irish architectural heritage resource and further information is available in the *Architectural Heritage Protection: Guidelines for Planning Authorities*, published by the Department of Arts, Heritage, and the Gaeltacht (2011). Protection of architectural heritage is provided for through a range of legal instruments that include the *Heritage Act (1995)*, the *Architectural Heritage (National Inventory) & National Monuments (Misc. Provisions) Act (1999)*, and the *Planning and Development Act (2000)*. The Heritage Act (1995) (as amended) defines architectural heritage as:

*‘all structures, buildings, traditional and designed, and groups of buildings including streetscapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents.’*

The National Inventory of Architectural Heritage (NIAH) was established under the *Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999*, to record architectural heritage structures within the State. While inclusion in the NIAH does not provide statutory protection to a structure it is intended to advise local authorities on compilation of their Record of Protected Structures. The NIAH also includes a Designed Landscapes and Historic Gardens Survey which comprises a non-statutory, desk-based survey of such features.

The conservation principles of care and protection of architectural heritage and the facilitation of the listing of significant buildings of architectural heritage merit are set out in *Part IV of the Planning and Development Act (2000)*. This requires planning authorities to maintain a Record of Protected Structures (RPS) of structures with special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, to be included in their Development Plans. Any changes that materially affect the character of a protected structure require planning permission. A protected structure also includes the land and other structures within its curtilage. While the notion of curtilage is not defined by legislation, the *Architectural Heritage Protection Guidelines for Local Authorities* (Department of Arts, Heritage and the Gaeltacht, 2011), describes it as the parcel of land immediately associated with a structure and which is (or was) in use for the purposes of the structure. In addition, planning authorities must provide for the preservation of places, groups of structures and townscapes of architectural heritage significance within their administrative areas through the designation of Architectural Conservation Areas (ACAs).

There are no Protected Structures or buildings/gardens listed in the NIAH located within the proposed development site and it is not located within an ACA.

The *Dún Laoghaire-Rathdown County Development Plan 2022-2028* presents a number of objectives to ensure the protection of the architectural heritage resource within the County and these include:

*Policy Objective HER7: Record of Protected Structures It is a Policy Objective to include those structures that are considered in the opinion of the Planning Authority to be of special architectural, historical, archaeological, artistic, cultural, scientific, technical or social interest in the Record of Protected Structures.*

*Policy Objective HER12: National Inventory of Architectural Heritage (NIAH) It is a Policy Objective to review and update the RPS on foot of any Ministerial recommendations. The ‘Ministerial Recommendations’, made under Section 53 of the Planning Acts, will be taken into account when the Planning Authority is considering proposals for development that would affect the historic or architectural interest of these structures.*

The *Wicklow County Development Plan 2022-2028* includes the following relevant objectives in relation to the protection of the architectural heritage resource:

*CPO 8.10 To protect, conserve and manage the built heritage of Wicklow and to encourage sensitive and sustainable development to ensure its preservation for future generations.*

*CPO 8.12 To have regard to ‘Architectural Heritage Protection: Guidelines for Planning Authorities’ (Department of Arts, Heritage and the Gaeltacht, 2011) in the assessment of proposals affecting architectural heritage.*

### 11.3.3. EIA Legislative Framework

The EIA Directives (from 1985 to 2014) set out the requirement for an EIA in European law. This assessment has been prepared in accordance EIA requirements of codified Council Directive 2011/92/EU as amended by EIA Council Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended). Ireland has transposed EU Directive 2014/52/EU by way of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which came into operation on 1 September 2018. The Regulations provide for the transposition of the 2014 EIA Directive and give further effect to the 2011 EIA Directive by way of extensive amendments to existing planning law.

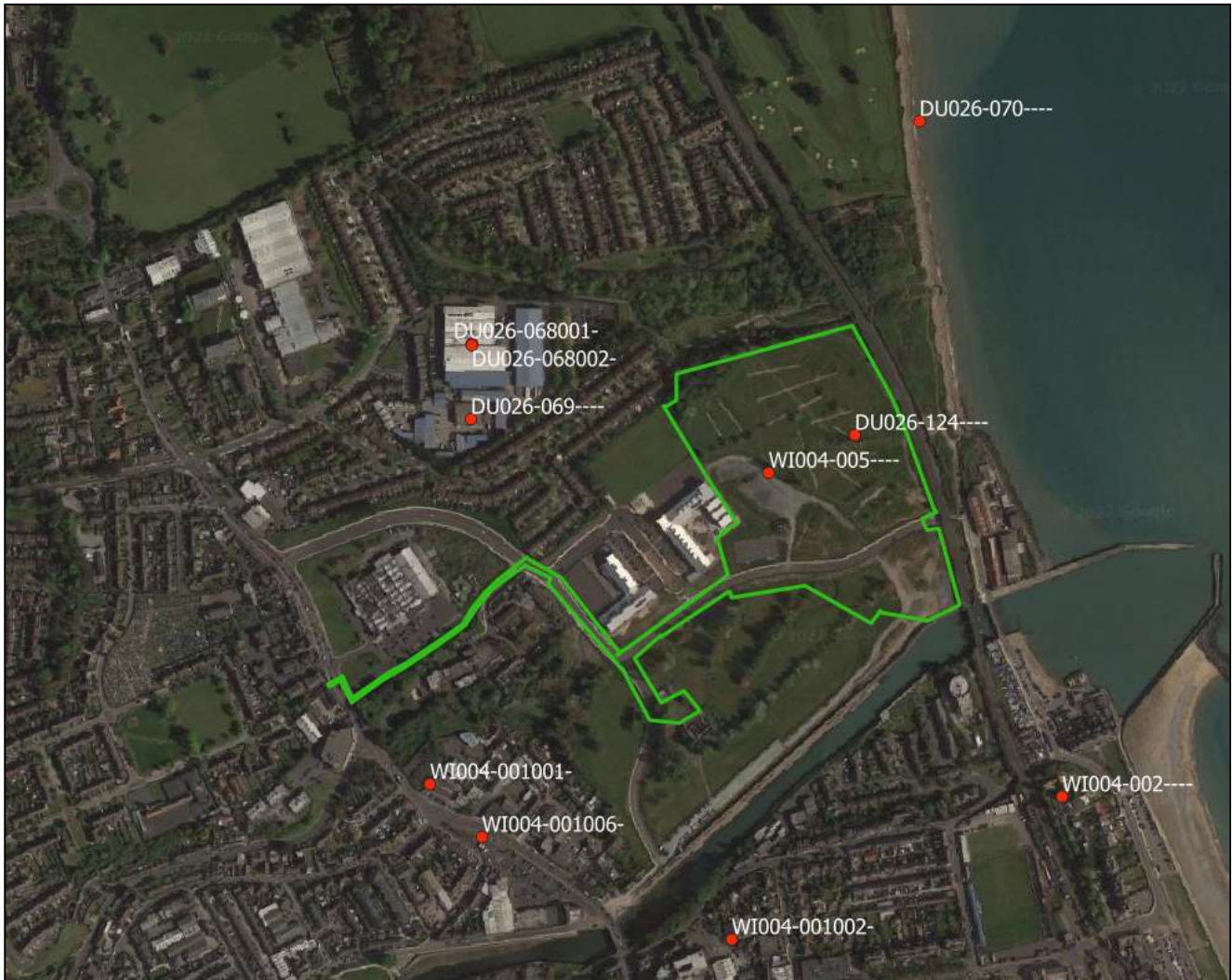
### 11.3.4. Archaeological and Historical Context

The SMR/RMP for Counties Dublin and Wicklow list a total of nine recorded archaeological sites within the study area and one of these, Linear Earthwork (DU026-124----/ WI004-005----), extends into the proposed development (Table 11-5 and Figure 11-1).

The following section presents brief summary details of the main periods within the Irish archaeological record with references to these recorded archaeological sites, including their inventory descriptions published by the Archaeological Survey of Ireland (ASI). Datasets have been interrogated and retrieved from state and local area authority sources and are considered accurate and current per publicly available information. The dating framework used for each period of the archaeological record is based on the *Guidelines for Authors of Reports on Archaeological Excavations* published by the National Monuments Service (2006) and the below sections describing the origins and development of Bray settlement have been informed by the account published in the *Irish Historic Town Atlas – No.9, Bray* (Davies, 1998).

**Table 11-5 - Recorded archaeological sites within study area**

Monument no	Class	Townland	ITM Ref.	Distance from proposed development
DU026-068001-	Church	Cork Great	726103, 719600	250m
DU026-068002-	Graveyard	Cork Great	726103, 719598	250m
DU026-069----	Ritual Site - holy well	Cork Great	726102, 719510	250m
DU026-070----	Martello tower	Cork Great	726637, 719865	250m
DU026-124---- WI004-005----	Linear earthwork	Cork Great and Ravenswell	726560, 719491	Within
WI004-001----	Historic town	Bray, Little Bray and Ravenswell	726288, 718817	330m
WI004-001001-	Cross-slab (find spot)	Bray	726053, 719075	455m
WI004-001006-	Castle - tower house	Little Bray	726115, 719012	450m
WI004-002----	Martello tower	Bray	726807, 719060	260m



**Figure 11-1 - Location of recorded archaeological sites within study area (Source: [www.archaeology.ie](http://www.archaeology.ie))**

### Early prehistoric periods

Until recent years the earliest recorded evidence for human settlement in Ireland dated to the Mesolithic period (7000–4000 BC) although dating evidence recovered from a cave Site in Co. Clare suggests that humans may have been present on the island during the Palaeolithic period. While the Mesolithic period hunter-gatherers did not construct any settlements or monuments that leave any above ground traces, their presence in an area can often be identified by scatters of worked flints in ploughed fields, shoreline shell middens and traces of temporary camps occasionally uncovered during ground works. The archaeological record indicates that these nomadic groups tended to favour coastal, lake and river shorelines which provided a transport resource through the heavily forested landscape as well as a food source for elements of their varied diet. The Neolithic period (4000-2400 BC) began with the arrival and establishment of agriculture as the principal form of economic subsistence, which resulted in more permanent settlements within farmlands created in areas of cleared forestry. As a consequence of the more settled nature of agrarian life, new Site-types, such as substantial rectangular timber houses and various types of megalithic tombs, and new artefacts, including pottery, begin to appear in the archaeological record during this period. While there are no recorded early prehistoric monuments within the study area, examples from both periods have been recorded within the wider region.

### Late prehistoric periods

Metalworking arrived in Ireland with the advent of the Bronze Age period (ca. 2400–500 BC) and saw the introduction of a new artefactual assemblage, including metal and ceramic objects. This period was also associated with the construction of new monument types such as standing stones, stone rows, stone circles and burnt mounds known as fulachta fia. The development of new burial practices during this period also saw the construction of funerary monuments such as cairns, barrows, boulder burials and cists. The arrival of iron-working technology in Ireland saw the advent of the Iron Age (600 BC – 400 AD). This period has traditionally been

associated with a Celtic 'invasion' but recent archaeological evidence points instead to a gradual acculturation of the Irish Bronze Age communities following centuries of contacts with Celtic-type cultures in Europe. Relatively little was known about Iron Age settlement and ritual practices in Ireland until recent decades when the corpus of evidence for the period has been greatly increased by the discovery of sub-surface sites dating to this period during archaeological investigations in advance of development projects. While there are no recorded late prehistoric monument located within the study area, the discovery of a number of Romano-British burials (WI004-004----) in the shoreline area now occupied by Esplanade Terrace within an area of Bray town to the south demonstrates that cross-sea contacts with Britain existed in the area during the second-century AD.

### Early medieval period

This period began with the introduction of Christianity in Ireland and continued up to the arrival of the Anglo-Normans during the 12th-century (ca. 400–1169 AD). The establishment of the Irish church was to have profound implications for political, social and economic life and is attested to in the archaeological record by the presence of church sites, associated places for burial and holy wells. The early medieval church sites were morphologically similar to ringforts but are often differentiated by the presence of features such as church buildings, graves, stone crosses and shrines. This period saw the emergence of the first phases of urbanisation around the large monasteries and the Hiberno-Norse ports although the dominant settlement pattern of the period continued to be rural-based in sites such as ringforts. During the 8th century the Uí Briúin Chualann were recorded to the ruling sept in this region and in the period prior to the Anglo-Norman invasion, the area was shared between Diarmuid Mac Murchacia's son-in-law, Domnall MacCilla Mo-Cholmóc, and the offspring of the Dublin Ostmen Chief Thorkill (Davies 1998). While there are no extant early medieval archaeological sites located within the study area it does contain the former locations of three recorded examples associated with ecclesiastical activity that may conceivably have had its origin during this period. This includes the recorded Site of a church and graveyard (DU026-068001-/02-), which are now occupied by a modern housing estate, located at a distance of ca. 250m to the northwest of the proposed development Site. The former Site of a holy well is recorded within a developed area ca. 60m to the south of the church and ca. 250m to the west of the proposed development. These well sites may have their origins in the early medieval period, or perhaps earlier, and some examples continue to be venerated into the modern period. A cross inscribed slab (WI004-001001-) was discovered at a location on the east side of Castle Road, at a distance of ca. 455m to the west of the proposed development, in the 1960s and was relocated to the National Museum of Ireland. The following comprise the ASI inventory descriptions of these archaeological sites:

*Church and Graveyard (DU026-068001-/02-)*

*Formerly located in a low lying coastal situation. According to the OS Letters (1837) Cork Abbey was built on the Site of an earlier abbey. The letters also record the presence of a burial ground a little to the S and W of the house where headstones and bones had been dug up (Herity, 2001, 33). Corke Abbey House has since been knocked down and a housing estate built on the Site (Healy, 1975, 1-19).*

*Holy Well (DU026-069----)*

*The holy well is marked on Duncan's map of 1821. The OS Letters (1837) describe the Abbey Well which was located to the E of a burial ground associated with old Cork Abbey (DU026-068001-). This was a fine spring well, encased in brick and vaulted (O'Flanagan ed. 1926, 32). The Site is E of Oldconnaught Village on the Bray coastline. There is currently a housing estate on the Site and there is no visible trace of the holy well.*

*Cross slab (WI004-001001-)*

*A cross inscribed slab was found at this location, now in the National Museum of Ireland (NMI Register 1965:50).*

### High and Late medieval periods

The arrival and conquest of large parts of Ireland by the Anglo-Normans in the late 12th century broadly marks the advent of the late medieval period which continued until ca. 1400 AD and was then followed by the late medieval period which extended to ca. 1550 AD. These periods saw the continuing expansion of Irish urbanisation as many of the port cities developed into international trading centres and numerous villages and towns began to develop as local or regional market centres. While earlier masonry castles were already in existence, the descendants of the Anglo-Norman gentry began the widespread construction of tower-houses as fortified residences within their landholdings at the start of the 15<sup>th</sup> century and this trend was subsequently adopted by wealthy Irish families within areas under Gaelic control.

Following the arrival of the Anglo-Normans the manor of Bre was granted by the Earl of Pembroke, then Lord Deputy, to Walter de Riddlesford in 1173 who shortly afterwards built a motte earthwork castle in the area (Davies 1998). The grant of a market to the settlement in 1213 indicates that Bray has achieved borough status by this

time and the first reference to a burgage was in ca.1225 when de Ridelesford granted a burgage 'opposite my castle beyond the river'. During the 13<sup>th</sup> century, Bray was frequently attacked by the mountain clans of the O' Byrnes and O' Tooles who, in 1316, destroyed the Castle, but were then defeated by an English force led by Edmund Le Boteler. In 1402 the O' Byrnes were heavily defeated at 'Bloody Bank', which in an area now known as Sunnybank. In 1459, a new 'ten-pound' castle was constructed in Little Bray to defend the ford from the south. A second fortification, Great Bray Castle was constructed on the south side of the river and was demolished in the late 18<sup>th</sup> or early 19<sup>th</sup> century. The north end of the Zone of Notification around the historic town of Bray (WI004-001----) is located ca. 300m to the southwest of the proposed development and the settlement has been described as follows by the ASI:

- *The town of Bray is situated on the Dargle River and is divided into Little Bray to the N and Great Bray to the S. The manor of Bray was granted to Walter de Ridelesford before 1176 and was resigned to the Crown in 1280. The first reference to a burgage is ca. 1225 when de Ridelesford granted a burgage 'opposite my castle beyond the river' to St Mary's Abbey, Dublin. A mill stood below the castle (WI004-001003-) and a number of Roman burials were discovered near the seafront (WI004-004----). (Scott 1913; Davies 1986, 22; Bradley and King 1989, 12-17).*

The NMI topographical files also record the discovery of a sherd of medieval pottery (NMI ref. IA/27/2005) within an area of the golf course located ca. 200m outside the southeast corner of the proposed development and this may have been retrieved during archaeological investigations undertaken within the area in 2005.

The study area contains the recorded former Site of a now levelled tower-house (WI004-001006-) which formerly stood ca. 400m to the west of the proposed development and has been described as follows by the ASI:

*Castle - Tower house (WI004-001006-)*

*'Castle' indicated on the First ed. OS 6-inch map. No visible trace survives and the Site now forms part of the road.*

### **Post-medieval and Early Modern Periods**

The centuries following 1550 are referred to as the post-medieval period, which is generally considered to continue into the mid-19<sup>th</sup> century with the period thereafter described as early modern. The early part of the post-medieval period was a turbulent time in Irish history and in the later decades of the 16<sup>th</sup> century the Tudors began to re-assert English control. The resultant wars between the 1560s and 1603 brought this unsettled period to a temporary end although further widespread strife ensued during the Cromwellian Wars which ended with extensive dispossession of forfeited Gaelic lands. An agricultural boom in the late 18<sup>th</sup> and early 19<sup>th</sup> centuries saw a rise in prices for both tillage and dairy produce which resulted in landlords investing in extensive land improvement works within their holdings to increase land productivity. This included extensive enclosure of open lands into bounded field systems many of which survive to the present-day. The post-medieval period saw the development of high and low status stone houses throughout the Irish countryside and rural settlement clusters at this time typically consisted of single-storey thatched cottages with associated farm buildings while two-storey farmhouses became more common in the 19<sup>th</sup> century. The settlement pattern throughout much of the rural landscape was greatly affected by the famine period in the middle of the 19<sup>th</sup> century.

The Down Survey was compiled during the 17<sup>th</sup> century as part of the Cromwellian Plantation and records that Cork Great townland comprised 134 plantation acres at that time and was in the ownership of James Walsh in 1641 and John Walsh in 1671. No details are provided in the Down Survey for the townlands of Ravenswell or Little Bray. In 1666 the manor of Bray was formally partitioned between the Second Earl of Meath and the Earl of Tyrconnell. This partition brought a period of stability and in c.1660 a stone bridge was built over the river as a replacement for a ford that had been in use since at least the late medieval period. By ca. 1700, the village extended from Sunnybank in the north to the area now occupied by the west end of Quinsborough Road. The 17<sup>th</sup> century bridge was replaced by a four-arch bridge in 1736 which shortly thereafter collapsed in a storm and was replaced by another four-arch bridge in 1741. The current bridge was constructed at the same location, at a distance of 450m to the southwest of the proposed development, in the mid-19<sup>th</sup> century and is listed in the NIAH (ref. 1301267). A number of 18<sup>th</sup> century maps of the area show the settlement clustered to the south of the river bridge with some buildings extending southwards along the main street. While Bray could be considered a coastal town at this stage, the main street was located ca. 600m from the coastline at its closest point and the lands in between were occupied by farmland until the 19<sup>th</sup> century. By the middle of the 18<sup>th</sup> century the settlement comprised a small market town which was served by a regular coach service from ca. 1770 and a mail coach service from ca. 1790. The town began to develop as a seafront resort centre for Dublin visitors by the end of the 18<sup>th</sup> century and this aspect of the settlement expanded rapidly in 19<sup>th</sup> century. The growth of the town is illustrated by the statistic that in 1788 Bray had eight shopkeepers and tradesmen and this had risen to twenty by 1824 and to over fifty by 1846, all of which were concentrated along the main street. The overall town population also increased from ca. 250 inhabitants in the 17<sup>th</sup> century up to 3,500 by the mid-19<sup>th</sup> century.

The development of Bray as a seaside resort in the 19<sup>th</sup> century was facilitated by the extension of the Dublin-Kingstown railway line to the town in 1854 which was overseen by a railway engineer named William Dargan and greatly increased the amounts of visitors from Dublin. Much of the land containing the railway line within the Bray area was in the ownership of a prominent local business man named John Quin who was heavily involved in its development, including the siting of the railway station within the town centre which was financed by the Dublin & Wicklow Railway Company. The railway line flanked the coastline and involved bridging of the Dargle with a 130m long embankment in the area to the southeast. The section of the railway line adjoining the east end of the proposed development was moved to its current location in 1907 due to coast erosion of the original line which was closer to the seafront.

The lands on the north side of the River Dargle which contain the proposed development remained outside the urban area until the early modern period and details on the layout of the Site during the 19<sup>th</sup> century are presented in the review of cartographic sources provided below. The northern section of the proposed development formed part of Co. Dublin until it was transferred to Co. Wicklow under the Local Government (Ireland) Act of 1898. Ravenswell House stood ca. 250m to the west of the proposed development and was in the ownership of I. Weld, Esq during the first half of the 19<sup>th</sup> century (Lewis, 1837) and was in the ownership of the de Butt family at the end of that century. The development of the existing golf course within the proposed development commenced in the southern end in 1897 and remained in operation until 2003. The golf pavilion was located within an area outside the southwest end of the proposed development.

The study area surrounding the proposed development contains two Martello towers (DU026-070---- & WI004-002----) which date to the post-medieval period and these are described as follows by the ASI:

*Martello Tower (DU026-070----)*

*This Martello tower is located along the coastline N of Bray. It is marked on Duncan's map of 1821 and on the 1st edition OS 6-inch map (1843). It was located on the coastline above Bray. It has since been removed. The coastline has been eroded at this point which probably resulted in its disappearance. In 1864 there were reports that the tower had been found shaking in its foundations by heavy seas and gales (Turner 1983, 91).*

*Martello Tower (WI004-002----)*

*Detached multiple-bay two-storey former Martello tower, built 1804-5, and now in use as a private residence. The building is constructed in coursed granite. The circular tower comprises of a high battered granite wall with small plain defensive openings. It is now surmounted by a glazed "drum" with a glazed conical roof. The tower overlooks the shoreline and Site on a bailey-like artificial mound which is contained by a battered stone wall.*

The proposed development also contains a linear earthwork (DU026-124---- / WI004-005----) and the following ASI description of this feature includes a postulation that it possibly formed part of the medieval Pale ditch but the results of a number of archaeological investigations in recent decades indicates that it is in fact of 19<sup>th</sup> century date (see Excavations Database section below):

*A continuous curving section of flat-topped bank (L 150m; Wth at top 1.60m; Wth at base 10m; H.0.80m) which runs on a NNE -WSW axis. It follows the line of the county boundary and is in flat coastal terrain with view onto the Sugarloaf Mountain to the S. Some mature Sycamores grow along the side. Possibly part of the Pale Ditch. (pers. comm. Rob Goodbody; SMR file DU026-124----) Archaeological test trenching was carried out on a section of this ditch in 2002 (Excavation Licence 02E1717), the results suggested that it had been levelled in the area tested during the construction of the golf course (Gowan 2004, 533). Archaeological monitoring, carried out as part of the Shanganagh and Bray main drainage scheme in 2005 (Excavation Licence 02E1717 ext.), uncovered a low much-degraded bank (Wth 5.5m; H ca. 0.3m) and a ditch (Wth 2.5m; D 0.6m) alongside it to the S.*

**Database of Irish Excavation Reports**

A review of this database ([www.excavations.ie](http://www.excavations.ie)) revealed that a number of archaeological investigations have been undertaken within the 500m study area surrounding the proposed development and included programmes of advance test trenching and construction phase monitoring undertaken on sections of the linear earthwork (WI004-005----/DU026-124----) within the former golf course. The Excavation Database entries for all the investigations carried out within the study area are provided in Appendix 11.3 and a summary of relevant examples follows hereafter.

The excavation of a test trench across the earthwork within the former golf course in advance of a drainage scheme in 2002 revealed no trace of a well-defined ditch and only uncovered modern inclusions which the excavator interpreted as the result of recent disturbance (Appendix 11.3: Gowan, 02E1717). Subsequent monitoring of drainage scheme ground works revealed a 2.5m wide by 0.6m deep ditch associated with the earthwork which contained further modern inclusions (Appendix 11.3: Moriarty, Licence 02E1717 ext.). The

excavator noted that the potential existed that the ditch may have been a medieval feature that was cleaned out and reused as a field drain at a much later date. Archaeological monitoring of ground works within the golf course as part of the Shanganagh-Bray main drainage scheme revealed no features of archaeological significance (Appendix 11.3: Clutterbuck, O' Connor & Bailey; Licences 05E0392 ext. and 11E0304). A 2004 programme of test trenching across the earthwork found no evidence for a ditch and the low bank was found to overlie 18<sup>th</sup>/19<sup>th</sup> century inclusions. The excavator concluded that the earthwork was a late 18<sup>th</sup> or early 19<sup>th</sup>-century landscape feature associated with the former Ravenswell House (Appendix 11.3: Byrne, Licence 04E0354). A 2014 programme of advance test trenching and subsequent archaeological monitoring was also undertaken along the line of the earthwork at the proposed location of St Philomena's School and Coláiste Ráithín in the area adjacent to the west side of the proposed development. These investigations included the excavation of cross-sections across the linear earthwork which revealed 19<sup>th</sup>-century inclusions at the base of an associated sub-surface ditch and the excavator concluded that the earthwork feature was 19<sup>th</sup> century in date (Appendix 11.3: O'Connell, Licence 14E0225). The school development was subsequently constructed on the footprint of the west end of the linear earthwork and nothing of archaeological significance was identified during archaeological monitoring of the construction phase. Figure 11-5 below shows an aerial view of the completed school development on the footprint of the west end of the Zone of Notification around the earthwork.

In conclusion, the archaeological investigations previously carried out on the linear earthwork (WI004-005---/DU026-124---) within the proposed development have produced no evidence to demonstrate that it formed part of the Pale ditch while two of these investigations concluded that it is instead the result of 18<sup>th</sup> or 19<sup>th</sup> century landscaping.

### **Cartographic and Aerial Imagery Review**

The detail on historic cartographic sources demonstrates the nature of past settlements and land use patterns in recent centuries and can also highlight the impacts of modern developments and agricultural practices. This information can aid in the identification of the location and extent of unrecorded or partially levelled features of archaeological or architectural heritage interest. The cartographic sources examined for the study areas include the 17<sup>th</sup> century Down Survey map (surveyed 1650's) (Figure 11-2), the first edition 6-inch OS map (published 1843) (Figure 11-3) and the 25-inch OS map (published 1910) (Figure 11-4). The Down Survey Map for the area shows the proposed development within an undeveloped area with no depicted structures while the settlement at Bray is annotated on the Barony of Rathdowne map. No information is provided for the townlands of Little Bray, Bray Commons or Ravenswell on the parish map. The 6-inch OS map shows the proposed development as vacant lands likely associated with Ravenswell House to the west (Figure 11-3). A number of tree belts and drainage boundaries are depicted, including a potential lane feature on the line of the linear earthwork which may have formed an access route to the seafront to the east. Ravenswell House is shown within an area located ca. 250m to the west of the proposed development boundary.

The 25-inch map depicts a similar landscape to the 6-inch OS map, the only changes of note being the conversion of Ravenswell House into Ravenswell Convent and the sub-division of larger fields within the general area into smaller plots. Bray Golf Club, which was established in 1897 is depicted as being confined to the southern area of the proposed development and is annotated as 'Links' while the northern portion of the Site is still portrayed as an agricultural field at this time. The current line of the of the linear embankment continues to be depicted as an access lane extending to the coast from Ravenswell House, now labelled as Ravenswell Convent.

A review of modern aerial images demonstrated the continuing green field character of much of the area within the proposed development boundary, albeit with localised areas disturbed by an access road and hardstand areas associated with the recent construction of a school development within the adjoining area to the west (Figure 11-5). As noted above, the recent construction of this school impinged on the western end of the archaeological zone of notification around the linear earthwork. A pre-development programme of archaeological test trenching indicated that the earthwork is of 19<sup>th</sup> century date and subsequent monitoring of the construction of the school buildings on its footprint revealed nothing of archaeological significance (Appendix 11.3: O'Connell, Licence 14E0225).





Figure 11-2 - Extract from 17th century Down Survey mapping with the general location of the subject Site circled (Source: Down Survey of Ireland, Trinity College Dublin [www.downsurvey.tcd.ie](http://www.downsurvey.tcd.ie))

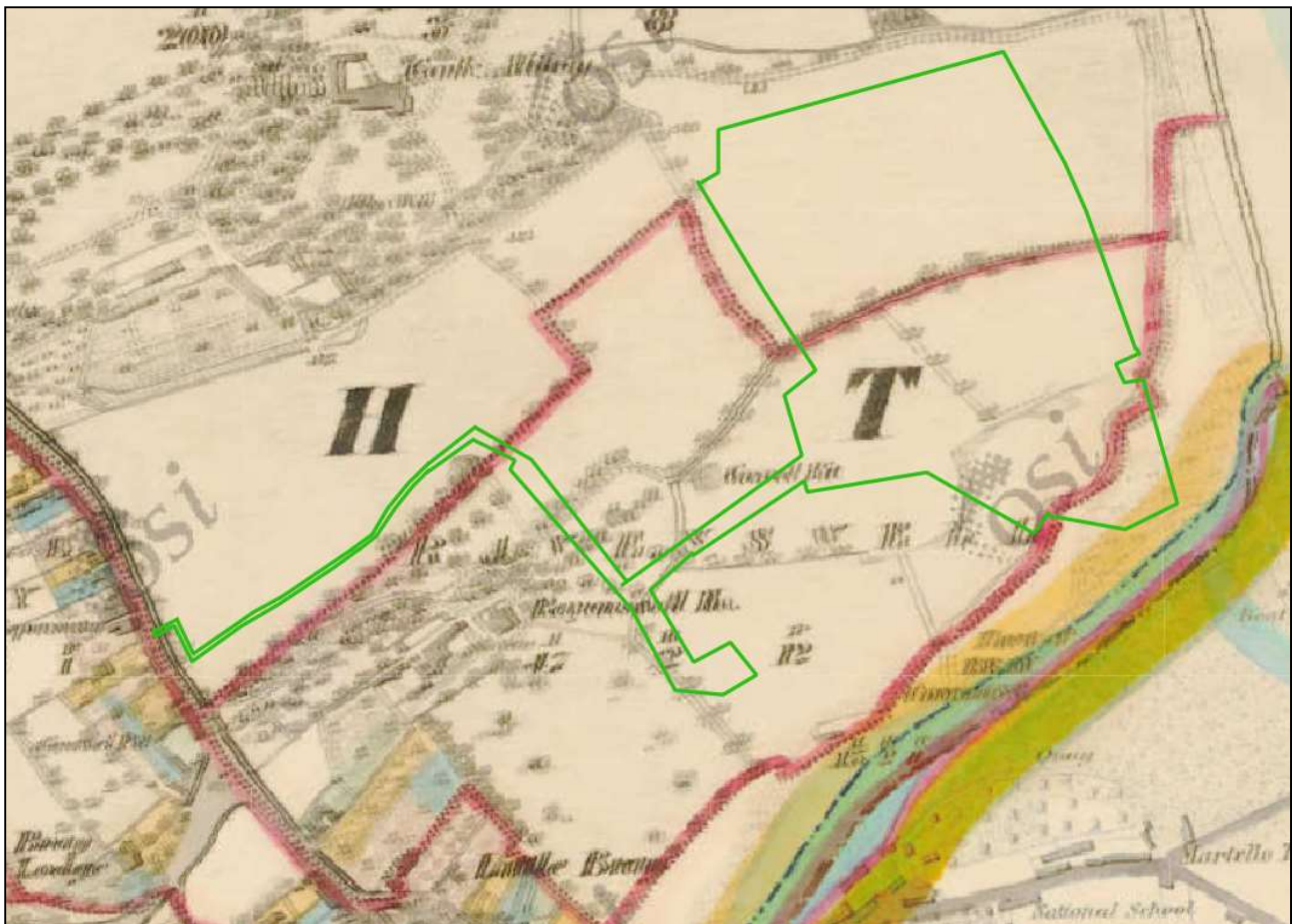


Figure 11-3 - 6-inch OS map (published 1843) with application boundary of proposed development outlined with green line [OSI Licence ref. 0003322]. The section of the boundary incorporating the Site

access and construction compound to the west of the proposed development area is now occupied by modern roads and a car park

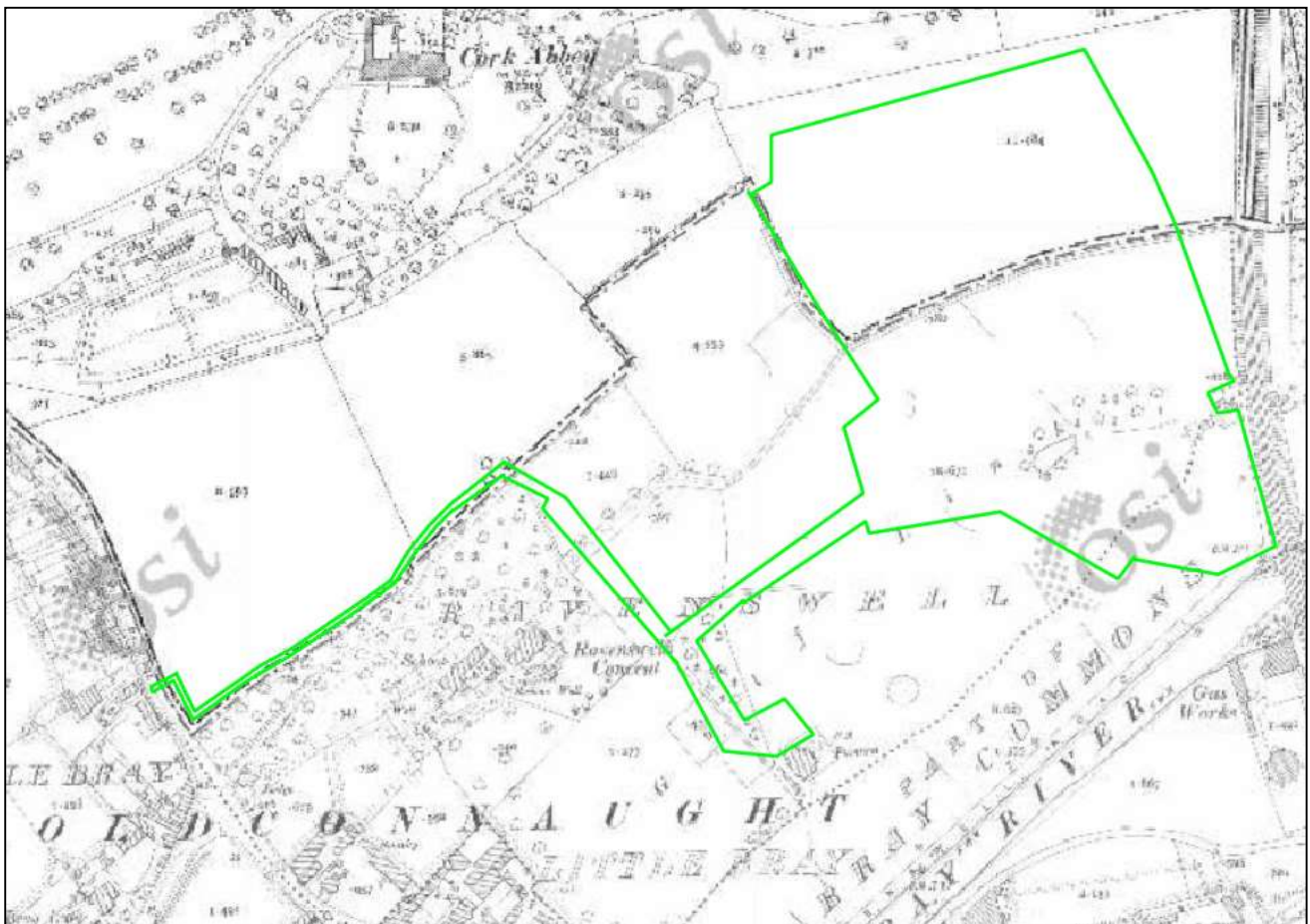


Figure 11-4 - 25-inch OS map (published 1910) with application boundary of proposed development outlined with green line [OSi Licence ref. 0003322]. The section of the boundary incorporating the Site access and construction compound to the west of the proposed development area is now occupied by modern roads and a car park.



Figure 11-5 - Modern aerial image of application boundary (indicated with green line) showing extent of zone of notification around linear earthwork (WI004-005/DU026-124) shaded in red with school recently constructed on its west end visible outside western Site boundary [aerial image source: [www.google.com](http://www.google.com); zone of notification source: [www.archaeology.ie](http://www.archaeology.ie)]

### 11.3.5. Architectural Heritage

There are no Protected Structures or buildings listed in the National Inventory of Architectural Heritage (NIAH) located within the proposed development and it is not within or adjacent to an Architectural Conservation Area (ACA). In addition, there are no extant structures of any date located within the proposed development boundary and it is not within the curtilage of a Protected Structure. The built environment within its surrounds is modern in date and includes the school development to the west and a housing estate to the north. The southern end of the surrounding 500m study area extends into streets within the north end of the town centre which contain various protected structures and other structures listed in the NIAH for Co. Wicklow and none of these are located within 200m of the proposed development.

### 11.3.6. Undesignated Cultural Heritage Assets

While encompassing the archaeological and designated architectural heritage resources, cultural heritage also includes various undesignated assets such as folklore, demesne landscapes, vernacular structures, placenames, townland boundaries and historical events. There are two undesignated cultural heritage assets identified within the proposed development and these comprise two levelled townland boundaries between Cork Great and Ravenswell to the north and Bray Commons and Ravenswell to the south. Townlands are the smallest unit of land division in the Irish landscape and many may preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The layout and nomenclature of the Irish townlands was recorded and standardised by the work of the Ordnance Survey in the 19<sup>th</sup> century. The Irish origins of many townland names often refer to natural topographical features, but some name elements may also give an indication of the presence of past human activity within the townland. The translations of the townland names within the study area were sourced from [www.logainm.ie](http://www.logainm.ie) and mainly record topographical features and associations with past landowners. The proposed development extends into four townlands: Cork Great in Co. Dublin and Ravenswell, Bray Commons and Bray in Co. Wicklow. The study area extends into a further two townlands: Little Bray and Old Connaught both of which are located within Co. Wicklow.

**Table 11-6 - Translation of townland names within the study area (Source: www.loganim.ie)**

Name	Irish	Logainm Translation
Ravenswell	-	-
Cork Great	Corcach Mhór	Large marsh
Bray	Bré	Previously mistranslated as Brí (hill), may have been original name of River Dargle
Bray Commons	Coimín Bhré	Bray Commons
Little Bray	Bré Beag	Little Bray
Old Connaught	Seanchonach	Old field of the hounds

### 11.3.7. Site Inspection

The proposed development encompasses greenfield and brownfield areas within the townlands of Cork Great, County Dublin and Ravenswell and Bray Commons, County Wicklow. The application boundary also encompasses the Site access along sections of the public roadways to the west and a construction compound within an existing golf club car park area. The proposed development comprises a remnant of the former Bray Golf Course, with the landscaped areas consisting of green areas delimited by tree belts, earthworks and sand bunkers. The Site is enclosed by modern palisaded fencing on all sides, which is fronted by a mature tree line to the north and flanked by the railway line to the east. Hard-standing surfaces were noted in the southern and western portions of the Site during the inspection and drainage features were noted throughout the interior. The southern end of the proposed development has been subject to ground disturbance during the recent construction of an access road which extends east to west across this portion of the Site. This road appears to have been constructed in recent years as part of the construction of Ravenswell Primary School and Coláiste Ráithín in the area adjoining the west end of the proposed development (WCC Planning Ref 15/190).

The townland boundary between Ravenswell and Cork Great extends through the proposed development and marks the line of the present county boundary between Dublin and Wicklow, although this county boundary line is of late 19<sup>th</sup> century date having previously been located along the River Dargle to the south of the proposed development. The current line of the county boundary within the proposed development is defined by a low linear earthwork which has been designated as a recorded archaeological monument by the Archaeological Survey of Ireland (ASI) and is included in the RMP for County Dublin (DU026-124----). The linear earthwork is currently visible as a low (0.8m high) section of bank (150m long) which extends on an NNE-WSW axis. It contains a splayed, flat-topped bank (1.60m wide at top; 10m wide at base) with some mature deciduous tree growth along its margins and no discernible surface traces of a flanking ditch were observable on either side.

The long-term use of the lands within the proposed development boundary as a golf course appears to have involved significant disturbance of ground levels during landscaping and regrading works undertaken during its operational years and other than the low surviving remains of the linear earthwork, no surface traces of any features of potential cultural heritage significance were noted during the Site inspections.

### 11.3.8. Geophysical Survey

Following consultation with the National Monuments Service (NMS) during the preliminary phase of the assessment process, a geophysical survey of the proposed development was undertaken by Ms. Joanna M. Leigh in October 2020 (Detection Licence Ref. 20R02014). The linear earthwork was presented in the geophysical data as a curvilinear band of increased magnetic and ferrous response. In addition, a number of features of low archaeological potential were identified within the Site. There were no definitive patterns of an archaeological character evident within the survey results and numerous small-scale ferrous responses were evident throughout the survey area. The full report on this Site investigation is presented in Appendix 11.1 and the report has also been submitted to the National Monuments Service in accordance with licensing requirements.

### 11.3.9. Archaeological Test Trenching

The following section presents a summary overview of the results of the archaeological test trenching of the proposed development in November 2020 and should be read in conjunction with the full report on this Site investigation presented in Appendix 11.2, which contains drawn and photographic records of the works. A copy of the test trenching report has been submitted to the National Monuments Service to comply with licensing requirements. The programme of archaeological test trenching, which was carried out following consultation with the National Monuments Service, under Excavation Licence 20E0482 and Detection Device Licence 20R00197 (metal-detecting) was completed within a three-day period in November 2020. Test trenching was carried out in the available areas of the Site and the layout of the ten excavated trenches (650m linear metres in combined

length) targeted the locations of the anomalies identified during geophysical survey, as well as available areas not subjected to geophysical survey (Figure 11-6). Two test trenches were manually excavated across the linear earthwork (WI004-005----/DU026-124---).

In general, the topsoil layer within the excavated trenches consisted of a mid-brown sandy clay with occasional modern inclusions present to its base, including sherds of modern ceramics, glass and other modern objects. The topsoil measured up to 0.6m in depth and contained numerous modern drainage pipes. The underlying natural subsoil was highly disturbed in places, presumably due to landscaping works associated with the former golf club. The sub-surface remains of a levelled field boundary were revealed in Trenches 5, 6 and 7 and the shallow sub-surface remains of this feature contained inclusions of brick fragments. The geophysical survey report tentatively interpreted several anomalies in Trenches 3, 5 and 7 as being of low archaeological potential. The testing programme revealed that these were most likely related to recent burning activity as modern burnt ferrous material was noted down to the surface of the natural subsoil at their locations.

Two manually excavated trenches (Trenches 3 and 4) were excavated across the alignment of the linear earthwork. The stratigraphy encountered in both trenches suggests that the feature was formed by the demolition of the upper courses of a random rubble wall at this location which may have formed part of a lane shown on historic OS maps. The rubble was primarily heaped on the northern side of the remnant basal course of the wall where the terrain slightly dips and was subsequently overlain with soil to create the slightly elevated flat-topped earthwork. A sub-surface ditch cut measuring 1.5m wide by 0.3m deep was uncovered under the north side of the embankment material and its basal fill contained late 19<sup>th</sup> /early 20<sup>th</sup> inclusions such as glass and ceramic sherds. In summation, the results of the archaeological test trenching, in conjunction with the cartographic evidence and previous archaeological investigations of the feature, indicates that the existing linear earthwork within the proposed development is a landscaped feature of late 19<sup>th</sup> or early 20<sup>th</sup> century date and is not of archaeological origin. As noted in Section 11.2.7, the National Monuments Service reviewed the submitted report on the archaeological test trenching investigations and confirmed by email (14/04/21) that they concurred with this conclusion.

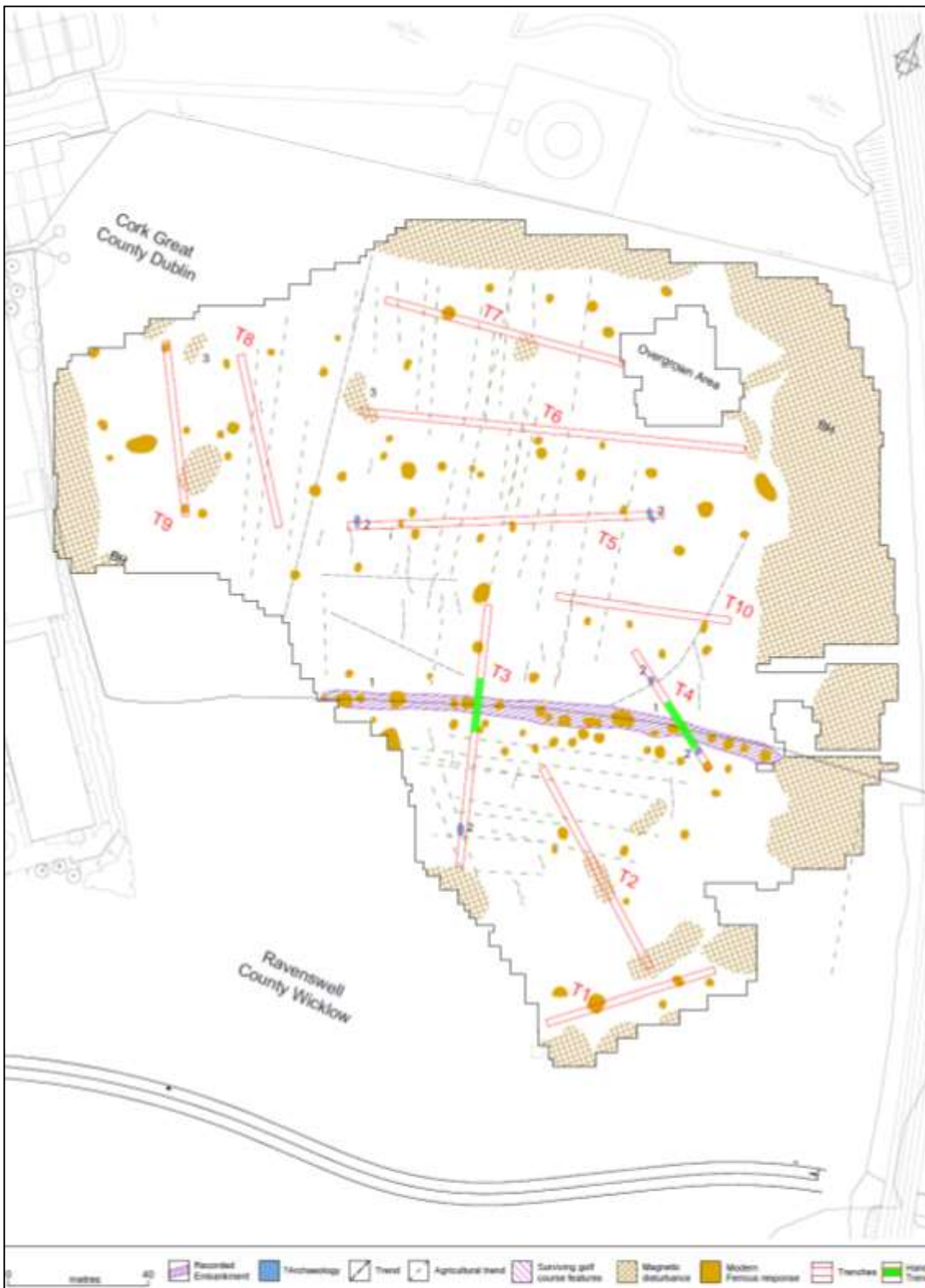


Figure 11-6 - Extract from geophysical report showing trench layout (T.1 – T.10) (red mechanical, green manual) superimposed on interpretation of results

### 11.4. Potential Impacts on Cultural Heritage during Construction Phase

The Record of Monuments and Places lists one recorded archaeological Site located within the proposed development and this comprises a linear earthwork (DU026-124-/WI004-005-) which will be removed during the construction phase. A number of archaeological investigations of this feature, including manual test trenching

undertaken as part of the current assessment, have indicated that the earthwork is of 19<sup>th</sup> /20<sup>th</sup> century date and is, therefore, not archaeological in origin. It is noted that archaeological monitoring, under a licence issued by the National Monuments Service, of the recent construction of the school development in the adjoining property to the west, which built was on the direct footprint of the section of the linear earthwork in that area, uncovered nothing of archaeological significance. The linear earthwork also forms the boundary between the townlands of Ravenswell and Cork Great and this cultural heritage attribute has been considered as part of the assessment of impact significance presented in Table 11-7.

No potential unrecorded archaeological features were identified within the proposed development boundary during the desktop study and Site investigations undertaken as part of this assessment or during previous archaeological investigations carried out within the Site and its environs. The proposed development will, therefore, have no predicted direct impacts on any previously unrecorded archaeological features during the construction phase. The known archaeological resource within the surrounding study area includes the recorded locations of a number of sites that are now occupied by modern developments and no potential indirect impacts on any extant archaeological sites were identified (Table 11-7).

There are no designated or previously unrecorded architectural heritage features located within the proposed development or its close environs and it is not located within an Architectural Conservation Area. The construction phase of the proposed development will, therefore, have no predicted impact on the architectural heritage resource.

**Table 11-7 - Summary of predicted construction phase impacts on the archaeological resource within study area**

Monument no	Class	Value	Impact Type	Impact Quality	Magnitude	Duration	Significance
DU026-068001-	Church (levelled and Site occupied by modern housing)	Low	None	Neutral	None	n/a	None
DU026-068002-	Graveyard (levelled and Site occupied by modern housing)	Low	None	Neutral	None	n/a	None
DU026-069- ---	Holy well (levelled and Site occupied by modern housing)	Low	None	Neutral	None	n/a	None
DU026-070- ---	Martello tower (levelled and Site removed by coastal erosion)	Low	None	Neutral	None	n/a	None
DU026-124- --- WI004-005-- --	Linear earthwork (extant) and townland boundary	Negligible to Low	Direct	Negative	High	Permanent	Slight

WI004-001-- --	Historic town	High	None	Neutral	None	n/a	None
WI004-001006-	Tower house (levelled and Site occupied by modern road)	Low	None	Neutral	None	n/a	None
WI004-002-- --	Martello tower (extant)	High	None	Neutral	None	n/a	None

## 11.5. Potential Impacts on Cultural Heritage during Operational Phase

There are no Protected Structures located within the proposed development or its close environs, which are occupied by a number of modern developments, and the proposed development will not result in any predicted impacts on the architectural heritage resource during the operational phase. Following the successful implementation of the mitigation measures presented in Section 11.7.1, the proposed development will also have no predicted impacts on the archaeological resource during the operational phase.

## 11.6. Do-Nothing Scenario

If the proposed residential development is not undertaken the baseline cultural heritage environment would remain unchanged. The 'do-nothing' scenario would result in neutral impacts with regards to cultural heritage.

## 11.7. Mitigation Measures

### 11.7.1. Construction Phase

A suitably qualified archaeologist will be appointed by the Developer to carry out a programme of archaeological monitoring of ground excavation works during the construction phase and this will be carried out under a licence issued by the National Monument Service. Given the absence of any unrecorded, sub-surface archaeological features identified during the geophysical survey and subsequent test trenching investigations carried out as part of this assessment the potential for the presence of such features is not considered likely but in the event that any archaeological remains are identified during monitoring they will be recorded and left to remain securely in situ while the National Monuments Service are consulted to determine further appropriate mitigation measures, which may entail preservation in situ by avoidance or preservation in record by archaeological excavation.

Whilst the linear earthwork feature is of no great antiquity or cultural heritage significance (as evidenced by a series of archaeological investigations of the feature), the positioning of the roads and residential blocks have been arrayed so that they form a spatial marker (or morphological memory) of the 'Nun's Walk' former location and alignment. The Nun's walk will feature and be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A. The space also allows for the potential installation of public artwork to further define the character and mark the history of the space, including delineation of the alignment of the earthwork through paving, interpretive text and imagery. In addition, the design provides for a feature stone wall along this section of the railway boundary to act as 'stage scenery' and reinforce the importance of this area of open space. This open space will provide connectivity with the Green Spine and the Coastal Gardens character areas to maintain pedestrian permeability throughout the development. Refer to Chapter 5 - Landscape and Visual.

### 11.7.2. Operational Phase

Given the factors outlined in Section 11.5 of this chapter combined with the implementation of the mitigation measures presented in Section 11.7.1 which will provide for either the avoidance or the proper and adequate recording of any currently unrecorded archaeological features within its boundary, there are no predicted mitigation measures required for the cultural heritage resource during the operational phase.



## 11.8. Residual Impacts

Given that no features of archaeological origin were identified within the proposed development during the desktop research, geophysical survey and test trenching investigations carried out as part of this assessment in combination with the successful implementation of the mitigation measures presented in Section 11.7.1, no significant adverse residual impacts on this element of the cultural heritage resource are predicted to result from the construction or operational phases. There are no structures of architectural heritage significance located within the proposed development, which is not located within an Architectural Conservation Area, and no residual adverse impacts during the construction and operational phases on this element of the cultural heritage resource are predicted.

## 11.9. Monitoring Requirements

There are a number of obligatory processes required as part of archaeological licence applications to the National Monuments Service and these will allow for monitoring of the successful implementation of the archaeological mitigation measures presented in Section 11.7.1. The archaeologist appointed to undertake licensed monitoring of the construction phase shall submit a method statement detailing the proposed strategy for archaeological supervision of ground works to the National Monuments Service as part of the license application. This will clearly outline the proposed extent of ground works and outline the consultation process to be enacted in the event that any unrecorded archaeological remains are identified, which may include preservation in situ by avoidance or preservation in record by archaeological excavation. The appointed archaeologist will compile a report on all archaeological Site investigations which will clearly present the results in written, drawn and photographic formats. Copies of this report will be submitted to the National Monuments Service and the National Museum of Ireland by the appointed archaeologist.

## 12. Material Assets

### 12.1. Introduction

This section of the EIAR report has been prepared by Atkins. According to relevant EPA guidance (EPA, 2022) the following topics warrant consideration under material assets:

- Built Services;
- Roads and Traffic; and,
- Waste Management.

Roads and traffic have been assessed separately as part of this EIAR. Refer to Chapter 8 – Traffic. Therefore, this assessment examines material assets serving the proposed development specifically in relation to existing and proposed built services (i.e. foul sewerage, surface water drainage, water supply, gas, electricity, and telecommunications utilities), and waste management; both of which are assessed separately within this section.

### 12.2. Built Services

#### 12.2.1. Assessment Methodology

The methodology used to prepare this section of the EIAR is in accordance with the EPA ‘*Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)*’ (2022), and ‘*Advice Notes for Preparing Environmental Impact Statements Draft September 2015*’. The following sources have been used to collate information on built services within the general area of the Site;

- ESB Network Utility Plans;
- eir Telecommunications Plans; and
- Available utility information and maps received from Irish Water, Wicklow County Council (WCC) and Dún Laoghaire-Rathdown County Council (DLRCC).

This information has been supplemented by observations recorded during various Site walkover surveys, and pre-application consultation with Irish Water, WCC and DLRCC. Surface water runoff, foul drainage discharge and water supply requirements have also been designed with due regard to the following guidelines:

- Bray Municipal District Local Area Plan (LAP);
- CIRIA report C753 ‘The SuDS Manual – v6;
- DLRCC Development Plan Appendix 7 – Sustainable Drainage Systems Measures
- Greater Dublin Strategic Drainage Study (GDSDS);
- Irish Waters Code of Practises and Technical Standards (IW-CDS-5030-01 to 04 & IW-TEC-800);
- Irish Waters Pre-Connection Enquiry Application (water demand and foul water loading);
- Irish Waters Statement of Design Acceptance; and,
- Irish Waters Confirmation of Feasibility (Diversion).

#### 12.2.2. Receiving Environment

The Site of the proposed development is a former Golf Course. Residential properties including Corke Abbey are located to the west of the Site and further north, with School Developments bordering the western Site boundary. Retail units are located further west of the proposed development Site with the railway line bordering the eastern Site boundary. Consultation with relevant bodies has been undertaken to determine existing utilities present in the vicinity of the Site. A complete set of all utility / service plans received showing the general vicinity of the Site is presented in Appendix 12.1.

##### 12.2.2.1. Storm Water Drainage

There is existing storm water drainage infrastructure along the access path to the school development and therefore the proposed access road for the proposed development. This roadway will separate the southern portion of the Site from the northern portion of the Site and therefore this storm water infrastructure is aligned in an east-west direction through the Site. Refer to Appendix 12.1.

#### 12.2.2.2. Foul Water Drainage

There is an existing major foul water network with associated Irish Water services along the northern, eastern and southern boundary of the proposed Site as well as through the Site to the north of the access path to the school development in an east-west direction with a foul drainage network located to the north and south of the Site (outside the Site boundary). Refer to Appendix 12.1.

#### 12.2.2.3. Water Supply & Distribution

The Site is currently not serviced by a public water supply. Refer to Appendix 12.1.

#### 12.2.2.4. ESB Supply

As presented in Appendix 12.1 there are existing underground ESB services along the northern, eastern and southern Site boundaries as well as through the Site within vicinity of the access path to the school development / proposed access route to the proposed development. An ESB pole is also located in the north eastern corner of the Site. There are overhead ESB services further east of the Site, on the opposite side of the railway track with none identified within the immediate vicinity of the Site.

#### 12.2.2.5. Gas Supply

There are existing gas utilities within the south eastern section of the Site. Refer to Appendix 12.1.

#### 12.2.2.6. Eir Network

Existing eir ducting is located along the southern and eastern boundaries of the Site. Refer to Appendix 12.1.

#### 12.2.2.7. Street Lighting

There is existing street lighting along the access path to the school development with street light also leading to the underpass.

### 12.2.3. Impact Assessment

#### 12.2.3.1. Characteristics of the proposed development

A detailed description of the proposed development is presented in Chapter 2 - Project Description. The following summary relates to the characteristics of the proposed development specifically in relation to proposed built services / utilities.

##### 12.2.3.1.1. Surface Water / Storm Water Drainage

Stormwater run-off will be collected from the roofs, pavements and other impermeable surfaces i.e. open space via a standard manhole and underground pipework system which will be primarily laid along the internal road network. SuDS have been incorporated into the drainage design to reduce run-off rates and to improve run-off quality. The SuDS features to be used in the drainage network include filter drains, swales, permeable paving, tree pits, extensive green roofs, intensive green courtyards and modular attenuation systems with a permeable base (where appropriate) with discharge to the Dargle River. For the east side of the Site there are green roofs on the development units (apartments) and much of the rainfall for this side of the Site will be absorbed by these sedum and wildflower areas. For areas of soft landscaping, e.g. woodland mix planting, wildflower meadows, grassland areas and residential gardens the rainfall will drain to ground mimicking nature and managing rainfall close to where it falls. The permeable paving similarly allows for localised management of rainfall where during low rainfall events surface water will infiltrate to ground. For larger rainfall events the permeable paving will have an outlet to allow storm water to discharge into the proposed surface water network. The soft landscaping and drainage designs also includes for swales which will also minimise surface water runoff to the local network by allowing rainfall to be slowed and soaked to ground. The SuDS drainage design allows for opportunities for using runoff rainfall where it falls which will ultimately allow for greatly reduced storm water volumes out-falling to the River Dargle whilst also providing for watering of extensive areas of soft landscaping. The drainage design also includes for underground attenuation systems and flow controls to slow and manage storm water drainage before final outfall to the River Dargle which will ensure there is protection to the natural flow regimes of the watercourse.

The various SuDS measures to be adopted as part of the proposed development are detailed further within Chapter 10 – Water. The proposed drainage system (minimum of 225mm diameter pipeline) has been designed based on 2no. separate catchment areas (Catchment A and B), as presented in Drawing Ref: 5214419-ATK-01-ZZ-DR-CE-0503 (refer to Appendix 12.2 of this EIAR) and summarised as follows.

**Catchment A:** Storm water from Catchment A will be attenuated via an underground modular attenuation system with the flow controlled via a Vortex Control device. Based on a maximum discharge

rate of 13.04l/s, a tank volume of 918m<sup>3</sup> is required for 1 in 100-year 6-hour storm event including 20% for climate change and 10% for Urban creep (total 30%). As outlined in the Stormwater Impact Assessment Report (Atkins 2022) (document ref.: 5214419DG0012), the tank volume has been increased to 988.9m<sup>3</sup> to remove surface level flooding during a 50% blockage scenario.

**Catchment B:** Storm water from Catchment B will be attenuated via. an underground modular attenuation system with the flow controlled via. a Vortex Control device. Based on a maximum discharge rate of 45.87l/s, a tank volume of 1,100m<sup>3</sup> is required for 1 in 100-year 6-hour storm event including 20% for climate change and 10% for Urban creep (total 30%) for climate change.

A full set of all proposed drainage design drawings are presented in Appendix 12.2 of this EIAR.

#### 12.2.3.1.2. Foul Drainage

Proposed foul drainage services (225mm diameter pipeline) will be provided; all wastewater will discharge to a proposed manhole that will be constructed as part of the future foul network reinforcement project to be carried out by Irish Water. Existing rising main and gravity return drains that serve the storm holding tank will be diverted ca.30m southwards to avoid proposed structures. Irish water has confirmed that the existing foul network has sufficient capacity to meet the combined wastewater discharge volumes of ca. 264,470l/d from the proposed development, once operational (refer to Engineering Planning Report). A full set of all proposed drainage design drawings are presented in Appendix 12.2 of this EIAR. Refer also to the Engineering Planning Report prepared by Atkins (2022) (document ref.: 5214419DG0018), submitted as part of this planning application. All foul drainage related works will be carried out in consultation with Irish Water and in accordance with all relevant Irish Water guidelines and any Site-specific additional requirements.

#### 12.2.3.1.3. Water Supply and Distribution

Proposed watermain services (100-225mm diameter pipeline), including firewater requirements for the development will be provided. The peak daily domestic water demand (including potable use) for the proposed development is calculated to be 2.854 l/s. Irish Water has confirmed that the existing water network has sufficient capacity to meet these peak operational water requirements. A full set of all proposed watermain service drawings are presented in Appendix 12.2 of this EIAR. Refer also to the Engineering Planning Report prepared by Atkins (2022), submitted as part of this planning application.

#### 12.2.3.1.4. ESB

Power supply, and the requirement for any alterations to the existing power supply network for the development of the subject Site, will be agreed with ESB Networks in advance of construction. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines.

#### 12.2.3.1.5. eir Network

Connection to the existing eir network in the vicinity of the proposed development will be agreed in advance of construction with eir. All telecommunication supply related works will be carried out in accordance with relevant eir guidelines. All construction works within the vicinity of these areas will be carried out in accordance with the Health and Safety Authorities (2016) 'Code of Practice for Avoiding Danger from underground services'

#### 12.2.3.1.6. Street Lighting

A MEP Engineering Report & Energy Statement was prepared by Atkins (2022), as presented in full in Appendix 12.3. This Report includes an Outdoor Lighting Report in Appendix A which was prepared in accordance with relevant standards and guidelines and which will be implemented as part of the proposed development. The MEP Engineering Report & Energy Statement states that the '*public lighting system will be a very high quality, energy efficiency and future proofed road lighting for private development*'. The Outdoor Lighting Report has also been developed in consultation with bat and biodiversity specialists and is in line with the guidelines and legislation for the protection of bats with an aim of minimising disruption and disturbance to local bat populations. As identified within the MEP Engineering Report & Energy Statement, a number of design principles will be implemented so as to '*minimise light intrusion within the identified key bat areas*' which were identified following a bat survey at the site (Refer to the MEP Engineering Report & Energy Statement (Atkins, 2022) (Doc. ref. 5214419DG0023).

#### 12.2.3.2. Potential Impacts during the Construction phase

The following potential impacts could occur during the Construction phase:-

- Damage to existing major foul water network, within the associated services, along the northern, eastern and southern boundary of the Site;
- Damage to existing underground power supply which runs along the boundaries of the Site;
- Damage to existing eir telecommunication assets along the southern and eastern Site boundaries;
- Potential power outages to existing services in the surrounding area during the connection of the proposed new supply networks within the residential development to the existing networks;
- Contamination to the existing public water supply network during connection to the proposed new water supply network within the residential development; and,
- Damage to the gas network located within the southern portion of the site.

These potential impacts are considered to be unlikely and should they occur, would be temporary and moderate adverse.

#### 12.2.3.3. Potential Impacts during the Operational Phase

Irish water has confirmed that the foul network will have sufficient capacity for the proposed development following completion of the proposed Ravenswell section of the Irish Water Local Network Reinforcement Project which is expected to be delivered by Q4-2022, and that the water supply network has sufficient capacity to meet the foul and water supply requirements of the proposed residential development, once operational. All foul water, storm water and water main services will be installed and commissioned within the proposed development in accordance with all Irish Water requirements and standard best practice guidelines.

As previously stated, all power, telecommunications networks and street lighting will be installed and commissioned within the proposed development in accordance with the relevant service providers guidelines and requirements and standard best practice guidelines. A Telecommunications Impact Assessment report has been prepared by BBSC (2022), as presented within the MEP Engineering Report & Energy Statement in Appendix 12.3. Key conclusions are summarised below:

- *'The proposed development will not impact on fixed line telecommunications.'*
- *'The proposed development will not impact on existing sight lines.'*
- *'The proposed development may affect local radio (mobile phone) communications. On site network surveys, which can only be carried out once the development has been constructed, will be required to determine whether additional microwave radio transmitters are required. Recommendations will be implemented as needed.'*
- *'The proposed development would result in an approximate range of 1,465 to 2,637 additional people within the locality. For this quantum of development, a minimum of 3 to 4 additional mobile phone transmitters may be required to provide 4G or better service within the area. As is the case for developments of this scale, any requirement for additional mobile phone transmitters will be subject to a network load analysis by the mobile phone network providers that can only be carried out once the development has been constructed. Should this network load analysis conclude that additional mobile phone transmitters are required, these could be located in or at Block B2 as it is the tallest building within the proposed development (12 storeys). A standalone planning permission would be required for any mobile phone transmitters.'* (BBSC, 2022)

#### 12.2.4. Do Nothing Impact

The Material Assets Assessment assumes that under the 'Do-Nothing' scenario the proposed scheme would not be developed. Thus, there would be a neutral impact on built assets within the vicinity of the proposed development.

#### 12.2.5. Cumulative Impacts

No cumulative impacts are anticipated during the construction or operational phases of the proposed development associated with built services.

#### 12.2.6. Proposed mitigation measures

##### 12.2.6.1. Construction Phase

The following mitigation measures will be implemented during the construction phase;

- A project-specific Detailed Construction Environmental Management Plan (CEMP) will be prepared by the appointed Contractor prior to the commencement of construction works. This document will take account of all of the environmental considerations (including water, dust and noise nuisance control; soil / stockpile

management; temporary groundwater management; appropriate Site management of compound area; fuel, oil and chemical storage and use; and waste management) set out in the Outline CEMP submitted as part of this planning application;

- Phasing of the diverted foul water network is to be fully coordinated with Irish Water to ensure the reduced likelihood of requirements to use the existing system while the diversion is being made;
- The construction compounds will include adequate temporary welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the compound will be removed off site to an appropriately licensed facility for disposal until a connection to the public foul drainage network has been established;
- All newly installed utilities/ services will be assessed, tested and certified as required prior to being fully commissioned;
- Connections to the existing and proposed foul networks will be coordinated with the relevant utility provider. All works associated with the existing and proposed utilities for the proposed development will be carried out in strict accordance with the guidelines of the relevant stakeholders (specifically ESB, eir and Irish Water), Health and Safety Authority and any additional site specific requirements;
- A copy of all available existing, and as built utility plans will be maintained on Site during the construction of the proposed development. The underground power lines and foul water mains within the existing Irish Water services, located onsite will be clearly marked and all Site personnel will be made aware of the known location of any onsite underground or over ground services during the construction phase; and,
- Street Lighting will be implemented in accordance with the MEP Engineering Report & Design Statement prepared by Atkins (2022).

#### 12.2.6.2. Operational Phase

The following mitigation measures will be implemented during the operational phase;

- On site network surveys, which can only be carried out once the development has been constructed, will be required to determine whether additional microwave radio transmitters are required. Recommendations will be implemented as needed (BBSC, 2022).
- The proposed development would result in an approximate range of 1,465 to 2,637 additional people within the locality. For this quantum of development, a minimum of 3 to 4 additional mobile phone transmitters may be required to provide 4G or better service within the area. As is the case for developments of this scale, any requirement for additional mobile phone transmitters will be subject to a network load analysis by the mobile phone network providers that can only be carried out once the development has been constructed. Should this network load analysis conclude that additional mobile phone transmitters are required, these could be located in or at Block B2 as it is the tallest building within the proposed development (12 storeys). A standalone planning permission would be required for any mobile phone transmitters (BBSC, 2022).

## 12.3. Waste Management

### 12.3.1. Assessment Methodology

This section of the EIAR has been prepared in accordance with the EPA 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022), 'Advice Notes for Preparing Environmental Impact Statements Draft September 2015', and 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects' (EPA 2021).

The findings of the Construction Resource and Waste Management Plan (RWMP) (Atkins, 2022) (document ref.: 5214419DG0011) prepared as part of this planning application have been incorporated into this assessment where relevant. A copy of the RWMP is presented in Appendix 12.4. This document has been prepared with due regard to the following relevant documents:

- 'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects' (EPA, 2021);
- 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (EPA, 2018);
- 'A review of Design and Construction Waste Management Practices on Selected Case Studies – Lessons Learned' (EPA, 2015);
- Bray Municipal District Local Area Plan 2018-2024 (WCC 2017);
- 'Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams' (EPA, 2015);

- ‘Development of an Audit Methodology to Generate Construction Waste Projection Indicators for the Irish Construction Industry’ (EPA, 2009).
- Dún Laoghaire-Rathdown County Development Plan 2022-2028 (DLRCC, 2022); Guidance Notes for Waste Management in Residential and Commercial Developments (DLRCC 2020);
- Wicklow County Development Plan 2016-2022 (WCC, 2016);
- Draft Wicklow County Development Plan 2022-2028 and proposed amendments (WCC, 2022); and,
- Wicklow County Development Plan 2016 -2020 Development and Design Standards (WCC, 2016).

This assessment has also been informed by findings of the Chapter 9 – Land, Soils and Geology section of this EIAR.

The findings of the Operational Waste Management Plan (OWMP) (Atkins, 2022) (document ref.: 5214419DG0009) prepared as part of this planning application have been incorporated into this assessment where relevant. A copy of the OWMP is presented in Appendix 12.5. This document has been prepared with due regard to the following relevant documents:

- Environmental Protection Agency (EPA) National Waste Statistics: Guidance for estimating quantity of waste generated on-site (EPA, 2020);
- Waste Storage Guide for Northern Ireland (Building Control Northern Ireland, 2010);
- Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (Department of Housing Planning and Local Government, 2018);
- Organic Waste Management in Apartments prepared for the EPA (Carey. C., Phelan., W. and Boland., B. 2008); and,
- BS 5906:2005 Waste Management in Buildings – Code of Practice.

Additionally, the following relevant best practice guidance documents and Development Plans were also consulted:

- Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams’ (EPA, 2015);
- EPA National Waste Statistics Summary Report 2020 (EPA 2020);
- Dún Laoghaire-Rathdown County Development Plan 2022 – 2028 (DLRCC 2022);
- Guidance Notes for Waste Management in Residential and Commercial Developments (DLRCC 2020);
- Draft Wicklow County Development 2022-2028 and proposed amendments (WCC, 2022); and,
- Wicklow County Development Plan 2016 -2020 Development and Design Standards (WCC, 2016).

## 12.3.2. Receiving Environment

Historic land-use at the Site was greenfield, based on a review of available historic mapping and aerial photography before being developed as a former Golf course. The GSI bedrock geology 100k map identifies the underlying bedrock in the centre, north and west of the study area as the Maulin Formation, which is comprised of slate, phyllite and schist and described as blue grey slates and phyllites. To the south lies the Bray Head Formation comprised of greywacke and quartzite. Based on all available evidence, including soil analytical data and findings from the geotechnical investigation (as detailed in Chapter 9 – Land, Soils and Geology), taking account of proposed mitigation measures, soils beneath the Site are not considered to pose an unacceptable risk to human health, building and services, environmental receptors or third-party sites.

## 12.3.3. Impact Assessment

### 12.3.3.1. Characteristics of the proposed development

A detailed description of the proposed development is presented in Chapter 2 – Project Description. The following summary relates to the characteristics of the proposed development specifically in relation to waste management. The proposed residential development will be designed, planned, constructed and operated to minimise waste generation at every stage.

The management of waste generated during the construction of the proposed development will be in accordance with the Construction RWMP submitted as part of this planning application. The following waste streams will be generated during the construction phase: native non-contaminated soils, mixed C&D waste, wood / timber, metal, paper, plastics and packaging, canteen / office waste, and other waste (comprising soiled paper, cardboard, plastics, cloth, insulation and plasterboard).

During the operational phase, the proposed residential development has been designed to provide adequate domestic refuse storage areas for individual dwellings, within a paved collection area at the entrance to each home zone, and within communal waste collection areas for the commercial and apartment units. The following primary waste streams will be generated during the operational phase: residual waste, dry recyclables and organic waste. In addition, the following waste streams will occasionally be generated by the residents of the proposed development: WEEE, batteries, fluorescent tubes, furniture, chemicals and textiles.

#### 12.3.3.2. Potential Impacts during Construction phase

During the construction phase, it has been estimated that the various waste streams will be generated and managed as follows (refer to the RWMP presented in Appendix 12.4).

##### 12.3.3.2.1. Native Non-Contaminated Soils

The estimated volume of soil generated during the construction phase (ca.: 41,200m<sup>3</sup>) will be minimised by reducing / eliminating the need for excavation and importing of capping layers. Lime stabilisation may also be used to reduce the amount of soils generated onsite. The balance of soil materials excavated from the Site will be reused where possible for landscaping purposes, and infill where appropriate, ensuring that any residual soil waste is kept to a minimum. Any surplus soil will be characterised and removed offsite in accordance with all relevant waste management legislation.

##### 12.3.3.2.2. Mixed C&D Waste

Following segregation onsite, any residual mixed C&D waste (ca.: 908 tonnes) will be collected in containers specifically for mixed C&D waste; these will be removed offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility.

##### 12.3.3.2.3. Wood / Timber

Timber waste (ca.: 1324 tonnes) will be segregated in order to prevent contamination by other wastes and will be stored so as to limit the potential for this material to rot. Wooden pallets will be returned to relevant suppliers where possible. Timber offcuts will be reused onsite where feasible. A covered receptacle for waste wood will be placed in the waste storage area, prior to removal from Site for recycling. All such timber will be free from chemical treatment.

##### 12.3.3.2.4. Metals

Metal waste (ca.: 717 tonnes) will be generated during the project, particularly arising from the use of rebar. All waste metal will be segregated offsite at the waste disposal / recovery facility for reuse and recycling. Given the significant scrap value associated with metal waste, this waste will be stored in a dedicated container within a secure part of the Site, and regular collections from Site to the waste recycling facility will limit the potential for unauthorised entry and theft.

##### 12.3.3.2.5. Paper, plastics and Packaging

Packaging wastes (ca.: 758 tonnes) will be removed (paper / cardboard / plastic / general waste) offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility. Waste packaging will be stored in dedicated containers in the waste storage area for collection and subsequent segregation and recycling.

##### 12.3.3.2.6. Canteen / Office Waste

Onsite staff canteens will generate food and packaging waste (ca.: 112 tonnes). Dedicated containers will be provided at each canteen to permit easy segregation of these wastes; brown bins will be provided for compostable food waste, green bins will be provided for dry recyclables (packaging, hard plastic, paper, cardboard, tetrapak etc.) and black bins will be provided for any residual waste.

##### 12.3.3.2.7. Other wastes

In addition to the above waste streams, other waste materials (ca.: 2706 tonnes) will be generated during the construction phase. These residual wastes will typically comprise non- recycling waste such as soiled paper / cardboard / plastics / cloth, fibreglass, polystyrene insulations and plasterboard. These materials will be stored separately to all other waste streams in order to prevent any cross contamination.

All waste materials will be segregated onsite into the various waste streams, via. dedicated skips and storage areas. All waste will be removed from Site by one or more waste haulage contractor(s) who hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials generated during the construction phase will be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility. All waste removed offsite will be appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management



regulations as amended). All waste management and disposal / recovery records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer's Representative and statutory consultees (DLRCC, WCC, EPA) as required.

The waste management strategy during the construction phase of the proposed development has been developed in accordance with the relevant Regional Waste Management Plans for Dún Laoghaire-Rathdown County Council and Wicklow County Council and the 'Eastern-Midlands Region Waste Management Plan 2015-2021'. The overarching objectives of the Eastern-Midlands Region Waste Management Plan 2015-2021 have been incorporated into the latest development plans pertinent to this Site i.e. Dún Laoghaire-Rathdown Development Plan 2022-2028 (DLRCC), Wicklow County Development Plan 2016-2022 (WCC) and Draft Wicklow County Development Plan 2022-2028 and proposed amendments (WCC). According to WCC (2016) the Regional Waste Management Plan has the following objectives:

- Prevent or minimise the production of waste in the first instance;
- Reduce, re-use and recycle to the maximum extent possible;
- Endeavour to recover energy from waste where possible; and
- Ensure the efficient and safe disposal of any residual waste.

The Wicklow County Development Plan 2016-2022 sets out the following objectives with regards to construction and demolition waste management:

*'WE1 – To require all developments likely to give rise to significant quantities of waste, either by virtue of the scale of the development or the nature of the development (e.g. one that involves demolition) to submit a construction management plan, which will outline, amongst other things, the plan for the safe and efficient disposal of waste from the site.'*

*'WE2 – To require all new developments, whether residential, community, agricultural or commercial to make provision for storage and recycling facilities (in accordance with the standards set out in Development & Design Standards of this plan).'*

The Draft Wicklow County Development Plan 2022-2028 and proposed amendments sets out the following objectives with regards to construction and demolition waste management:

*'CPO 15.1 – To require all developments likely to give rise to significant quantities of waste, either by virtue of the scale of the development or the nature of the development (e.g. one that involves demolition) to submit a construction management plan, which will outline, amongst other things, the plan to minimise waste generation and the plan to protect the environment with the safe and efficient disposal of waste from the site.'*

*'CPO 15.2 – To require all new developments, whether residential, community, agricultural or commercial to make provision for storage and recycling facilities (in accordance with the standards set out in Development & Design Standards of this plan).'*

The Dún Laoghaire-Rathdown County Development Plan 2022-2028 sets out the following policy objectives regarding construction and demolition waste and resource management

*'E11: Resource Management – It is a Policy Objective to implement the Eastern-Midlands Region Waste Management Plan 2015-2021 and subsequent plans, in supporting the transition from a waste management economy towards a circular economy, to enhance employment and increase the value recovery and recirculation of resources.'*

*'E12: Waste Management Infrastructure, Prevention, Reduction, Reuse and Recycling (Circular Economy approach) – It is a Policy Objective:*

- *To support the principles of the circular economy, good waste management and the implementation of best international practice in relation to waste management in order for the County and the Region to become self-sufficient in terms of resource and waste management and to provide a waste management infrastructure that supports this objective.*
- *To aim to provide a supporting waste management infrastructure in the County for the processing and recovery of waste streams such as mixed municipal waste in accordance with the proximity principle.*
- *To ensure new developments are designed and constructed in line with the Council's Guidelines for Waste Storage Facilities.*

*'E13: Hazardous Waste – It is a Policy Objective to adhere to the recommendations of the 'National Hazardous Waste Management Plan 2014-2020' and any subsequent plan, and to co-operate with other*

*agencies, to plan, organise, authorise and supervise the disposal of hazardous waste streams, including hazardous waste identified during construction and demolition projects.'*

Therefore, while waste will be generated during the construction of the proposed development, all waste streams will be managed in accordance with statutory waste management and environmental requirements, regional waste related policy, best practice waste management guidance, and a project specific RWMP. As with any construction project, there is potential for nuisance issues to arise during the construction phase, associated with dust or waste materials impacting roads and footpaths adjacent to the proposed development. The potential impacts of waste generated during the construction phase (via. transport and disposal / recovery to appropriately permitted / licenced facilities; and potential nuisance issues) will be temporary and slight adverse. Mitigation measures will be implemented as required to further manage these potential impacts.

#### 12.3.3.3. Potential Impacts during Operational Phase

During the operational phase, communal waste collection areas for apartments and commercial units will be clearly identified, secure, have adequate lighting and drainage, and will be easily accessible for bin collection crews.

Bin storage capacity at these communal waste collection areas will be as follows;

- 1100L wheeled bins for residual waste;
- 1100L wheeled bins for dry recyclable waste; and,
- 240L wheeled bins for organic waste.

It is expected that individual houses with external access to the rear of the property will store the wheeled bins to the rear of the houses. Houses with no external rear access will store the wheeled bins to the front of the house in a covered area. Each house will have storage capacity for 2no. 240L wheeled bins for residual waste and dry recyclable waste and 1no. 140L wheeled bin for organic waste.

During the operational phase waste shall be collected on a fortnightly basis (for all houses and duplex units) and a weekly basis (for all apartment blocks and commercial units) by a commercial waste contractor who holds a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials will be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility. All such waste will be transported and disposed of in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended). Further details are included in the Operational Waste Management Plan prepared by Atkins (2022) as part of this planning application which is included in full in Appendix 12.6.

Therefore, while waste will be generated during the operational phase of the proposed development, all such waste will be managed in accordance with statutory waste management and environmental requirements, regional waste related policy, and best practice waste management guidance. As with all residential developments, there will be potential for litter pollution within the proposed housing estate and surrounding areas. The potential impacts of waste generated during the operational phase (via. transport and disposal / recovery to appropriately permitted / licenced facilities; and potential litter issues) will be long-term and imperceptible. Regardless, mitigation measures will be implemented to manage potential litter impacts.

### 12.3.4. Proposed mitigation measures

#### 12.3.4.1. Construction Phase

The following mitigation measures will be implemented during the construction phase:

- All waste management procedures implemented onsite during the construction phase will be in accordance with the RWMP (Atkins, 2022) submitted as part of this planning application. In advance of commencement onsite, the Contractor will prepare a project specific Detailed RWMP which will further develop this plan, and will provide specific details in terms of proposed permitted haulage contractors, and permitted / licenced waste disposal / recovery facilities;
- Scheduling and planning the delivery of materials will be carried out on an 'as needed' basis to limit any surplus materials;
- Materials will be ordered in sufficient dimensions so as to optimise the use of these materials onsite, and will be carefully handled and stored so as to limit the potential for any damage;
- Where feasible, sub-contractors will be responsible for the provision of any materials they require onsite in order to help reduce any surplus waste;
- All loaded trucks entering and exiting the Site will be appropriately secured and covered; and,

- Dust will be controlled at entry and exits to the Site using wheel washes (as required) and/or road sweepers, and tools and plant will be washed out and cleaned in designated areas. Wheel / road sweeper washings will be contained and treated prior to discharge.

#### 12.3.4.2. Operational Phase

Waste management during the operational phase of the development will be undertaken by private waste contractors (in accordance with statutory waste management and environmental requirements, regional waste related policy, and best practice waste management guidance), and regulated by Dún Laoghaire-Rathdown and Wicklow County Council. All waste management procedures implemented onsite during the operational phase will be in accordance with the Operational WMP (Atkins, 2022) submitted as part of this planning application. Therefore, no further mitigation measures are required with regard to the transport and disposal or recovery of all waste streams which will be generated during the operational phase.

The following mitigation measures will be implemented during the operational phase in order to minimise the potential impact of litter pollution;

- Suitably sized waste receptacles will be provided in communal areas within the residential development and commercial units by private waste contractors;
- During the operational phase waste shall be collected on a fortnightly basis from all houses and duplexes, and on a weekly basis from all apartment blocks and commercial units; and,
- It will be the responsibility of residents, crèche users, commercial unit occupants and maintenance workers to ensure that all waste generated is disposed of appropriately and responsibly, with penalties and legal sanctions being issued to anyone who is found to litter in accordance with the Litter Pollution Act by Wicklow County Council (2019-2024) and Litter Management Plan for Dún Laoghaire-Rathdown County Council (2021-2023).

## 12.4. Residual Impacts

Taking account of the proposed mitigation measures for Material Assets, specifically built services the residual impacts of the proposed development will be short-term and slight adverse during the construction phase, and long-term and not-significant during the operational phase.

Taking account of the proposed mitigation measures for Material Assets, specifically waste management, the residual impacts of the proposed development will be short-term and imperceptible during the construction phase, and long-term and imperceptible during the operational phase.

## 12.5. Do Nothing Scenario'

The Site is currently the location of a disused golf course and is informally used as public open space and is partially serviced by storm water and foul water infrastructure, ESB services, gas utilities, Eir ducting and street lighting. The site access is currently used by traffic for the near-by school developments and there are no waste collection requirements at the Site, given its current condition. The do-nothing scenario will have a neutral and imperceptible effect on the Site with regards to Material Assets.

## 12.6. Monitoring Requirements

As detailed within the Construction RWMP (Atkins, 2022) prepared as part of this planning application, the Contractor will be responsible for maintaining waste records and documentation for the full duration of the construction phase. The Contractor will track and monitor all waste volumes transported offsite. All waste records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer's Representative and statutory consultees (WCC, DLRCC, EPA) as required.

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

# 13. Cumulative Impacts

## 13.1. Introduction

This Chapter assesses the potential for the proposed development to act in combination with committed developments in the vicinity to result in cumulative impacts on the environment. Each of the technical chapters within this EIAR (i.e. Chapter 3 to 12) have considered the potential for cumulative impacts with committed developments in the vicinity of the Site which are included in this Chapter.

A list of all committed developments, including the Harbour Point Masterplan Development, which have been assessed by each individual specialist as part of this report is included in full in Section 2.9. The results of the cumulative impact assessment for each environmental topic are presented in this Chapter (within Section 13.3.1 to 13.3.10).

In summary, there are no significant adverse cumulative environmental impacts anticipated as a result of the proposed development. In addition, significant positive cumulative impacts are anticipated with respect to population and human health.

## 13.2. Methodology

As previously stated in Section 2.9 of Chapter 2 of this EIAR, potential cumulative impacts, are defined as ‘the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects’ (EPA, 2022) and have been considered for each environmental topic within this EIAR. A summary of all committed development in the immediate environs of the proposed development, which have been approved by Dún Laoghaire-Rathdown County Council, Wicklow County Council or ABP within the last 7 years, have been reviewed as part of the preparation of this EIAR (refer to Chapter 2). The majority of these developments have already been constructed or are of small scale in nature (i.e. extension works, or property retention works) or are considered to be a reasonable distance from the Site and so do not warrant further consideration as part of this assessment. Relevant committed development has been considered under three broad categories; residential development, development within adjacent business parks, and community and utility development. Each environmental topic, where relevant, includes a cumulative impact assessment of the proposed development with other committed developments in the immediate area. Therefore, each of the committed developments, which are not part of the existing environment, has been reviewed in terms of potential cumulative environmental impacts that may arise with the proposed construction and operation of this development.

The search of the Dún Laoghaire-Rathdown County Council and Wicklow County Council planning records identified 18no. committed developments within the vicinity of the Site as well as the Harbour Point Masterplan development; all of which have been assessed as part of this EIAR. Of these 18no. developments, each individual environmental topic further assessed only the developments which had the potential to act cumulatively with the proposed development. Therefore, some environmental topics assessed only the Harbour Point Masterplan Development, while others assessed this development as well as other committed developments within the area.

The proposed project is a standalone project and is therefore not functionally dependent on the Harbour Point Masterplan development or any element of such development. This cumulative impacts assessment has been supplemented by the assessment of elements of the future Harbour Point Masterplan development as far as is practical at this stage. It is noted that the future masterplan development and all elements of such development are currently at preliminary design stage and will be subject to detailed assessment at future application. It is also noted, that the masterplan development will be a standalone development, and will undergo a separate planning application which will include an EIAR (where required).

## 13.3. Cumulative Impacts Assessment

### 13.3.1. Population & Human Health

The proposed development forms part of a non-statutory Masterplan that is submitted with this application. Development on the masterplan lands, separate to the subject project, will be by way of another planning application(s) and associated EIAR if required.

The balance of Masterplan provides for ca. 700 no. residential units, 5,000sq.m commercial floorspace, 20,000sq.m retail floorspace, public park (ca.1.5ha), boardwalk and promenade and a hotel.

The traffic, noise, air quality, cultural heritage, biodiversity and landscape and visual chapters of this EIAR consider the cumulative impacts of the development of the masterplan site in so far as is practicable. Following

the outcomes of these assessments, it is concluded that there is no residual likely significant effects on population and human health.

The additional population that will be generated by development of the outstanding masterplan lands along with the subject development will require sufficient social infrastructure.

It is envisaged that any future development within the masterplan lands shall include sufficient childcare places to meet projected demand. A public park of ca. 2ha and a boardwalk and promenade shall also be provided.

Cumulatively the proposed development and the future planned development of the masterplan lands will provide ca. 1,300no. residential units of which ca. 130no. will be allocated social and affordable residential units. At an average occupancy of 2.5 the future population could be in the order of 3,250 people. The effect on housing delivery within the metropolitan area is significantly positive and permanent in duration. Enabling people to live in close proximity to town centres, high capacity public transport networks and in areas of with significant local amenities and employment opportunities has very positive effects in terms of the carbon footprint of future residents.

The masterplan lands are currently significantly under-utilised. The proposed development and wider masterplan will provide additional pedestrian and cycle routes and will have a significant positive effect in integrating the existing and proposed new community with a permanent duration.

There are recently consented residential and other developments in the general vicinity of the study area including:

- **Silverbow Limited, The former Heiton Buckley site on Castle Street; St. Anthony's Dwyer Park and No. 20 Dwyer Park (ABP Planning Ref: 313442 – Awaiting decision: due 17/08/2022)** – permission to demolish existing commercial buildings and residential buildings as well as sections of the boundary walls, and the construction of a mixed use residential and commercial development comprising 2no. apartment blocks, accommodating 139no. apartments, creche and mixed use unit along with all associated site works.
- **Shankill Property Investment Limited, Seapoint Road, Ravenswell, Bray, Co. Wicklow (Planning Ref: 22188 – Awaiting decision: RFI issued 20/04/2022)** - demolition of 4 light industrial/commercial buildings including their extensions, change of use from light industrial/commercial to residential use, and the construction of a total of 54 no. apartment units across 2 no. blocks comprising: Block A consisting of 4 storeys with setback 5th storey (5 storeys overall), all over undercroft parking and providing 14 no 1 bed units and 17 no. 2 bed units, with a 220sqm communal terrace located above the 4th storey; and Block B consisting of 3 storeys with a setback 4th storey(4 storey overall), all over undercroft parking providing 9 no. 1 bed units and 14 no. 2 bed units. The development will also include: private open spaces in the form of balconies and terraces; 193 sqm public open space and associated play areas and landscape works; roof mounted solar photovoltaic panels; 36 no. undercroft car parking spaces and 1 no. disabled parking space at surface; 85 no. resident bicycle spaces and 28 no. visitor bicycle spaces; upgraded vehicular access from Seapoint Road and all ancillary utilities, plant and bin stores, boundary treatments and associated site development works.
- **Duo Build Ltd, The Old Printworks , St. Laurence's Terrace and Adelaide Villas , Bray, Co. Wicklow (Planning Ref: 191189 – Granted April 2020)** – permission to demolish existing industrial buildings, structures and boundary walls along St. Laurence's Terrace and Adelaide Villas and adjoining property, the construction of a three storey apartment building, comprising of 18 no. residential units (4no. one bedroom apartments, 13 no. 2 bedroom apartments and 1 no. 3 bed apartment), new boundary walls, bin store and 18 no. car parking spaces, 6 bicycle parking spaces, vehicular entrance at St. Laurence's Terrace and associated site works.
- **Deirdre Gurney, The Printworks, Adelaide Villas, Bray, Co. Wicklow (Planning Ref: 181364 – Granted March 2019)** – 1 no. 2 bedroom fully serviced apartment on the third floor level including extension / alterations to the existing common staircase/ apartment building together with all associated site works and carparking space;
- **Deirdre Gurney, The Printworks, Adelaide Villas, Bray, Co. Wicklow (Planning Ref: 171429 – Granted March 2019)** – 3 no. 2 bedroom fully serviced apartments on the second floor levels including extension/alterations to the existing common staircases/apartment buildings together with all associated site works and carparking spaces.
- **Kildare & Wicklow Education & Training Board, Bray Institute of Further Education, Novara Avenue, Bray, Co. Wicklow (Planning Ref: 20255 – Granted June 2020)** – Detached single storey temporary demountable building containing toilet facilities, erection of a single storey temporary demountable building extension containing kitchen store and changing facilities, associated site works and ancillary related works.

- **Woodbrook Campus Limited, The Aske House, Dublin Road, Bray, Co Dublin (Site address also known as The Aske, Old Bray Road, Shankill, Co Dublin) (Planning Ref: D17A/0065 – Granted July 2020)** - Permission for the development of a Specialist Hospital for 56 no. in-patients out-patient care and teaching unit, including works to Protected Structures.
- **Aeval Unlimited Company, SHD Planning, Townland of Corke Little, Woodbrook, Shankill, Co. Dublin (Planning Ref: ABP30584419 – Granted February 2020)** - Permission for a Strategic Housing Development comprising 685no. residential units and 1no. childcare facility in buildings ranging from 2 to 8-storeys. The breakdown of residential accommodation includes detached, semi-detached, terraced and end of terrace houses as well as 3 storey houses, apartments and duplexes.
- **Avonvard Ltd, Nursing Home, Vevay Rd & Boghall Rd, (Former Dell site), Bray, Co. Wicklow (Planning Ref: 181181 – Granted April 2019)** - A four storey nursing home building, accommodating 205 no. bedrooms, ancillary resident and staff facilities, and a plant area at roof level, which includes plant, storage and car and cycle spaces. The proposals include internal courtyards and terrace areas, and adjacent landscaped amenity space. A four-storey office building, including a ground floor café and plant area at roof level. Internal access roads, and parking comprising 107 no. surface car parking spaces, 38 no. basement car parking spaces, 5 no. motorcycle spaces and 141 no. cycle spaces.
- **Cosgrave Property Group, Fassaroe & Monastery, Bray, Co. Wicklow, (Planning Ref: 16999 – Granted June 2017)** - mixed use development comprising of 658no. residential units (comprised of 390 no. apartments and 268no. houses), a neighbourhood centre, comprising of a convenience food store, 6 no. retail / commercial units and a cafe, security kiosk, 3 no. 3 storey office blocks, a two storey creche, a district park, residential public open space, realignment of part of existing road and provision of new road.
- **ES Shan Limited, SHD, south of Abingdon, Shanganagh Road, Shankill, Dublin 18, (Planning Ref: ABP30841820 – Granted February 2021)** - Permission for a Build To Rent Strategic Housing Development comprising 193no. apartments within 4no. blocks ranging in height from 5 to 8 storeys. The apartment mix will comprise: 193no. units as follows: 12no. studios; 110no. 1 bed; 1no. 2 bed (3 persons); 70no. 2 bed (4 persons). All apartments will be provided with associated private balconies/terraces facing north/ south/ east/ west. The development will include a pavilion, open spaces, tree houses, meeting rooms and flexible workspace, BBQ facilities, resident's gym, and residential amenities areas.
- **Hines Cherrywood Dev Fund ICAV, SHD, the townlands of Cherrywood, Dublin 18, (Planning Ref: DZ17A/0862 – Granted May 2018)** - The proposed development relates to a mixed-use town centre development on plots TC1, TC2 and TC4 in accordance with the Cherrywood SDZ Planning Scheme 2014 (As Amended). The proposed development will comprise a total of 15 blocks including: 1,269no. residential units, Retail Gross, High Intensity Employment (HIE) uses, Non Retail uses, Community uses and all associated roads, streets and public spaces, services infrastructure and all associated site and development works. The 15 blocks are located above 2-3 levels of basement/ below podium car parking and service areas which create revised/ new site levels across the site.
- **Wicklow County Council, Station Road, Florence Road, Adelaide Road, Quinsborough Road, Bray, Co. Wicklow, (Planning Ref:181386 – Granted Match 2019)** - The permission relates to the regeneration of the existing forecourt at Bray DART station to create a transport interchange while providing a landmark civic space. The proposed development will include the extent of the Bray Transport Interchange which consists of the general forecourt area in front of Bray Station and incorporates sections of Quinsborough Road, Adelaide Road and Florence Road.
- **Nypro Limited, Corke Abbey, Bray, Co Dublin, (Planning Ref: D19A/0887 – Granted December 2020)** - Permission for the construction of a new infill building (770 sq.m. floor area) linking Building 1 and Building 2 and all associated works. The roof profile of the proposed infill building matches the existing roof profile of Building 1.
- **PEMCO Ltd, 8 & 9 Harbour Industrial Estate, Bray Harbour, Bray, Co. Wicklow (Planning Ref: 16367 – Granted May 2016)** – permission extension of appropriate period for the demolition of existing light industrial/warehousing building (existing floor area c.1096m sq & height c.6.85m) and replacement of same with a new light industrial warehousing building (proposed floor area c.1473m sq. (1042m.sq. at ground floor & 431m.sq at first floor/mezzanine level) & height c.9m) all on site of circa. 1258.sq/0.31Ac.
- **Board of Directors of St. Gerard's School, St. Gerard's School, Thornhill Road, Bray, Co Dublin (Planning Ref: D17A/1104 – Granted March 2018)** - Permission is sought for the development of a new two-storey 672 sqm wing to the existing Junior School, a new two-storey 1948 sqm wing to the existing Senior School and associated site works.
- **Barnaby Investments Ltd, Boghall Road & Southern Cross Road, Bray, Co. Wicklow (Planning Ref: 18822 – Granted September 2018)** - single storey petrol filling station comprising a forecourt convenience (465 sqm gross floor area) shop with off licence, 2 no. café / restaurant concession areas with seating area,

public toilets and ancillary staff and store areas. The associated facilities within the site include 6 no. fuel pumps with canopy over, external seating area, external children's play area, car wash facility, air / water services and associated car parking and bicycle parking.

- **Irish Water, Old Connaught / Woodbrook Water Supply scheme at Ballyman Road, Ballyman, Co. Dublin (Planning Ref: D18A/0606 – Granted April 2019)** –The development will consist of: A 10 year permission to facilitate construction of water supply infrastructure in two phases. The Phase 1 infrastructure to be constructed comprises the following: 10,000m<sup>3</sup> covered low level reservoir approximately 2560sqm with height above ground up to 4.5m approximately without handrailing on the roof (up to 5.7m approximately with handrailing); 2,500m<sup>3</sup> covered high level reservoir approximately 660sqm. Phase 2 of the development will be required when water supply demand reaches the capacity of the Phase 1 infrastructure, requiring additional storage to ensure at least 24 hours at average day demand. The Phase 2 infrastructure to be constructed comprises of the same assets listed above. Both phases are proposed within a site of approximately 6.3 hectares.

In addition, a number of local infrastructural works are scheduled for commencement during September on or adjacent to the site by others. These works are as described below:

- Irish Rail works – set down / compound area for Irish Rail which is undertaking upgrade works to the rail bridge over the underpass from the application site to Harbour Road. The temporary compound which is required for an approx. two week period from 23.09.22 required minor grading of the area and placement of a hardcore base to position a crane and materials on.
- Irish Water Works - these works are part of a wider Local Area Reinforcement Project by Irish Water and local diversion works. These works involve the laying of a new foul sewer and the diversion of an existing sewer in the existing road leading to the underpass (at the southern side of the site). Irish Water has advised that it intends to commence these works in mid – September and the works will last for approx. 6 weeks.

These developments will influence demographic change, population growth, and the intensity of commercial use in this area, cumulatively contributing to increasing population and employment growth in the wider area which represents a positive cumulative impact which accords with the planning policy context for the area. The planning policy context, including the Wicklow and Dún Laoghaire – Rathdown County Development Plans and the Bray District LAP 2018 - 2024 provide for the necessary and appropriate range of facilities and services in the area which will deliver further improvements in service provision in line with the planned population growth.

The existing high capacity public transport services and the planned improvements, including Bus Connects and Luas extension shall provide for this population growth.

The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. This will have a moderate impact on the population (human beings) in the area. This impact is likely to be long term and is considered to be positive, having regard to the zoning objective for the subject lands, and their strategic location in close proximity to public transport, and the high level of demand for new housing in the area.

The overall cumulative impact of the proposed development will therefore be long term and positive with regard to population and human health, as residents will benefit from a high quality, visually attractive living environment, with ample opportunity for active and passive recreation and strong links and pedestrian permeability.

### 13.3.2. Biodiversity

Cumulative impacts with the following plans and projects were considered during the preparation of this report and the accompanying Natura Impact Statement (Atkins, 2022).

Wicklow County Development Plan 2016-2022, Wicklow County Development Plan 2022-2028, Dún Laoghaire Rathdown County Development Plan 2016-2022 and Dún Laoghaire-Rathdown County Development Plan 2022-2028 set out policies and objectives for the development of both districts. The plans aim to promote the sustainable development and improvement of the economic, environmental, cultural and social aspects of their districts. The County Development Plans also require that any developments must be subject to the AA process and that permitted developments comply with the requirements of the Water Framework Directive, the relevant River Basin Management Plans and the Habitats Directive. A Strategic Environmental Assessment (SEA) was prepared for each of the County Development Plans and they both went through the Appropriate Assessment Process. The findings of which were integrated into the objectives of each Plan resulting in plans that afford high levels of protection to the environment and European sites.

Bray Municipal District Local Area Plan 2018-2024 details the framework to guide future sustainable development of the Bray Municipal District, which includes the lands of the proposed development site. The 'Former Bray Golf Course' lands are zoned as Mixed Used development and the LAP outlines for the Site: '*This MU zoned area measures c. 17ha. It is an objective that this land be developed as a mixed commercial, residential, education /*

*community facilities and open space zone.* This LAP was subject to the AA and SEA process and the SEA concludes in terms of environmental impacts: *'The potential impacts on biodiversity are mostly neutral or positive in nature. The LAP generally avoid impacts on natural ecosystems and biodiversity.'*

### Granted Developments

A search of the Wicklow County Council EPlan and Dún Laoghaire-Rathdown Planning Search site was conducted in July 2022 to determine if there are any granted developments within the vicinity of the project which could act in combination with the project to give rise to cumulative impacts. This search identified in excess of 100no. granted developments since 2015, the majority of which are small scale developments such as single residential properties, extension works and retention projects. Larger projects within the vicinity of the proposed development which were reviewed include: -

- Aeval Ltd, SHD Planning, Townland of Cork Little, Woodbrook, Shankill, Co. Dublin (Planning Ref: ABP30584419) – Granted February 2020;
- Shankill Property Investments Ltd, Seapoint Road, Ravenswell, Bray, Co. Wicklow (Planning Ref: 22188) – Status; Further Information;
- Board of Directors of St. Gerard's School, Thornhill Road, Bray, Co Dublin (Planning Ref: D17A/1104) – Granted March 2018;
- Duo Build Ltd, The Old Printworks, St. Laurence's Terrace and Adelaide Villas, Bray, Co. Wicklow (Planning Ref: 191189) – Granted April 2020;
- Woodbrook Campus Ltd., The Aske House, Dublin Road, Bray, Co Dublin (Site address also known as The Aske, Old Bray Road, Shankill, Co Dublin) (Planning Ref: D17A/0065)- Granted on December 2017;
- PEMCO Ltd, 8 & 9 Harbour Industrial Estate, Bray Harbour, Bray, Co. Wicklow (Planning Ref: 16367) – Granted May 2016; and,
- Silverbow Ltd. St. Anthony's Dwyer Park and No. 22 Dwyer Park, Bray (ABP ref; 313442).

### Planned Projects

It is proposed to develop lands directly adjacent to the Site. The overall proposed Harbour Point Masterplan Development comprises phased residential, retail and commercial development at a key development site within Bray town, via. the following 4no. core phases;

- Coastal Quarter Phase 1A – the subject of this particular planning application.
- Coastal Quarter Phase 1B – this phase will consist of the development of a mixed use building (referred to as the Landmark Building) which will include for the provision of commercial and restaurant units as well as a gym facility and possibly a small hotel;
- River Quarter Phase 2A – this development will comprise ca. 500no. residential units, commercial units (5,000 sqm), a transport bridge over the River Dargle with associated transport route, an access route in the south western corner of the site and a public park area as well as all associated site works; and,
- River Quarter Phase 2B – this development will consist of the development of retail units (20,000 sqm) as well as ca. 200no. residential units, landscaping and all associated site works.

### Cumulative Impacts to Designated Sites

Aeval Ltd, SHD Planning, Townland of Cork Little, Woodbrook, Shankill, Co. Dublin (Planning Ref: ABP30584419 – Granted February 2020); Permission for a Strategic Housing Development consisting of a residential-led development comprising 685no. residential units and 1no. childcare facility in buildings ranging from 2 to 8-storeys. This development is located ca. 750m north of the project. An Environmental Impact Assessment and Appropriate Assessment Screening Report were submitted as part of the planning application for this project which determined that significant environmental / ecological impacts are not anticipated.

Silverbow Ltd. St. Anthony's Dwyer Park and No. 22 Dwyer Park, Bray (ABP ref; 313442). – (Decision due 17/08/2022). Demolition of existing buildings, construction of 139no. apartments, creche and associated site works. This development has been subject to the Appropriate Assessment process which concluded; *'on the basis of the best scientific knowledge available, that the possibility of any significant effects on any European Sites, whether arising from the project itself or in combination with other plans and projects, can be excluded.'*

In regard to the development of Phase 2 River Quarter and Phase 1B Landmark building, due to the location, scale and nature of the Phase 1, Phase 1B and Phase 2 developments and lack of viable pathways from any of the proposed development sites to any European site it is considered that the construction and/or operation of either phase of the SHD, either alone or in combination, will not give rise to impacts on any European sites.



Given the elements of the different plans and projects described above, these plans and projects are not anticipated to act in-combination with the proposed development to affect any designated site.

### **Cumulative Impacts to Habitats**

The proposed works will result mostly in the loss of habitat of negligible ecological importance (amenity grassland) and some small areas/habitats of local importance (woodlands/scattered trees). On assessment of the proposed landscape plan and enhancements included in this development (such as native tree planting, pollinator species planting, bird nesting boxes, bat roosting boxes and roof gardens) it is considered there will be a net gain and moderate positive impact for local biodiversity in the long term. Given that no significant adverse impacts are anticipated on habitats of high ecological value as a result of the proposed project, it is considered that the proposed project will not act in combination with other plans and projects to give rise to significant effects on habitats of high ecological value.

### **Cumulative Impacts to Species**

The proposed development will result in slight temporary negative impacts to local bat and bird species and moderate impacts to local mammal species in the form of foraging badger.

The granted Aeval Ltd. SHD in Woodbrook is considered to be the only project within the vicinity which has the potential to act in combination with the proposed project to potentially affect protected species. This granted development in Woodbrook may have a temporary impact on local badgers given the proximity of a badger sett and the detailed badger mitigation measures required to be undertaken for the Woodbrook development project.

The proposed landscape plan and enhancements ensures connectivity of habitats and foraging routes enabling local badgers to continue to have a territorial range over and foraging areas within Rathmichael woodlands and stream, the railway corridor and the large area of undeveloped lands on the east side of the railway line.

Cumulative impacts to local bats and bird species are considered to be imperceptible in the long term. Cumulative impacts of the proposed development with the granted Aeval Ltd. SHD in Woodbrook will lead to an overall reduction in badger foraging area, however the 2no. projects do allow for badger mitigation in the form of habitat creation, habitat connectivity and the creation of wildlife corridors. As such it is considered cumulative impacts of the 2no. projects will have a long term moderate negative impact of badgers at a local geographical level.

### **Cumulative Impacts to Aquatic Ecology**

Impacts on surface water features and aquatic ecology are not anticipated from the proposed development as only small-scale works (i.e. 1no. pipe outfall) are necessitated on the artificial banks of the River Dargle. The next phases of the proposed Harbour Point Masterplan development will be designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works and Sewers (GDSDS). Cumulative impacts on the local surface water features are not anticipated.

## **13.3.3. Landscape and Visual**

Cumulative effects can occur as either interactions between different effects associated with one project or interactions between the effects of a number of developments occurring within the same area.

### **Construction**

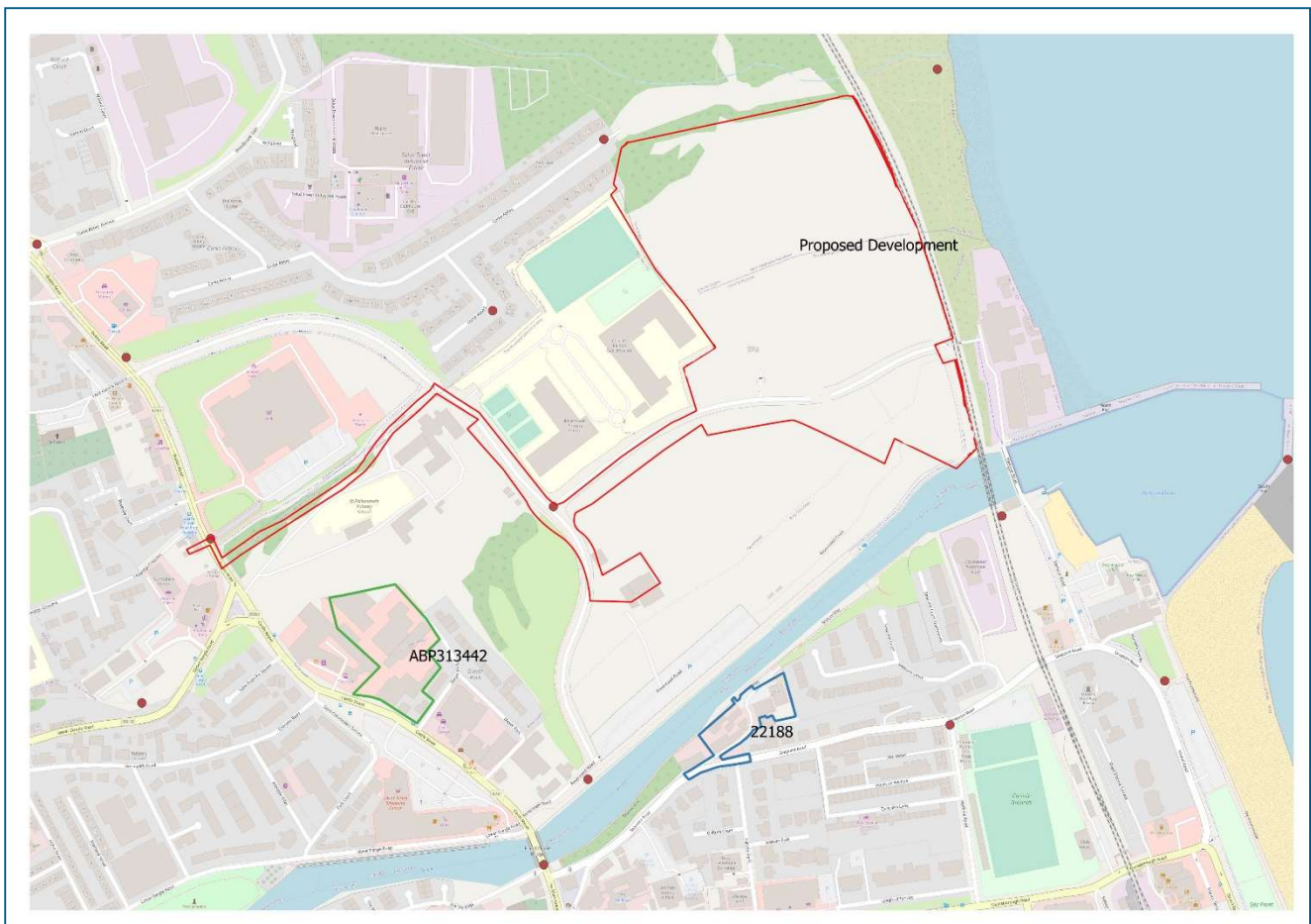
- In terms of intra-project cumulative impacts, occupants of residential properties and the school development in close proximity to the site will experience combined adverse nuisance effects arising from visual intrusion as a result of the enabling demolition and construction activities. Whilst there is the potential for these adverse combined effects to occur throughout the construction phase, these effects would generally be restricted to short periods of time due to the transient nature of the works and the magnitude of the effects will vary depending on the stage of works. Mitigation measures will be set out in the construction methods and procedures documents (see section 5.6), but it is recognised that even with the implementation of the mitigation measures the combined effect on the nearby residential and community occupants during demolition and construction is likely to remain moderate adverse.
- During the peak period of construction traffic, which will be for a limited time within the overall construction programme, the proposed construction activities will result in a temporary (medium term) minor adverse effect in terms of the increase in Heavy Good Vehicles (HGVs) on the surrounding highway network. This effect would be limited to agreed construction working hours with deliveries to be limited to outside of the peak hours.

### **Operation**

- There is the cumulative impact of the proposed pedestrian/cycle paths that integrate with existing and planned green routes that will provide a coherent and comprehensive network of east-west and north-south

linkages providing permeability within Harbour Point and connecting with external destinations including Bray town centre and Bray Daly railway station.

In order to assess the inter-project cumulative effects, a review of planning applications for developments within the area was carried out in order to identify those development schemes which may potentially give rise to significant cumulative effects together with the proposed development. In identifying the cumulative schemes, consideration was given to their distance from the proposed development, size, density and other relevant information, if available. In addition, reference was made Chapter 2 of this EIAR and to the Screening Report for the proposed development dated 7<sup>th</sup> July 2020, which stated the following: ‘A search of the Wicklow County Council EPlan and Dún Laoghaire-Rathdown Planning Search site was conducted ... to determine if there are any granted developments within the vicinity of the project which could act in combination with the project to give rise to cumulative impacts. This search identified in excess of 100 no granted developments since 2015, the majority of which are small scale developments such as single residential properties, extension works and retention projects. One granted development within vicinity of the development is considered further.’ Further details of the development referred to (ABP30584419) are given below along with other potential developments that may give rise to cumulative effects.



**Figure 13-1 - Location of proposed developments ABP313442 and Wicklow County Council 22188**

Source: OpenStreetMap

**Table 13-1 - Cumulative effects**

**Scheme – ABP313442 St Anthony’s Dwyer Park and No 22 Dwyer Park, Bray - ([www.castlestreetshd.ie](http://www.castlestreetshd.ie))**

Located on the former Heiton Buckley site on Castle Street, 1.06 ha, in Town Centre and R-HD: New Residential Site zoning, in vacant builder’s merchants and 2 no vacant residential properties. Proposals comprise 139 apartments consisting of 33 one bedroom apartments, 91 two bedroom apartments and 15 three bedroom apartments together with 2 no commercial units, a creche and a community outreach building. The development comprises 2 primary blocks (A and B) ranging in height from 1 to 7-storeys set around a central, podium level amenity space and a separate single storey pavilion building along Castle Street. Vehicular access from Castle

Street to 59 no undercroft car parking spaces and 3 no creche drop-off spaces with footpath access route to creche. Principal pedestrian and cyclist access from Castle Street with secondary access from Dwyer Park. Landscaped communal open spaces, boundary treatments, bicycle parking, signage, loading bay at Dwyer Park and all associated site works and services.

### Status

Case is due to be decided by 17/08/2022

### In Combination Effect with proposed development

This proposal increases the residential provision within 200m of the proposed development. This land is zoned as TC Town Centre within the Bray Municipal District Local Area Plan Map No 2 Land Use Zoning Map and is considered an acceptable size and in accordance with the zoning objective and *'broadly consistent with many of the specific local objectives with the area'*, although concerns were raised about the height. (WCC, Chief Executives Report to ABP).

This development is glimpsed in Viewpoint 6, Viewpoint 13 and 15 but the site is sufficiently disconnected from the proposed development to avoid continuous built form and there is minimal direct visual connection.

## Scheme – Planning Reference 22188 – Seapoint Residential Development, Seapoint Road, Bray

Situated on the north side of Seapoint Road, adjacent to and east of Milton Terrace and just south of the River Dargle. The development comprises the demolition of existing 4 no light industrial/commercial buildings, general site clearance and the construction of a 54 no apartment units across 2 no blocks ranging between 3 and 5 storeys over undercroft car parking, public, communal and private open spaces and associated landscape works; bicycle and bin stores; upgraded vehicular access from Seapoint Road and all ancillary utilities and site development works. Visually the proposed massing and setbacks of the blocks will present a strong edge to the river.

### Status

April 2021, Wicklow County Council requested further information from Shankill Property Investment Ltd., c/o RPS Group Ltd and expressed concerns that the development would overwhelm/overbear the housing on Seapoint Road and Milton Terrace, and it would result in severe overlooking of existing developments.

### Effects

These proposals constitute change of use, as the existing light industrial/commercial buildings on site, the majority of which are vacant and are in poor repair, will be replaced by residential provision. The planning report considered this appropriate as the site is generally surrounded by residential uses and is located in close proximity to existing town centre services and public transport. This proposed residential use is permitted under the subject site's Town Centre zoning objective.

Seapoint Court Development Group commented that the proposed development does not strike the required balance between the reasonable protection of the community and privacy of the adjoining dwellings nor does it protect the existing character of the existing residences surrounding houses. Height and scale are not an appropriate typology in this context at such proximity to 2 storey existing residences.

### In Combination Effect with proposed development

This proposal increases the residential provision within 200m of the proposed development. This land is zoned as TC Town Centre within the Bray Municipal District Local Area Plan Map No 2 Land Use Zoning Map which provides for a range of uses including residential, and the site is approximately an 8 minute walk to Bray Railway Station.

#### Construction:

There is no demolition involved on the proposed development. Receptors walking along the promenade (Viewpoint 2) will have visibility of the demolition and construction works on the 22188 located 200m away, bordering the south side of the River Dargle. Construction works on the proposed development will be perceptible

on the higher storeys of Block B but less perceptible on the other blocks as it will be screened by the mature trees.

Operation:

This development on Seapoint Road is a discernible addition to the view along the south side of the promenade of the River Dargle, (Viewpoint 2) and receptors walking along the promenade will have visibility of the development (22188) located 200m away, along with the proposed development in the middle distance on the north side of the River. There is, however, little visual connectivity, or cumulative impact as the proposed development is a small component in the wide expansive view.

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### **Scheme – PL27.306876 Harbour Industrial Estate Bray Strategic Housing Development**

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Demolition of existing structures, construction of 126 no apartments and associated site defined as ‘the development of 100 or more houses on land zoned for residential use or for a mixture of residential and other uses’.

In Bray MD LAP 2018-2024 – 1.4Ha, Zoning MU, ‘These lands shall be subject to a masterplan that may or may not include residential development; the land bank is limited and is partly ‘made land’ and until further study is completed, it is not clear if significant residential development would be viable.’

As of the date of this report there is no decision on the ABP planning portal, which states ‘Requires further consideration/amendment’ dated 11/06/2020.

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### **Scheme – Planning Ref 16367 – 8 & 9 Harbour Industrial Estate, Bray Harbour**

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Permission extension of appropriate period for the demolition of existing light industrial/warehousing building (existing floor area c.1096m sq & height c.6.85m) and replacement of same with a new light industrial warehousing building (proposed floor area c.1473m sq. (1042m.sq. at ground floor & 431m.sq at first floor/mezzanine level) & height c.9m) all on site of circa.1258.sq/0.31Ac.

Status	Effects
Granted May 2016	Removal of existing buildings and replacement with new structures with increased floor area and height.

#### **In Combination Effect with proposed development**

The increased height of the approved proposal will provide additional screening to the proposed development. Potential improvement in visual quality of building stock along waterfront.

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### **Scheme – Planning Reference ABP30584419 - Residential-led development, Townland of Corke Little, Woodbrook, Shankill, DLCC**

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21.9 hectares net residential density 78 no units per ha, based on a net developable site area of 8.8ha. 2.96ha of public open space. Proposed development comprising 685 no. residential units and 1 no. childcare facility in buildings ranging from 2 to 8-storeys. This includes provision of Woodbrook Distributor Road/Woodbrook Avenue from the Old Dublin Road to the future Woodbrook DART Station, including the provision of a temporary surface car park (164 no parking spaces) adjacent to the future Woodbrook DART Station in northeast of site on lands currently forming part of Woodbrook Golf Course. New vehicular access provided from the Old Dublin Road including new junction arrangements and associated road re-alignment; provision of emergency access to Shanganagh Cemetery access road; provision of internal road network including pedestrian and cycle links; provision of a series of linear parks and green links, associated and ancillary site development and infrastructural works (including plant), hard and soft landscaping and boundary treatment works.

The site is generally bound by the Old Dublin Road (R119) to the west, Shanganagh Public Park and Shanganagh Cemetery to the north, Woodbrook Golf Course to the east and Corke Lodge and woodlands to the south. The

site represents a distinct 'parcel' of zoned land surrounded by a green belt area with existing access routes (both road and DART) generally running along its western and eastern boundaries.

Status	Effects
Approved February 2020	Loss of trees and vegetation. Loss of recreation and greenfield lands. Increased built form and transport infrastructure.

**In Combination Effect with proposed development**

This development is expected to have a permanent moderate adverse impact on landscape character, arising from the proposed change in land use. However, this change in land-use is consistent with existing and emerging trends and is in keeping with the current zoning policy for the subject lands.

The site is sufficiently disconnected from the proposed development to avoid continuous built form and there will be no direct visual connection.

There is some degree of separation, ca. 0.7km, between the approved scheme and the proposed development, with the Corke Abbey Valley Park Estate, woodland to the north and the south west corner of the golf course, in the intervening land.

The proposed development is considered an extension of the existing Bray town centre, whereas this development has less connection with the existing urban environment. See Figure 5-8.

The Bray MD LAP 2018-2024 outlines its plan to focus new residential development into the existing built envelope (p.24) and is adopting a mixed strategy on the densification of development. The proposed development is classed as Mixed Use, consequently community infrastructure including a café, crèche, public play areas and gardens are provided to match the need of new residents and the built environment along with proposed developments may have less of a cumulative impact.

The proposed Coastal Quarter Strategic Housing Development (SHD) of which the proposed development is part, will result in further development within the remainder of the golf course lands running parallel to the River Dargle. This will include further residential development of a similar height to the proposed development which will result in similar landscape and visual impacts. In addition to the residential development the proposed Coastal Quarter will entail the development of a new community park which will enhance the aspect along the River Dargle when viewed from the Bridge over the River Dargle on Main Street.



Figure 13.2: Site Context: Application Site outlined and shaded in red line (source google maps).

**Figure 13-2 - Site Location of proposed Woodbrook Residential Area - EIA Report**

**13.3.3.1. Sequential Cumulative Assessment**

Sequential visual impacts can be investigated through considering the potential impact of the proposed development in the context of other existing and proposed residential developments, on key routes through the area. The proposed development lies on the northern outskirts of Bray town centre in an area with commercial/retail outlets, education establishments and residential housing. To the east is the railway line beyond which is the coastal area.

The 36 viewpoints indicate that sequential cumulative impacts of residential developments are very limited and only likely to occur in the local area around the proposed development. This would include Dublin Road, the promenade along the north side of the River Dargle, and views along Bray promenade and shoreline. Existing built form on Dublin Road precludes sequential visibility. Viewpoint 2 indicates that while there is combined viewing of the proposed development and 22188 Wicklow development on the River Dargle promenade, sequential impact is not applicable. The proposed development along with ABP313442 and 22188 can be accommodated without adverse sequential impact from Bray seafront.

**13.3.3.2. Summary**

The landscape of Bray town centre and its outskirts can accommodate the proposed development without any adverse cumulative impacts. Whilst the proposed development along with other proposals increase the residential provision within 200m of the Site, these developments accord with the zoning strategy of the Bray MDI LAP 2018-2024. The proposed development is sufficiently disconnected from other proposals to avoid continuous built form, minimal direct visual connection and cumulative impact and sequential cumulative impacts.

### 13.3.4. Air Quality & Climate

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. However, provided the mitigation measures outlined in Section 6.7 and Appendix 6.3 are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted.

Due to the short-term duration of the construction phase and the low potential for significant CO<sub>2</sub> and N<sub>2</sub>O emissions, cumulative impacts to climate are considered direct and imperceptible.

There are no significant cumulative impacts to air quality or climate predicted for the construction 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 cumulative impact is predicted to be long-term, direct and imperceptible with regards to air quality and climate.

### 13.3.5. Noise & Vibration

The traffic data used to assess the operational stage impacts from noise and vibration 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.

In terms of construction noise, it is noted that construction works for other phases of the overall masterplan may be ongoing at an adjacent site simultaneous to this project. In this scenario elevated construction noise emissions due to cumulative noise are likely to occur at receptor locations equidistant to both sites, for instance the school situated at the west of the site. Cumulative impacts will need to be considered and managed during the construction phase. It is recommended that liaison between the proposed development construction site and any adjacent construction sites arising from subsequent phased development of the Harbour Point Masterplan is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors.

In addition, the construction of the proposed Bray sustainable transport bridge has some potential to cause cumulative impacts. However, given the location of the proposed bridge and the location of the Harbour Point development it is expected that the Harbour Point construction phase would be dominant in terms of construction noise impacting on the identified receptors due to its closer proximity. Hence, the sustainable transport bridge is unlikely to have any additional significant impact on the receptors. Nevertheless, it is recommended that liaison between both construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors.

All other known proposed or permitted developments are further than 300m from this proposed development and as a result will not cause a cumulative noise or vibration impact.

### 13.3.6. Traffic

#### 13.3.6.1. Harbour Point Masterplan

A cumulative impact assessment which included the full buildout of the greater Harbour Point Masterplan was undertaken for the same junctions assessed in the Traffic Chapter.

In order to appropriately assess the traffic impact of the full Harbour Point development, the required modelling scenarios to be tested are similar to the Coastal Quarter and based, in the first instance, on the assumption of growth in background traffic and, in the second instance, on the assumed period for the full build out of the full development. Given that the growth in background traffic has been estimated to be a 'no growth' scenario, then the base year assessment of the relevant junctions based on the 2019 and 2020 traffic surveys also acts as the future year 'without development' scenario.

In terms of the build out period for the full development is assumed, for the purposes of the traffic assessment, to begin in the opening year of 2024 and be completed by 2039, the 'Opening Year + 15' scenario. Therefore, the only 'with development scenario' that needs to be tested, mindful of the 'no growth' scenario in background traffic, is the 'Opening Year + 15'

**Table 13-2 - Proposed Development Scenarios**

Scenario	Development
Base Year	No development
Opening +15 Year with development - 2039	Harbour Point Masterplan Full Buildout

The no growth scenario considered as part of the traffic impact relates solely to car trips. In terms of overall trips, it is considered that these will grow in line with population and development expansions but that the capacity to accommodate these will be served by public transport and other sustainable transport options.

The proposed development is thus planned in the context of the committed wider transport strategy being planned and implemented by the NTA for Bray and the surrounding area. This includes the planned BusConnects initiatives, including the bus corridor project from Bray to UCD and the improved Bus Network and the Bray Area Cycle Network Plan.

This assessment has been carried out with development and existing traffic utilising both the Northern Development Road Access Junction (Northern Access Junction) onto the R761 Dublin Road and the upgraded Upper Dargle Road Signalised Junction (Central Access Junction) onto the Dublin Road. The Ravenswell Road Access Junction onto the R761 Castle Street (Southern Access Junction) is assumed to be closed to through traffic and will cater to only a minor volume of development traffic.



**Figure 13-3 – Harbour Point Masterplan Junction Assessment Location**

**Table 13-3 – Cumulative Traffic Impact**

Assessment Year	Junction 2		Junction 3		Junction 4		Junction 5	
	AM	PM	AM	PM	AM	PM	AM	PM
2021 – Existing Traffic	106.9%	82.3%	29%	10%	66.9%	66.8%	82%	52%
2036 – Junction Assessment	115.0%	88.7%	29%	14%	77.9%	72.5%	78%	55%



2036 – Modal Share Sensitivity Assessment	119.7%	89.7%	35%	15%	80.2%	74.0%	80.0%	56%
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Based on the above results, it is anticipated that the impact of the Harbour Point on the existing road network will be modest and well within the carrying capacity of existing infrastructure, inclusive of the existing public transport network.

It should be noted that, the AM peak degree of saturation (DOS) associated with Junction 2, the R761 Dublin Road, Old Connaught Avenue and Corke Abbey Avenue, is operating above its theoretical capacity of 90% indicating that the main capacity issues associated with the junction relate to the background traffic on the network and not the traffic generated by the proposed development.

In the worst case scenario, where mode share for working remotely is reduced to 10%, all arms of the junction operate within capacity except for the Cork Abbey and Dublin Road South approaches in the morning peak hour. The increase in degree of saturation is therefore a marginal impact on the junction due to the proposed development. In reality further transfers to public transport coupled with increased opportunities for workers to travel off peak and indeed work from home will result in this scenario not being realised.

As such, the above reported impact represents a long term slight negative effect. Refer to the “Traffic and Transport Assessment“ for full detail of results.

Similarly to the Coastal Quarter, this sensitivity analysis assessed the scenario of a reduced work from home percentage of 10%, compared to the 20% target set in the National Remote Work Strategy.

In this context of the development, and in the more general context of rapidly changing lifestyles and work patterns it is anticipated that the impact of the proposed development on the existing road network will be modest and within the carrying capacity of existing infrastructure, inclusive of public transport.

For details on the cumulative traffic assessment, including junction capacity assessment results, please refer to Appendix 8.

#### 13.3.6.2. Other Committed Development

The no growth scenario considered as part of the traffic impact relates solely to car trips. In terms of overall trips, it is considered that these will grow in line with population and development expansions associated with planned and committed developments but that the capacity to accommodate these will be served by public transport and other sustainable transport options.

The proposed development is thus planned in the context of the existing and committed wider transport strategy being planned and implemented by the NTA for Bray and the surrounding area. This includes the planned BusConnects initiatives, including the bus corridor project from Bray to UCD and the improved Bus Network and the Bray Area Cycle Network Plan.

#### 13.3.7. Land, Soils & Geology

All relevant developments in the immediate environs of the proposed development, which have been approved but are not yet built or operational, have been reviewed<sup>45</sup> as part of this assessment and key developments are summarised below;

- **Harbour Point Masterplan** – Refer to the detailed description presented in Chapter 2 - Project Description. Based on the scale and phasing of the proposed development within the masterplan lands, and taking account of the overall Masterplan Design, no cumulative impacts on land, soils and geology environment are anticipated.
- **Silverbow Limited, The former Heiton Buckley site on Castle Street; St. Anthony’s Dwyer Park and No. 20 Dwyer Park (ABP Planning Ref: 313442 – Awaiting decision: due 17/08/2022)** – permission to demolish existing commercial buildings and residential buildings as well as sections of the boundary walls, and the construction of a mixed use residential and commercial development comprising 2no. apartment blocks, accommodating 139no. apartments, creche and mixed use unit along with all associated site works. Located ca. 0.4km southeast of the Site. Due to the location, scale, and nature of this project no cumulative impacts associated with the proposed development on land, soils or geology are anticipated.

<sup>45</sup> Review of DLRC online planning files (<https://planning.agileapplications.ie/dunlaoghaire/search-applications/>) and WCC online planning files (<https://www.wicklow.ie/Living/Services/Planning/Planning-Applications/Online-Planning>) carried out in August 2022.

- Shankill Property Investment Limited, Seapoint Road, Ravenswell, Bray, Co. Wicklow (Planning Ref: 22188 – Awaiting decision: RFI issued 20/04/2022)** - demolition of 4 light industrial/commercial buildings including their extensions, change of use from light industrial/commercial to residential use, and the construction of a total of 54 no. apartment units across 2 no. blocks comprising: Block A consisting of 4 storeys with setback 5th storey (5 storeys overall), all over undercroft parking and providing 14 no 1 bed units and 17 no. 2 bed units, with a 220sqm communal terrace located above the 4th storey; and Block B consisting of 3 storeys with a setback 4th storey(4 storey overall), all over undercroft parking providing 9 no. 1 bed units and 14 no. 2 bed units. The development will also include: private open spaces in the form of balconies and terraces; 193 sqm public open space and associated play areas and landscape works; roof mounted solar photovoltaic panels; 36 no. undercroft car parking spaces and 1 no. disabled parking space at surface; 85 no. resident bicycle spaces and 28 no. visitor bicycle spaces; upgraded vehicular access from Seapoint Road and all ancillary utilities, plant and bin stores, boundary treatments and associated site development works. Due to the location (on the southern side of the Dargle River), scale, and nature of this project no cumulative impacts associated with the proposed development on land, soils or geology are anticipated.
- Duo Build Ltd, The Old Printworks , St. Laurence's Terrace and Adelaide Villas , Bray, Co. Wicklow (Planning Ref: 191189) – Granted April 2020)** – permission for the demolition of existing industrial buildings, structures and boundary walls along St. Laurence's Terrace and Adelaide Villas and adjoining property, the construction of a three storey apartment building, comprising of 18no. residential units (4no. one bedroom apartments, 13no. 2-bedroom apartments and 1no. 3 bed apartment), new boundary walls, bin store and 18no. car parking spaces, 6no. bicycle parking spaces, vehicular entrance at St. Laurence's Terrace and associated Site works. Located ca. 0.5km west of the Site. Due to the location, scale, and nature of this project no cumulative impacts associated with the proposed development on land, soils or geology are anticipated.
- Woodbrook Campus Ltd., The Aske House, Dublin Road, Bray, Co Dublin (Site address also known as The Aske, Old Bray Road, Shankill, Co Dublin) (Planning Ref: D17A/0065)- Granted on December 2017.** Permission for a 56no. inpatient specialist hospital. Located ca. 1km north west of the Site. Due to the location, scale, and nature of this project no cumulative impacts associated with the proposed development on land, soils or geology are anticipated.
- Aeval Ltd, SHD Planning, Townland of Cork Little, Woodbrook, Shankill, Co. Dublin (Planning Ref: ABP\_305844-19) – Granted February 2020)** - Permission for a Strategic Housing Development consisting of a residential-led development comprising 685no. residential units and 1no. childcare facility in buildings ranging from 2 to 8-storeys. The breakdown of residential accommodation is as follows: - 207no. own door detached, semi-detached, terraced and end of terrace houses, including: - 134no. 3-bed 2-storey houses (House Type 01, 02, 03, 08, 10) - (House Type 01 are provided with optional ground floor extensions and/or attic conversions, House Type 03 are provided with optional ground floor extensions); 48no. 4-bed 2 - 3-storey houses (House Type 04, 05, 07) - (House Type 05 are provided with optional ground floor extensions); 25no. 5-bed 3-storey houses (House Type 06). 48no. duplexes (33no. own door), in 3 to 4-storey buildings, including: - Old Dublin Road Blocks accommodating 16no. 2-bed duplex and 17no. 3-bed duplex; Park Edge Block accommodating 6no. 2-bed duplex 6no. 3-bed duplex; Block A accommodating 3no. duplexes (3no. 2-beds). 430no. apartment units accommodated in 6no. 3 to 8-storey buildings, including: - Block A accommodating 66no. apartments (14no. 1-beds and 52no. 2-beds) and Tenant Amenity area (ca. 93 sq. m gross floor area); Block B accommodating 151no. apartments (47no. 1-beds and 104no. 2-beds) and Tenant Amenity area (ca. 203sq. m gross floor area); Block C accommodating 151no. apartments (47no. 1-beds and 104no. 2-beds) and Tenant Amenity area (ca. 203sq. m gross floor area); Block D accommodating 36no. apartments (13no. 1-beds, 18no. 2-beds and 5no. 3-bed); Block E accommodating 21no. apartments (7no. 1-beds, 13no. 2-beds and 1no. 3-bed); Old Dublin Road Block accommodating 5no. apartments (2no. 1-beds and 3no. 2beds). Private rear gardens are provided for all houses. Private patios/ terraces and balconies are provided for all duplex and apartment units at ground floor. Located ca. 0.8km north of the Site.
- This project was subject to the completion of an EIAR which was considered by ABP as part of the decision to grant permission and who concluded that *'the environmental impact assessment report, supported by the documentation submitted by the applicant, adequately identified and describes the direct, indirect, secondary and cumulative effects of the proposed development on the environment'*. In relation to Land, Soils and Geology no significant residual adverse impacts were identified associated with this development. Therefore taking account of the location and nature of the development, along with the planning conditions attached to

the permission and given the location of this project, no cumulative impacts associated with the proposed development on land, soils or geology are anticipated.

- **Board of Directors of St. Gerard's School, Thornhill Road, Bray, Co Dublin (Planning Ref: D17A/1104) – Granted March 2018** - Permission for the development of a new two-storey 672sqm wing to the existing Junior School, a new two-storey 1948 sqm wing to the existing Senior School and associated Site works. The proposed development will total 2620sqm in area and consist of the provision of upgraded teaching accommodation to provide larger teaching spaces, specialist rooms and will include the re-alignment of the existing internal road, set-down, car parking facilities, bicycle parking, associated Site works and drainage. Located ca. 2km south west of the Site. Due to the location of this project no cumulative impacts associated with the proposed development on land, soils or geology are anticipated.

There are over 100no. other planning applications in the general south Dún Laoghaire-Rathdown County Council and north Wicklow County Council area. The remainder of committed developments in the vicinity generally comprise the redevelopment or extension of existing properties or small scale property construction projects. Therefore, in summary, no cumulative impacts associated with the proposed development with respect to land, soils or geology are anticipated during the Construction or Operational Phases.

### 13.3.8. Water

All relevant developments in the immediate environs of the proposed development, which have been approved but are not yet built or operational, have been reviewed<sup>46</sup> as part of this assessment and key developments are listed below (refer to Section 13.3.7 above for a summary description of each development);

- Silverbow Limited, The former Heiton Buckley site on Castle Street; St. Anthony's Dwyer Park and No. 20 Dwyer Park (ABP Planning Ref: 313442 – Awaiting decision: due 17/08/2022)
- Shankill Property Investment Limited, Seapoint Road, Ravenswell, Bray, Co. Wicklow (Planning Ref: 22188 – Awaiting decision: RFI issued 20/04/2022)
- Duo Build Ltd, The Old Printworks, St. Laurence's Terrace and Adelaide Villas , Bray, Co. Wicklow (Planning Ref: 191189) – Granted April 2020);
- Woodbrook Campus Ltd., The Aske House, Dublin Road, Bray, Co Dublin (Site address also known as The Aske, Old Bray Road, Shankill, Co Dublin) (Planning Ref: D17A/0065)- Granted on December 2017;
- Aeval Ltd, SHD Planning, Townland of Cork Little, Woodbrook, Shankill, Co. Dublin (Planning Ref: ABP30584419) – Granted February 2020); and,
- Board of Directors of St. Gerard's School, Thornhill Road, Bray, Co Dublin (Planning Ref: D17A/1104) – Granted March 2018.

For each of the above projects, based on the location, and nature of these projects, no cumulative impacts associated with the proposed development with respect to water (i.e. hydrology and hydrogeology) are anticipated. There are over 100 other planning applications in the general south Dún Laoghaire-Rathdown County Council and north Wicklow County Council area. The remainder of committed developments in the vicinity generally comprise the redevelopment or extension of existing properties or small scale property construction projects and due to their nature, we have assessed that these projects, either individually or cumulatively with the proposed development, will have imperceptible impacts on water.

In addition, available information at this preliminary juncture for the Harbour Point Masterplan has been considered with regard to cumulative hydrogeology / hydrology / flood risk impacts. Taking account of the design of the proposed development, in the context of the receiving water environment, no significant cumulative hydrogeological or hydrological impacts are likely to occur. Regarding potential cumulative flood risk impacts, based on a technical review undertaken by IE Consulting Ltd. (2022), presented in Appendix 10.4, the following conclusions have been made (IE Consulting Ltd., 2022):

- *'A Stage 3 Flood Risk Assessment has been carried out for the subject site and the proposed layout ensures that none of the 'highly vulnerable' elements of the Development are located within Flood Zone 'A' or Flood Zone 'B'. The proposed development will not increase the flood risk from the River Dargle to surrounding people or any property outside of the applicant's landholding.*
- *While the Masterplan concept design for the Lands outside of the subject site has considered the relevant information, any future application and development of these Masterplan Lands will be subject to a stand-*

<sup>46</sup> Review of DLRC online planning files (<https://planning.agileapplications.ie/dunlaoghaire/search-applications/> ) and WCC online planning files (<https://www.wicklow.ie/Living/Services/Planning/Planning-Applications/Online-Planning> ) carried out in August 2022

alone Stage 3 Flood Risk Assessment including a Justification Test in consultation with Wicklow County Council.

- *The proposed development of the sustainable transport bridge as outlined in the lodged Wicklow County Council Part 8 Planning Application (Planning Ref. PRR 21/869) has been considered within the Masterplan lands from a flood risk perspective and it is not expected to adversely impact on the Coastal Quarter Development, specifically in terms of altering the risk to 'highly vulnerable' developments.*
- *The remaining portion of the Masterplan lands will be progressed in tandem with the stand alone Stage 3 FRA noted above to ensure that there will be no increased risk of flooding to the Coastal Quarter Development. The design will also ensure that there will be no increased flood risk to any other existing adjacent developments or properties. The building positions and their levels above ground will be such that they will facilitate an overland flow route, and will not impact on the function of the emergency storm outlets on the northern flood defence wall.'*

Therefore, in summary, no cumulative impacts associated with the proposed development with respect to water (i.e. hydrology, hydrogeology and flood risk) are anticipated during the Construction or Operational Phases.

### 13.3.9. Cultural Heritage

The results of archaeological Site investigations undertaken as part of a number of developments within the environs of the proposed development were reviewed to assess the potential for cumulative impacts on the archaeological resource (see Appendix 11.2). The proposed development will result in the removal of the eastern remaining section of linear earthwork (DU026-124---- / WI004-005----) and the western section of this feature is now occupied by the St Philomena's School and Coláiste Ráithín development which was constructed in 2016. A programme of pre-development test trenching and subsequent monitoring of the construction phase of the school development revealed that the linear earthwork was of 19<sup>th</sup> century date and nothing of archaeological significance was identified during either phase of investigation. A review of licensed archaeological investigations undertaken during the Shanganagh-Bray Main Drainage Scheme which extended through the former golf course revealed that these investigations did not impact on any previously unrecorded archaeological sites or features. Two separate phases of pre-development archaeological investigations within areas of the residential area to the north of the proposed development also did not reveal anything of archaeological significance. A programme of archaeological investigations undertaken along the River Dargle as part of a flood defence scheme revealed traces of earlier bridge structures at the location of the existing 19<sup>th</sup> century bridge which is 450m to the southwest of the proposed development. A programme of archaeological test trenching (Licence 20E0618) was carried out as part of an archaeological impact assessment of the proposed development of the former Heiton Buckley site on Castle Street in the area to the west of the proposed development (ABP ref. 313442)<sup>47</sup>. No features of archaeological significance were noted during the excavations.

While the proposed development will act in combination with the recent construction of the adjacent school premises to result in the removal of the linear earthwork ((DU026-124---- / WI004-005----), three separate archaeological investigations undertaken on this feature, including the Site investigations carried out as part of the current assessment, have concluded that it dates to recent centuries and does not form part of the medieval Pale ditch. It is noted that archaeological monitoring, licensed by the National Monuments Service, of the construction of the school buildings on its western extent did not reveal anything of archaeological significance. In addition, the combined results of the geophysical survey and archaeological test trenching undertaken within the remainder of the proposed development as part of the current assessment did not reveal anything of archaeological significance.

In addition, a review of the masterplan for adjacent lands as well as other committed developments in the area, which have been permitted but not yet built, did not reveal any likely impacts on known elements of the cultural heritage resource. Furthermore, a review of the location of the proposed Bray Sustainable Transport Bridge development was carried out and there are no recorded archaeological sites or designated architectural heritage structures located within its boundary. In addition, the Excavations Database does not contain any entries for advance archaeological site investigations or surveys associated with this development.

Given the absence of any identified archaeological remains within the proposed development during the geophysical survey and test trenching investigations carried out as part of this assessment in combination with the above summary of other developments in the area it is, therefore, concluded that the proposed development will not result in any significant cumulative impacts on the known archaeological resource.

<sup>47</sup> <https://castlestreetshd.ie/wp-content/uploads/2022/04/22-Archaeological-Impact-Assessment.pdf>

### 13.3.10. Material Assets

With regard to proposed waste management strategies, no potential cumulative impacts are anticipated during the construction and operational phases of the proposed development.

No cumulative impacts are anticipated during the construction or operational phases of the proposed development associated with built services.

# 14. Interactions

## 14.1. Introduction

This chapter describes interactions between impacts on different environmental factors. All potential interactions have been addressed as required throughout the EIAR. During the scoping, baseline assessment and impact assessment stages of this report, contributors (as set out in Section 1.3 of the EIAR) have liaised with each other where relevant to ensure that all such potential interactions have been robustly addressed. A detailed description of the proposed development is presented in Chapter 2 – Project Description.

## 14.2. Summary of Interactions

The interactions between each of the topics as discussed within Chapter 3 to Chapter 12 of this EIAR have been considered in order to determine the potential direct and indirect environmental impacts, via various pathways, which could arise as a result of the proposed residential development. This section of the EIAR has been prepared in accordance with EPA ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ (2022) which states the following;

*‘Some topics could be placed under more than one heading, for example where hydrogeology is a relevant topic it may be relevant under the heading of ‘Aquatic Ecology’ as well as under ‘Water’ or ‘Ground Water.’ Another example would be amenity which may be relevant under ‘Population and Human Health’ and ‘Landscape’. The requirement for the EIAR to consider ‘Interactions’ addresses this issue by ensuring that effects are cross-referenced between topics, thus reducing the need to duplicate coverage of such topics.’*

A summary matrix showing significant interaction and interdependencies between environmental attributes specifically in relation to the proposed development is presented in Table 14-1. Each environmental topic considered within this EIAR is further discussed below, in Section 14.3 (Population and Human Health) to Section 14.12 (Material Assets).

Table 14-1 – Summary Interactions Matrix

	Chapter 3 - Population & Human Health		Chapter 4 - Biodiversity		Chapter 5 - Landscape and Visual		Chapter 6 - Air Quality & Climate		Chapter 7 - Noise & Vibration		Chapter 8 - Traffic		Chapter 9 - Land, Soils & Geology		Chapter 10 - Water		Chapter 11 - Cultural Heritage		Chapter 12 - Material Assets	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Chapter 3 - Population & Human Health			x	x	x	x	✓	✓	✓	✓	x	x	✓	✓	✓	✓	x	x	x	x
Chapter 4 - Biodiversity					✓	✓	✓	✓	✓	✓	x	x	x	x	✓	✓	x	x	x	x
Chapter 5 - Landscape & Visual	x	x	✓	✓			x	x	x	x	x	x	x	x	x	x	✓	✓	x	x
Chapter 6 - Air Quality & Climate	✓	✓	x	x	x	x			x	x	✓	✓	✓	✓	x	x	x	x	x	x
Chapter 7 - Noise & Vibration	✓	✓	x	x	x	x	x	x			✓	✓	x	x	x	x	x	x	x	x
Chapter 8 - Traffic	x	x	x	x	x	x	✓	✓	✓	✓			✓	✓	x	x	x	x	x	x
Chapter 9 - Land, Soils & Geology	✓	✓	x	x	x	x	✓	✓	x	x	x	x			✓	✓	x	x	x	x
Chapter 10 - Water	✓	✓	✓	✓	x	x	✓	✓	x	x	x	x	✓	✓			x	x	x	x
Chapter 11 - Cultural Heritage	x	x	x	x	✓	✓	x	x	x	x	x	x	x	x	x	x			x	x
Chapter 12 - Material Assets	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	x	x	x	x		

### 14.3. Population & Human Health

Population and human health attributes interact with other environmental attributes as outlined in Chapter 3 of this EIAR and summarised as follows:

- **Air Quality & Climate** - Potential impacts on the receiving air quality and climate environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 3 – Population and Human Health, and those relevant in Chapter 6 – Air Quality & Climate will ensure that this will not occur.
- **Noise & Vibration** - Potential impacts on the receiving noise and vibration environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 3 – Population and Human Health, and those relevant in Chapter 7 – Noise and Vibration will ensure that this will not occur.
- **Land, Soils & Geology** - Potential impacts on the receiving land, soils and geology environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 3 – Population and Human Health, and those relevant in Chapter 9 – Land, Soils and Geology will ensure that this will not occur.
- **Water** - Potential impacts on the receiving water environment could also result in associated human health impacts. However, the mitigation measures described in Chapter 3 – Population and Human Health, and those relevant in Chapter 10 – Water will ensure that this will not occur.

### 14.4. Biodiversity

Biodiversity attributes interact with other environmental attributes as outlined in Chapter 4 of this EIAR and summarised as follows:

- **Landscape & Visual** - The biodiversity of the receiving environment has informed the landscape design associated with the proposed development. The most significant proposed soft landscaping feature is the creation of a 'green buffer zone' which will form an ecological corridor running north-south through the proposed development. This ecological corridor accommodates a variety of landscape typologies including woodland planting, hedgerows, wildflower meadows, standard sized trees and grasslands. Potential impacts on the receiving landscape could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 4 – Biodiversity, and those relevant in Chapter 5 – Landscape and Visual will ensure that this will not occur.
- **Air Quality & Climate** - Potential impacts on the receiving air quality and climate environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 4 – Biodiversity, and those relevant in Chapter 6 – Air Quality & Climate will ensure that this will not occur.
- **Noise & Vibration** - Potential impacts on the receiving noise and vibration environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 4 – Biodiversity, and those relevant in Chapter 7 – Noise and Vibration will ensure that this will not occur.
- **Water** – Potential impacts on the receiving hydrology and hydrogeology environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 4 – Biodiversity, and those relevant in Chapter 10 – Water will ensure that this will not occur.

### 14.5. Landscape and Visual

- **Biodiversity** - The nearest European site is Bray Head SAC, which is ca. 1.7km south along the coastline. There is no direct connectivity from the project site to Bray Head SAC or any other European site via hedgerows or treelines. The landscape design measures have been developed in conjunction with the Project Ecologist. A range of landscape treatments including native woodland mix planting, pollinator friendly plant species, green roof treatments and meadow planting will be combined with the provision of bat boxes, bird boxes and insect boxes to ensure the site maintains a high level of biodiversity value.
- **Cultural Heritage** - The County Boundary between Dublin and Wicklow runs through the site along with a historic linear earth feature known locally as the 'Nun's Walk'. These elements will be recognised through feature paving within an area of public open space to acknowledge and preserve their importance within the proposed development. This will also create an interactive landscape feature within the public realm for use by residents and visitors.



While the proposed development will have impacts on the landscape character and visual amenity of the Site, there will also be long term benefits created by the development including increased public access to Bray town centre and seafront for the wider community, managed habitats to encourage biodiversity improvement, formal recreation facilities and an increased awareness of the landscape and cultural features on the Site.

## 14.6. Air Quality and Climate

- **Population and Human Health** - Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is negative, direct, short-term, localised and imperceptible in the construction stage and long-term, direct, negative and imperceptible with respect to population and human health in the operational phase.
- **Traffic** - Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.
- **Land, Soils and Geology** - 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. No other significant interactions with air quality and climate have been identified.

## 14.7. Noise and Vibration

In compiling this impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and traffic flow projections associated with the development provided by the traffic consultants.

- **Population and Human Health** – There is an interaction with Human Health, which has informed Chapter 3- Population and Human Health of this EIAR.
- **Traffic** - There is an interaction with Traffic, which has informed Chapter 8- Traffic of this EIAR.

## 14.8. Traffic

All interactions with traffic during both Construction and Operational Phases have been identified in the relevant Chapters and where appropriate, mitigation measures have been applied. The following provides a summary of the identified interactions:-

- **Air Quality and Climate** - During the construction stage, on-site construction works will contribute to a temporary decrease in air quality. In the development operational stage traffic generation associated with the development will contribute to increased traffic volumes on the surrounding network which in turn will decrease air quality. Further details in relation to direct impacts are addressed in Chapter 6 – Air Quality and Climate.
- **Noise and Vibration** - During the construction stage, development of the Site will result in a short term increase of construction traffic related to noise and vibration. In the development operational stage, traffic generation associated with the development will contribute to increased noise levels on the surrounding local road network. Further details in relation to direct impacts are addressed in Chapter 7 – Noise and Vibration.

## 14.9. Land, Soils and Geology

- **Potential human health** risks associated with quality impacts to soils arising from the proposed development during the Construction Phase have been identified as follows;
  - Potential risk to receptors (i.e., construction workers) through direct contact, ingestion or inhalation with any soils which may potentially contain hydrocarbon concentrations from Site activities (potential minor leaks and spills of fuels, oils and paint). However, this risk will be addressed by implementation of the mitigation measures outlined fully in Chapter 9 – Land, Soils and Geology.

- Potential risk to receptors during the operational phase (i.e., residents) through ingestion of marginally elevated levels of naturally occurring Barium in the event that residential gardens at two localised hotspots within the proposed footprint of the housing and duplex units are used to grow produce which are subsequently consumed. However, this risk will be fully addressed by the implementation of the mitigation measures outlined fully in Chapter 9 – Land, Soils and Geology.
- Taking account of the baseline environmental setting and the proposed mitigation measures during the Construction Phase, no human health risks associated with exposure to contaminants (via. direct contact, ingestion or inhalation) resulting from the proposed development are anticipated.
- **Air Quality & Climate** - Potential impacts on the receiving Land, Soils and Geology environment could also impact on air quality conditions present. However, the mitigation measures described in Chapter 9 – Land, Soils & Geology, and those relevant in Chapter 6 - Air Quality & Climate will ensure that this will not occur.
- **Water** - Potential impacts on the receiving land, soils and geology environment could also impact on hydrology and hydrogeology conditions present. However, the mitigation measures described in Chapter 10 – Water, and those relevant in Chapter 9 – Land, Soils & Geology will ensure that this will not occur.

## 14.10. Water

Water attributes interact with other environmental attributes are summarised as follows: -

- **Population & Human Health** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on human health. However, the mitigation measures described in Chapter 10 – Water, and those relevant in Chapter 3 – Population and Human Health will ensure that this will not occur.
- **Biodiversity** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on biodiversity conditions present. However, the mitigation measures described in Chapter 10 – Water, and those relevant in Chapter 4 – Biodiversity will ensure that this will not occur.
- **Air Quality & Climate** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on air quality conditions present. However, the mitigation measures described in Chapter 10 – Water, and those relevant in Chapter 6 - Air Quality & Climate will ensure that this will not occur.
- **Land, Soils & Geology** - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on land, soils and geology conditions present. However, the mitigation measures described in Chapter 10 – Water, and those relevant in Chapter 9 – Land, Soils and Geology will ensure that this will not occur.

## 14.11. Cultural Heritage

The authors of the Cultural Heritage chapter compiled preliminary constraint reports on the known archaeological and architectural heritage assets within the study area at the outset of the project to inform the design team of their location, extent and designations in order to ensure that they were factored into the development design at an early stage and to assist in considerations of potential interactions with other environmental attributes. While a number of archaeological investigations have concluded that the linear earthwork within the proposed development boundary dates to recent centuries and does not comprise part of the medieval Pale boundary, the authors also liaised with the design team in relation to incorporating its alignment as part of the design of the proposed development. In addition, the Landscape and Visual chapter of the EIAR was reviewed by the authors as part of the assessment process to ascertain if any interactions with the cultural heritage resource will arise.

- **Landscape & Visual** - The cultural heritage setting of the proposed development has therefore informed the landscape design, as the design has developed. The County Boundary between Dublin and Wicklow runs through the site along with a historic linear earth feature known locally as the ‘Nun’s Walk’. These elements will be recognised through feature paving within an area of public open space (as detailed within Chapter 5 – Landscape and Visual) to acknowledge and preserve their importance within the proposed development. This will also create an interactive landscape feature within the public realm for use by residents and visitors.
- All relevant mitigation / design measures described in Chapter 5 – Landscape and Visual, and Chapter 11 – Cultural Heritage will be fully implemented. It is noted that the landscape and visual specialists conclude that the proposed development is not predicted to result in any significant visual impacts on any cultural heritage receptors within the surrounding townscape.

## 14.12. Material Assets

Material Assets attributes interact with other environmental attributes as outlined in Chapter 12 of this EIAR and summarised as follows: -

- **Land, Soils & Geology** - Waste management strategies during the construction phase of the proposed development have been informed by the receiving land, soils and geology environment. Refer to Chapter 9 – Land, Soils and Geology, and relevant sections including mitigation measures described in Chapter 12 – Material Assets.
- **Traffic** - Traffic is one of the environmental attributes typically assessed under Material Assets. For the purposes of this EIAR a full Traffic Impact Assessment has been undertaken and is presented in Chapter 8 – Traffic, along with all relevant mitigation measures.

# 15. Schedule of Environmental Commitments

All mitigation and monitoring commitments detailed within this EIAR have been included in a separate compendium and are presented in Table 15-1 and 15-2 below. Together these tables form the Schedule of Environmental Commitments which will be implemented as required during the construction and operational phases of the proposed residential development at Dublin Road, Bray, Co. Wicklow. In addition, the following reinstatement commitments must be fully implemented upon completion of the construction phase:

- All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings;
- All construction waste and / or scrapped building materials are to be removed from Site on completion of the construction phase;
- Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase; and,
- Any remaining liquids are to be removed from Site and disposed of at an appropriately licenced waste facility.

All of the mitigation and monitoring commitments detailed below have been incorporated into the Construction Environmental Management Plan (CEMP) submitted as part of this planning application; this is a live document which will be further added to in the Detailed CEMP prepared by the Contractor and will include any future additional mitigation measures as may be required.

**Table 15-1 – Schedule of Environmental Commitments – Mitigation Measures (Construction and Operational Phases)**

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
1	Chapter 3 – Population and Human Health	<p>During the construction phase, all legal duties under the Construction Regulations (Safety, Health and Welfare at Work (Construction) Regulations 2013) will be adhered to. In accordance with these duties, a Project Supervisor Design Process (PSDP) will be appointed by the relevant contractor to co-ordinate the design effort and minimise the construction risks during the design period. In addition, a Project Supervisor - Construction Stage (PSCS) will be appointed to coordinate and supervise all safety aspects of the project.</p> <p>The CEMP (document ref.: 5214419DG0005) for the project which accompanies this planning application, sets out the basic measures to be employed in order to mitigate potential negative effects during construction. This document represents a comprehensive approach to construction phase mitigation which in accordance with good practice, will be refined and added to as the project proceeds on Site. The CEMP includes the following with regard to population and human health.</p> <p><i>“A rodent and pest control plan will be put in place so as to manage and limit any potential disturbance to populations that may utilise the Site. The pest control plan will be in accordance with the Chartered Institute of Environmental Health’s “Pest minimisation Best practice for the construction industry” guidelines or a similar appropriate standard.”</i></p> <p>Procedures shall also be adopted to ensure that noise impacts from construction operations are minimised, to protect local amenity as detailed in Chapter 7 - Noise and Vibration. The proposed mitigation measures to minimise noise impacts during the construction phase are detailed in Section 7.7.1 in Chapter 7 – Noise and Vibration. Prior to the commencement of construction, the CEMP will be refined by the selected contractor prior to work commencing on Site.</p> <p>The main purpose of a CEMP is to provide a mechanism for implementation of the various mitigation measures which are described in this EIAR and contained within the CEMP that accompanies this application under separate cover.</p> <p>All personnel will be required to understand and implement the requirements of the CEMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.</p> <p>There are a number of existing significantly scaled open spaces available for use by walkers and dog walkers in the local environs including, Bray Promenade and Beach, the People’s Park and Corke Abbey Valley Park.</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
1	Chapter 3 – Population and Human Health	<p>Mitigation measures will be implemented during the detailed design, and construction phase, and are detailed in full in the following sections of this EIAR: Chapter 6 – Air Quality and Climate; Chapter 7 – Noise and Vibration; and Chapter 9 – Land, Soils and Geology.</p> <p>Adherence to the construction phase mitigation measures presented in this EIAR will ensure that the construction of the proposed development will have an imperceptible and neutral impact in terms of health and safety.</p>	<p>✓</p> <p>✓</p>	
		<p>Mitigation measures will be implemented during the detailed design and construction phase, as described in full in Chapter 9 – Land, Soils and Geology, to remove the potential identified risk during the operational phase to human health receptors (i.e. new residents) through ingestion of naturally occurring barium in soils in two localised hotspots in the vicinity of the proposed housing / duplex units. Accordingly, no significant human health impacts are likely to arise during the operational phase of the proposed development.</p> <p>There are a number of existing significantly scaled open spaces available for use by walkers and dog walkers in the local environs including, Bray Promenade and Beach, the People’s Park and Corke Abbey Valley Park. In addition the operational site will provide new routes connecting existing public spaces for use by all and proposed public open space.</p>		<p>✓</p> <p>✓</p>
2	Chapter 4 – Biodiversity	<p>The appointed Contractor shall ensure specialist ecological surveying is undertaken where required i.e. mammal surveys, bat surveys, and nesting bird surveys as detailed further below. Construction phase ecological mitigation measures shall be developed and undertaken in coordination with ecological specialists (i.e. bat specialist and suitably qualified ecologist) as required.</p> <p><b>Protection of Sites Designated for Nature Conservation</b></p> <p>Protection of sites designated for conservation, and the features of interests associated with designated sites, is through prevention of potential impacts to the aquatic environment during the construction phase.</p> <p>Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase.</p> <p>Works will follow best practice guidance as outlined in <i>Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters</i> (IFI, 2016).</p> <p><b>Mitigation of habitat loss/damage during construction</b></p> <p>Hedgerows, treelines and boundary woodland areas are to be retained on-site; Site boundaries will be protected from any accidental damage during construction by means of exclusion through use of fencing. All trees, including cypresses, along the northern boundary</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<p>will be retained with only unsafe trees being removed during the construction phase. This is set out in full in the accompanying Tree Survey Report and Landscape Planting Plan. Measures will be taken to ensure that trees and hedges being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around retained trees and hedgerows and fencing will be erected so as to encompass the Root Protection areas (RPAs) of trees and hedgerows. The fencing will be at least 2m high and constructed in accordance with the RPA outlines in the Tree Survey Report (Appendix 5.2). Similarly, a buffer is to be maintained between the Site and neighbouring woodland to prevent negative impacts to woodland during construction.</p> <p>Site clearance of potential bird nesting habitat is detailed below. Site clearance of potential bat roost habitat is detailed below.</p> <p>To compensate for the loss of woodland substantial native tree and hedgerow planting will be planted on the Site and existing hedges which are to be retained will be reinforced with native planting. This will reduce the impact of the proposed development upon habitats in the area and there will be no significant operational impact upon habitats due to the provision of substantial native and pollinator friendly habitats proposed for the Site (refer to Landscape Planting Plan Drawings Nos. 6948_L-2000 &amp; 2002). Landscape enhancement measures are outlined in greater detail below in Section 4.5.1.10.</p> <p><b>Bats</b></p> <p><b>Loss of Foraging and Commuting Habitat</b></p> <p>Loss of commuting and foraging habitat at the Site will be mitigated by the landscaping proposals, which include hedgerow planting, wildflower and woodland planting. Planting schemes should ensure connectivity to linear/ woodland habitats in the wider landscape. It is noted that the landscaping proposals also include retention of hedgerow and boundary treeline and the planting of hedgerow where none is currently in situ. Trees that are being retained in the Site shall be protected during clearance and construction works in line with current guidelines e.g. British Standard 5837:2012 and National Roads Authority 2006a.</p> <p><b>Lighting</b></p> <p>To minimise disturbance to bats and other fauna (badger and otter) that are roosting/resting or active at night, no construction operations will be undertaken during the hours of darkness. If construction lighting is required during the bat activity period (dusk April to September), lighting shall be directed away from all hedgerow/ treeline habitats to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill.</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<p><b>Bat Conservation Plan and Bat Roosts</b></p> <p>A Bat Conservation Plan has been developed for the construction phase of the proposed development. The Bat Conservation Plan is included in Appendix 4.3 of this document. The Contractor will appoint a bat specialist prior to construction activities to supervise and implement the Bat Conservation Plan. The Bat Conservation Plan includes the following commitments; all trees noted to have potential bat roosting habitat will be surveyed by the appointed bat specialist prior to Site clearance works and if roosts are found the bat specialist will develop a method statement for the tree / roost clearance in consultation with the planning authority and NPWS and will seek the necessary derogation licence from local NPWS staff (if required). The Bat Conservation Plan also includes for the surveying and protection of existing bat roosts identified in the 2 no. oaks trees located on the former golf clubs lands outside of the Site boundary (refer to Appendix 4.3 for Bat Conservation Plan).</p> <p>Whilst there will be a loss of a number of trees which have the potential to have bat roosts, the design of the development includes for the installation of 36 no. bat boxes to act as summer and winter roosting sites. The installation of bat boxes will include 14no. winter bat boxes and 14 no. summer bat boxes to be installed within boundary landscaped areas and 8 no. bat tubes installed within walls around the pumping station (Refer to Landscape Masterplan for locations). The installation of bat boxes will be supervised and overseen by the appointed bat specialist. The landscape design also includes for the planting of native tree species which will in time provide for further potential roosting site habitat.</p> <p><b>Birds</b></p> <p>Removal of nesting habitat (hedgerows, scattered trees and woodland utilised by local and common bird species) will be carried out outside the breeding bird season from 1<sup>st</sup> March to 31<sup>st</sup> August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff. The comprehensive landscaping design calls for the planting of native trees and plant species suitable for pollinating insect species. The landscape design also includes for gorse planting which will provide for habitat suitable for stonechat. The landscape design should provide for a net gain in suitable bird nesting and foraging habitat. The landscaping design has followed the principles outlined in the All-Ireland Pollinator Plan 2021-2025.</p>	<p>✓</p> <p>✓</p> <p>✓</p>	



Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<p><b>Terrestrial mammals</b></p> <p>During the construction phase the Contractor will adhere to the ‘<i>Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes</i>’ (NRA 2006). The Site and all areas within 150m around the perimeter of the Site will be resurveyed for badger activity and the presence of setts by a suitably qualified ecologist (appointed by the Contractor) prior to the commencement of construction activities. Should an active sett be noted within the Site or survey area, NPWS will be informed and consulted. The suitable qualified ecologist will develop a method statement in agreement with NPWS for construction activities near an active badger sett. Method statement for works near an active sett will include; there shall be no blasting or pile driving within 150m of an active sett during the breeding season (December to June) or construction works within 50m of such an active sett during the breeding season.</p> <p>The creation of an ecological buffer zone along the northern and eastern boundaries of the Site will allow for connectivity of habitats and the continuance of the site to be used as a badger foraging area. The buffer zone allows for connectivity between Rathmichael woodlands/stream and the railway underpass which leads to scrub habitat and Woodbrook Golf Club lands which are known to be badger foraging territory. During the construction phase no works will be undertaken during night time hours and as such the construction activities will not take place whilst local badgers are foraging. During the construction phase an access track will be in situ along the northern and eastern boundaries which will allow for continued connectivity from Rathmichael woodlands to the railway underpass and to the important foraging habitats to the east of the railway line.</p> <p>During the construction phase the following standard management and protection measures will be implemented during the construction works and monitored by the project ecologist:</p> <ul style="list-style-type: none"> <li>• No excavations are to be left uncovered overnight or without a means of egress (e.g. a ramp or sloped plank) to prevent badgers from falling in or entering in search of food and becoming trapped;</li> <li>• No buildings or storage units are to be left open overnight to prevent badgers from entering in search of food and becoming trapped;</li> <li>• All food waste is to be properly secured and disposed of to avoid attracting badgers to the Site;</li> <li>• No toxic, poisonous or potentially harmful substances or materials are to be left unsecured overnight; and,</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<ul style="list-style-type: none"> <li>Should any new badger setts or mammal burrows be discovered within the Site or immediately adjoining areas the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS as necessary.</li> </ul> <p><b>Prevention of pollution to surface waters</b></p> <p>Mitigation measures as set out in Chapter 9 – Land, Soils and Geology; and Chapter 10 – Water will be implemented during the Construction phase.</p> <p>Works will follow best practice guidance as outlined in <i>Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters</i> (IFI, 2016).</p> <p><b>Invasive species prevention</b></p> <p>No legally restricted invasive species, such as Japanese knotweed, were found onsite. Strict bio-security protocols will be implemented during the construction phase so as to ensure no imported materials potentially contaminated with invasive plant species are brought to Site. All imported soil materials will be visually inspected by the Contractor’s ecologist for signs of invasive plant contamination (such as root fragments, rhizome material) prior to arrival on Site.</p> <p><b>Disturbance of faunal species mitigation</b></p> <p>Removal of nesting habitat (hedgerows, scattered trees and woodland) will be carried out outside the breeding bird season from 1<sup>st</sup> March to 31<sup>st</sup> August inclusive. Where nesting habitat clearance cannot be avoided during this period the NPWS will be consulted in advance and if, in consultation, it is deemed necessary then a suitably qualified ecologist will be appointed by the Contractor to oversee clearance of nesting habitat and ensure the area is free of nesting birds. The appointed ecologist will develop a method statement for the nesting habitat clearance in consultation with local NPWS staff.</p> <p><b>Additional Construction Phase Ecological Mitigation Measures</b></p> <p>With regard to potential impacts on ecological features the following mitigation measures are proposed:</p> <ul style="list-style-type: none"> <li>The Contractor shall engage a suitably experienced and qualified ecologist and/or specialist ecologist to undertake the required ecological surveying prior to construction activities. Pre-construction ecological surveys should include; terrestrial mammal surveys, bat roost surveys and breeding bird surveys (breeding bird surveys will be required if vegetation clearance is to be undertaken within nesting season 1<sup>st</sup> March – 31<sup>st</sup> August);</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<ul style="list-style-type: none"> <li>• The Contractor shall employ good practice environmental and pollution control measures with regard to current best practice guidance such as Environmental Good Practice On-site Guide (CIRIA, 2018);</li> <li>• The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides ‘Control of Water Pollution from Construction Sites’ and ‘Groundwater control - design and practice’ to minimise as far as possible the risk of pollution;</li> <li>• All of the mitigation measures for the protection of soils listed in Chapter 9 will be implemented onsite during the construction phase;</li> <li>• The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle from construction activities. The mitigation measures for prevention of potential surface water impacts as detailed in Water Chapter 10 shall be implemented;</li> <li>• The Contractor shall take all necessary precautions to prevent potential impact upon aquatic species of the River Dargle via the local groundwater body. All groundwater mitigation measures as outlined in Chapter 10 - Water shall be implemented; and,</li> <li>• The Contractor shall take all necessary precautions to prevent potential impact upon habitats and species from dust generated during the construction phase. All air quality mitigation measures as outlined in Chapter 11- Air Quality &amp; Climate shall be implemented.</li> </ul> <p>The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further added to by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.</p> <p><b>Design Measure Mitigation</b></p> <p><b>Landscaping</b></p> <p>A comprehensive landscaping design has been developed for the Site which will include for additional boundary planting and the creation of an ecological buffer zone along the northern and eastern boundaries of the Site. In line with DLRCC and WCC Biodiversity Action Plans and the All Ireland National Pollinator Plan and in order to create a biodiversity net gain at the Site the landscaping plan will include areas of ecological enhancement such as substantial areas of native tree planting and wild flower areas. The planted areas will link with the</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<p>Rathmichael woodland and the River Dargle. The landscape design incorporates additional standard size trees to be planted along the northern boundary to thicken the exiting treeline to help minimise potential light spillage from the development on the Rathmichael stream and woodland area. The landscape design includes for linear shrub planting along the eastern boundary adjacent to the railway line, with the inclusion of gorse, to provide cover for the movement of terrestrial mammals and to provide for habitat suitable for bird species; stonechat. This planting will comprise an appropriate mixture of native trees and shrubs, preferably of local provenance, and including species attractive to pollinators. The planting will incorporate a range of species that will attract feeding invertebrates, including moths, butterflies and bees. Refer to Landscape Planting Plans (Drawings Nos. 6948_L-2000 &amp; 2002) for details of the landscaping design.</p> <p>The landscape planting design provides for a net gain in number of trees within the Site. There are ca. 350 no. standard sized trees detailed within the proposed design including species:- <i>Pinus nigra</i>, <i>Tilia tomentosa</i>, <i>Quercus cerris</i>, <i>Acer pseudoplatanus</i>, <i>Crataegus laevigata</i> and <i>Prunus</i> ‘Accolade’. The soft landscaping design includes for additional hedgerow planting including species:- <i>Ilex crenata</i>, <i>Carpinus betulus</i>, <i>Escallonia</i> ‘Apple Blossom’, <i>Crataegus monogyna</i> and <i>Hedera helix</i> ‘Hibernica’.</p> <p>Extensive areas of woodland screening planting is also included in the design. There are ca. 4,718m<sup>2</sup> of woodland mix screening planting including species:- <i>Quercus robur</i>, <i>Cornus alba</i>, <i>Ilex aquifolium</i>, <i>Betula pendula</i>, <i>Alnus glutinosa</i>, <i>Corylus avellana</i>, <i>Pinus sylvestris</i>, <i>Sorbus aucuparia</i>, <i>Crataegus monogyna</i>, <i>Prunus spinosa</i> and <i>Acer campestre</i>.</p> <p>Extensive areas of wildflower meadows are also included in the soft landscaping design including species: - Black Medick, Common Vetch, Cowslip, Field Scabious, Greater Birdsfoot Trefoil, Hemp Agrimony, Common/Lesser Knapweed, Meadow Buttercup, Oxeye Daisy, Purple Loosetrife, Ragged Robin, Ribwort Plantain, Rough Hawkbit, Selfheal, Wild Carrot, Hedge Woundwort, Yarrow Iris, Yellow Rattle, Browntop Bentgrass, Slender Creeping Red Fescue, Chewings Fescue, Musk mallow, Wild primrose and Corncockle. There are ca. 3,930m<sup>2</sup> of wildflower meadow to be planted within the Site.</p> <p><b>Bats</b></p> <p>The following recommendations for enhancement are adapted from Landscape and Urban Design for Bats and Biodiversity (BCT, 2012). To attract nocturnal flying insects, plant:</p> <ul style="list-style-type: none"> <li>Mixtures of flowering plants, trees and shrubs to encourage a diversity of insects to sustain bats and other wildlife throughout the year. New planting will include pollinator-friendly tree species (Refer to Landscape Planting Plan Drawing No.6948-L-2002);</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<ul style="list-style-type: none"> <li>• Hedgerows will include a range of different species to provide food throughout the year, for example blackthorn for early season nectar; hawthorn and bramble for summer flowers and autumn berries; ivy for autumn nectar and later winter berries;</li> <li>• Flowers that vary in colour, fragrance, shape, amount of nectar and time of flowering;</li> <li>• Pale flowers that are more easily seen in poor light, so attracting insects at dusk;</li> <li>• Single flowers, which tend to produce more nectar than double varieties; and</li> <li>• Flowers with insect-friendly landing platforms and short florets, like those in the daisy families.</li> </ul> <p>Other enhancement measures include:</p> <ul style="list-style-type: none"> <li>• Bat roost boxes on mature trees and integrated bat boxes built into structures are included as biodiversity enhancement measures. 14 no. Rocket Bat boxes are to be installed in the dark zones within northern woodland and treeline habitats. These will be free standing chambers on free standing poles. 14 no. Summer Bat Boxes (1FF Schwegler woodcrete or similar design) will be erected within the treeline on the northern boundary of the Site. In the area of the pumping station (south east of the Site), 8 no. bat tubes to be installed within this structure. These are specifically designed boxes that provided alternative roosting for bats.</li> </ul> <p><b>Birds</b></p> <p>Within the landscape plan wildflowers, shrubs and trees which have the potential to support foraging populations of birds are proposed in the landscape plan and include (non-exhaustive list): -</p> <ul style="list-style-type: none"> <li>• Gorse (<i>Ulex europaeus</i>)</li> <li>• Hawthorn (<i>Crataegus monogyna</i>)</li> <li>• Holly (<i>Ilex aquifolium</i>)</li> <li>• Rowan/Mountain Ash (<i>Sorbus aucuparia</i>)</li> <li>• <i>Agapanthus africanus</i></li> <li>• <i>Alchemilla mollis</i></li> <li>• <i>Achillea millefolium</i></li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<ul style="list-style-type: none"> <li>• <i>Armeria maritima</i></li> <li>• <i>Rudbeckia fulgida</i></li> </ul> <p>The development design also includes for 10 no. bird nesting boxes to be erected in the woodland area to the northwest of the Site as well as along the ecological buffer zone along the northern and eastern boundaries of the Site.</p> <p><b>Invertebrates</b></p> <p>The Landscape design for the proposed development includes for the creation of wildflower areas to incorporate plant species which will attract pollinating insects. The installation of 10 no. insect hotels will also form part of the wildflower landscaping measures and these insect boxes will allow for insects to establish and have refuge in the landscaped areas.</p> <p>The planting schedule contains a mix of native plant species and emphasis has been placed on adhering to the objectives outlined in the All-Ireland Pollinator Plan 2021-2025 with the aim of planting species which are beneficial to pollinator species. Pollinator beneficial plant species include (non-exhaustive list): -</p> <ul style="list-style-type: none"> <li>• <i>Nepeta</i> ‘Walker Low’</li> <li>• <i>Salvia nemorosa</i></li> <li>• <i>Lavandula angustifolia</i></li> <li>• <i>Achillea millefolium</i></li> <li>• <i>Armeria maritima</i></li> <li>• Hemp Agrimony</li> <li>• Black Meddick</li> <li>• Musk mallow</li> <li>• Wild primrose</li> <li>• Hedge woundwort</li> </ul> <p>In addition, the roof level of apartment blocks will be developed into green spaces to have a mix of sedum and wildflowers to further benefit pollinating species. There are 11,980m<sup>2</sup> of green roof spaces within the design. Insect hotels are to be placed within these roof garden areas (Refer to Landscape Planting Plan Drawing No.6948-L-2002).</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<p>The following operational mitigation measures will be implemented either through the design of the proposed development (e.g. lighting, foul drainage, landscaping etc.), or by those in charge of maintenance and management of the development.</p> <p><b>Lighting</b></p> <p>The design of the lighting within and around the proposed development has been designed to be cognisant of minimising effects on local nocturnal species, such as bats and badgers, and has been developed so as to allow for a dark ecological corridor around the northern and eastern boundary of the Site. The lighting scheme for the Site has been developed with the following principals; only illuminating what needs to be illuminated (e.g. light directed to the path only), reducing night time light levels, reducing the height of the luminaires, shielding of luminaires and correct choice of light (e.g. a warm white spectrum &lt;2700 Kelvins).</p> <p>Project specific lighting designs include for:</p> <ul style="list-style-type: none"> <li>• All luminaires shall lack UV/IR elements to reduce impact;</li> <li>• LED luminaires shall be used due to the fact that they are highly directional, have lower intensity, have good colour rendition and dimming capability;</li> <li>• A warm white spectrum &lt;2700 Kelvins shall be used to reduce the blue light component of the LED spectrum;</li> <li>• Luminaires shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;</li> <li>• Column heights shall be carefully considered to minimise light spill. The shortest column height allowed shall be used where possible. Ca. 5.5m or less;</li> <li>• Bollard lighting shall be used for pedestrian and greenway areas, if lighting is deemed necessary;</li> <li>• Only luminaires with an upward light ratio of 0% and with good optical control shall be used;</li> <li>• Luminaires shall be mounted on the horizontal, i.e. no upward tilt;</li> <li>• Any external security lighting shall be set on motion-sensors and short (1min) timers; and,</li> <li>• The intensity of external lighting shall be limited to ensure that skyglow does not occur in order to reduce light pollution.</li> </ul>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
2	Chapter 4 – Biodiversity	<p>The lighting scheme has been designed in accordance with guidance contained in; <i>Institution of Lighting Professionals; Guidance Note 08/18; Bats and artificial lighting in the UK</i> (ILP 2018). The lighting design has been reviewed by a bat specialist and recommendations have been incorporated into the design. A lighting design review letter, as provided by bat specialist Dr Tina Aughney (2022), is provided in Appendix 4.2.</p> <p><b>Surface water drainage</b></p> <p>Sustainable drainage (SuDS) is also a key focus for the entire design of the development. Along with permeable paving for parking areas, the landscape design includes for attenuation areas throughout the development by channelling runoff to planted areas and tree pits. This has the added benefit of reducing surface water runoff rates. In addition, planted swales will be created to aid with storm water flow and these planted areas will contain suitably water tolerant plant species. The roof areas which will include sedum and wildflower green roof treatments will further slowdown the flow of water from areas that traditionally contribute to high runoff flow rates during rainfall events. SuDS features are also outlined as mitigatory measures in the accompanying NIS (Atkins document reference; 5214419DG0006).</p> <p><b>Foul Disposal</b></p> <p>Mains infrastructure for foul sewage disposal has been designed in accordance with Irish Water Code of Practice. All wastewater streams will be collected within the local foul water network and will be transferred to Shanganagh Wastewater Treatment Plant (WWTP). Irish Water has confirmed that the existing foul network has sufficient capacity to meet the wastewater discharge volumes expected from the proposed development, once operational.</p> <p><b>Landscaping Establishment</b></p> <p>The landscape design calls for an ecological buffer zone around the northern and eastern boundaries of the Site. This planted buffer zone will ensure the area provides for bat flight lines and badger foraging connectivity to/from the ecological features to the north (Rathmichael woodlands), east (scrub habitat and golf club lands) and south (River Dargle and remainder of former Bray Golf Club lands). Once operational the implementation of the landscape plan and compensatory habitat such as wild flower meadows and additional planting will be inspected by the Contractor within one year post planting. If measures have failed due to lack of management an alternative solution will be proposed by the Contractor. Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development.</p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>





Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	<p>instance Corke Abbey Valley Park and Corke Abbey and the adjacent school development through to Bray Harbour, Promenade and town centre.</p> <ul style="list-style-type: none"> <li>• The design, finishes of buildings will draw reference and inspiration from the existing traditional town centre with the development flowing from ‘old’ to ‘new’ and matching in scale, format and design.</li> <li>• Public and Communal open space is overlooked and dispersed throughout the scheme with a strong visual and functional relationship with the scheme. The maintenance responsibilities for all public open space areas will be the responsibility of the development Management Company to ensure all mitigation measures contained within these areas are fully maintained over a long-term basis to ensure they provide the maximum required impact.</li> <li>• The development has a series of new public open spaces including the Market Square incorporating space for artisan markets, seasonal community events and commercial ventures providing an element of social, community and residential services and The Orchard area with a multi-sports ball court and dog exercise area. Natural play areas will be developed within the open space areas to provide focal points along walking routes.</li> <li>• To increase biodiversity and wildlife habitats, the roof level of the apartment blocks will be planted with a mix of sedum and wildflowers to increase wildlife habitats. In addition, bird and bat boxes will be fixed to existing trees or on stand alone poles throughout the scheme and insect hotels will be introduced in wild flower meadow areas and on roofs.</li> <li>• The streets will be tree lined providing enclosure and a sense of place. Footpaths will be designed to encourage walking and cycling and seating areas will encourage social interaction and a sense of community.</li> <li>• Sustainable drainage is a key focus of the landscape treatment for the entire development. Along with permeable paving for parking areas, attenuation areas in the form of planting beds, tree pits and green roofs are incorporated into the landscape proposals.</li> <li>• The positioning of the roads and residential blocks have been arrayed so that they form a spatial marker (or morphological memory) of the ‘Nun’s Walk’ former location and alignment. The Nun’s walk will feature and be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A. The space also allows for the potential installation</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	<p>of public artwork to further define the character and mark the history of the space, including delineation of the alignment of the earthwork through paving, interpretive text and imagery. In addition, the design provides for a feature stone wall along this section of the railway boundary to act as ‘stage scenery’ and reinforce the importance of this area of open space. This open space will provide connectivity with the Green Spine and the Coastal Gardens character areas to maintain pedestrian permeability throughout the development. The Landscape Design also provides for high quality surface materiality - refer to the Landscape Design Strategy Report and Cultural Heritage Chapter for further information.</p> <ul style="list-style-type: none"> <li>• Whilst the public can enjoy the variety of spaces in the proposed development including the Market Square adjacent to apartment Block C, the Woodland Park on the northern boundary which provides a link to the existing adjacent Corke Abbey Valley Park; the Coastal Gardens which run along the eastern boundary of the site and link Corke Abbey Valley Park with the existing riverside pathway and cycle path to Bray Harbour; the Riverside Park – a new parkland area adjacent to the River Dargle in the south eastern corner of the Site; the Green Spine through the centre of the site which links with the Woodland Park and Coastal Gardens and provides access to apartment Block A; the Orchard on the existing underground Irish Water foul storage tank site at the site entrance, there are also semi-private communal amenity areas in the podium gardens of the apartment Blocks A, B and C and a communal woodland garden for the residents of apartment Block D. All houses, duplex units and apartments will also avail of private open space to the required standards.</li> <li>• The residential housing will incorporate car parking spaces. Car parking for the apartment blocks will be at the centre of the ground floor level enclosed by the creche, café, retail outlets, and services such as refuse area, cycle parking and other plant services.</li> </ul> <p><b>Landscape Design</b></p> <ul style="list-style-type: none"> <li>• The landscape design comprises of the following outdoor spaces: <ul style="list-style-type: none"> <li>- Home Zone – tree lined streets that provide shade and privacy to pedestrians and residents, SuDs integrated into planting schemes to enhance biodiversity in an urban setting, wide footpaths to encourage walking and cycling, seating area and car parking (not dominating space).</li> <li>- Private and communal gardens;</li> <li>- Play/recreation/leisure;</li> </ul> </li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p>	3

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	<ul style="list-style-type: none"> <li>- General landscape/public amenity/park;</li> <li>- Boundary treatments</li> <li>- Open space for areas for outdoor commercial opportunities; tables and seating and market.</li> <li>• Proposed habitats include: <ul style="list-style-type: none"> <li>- Woodland;</li> <li>- Hedgerows;</li> <li>- Shrub and herbaceous planting;</li> <li>- Amenity grass;</li> <li>- Meadow planting;</li> <li>- Green roofs – incorporating sustainable urban drainage within sedum planting;</li> <li>- Bat, bird and insect boxes/hotels.</li> </ul> </li> <li>• The proposed development will retain existing trees where possible and maintain strong native boundary planting to ensure existing wildlife corridors are retained, particularly along the northern, eastern and western boundaries of the site. It is intended to retain the hedgerow along the northern boundary and include additional planting along the entire boundary.</li> <li>• The landscape planting design provides for a net gain in number of trees within the Site. There are ca. 380no. standard sized trees included within the proposed design.</li> <li>• The north west corner of the site is densely stocked with existing conifers and poplar trees, some of which will need to be removed to facilitate the construction of Block D – refer to Appendix 5.2. It is proposed to create a woodland setting across the northern boundary, which will help to integrate Block D in the landscape and provide screening from the adjacent residential development on Corke Avenue.</li> <li>• Plans include a connection with Corke Abbey Valley Park and access routes through to Corke Abbey Valley Park, all subject to agreement with DLRCC.</li> <li>• The Coastal Gardens border the eastern side of the proposed development and run parallel with the railway line. They incorporate a combined footpath and cycleway, with play provision dispersed along the path leading to the existing railway underpass and a link to Bray town centre, the popular walk from Bray seafront to Greystones and the future East Coast Trail along with a connection to the Dargle Riverside Walkway.</li> </ul>	<p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p>	3

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
3	Chapter 5 – Landscape and Visual	<ul style="list-style-type: none"> <li>• Native planting to the Coastal Gardens bordering the railway boundary will create a green corridor and also soften the façade of Blocks A and B from views from the Harbour Wall and coastal path. Part of this boundary will incorporate a feature stone wall of approximately 22m.</li> <li>• A Green Spine runs through the centre of the northern half of the proposed development and links into the Woodland Setting. This incorporates footpaths, green spaces and pocket parks uniting the residential area, providing new habitat creation and Sustainable Urban Drainage.</li> <li>• Creation of the following habitats are included as biodiversity enhancement measures: <ul style="list-style-type: none"> <li>- 14no. Rocket Bat Boxes – free-standing chamber on free standing poles - will be provided in dark zones within woodland and treeline habitats;</li> <li>- 14no. summer bat boxes will be provided on mature trees;</li> <li>- existing pumping station screened with feature stone walls with 8no. interconnecting bat tubes;</li> <li>- 20no. bird nesting boxes attached to existing trees or on standalone poles including 2no. swift nesting boxes along the northern boundary and 10 no nesting boxes on the eastern boundary;</li> <li>- 10 no. insect hotels to be provided in wild flower meadow areas and on roofs.</li> </ul> </li> <li>• Hard landscaping materials have been chosen based on suitability for a residential scheme and long-term use with variations provided in the form of shape, unit size, mix and colour. All of the specified materials are robust in nature in order to maximize the longevity of the development and minimise maintenance issues.</li> </ul> <p>Root protection in accordance with BS 5837:2012 will be applied to the existing trees to be retained to ensure ongoing viability – refer to 6948-L-0001 – Vegetation Development Impact. All recommendations for tree removal due to poor condition will also be followed to maintain the ongoing safety of the site.</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	3
4	Chapter 6 – Air Quality and Climate	<p><b>Air Quality</b></p> <p>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 6.3. These measures have been</p>	<p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
4	Chapter 6 – Air Quality and Climate	<p>incorporated into the Outline Construction Environmental Management Plan (CEMP) prepared for the site.</p> <p>In summary the measures which will be implemented will include:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions;</li> <li>• Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads;</li> <li>• 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;</li> <li>• Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary;</li> <li>• 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; and,</li> <li>• 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.</li> </ul> <p>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.</p> <p><b>Climate</b></p> <p>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 proposed development. Construction vehicles, generators etc., may give rise to some CO<sub>2</sub> and N<sub>2</sub>O emissions. However, due to short-term nature of these works, the impact on climate will not be significant. Nevertheless, below are some Site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further;</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
4	Chapter 6 – Air Quality and Climate	<ul style="list-style-type: none"> <li>The prevention of on-site or delivery vehicles from leaving engines idling (even over short periods),</li> <li>Minimising waste of materials due to poor timing or over ordering on site (to minimise the embodied carbon footprint of the site).</li> </ul>	<p>✓</p> <p>✓</p>	
		<p>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 in Section 6.5.2 and within the Building Lifecycle Report prepared in support of this planning application. The impact of the proposed development on air quality and climate is predicted to be direct and imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.</p>		<p>✓</p>
5	Chapter 7 – Noise and Vibration	<p>With regard to construction activities, best practice control measures from construction sites within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2 will be used to control noise and vibration impacts. The implementation of all best practice noise and vibration control methods will ensure potential impacts to nearby residential noise sensitive locations are not significant. This will be particularly important during excavation and foundation construction which are likely to be the activities to have the highest potential noise and vibration impact.</p> <p>Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include:</p> <ul style="list-style-type: none"> <li>No plant used on site will be permitted to cause an ongoing public nuisance due to noise;</li> <li>The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;</li> <li>All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;</li> <li>Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;</li> <li>Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
5	Chapter 7 – Noise and Vibration	<ul style="list-style-type: none"> <li>• During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise;</li> <li>• All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures;</li> <li>• Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted; and,</li> <li>• Monitoring levels of noise and vibration during critical periods and at sensitive locations (i.e. at the boundary between the development site and the school and residential buildings).</li> <li>• Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These will include: Selection of plant with low inherent potential for generation of noise and/ or vibration;</li> <li>• Erection of good quality site hoarding to the site perimeters adjacent to sensitive receptors which will act as a noise barrier to general construction activity at ground level;</li> <li>• Erection of barriers as necessary around items such as generators or high duty compressors, and;</li> <li>• Situate any noisy plant as far away from sensitive properties as permitted by site constraints.</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	
		<p><b>Operational Phase – Mechanical and Electrical Plant</b></p> <p>As part of the detailed design of the development, plant items with appropriate noise and vibration ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers, anti-vibration mounts etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.</p> <p><b>Operational Phase – Inward Noise (Acoustic Design Strategy Part 2)</b></p> <p>As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. blockwork or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal.</p>		<p>✓</p> <p>✓</p>



Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase																								
5	Chapter 7 – Noise and Vibration	<p>In this instance the facades highlighted in Figure 7-10 will be provided with upgraded acoustic glazing and ventilation that achieves the minimum sound insulation performance as set out in the tables below. Other facades in the development have no minimum requirement for sound insulation.</p> <p>The sound insulation specifications are expressed in the following units:</p> <p><b>R<sub>w</sub></b>                      Weighted Sound Reduction Index – This is the value of the sound insulation performance of a partition or element measured under <u>laboratory conditions</u>. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature typically presents sound insulation data in terms of the R<sub>w</sub> parameter.</p> <p><b>D<sub>n,e,w</sub></b>                      Weighted element-normalized level difference. This is the value of sound insulation performance of a ventilator measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature for acoustic ventilators typically presents sound insulation data in terms of the D<sub>n,e,w</sub> parameter.</p> <p><b>Sound Insulation Performance Requirements for Upgraded Acoustic Glazing, SRI (dB)</b></p> <p>SRI (dB) per Octave Band Centre Frequency (Hz)</p> <table border="1"> <thead> <tr> <th>125</th> <th>250</th> <th>500</th> <th>1k</th> <th>2k</th> <th>4k</th> </tr> </thead> <tbody> <tr> <td>26</td> <td>27</td> <td>34</td> <td>40</td> <td>38</td> <td>46</td> </tr> </tbody> </table> <p><b>Sound Insulation Performance Requirements for Upgraded Acoustic Ventilation, SRI (dB)</b></p> <p>SRI (dB) per Octave Band Centre Frequency (Hz)</p> <table border="1"> <thead> <tr> <th>125</th> <th>250</th> <th>500</th> <th>1k</th> <th>2k</th> <th>4k</th> </tr> </thead> <tbody> <tr> <td>31</td> <td>33</td> <td>42</td> <td>43</td> <td>39</td> <td>44</td> </tr> </tbody> </table>	125	250	500	1k	2k	4k	26	27	34	40	38	46	125	250	500	1k	2k	4k	31	33	42	43	39	44		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
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5	Chapter 7 – Noise and Vibration	<p>The overall <math>R_w</math> and <math>D_{n,e}</math> outlined above are provided for information purposes only. The overriding requirements are the octave band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same or greater level of sound insulation performance as that set out in Table 7-15 and Table 7-16. It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.</p> <p>The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the detailed design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.</p>		<p>✓</p> <p>✓</p>
6	Chapter 8 – Traffic	<p>The following mitigation measure shall apply during the construction stage:</p> <ul style="list-style-type: none"> <li>All construction activities will be managed and directed by a Construction Traffic Management Plan (CTMP). The details of the CTMP will be agreed with the roads department of the Local Authority in advance of construction activities commencing on-site.</li> </ul> <p>Below is a list of proposed traffic management measures to be adopted during the construction works by the Contractor. Note that this is not an exhaustive list, and it will be the appointed contractor's responsibility to prepare a detailed Construction Traffic Management Plan to be approved with the Planning Authority prior to commencement of construction.</p> <ul style="list-style-type: none"> <li>Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access;</li> <li>Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes;</li> <li>Restriction of HGV movements during drop off and pick up times associated with the adjacent schools;</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	
6	Chapter 8 – Traffic	<ul style="list-style-type: none"> <li>Restriction of HGV movements during drop off and pick up times associated with the adjacent schools;</li> </ul>	<p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
		<ul style="list-style-type: none"> <li>• Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;</li> <li>• Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the Site;</li> <li>• Parking of Site vehicles will be managed, and will not be permitted on public roads, unless proposed within that designated area that is subject to traffic management measures;</li> <li>• A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public road leading away from the construction Site;</li> <li>• On Site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site, to avoid any potential for debris on the local roads;</li> <li>• All vehicles will be suitably serviced and maintained to avoid leaks or spillage of oil, petrol or diesel. Spill kits will be available on Site. All scheduled maintenance carried out off Site will not be carried out on the public highway; and,</li> <li>• Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footway. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users and mobility impaired persons.</li> <li>• HGV movements will be managed so as not to occur during the background traffic peak period, particularly the AM school drop off period.</li> </ul> <p>The above mitigation measures will minimise any significant environmental degradation or safety concerns in the vicinity of the proposed works, due to the presence of construction traffic. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
6	Chapter 8 – Traffic	<p>The proposed development is consistent with all national, regional and local policies. In particular, those policies and objectives aligned with active and sustainable travel and transportation. Specific mitigation measures proposed include the following:</p> <ul style="list-style-type: none"> <li>• Implementation of the public transport bridge (Part 8 – Bray Sustainable Transport Bridge, Planning Reference PRR 21/869) by Wicklow County Council which will link both bus and future Luas services to the Bray DART station. This bridge will improve connectivity to the Site and facilitate the future extension of the Luas to the Bray DART Station;</li> <li>• The Riverside Quarter includes for the provision of LUAS Stop(s) within the development lands which are expected to decrease dependence on private vehicles;</li> <li>• The overall Harbour Point Masterplan for the development lands takes cognisance of the provision of the Luas extension and its interface with the development and locations of LUAS stops;</li> <li>• The proposed BusConnects – Core Bus Corridor Route 13 has been included in the development plans which will further decrease private vehicle usage in the future;</li> <li>• The development takes cognisance of the NTA’s plans to redesign the bus network and provide a more efficient network with high frequency spines, new orbital routes and increased bus services;</li> <li>• The development is adjacent and accessible to Routes B1 and 14 /N5 Greater Dublin Area Cycle Network Plan;</li> <li>• Demand Management is also underpinned by the co-location of residential, education, local retail and leisure and amenity facilities; and,</li> <li>• The propensity for car ownership and car use is managed through measures that include reduced residential parking provision and increased cycle parking provision in line the ‘Design Standards for New Apartments’. The provision of car club parking spaces will facilitate a lower level of car ownership.</li> </ul> <p>The above mitigation measures will provide alternatives to the private car for making trips and are envisaged to promote low car ownership which will in turn ensure that the level of traffic generation and thus the traffic impact on the local road network is mitigated.</p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	<p>Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and will be located so as not to necessitate double handling.</p> <p>Soil beneath the proposed footprint of all housing and duplex units is suitable (from a human health and environmental perspective) for reuse within the proposed residential gardens, with the exception of two localised hotspots (TP205 and TP208). The extent of these hotspot areas (from ground level to 1mbgl) is estimated to be 10m x 10m, centred around each of the following locations:</p> <ul style="list-style-type: none"> <li>• TP205 Hotspot - Grid Reference: 726,442.09 E, 719,477.12 N; and,</li> <li>• TP208 Hotspot - Grid Reference: 726,491.25 E, 719,426.98 N.</li> </ul> <p>This material (ca. 200m<sup>3</sup>) should be removed for reuse elsewhere onsite, or for offsite disposal to a suitably licenced / permitted waste facility. These soils can be replaced if needed by soils from elsewhere beneath the proposed footprint of all housing and duplex units, or from the north-western portion of the Site (e.g., excavated material from Block D), or via. suitable imported uncontaminated soil / topsoil. Any subsoil or topsoil removed from a 10mx10m area surrounding the location of WS01B, WS03A, WS05A, TP203, TP209 and TP211 shall not be reused in the location of the houses or duplexes or any other location where there is a likelihood of home grown produce being grown. The Contractor, in consultation with the Client and the Engineer, will be responsible for ensuring that the two localised soil hotspots (TP205 and TP208) are removed and replaced with suitable material as required.</p> <p>The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations. The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. The Contractor will be responsible for ensuring these measures are fully implemented.</p> <p>The excavation of material will be minimised as much as possible to reduce the impact on soils and geology. Any surplus material, or materials which are deemed not suitable for onsite reuse will be classified in accordance with the EPA Guidance Document '<i>Waste Classification, List of Waste &amp; Determining if Waste is Hazardous or Non-Hazardous</i>' (2015). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed,</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	<p>transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation.</p> <p>The minor amount of waste C&amp;D material observed in a localised area within the southern portion of the Site will also be removed from site and disposed of in accordance with all relevant waste management legislation. A Resource and Waste Management Plan has been generated for the Site (Document Ref: 5214419DG0011(Atkins, 2022)). It will be the Contractors responsibility to ensure that a project specific Detailed Waste Management Plan is fully implemented onsite for the duration of the project.</p> <p>Based on CIRIA 665 guidance, gas protection measures would be required in the vicinity of proposed apartment blocks B and C, based on this part of the Site being CS2. The typical scope of protective measures for residential buildings (not low rise traditional housing), such as apartment blocks B and C (for CS2) is as follows (CIRIA 665, 2007):</p> <ul style="list-style-type: none"> <li>• <b>Option a)</b> - Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200g damp proof membrane (DPM) and underfloor venting; or;</li> <li>• <b>Option b)</b> - Beam and block or pre-cast concrete and 2000g DPM / reinforced gas membrane and underfloor venting; and,</li> <li>• All joints and penetrations sealed.</li> </ul> <p>Gas protection measures (based on the above scope) for apartment blocks B and C will be incorporated into the Detailed Design Stage of the proposed development; and will be installed by experienced and trained specialists and will be subject to inspection and certification, during the Construction Stage. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented and verified.</p> <p>Further mitigation measures for the prevention of soil / bedrock contamination during construction are proposed below. The Contractor will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Chapter 10 - Water are also applicable to the protection of soils and geology during the construction phase:</p> <ul style="list-style-type: none"> <li>• In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1, and the historic well located in the north-eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	<p>guidelines, ‘Good practice for decommissioning redundant boreholes and wells’ (UK Environment Agency, 2012);</p> <ul style="list-style-type: none"> <li>• Earthworks / piling plant and vehicles delivering construction materials to Site will be confined to predetermined haul routes around the Site for each phase of the proposed development;</li> <li>• The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any Site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the Site;</li> <li>• Dust suppression measures (e.g., dampening down) will be implemented as necessary during dry periods;</li> <li>• All excavated materials / piling arisings will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m;</li> <li>• A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site;</li> <li>• The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the proposed development in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001) which are also detailed in Chapter 10 – Water; and,</li> <li>• Specifically, regarding pollution control measures, the following will be adhered to; <ul style="list-style-type: none"> <li>- Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;</li> <li>- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;</li> <li>- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of;</li> </ul> </li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	





Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
7	Chapter 9 – Land, Soils and Geology	<p>given the task of overseeing the pollution prevention measures agreed for the Site to ensure that they are operating safely and effectively.</p> <p>The above mitigation measures will be incorporated (as required) during Detailed Design Stage and will form part of a site-specific Construction Environmental Management Plan (CEMP) which will be implemented during the Construction Stage (including initial Site preparatory / enabling works).</p>	✓	
		<p>Taking account of the relevant mitigation measures to be implemented during the Detailed Design Stage and Construction Stage (specifically the installation of an appropriate ground gas membrane beneath apartment blocks B and C, and the removal of two localised soil hotspots from the proposed footprints of the housing and duplex units and associated gardens), no further mitigation measures will be required during the operational phase.</p>		✓
8	Chapter 10 – Water	<p>With regard to groundwater and surface water quality impacts the following mitigation measures are proposed. The Contractor will be responsible for ensuring these measures are fully implemented:</p> <ul style="list-style-type: none"> <li>• In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix 9.1, and the historic well located in the north eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, ‘<i>Good practice for decommissioning redundant boreholes and wells</i>’ (UK Environment Agency, 2012);</li> <li>• The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guidelines ‘<i>Control of Water Pollution from Construction Sites</i>’ and ‘<i>Groundwater control - design and practice</i>’ and CIRIA 2010 ‘<i>Environmental Good Practice on Site</i>’ to minimise as far as possible the risk of pollution.</li> <li>• All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 will be implemented onsite during the construction phase.</li> <li>• Any groundwater temporarily dewatered during the excavation works for the proposed attenuation tanks and for building foundations in the central and southern portions of the Site, and during piling (as required), will be treated via. the installation of a temporary in-situ water treatment system;</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
8	Chapter 10 – Water	<ul style="list-style-type: none"> <li>- This system should be designed and sized to ensure that all pumped groundwater water is treated via. a temporary attenuation pond, prior to discharge to a selected onsite location (via. a temporary soakaway).</li> <li>- The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location.</li> <li>• The Contractor will be responsible for ensuring that the existing drainage network, specifically along the existing road, and as required elsewhere across the site, will be suitably protected (via. the use of physical barriers and / or the implementation a Site-specific water run-off management plan as required).</li> <li>• In order to prevent any potential surface water / groundwater impacts via. release of hydrocarbon / chemical contaminants the following standard measures will be implemented: <ul style="list-style-type: none"> <li>- Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;</li> <li>- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;</li> </ul> </li> <li>• A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation; <ul style="list-style-type: none"> <li>- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.</li> <li>- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.</li> <li>- All oil stored on Site for construction vehicles will be kept in a locked and bunded area;</li> <li>- Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> </ul>	

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8	Chapter 10 – Water	<ul style="list-style-type: none"> <li>- All Site vehicles used will be refuelled in bunded areas;</li> <li>- All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and,</li> <li>- All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.</li> <li>• In order to prevent any potential surface water / groundwater impacts via. release of cementitious materials the following measures will be implemented where poured concrete is being used on Site; <ul style="list-style-type: none"> <li>- The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed groundwater, the River Dargle or the Irish Sea;</li> <li>- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;</li> <li>- Any spillages will be cleaned up and disposed of correctly;</li> <li>- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;</li> <li>- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;</li> <li>- Mixer washings and excess concrete will not be discharged directly into the drainage network, or any drainage ditches, surface water bodies or exposed groundwater; and,</li> <li>- Surplus concrete will be returned to batch plant after completion of a pour.</li> </ul> </li> <li>• Foul drainage from Site offices and Site compounds will be directed to the existing wastewater network or will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations.</li> </ul> <p>The above mitigation measures will form part of the Construction Environmental Management Plan (CEMP) submitted as part of this planning application, and which will be further developed by the Contractor within the project-specific Detailed CEMP which will be in operation during the construction phase.</p>	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> </ul>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
8	Chapter 10 – Water	<p>With regard to groundwater and surface water quality impacts the following mitigation measures are proposed;</p> <ul style="list-style-type: none"> <li>• All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 will be implemented onsite during Detailed Design Stage and Construction Stage (specifically the installation of an appropriate ground gas membrane beneath apartment blocks B and C, and the removal of two localised soil hotspots from the proposed footprints of the housing and duplex units and associated gardens). The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented.</li> <li>• All plant and equipment utilised onsite during maintenance works should be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented;</li> <li>• Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented;</li> <li>• In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented); and,</li> <li>• A maintenance programme for the proposed surface water drainage system should be implemented. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented. Regular checks and maintenance of the proposed surface water drainage system should be implemented, as recommended in the Stormwater Impact Assessment Report (Atkins, 2022) (document ref.: 5214419DG0012) submitted as part of this planning application.</li> </ul>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
9	Chapter 11 – Cultural Heritage	<p>A suitably qualified archaeologist will be appointed by the Developer to carry out a programme of archaeological monitoring of ground excavation works during the construction phase and this will be carried out under a licence issued by the National Monument Service. Given the</p>		

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
9	Chapter 11 – Cultural Heritage	<p>absence of any unrecorded, sub-surface archaeological features identified during the geophysical survey and subsequent test trenching investigations carried out as part of this assessment the potential for the presence of such features is not considered likely but in the event that any archaeological remains are identified during monitoring they will be recorded and left to remain securely in situ while the National Monuments Service are consulted to determine further appropriate mitigation measures, which may entail preservation in situ by avoidance or preservation in record by archaeological excavation.</p> <p>Whilst the linear earthwork feature is of no great antiquity or cultural heritage significance (as evidenced by a series of archaeological investigations of the feature), The positioning of the roads and residential blocks have been arrayed so that they form a spatial marker (or morphological memory) of the ‘Nun’s Walk’ former location and alignment. The Nun’s walk will feature and be defined by engraved paving slabs laid through the public open space area located between apartment blocks A and B to echo the alignment of this linear earthwork along with the alignment of the boundary between Dublin and Wicklow. This feature will run through the paved area that also provides drop off access to the entrance of Block A. The space also allows for the potential installation of public artwork to further define the character and mark the history of the space, including delineation of the alignment of the earthwork through paving, interpretive text and imagery. In addition, the design provides for a feature stone wall along this section of the railway boundary to act as ‘stage scenery’ and reinforce the importance of this area of open space. This open space will provide connectivity with the Green Spine and the Coastal Gardens character areas to maintain pedestrian permeability throughout the development. Refer to Chapter 5 - Landscape and Visual for further information.</p>	<p>✓</p> <p>✓</p>	
		<p>Given the factors outlined in Section 11.5 of this chapter combined with the implementation of the mitigation measures presented in Section 11.7.1 which will provide for either the avoidance or the proper and adequate recording of any currently unrecorded archaeological features within its boundary, there are no predicted mitigation measures required for the cultural heritage resource during the operational phase.</p>		<p>✓</p>
10	Chapter 12 – Material Assets	<p><b>Built Services</b></p> <p>The following mitigation measures will be implemented during the construction phase;</p> <ul style="list-style-type: none"> <li>A project-specific Detailed Construction Environmental Management Plan (CEMP) will be prepared by the appointed Contractor prior to the commencement of construction works. This document will take account of all of the environmental considerations (including water, dust and noise nuisance control; soil / stockpile management; temporary groundwater management; appropriate Site management of compound area; fuel, oil and</li> </ul>	<p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
10	Chapter 12 – Material Assets	<p>chemical storage and use; and waste management) set out in the Outline CEMP submitted as part of this planning application;</p> <ul style="list-style-type: none"> <li>• Phasing of the diverted foul water network is to be fully coordinated with Irish Water to ensure the reduced likelihood of requirements to use the existing system while the diversion is being made;</li> <li>• The construction compounds will include adequate temporary welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the compound will be removed off site to an appropriately licensed facility for disposal until a connection to the public foul drainage network has been established;</li> <li>• All newly installed utilities/ services will be assessed, tested and certified as required prior to being fully commissioned;</li> <li>• Connections to the existing and proposed foul networks will be coordinated with the relevant utility provider. All works associated with the existing and proposed utilities for the proposed development will be carried out in strict accordance with the guidelines of the relevant stakeholders (specifically ESB, eir and Irish Water), Health and Safety Authority and any additional site specific requirements;</li> <li>• A copy of all available existing, and as built utility plans will be maintained on Site during the construction of the proposed development. The underground power lines and foul water mains within the existing Irish Water services, located onsite will be clearly marked and all Site personnel will be made aware of the known location of any onsite underground or over ground services during the construction phase; and,</li> <li>• Street Lighting will be implemented in accordance with the MEP Engineering Report &amp; Design Statement prepared by Atkins (2022).</li> </ul> <p><b>Waste Management</b></p> <p>The following mitigation measures will be implemented during the construction phase:</p> <ul style="list-style-type: none"> <li>• All waste management procedures implemented onsite during the construction phase will be in accordance with the RWMP (Atkins, 2022) submitted as part of this planning application. In advance of commencement onsite, the Contractor will prepare a project specific Detailed RWMP which will further develop this plan, and will provide specific details in terms of proposed permitted haulage contractors, and permitted / licenced waste disposal / recovery facilities;</li> <li>• Scheduling and planning the delivery of materials will be carried out on an ‘as needed’ basis to limit any surplus materials;</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
10	Chapter 12 – Material Assets	<ul style="list-style-type: none"> <li>Materials will be ordered in sufficient dimensions so as to optimise the use of these materials onsite, and will be carefully handled and stored so as to limit the potential for any damage;</li> <li>Where feasible, sub-contractors will be responsible for the provision of any materials they require onsite in order to help reduce any surplus waste;</li> <li>All loaded trucks entering and exiting the Site will be appropriately secured and covered; and,</li> <li>Dust will be controlled at entry and exits to the Site using wheel washes (as required) and/or road sweepers, and tools and plant will be washed out and cleaned in designated areas. Wheel / road sweeper washings will be contained and treated prior to discharge.</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	
		<p><b>Built Services</b></p> <ul style="list-style-type: none"> <li>On site network surveys, which can only be carried out once the development has been constructed, will be required to determine whether additional microwave radio transmitters are required. Recommendations will be implemented as needed (BBSC, 2022).</li> <li>The proposed development would result in an approximate range of 1,465 to 2,637 additional people within the locality. For this quantum of development, a minimum of 3 to 4 additional mobile phone transmitters <u>may</u> be required to provide 4G or better service within the area. As is the case for developments of this scale, any requirement for additional mobile phone transmitters will be subject to a network load analysis by the mobile phone network providers that can only be carried out once the development has been constructed. Should this network load analysis conclude that additional mobile phone transmitters are required, these could be located in or at Block B2 as it is the tallest building within the proposed development (12 storeys). A standalone planning permission would be required for any mobile phone transmitters (BBSC, 2022).</li> </ul> <p><b>Waste Management</b></p> <p>Waste management during the operational phase of the development will be undertaken by private waste contractors (in accordance with statutory waste management and environmental requirements, regional waste related policy, and best practice waste management guidance), and regulated by Dún Laoghaire-Rathdown and Wicklow County Council. All waste management procedures implemented onsite during the operational phase will be in accordance with the Operational WMP (Atkins, 2022) submitted as part of this</p>		<p>✓</p> <p>✓</p> <p>✓</p>

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Mitigation Measures	Construction Phase	Operational Phase
10	Chapter 12 – Material Assets	<p>planning application. Therefore, no further mitigation measures are required with regard to the transport and disposal or recovery of all waste streams which will be generated during the operational phase.</p> <p>The following mitigation measures will be implemented during the operational phase in order to minimise the potential impact of litter pollution;</p> <ul style="list-style-type: none"> <li>• Suitably sized waste receptacles will be provided in communal areas within the residential development and commercial units by private waste contractors;</li> <li>• During the operational phase waste shall be collected on a fortnightly basis from all houses and duplexes, and on a weekly basis from all apartment blocks and commercial units; and,</li> <li>• It will be the responsibility of residents, crèche users, commercial unit occupants and maintenance workers to ensure that all waste generated is disposed of appropriately and responsibly, with penalties and legal sanctions being issued to anyone who is found to litter in accordance with the Litter Pollution Act by Wicklow County Council (2019-2024) and Litter Management Plan for Dún Laoghaire-Rathdown County Council (2021-2023).</li> </ul>		<p>✓</p> <p>✓</p> <p>✓</p>

**Table 15-2 – Schedule of Environmental Commitments – Monitoring Requirements (Construction and Operational Phases)**

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
11	Chapter 3 – Population and Human Health	<p>Measures to avoid negative impacts on population and human health are largely integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development.</p> <p>Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Monitoring of compliance with Health and Safety requirements will be undertaken by the Project Supervisor for the Construction Process.</p> <p>It is considered that the monitoring measures outlined in regard to the other environmental topics will ensure that the proposed development is unlikely to result in any adverse impacts in relation to population and human health.</p>	<p>✓</p> <p>✓</p> <p>✓</p>	



Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
12	Chapter 4 – Biodiversity	<p>The Bat Conservation Plan (refer to Appendix 4.3) will be implemented by the Contractor under the supervision of the appointed bat specialist. Pre-construction (pre-site clearance) monitoring shall be undertaken by the Contractor appointed Bat Specialist where trees shall be inspected for the presence of roosting bats. Following the tree surveys, specific Site clearance protocols will be established and, if necessary and bat roosts are found within trees to be lost, then NPWS consultation will be undertaken. If required, method statements will be proffered and derogation sought from NPWS for the safe removal of bats from roost sites. The identified bat roosts in 2 no. oak trees off Site (refer to Appendix 4.3 for locations) will be surveyed for the presence of bats. These 2 no. oak trees will be retained and the bat and bat roost protection measures outlined in the Bat Conservation Plan will be adhered to throughout the construction phase.</p> <p>Pre-construction / pre-Site clearance terrestrial mammal surveys will be undertaken by the Contractor appointed suitably qualified ecologist to assess if badgers, or any other protected mammals, have established refugia (e.g. a badger sett) within the Site. If protected mammal refugia is found within the Site, then consultation with NPWS will be undertaken by the project ecologist and associated method statements and mitigation will be proffered and derogation sought from NPWS.</p> <p>Removal of nesting habitat (hedgerows, trees and woodland) must be carried out outside of the bird breeding season (from 1<sup>st</sup> March to 31<sup>st</sup> August). Consultation must be undertaken with the National Parks and Wildlife Service for any nesting habitat clearance works outside of this seasonal window (as detailed in the Construction phase mitigation measures above).</p> <p>Once operational the implementation of the landscape plan and compensatory habitat such as wild flower meadows and additional planting should be inspected by the Contractor within one year post planting. If landscaping measures have failed an alternative solution should be proposed by the Contractor.</p> <p>Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development. Operational phase monitoring in order to ensure the success of the refuge habitats shall be undertaken by those in charge of the maintenance and management of the development.</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	
		<p>Operational phase monitoring (in order to ensure the continued success of the landscape features, specifically in relation to biodiversity enhancement measures) shall be undertaken by those in charge of the maintenance and management of the development. Operational phase monitoring in order to ensure the success of the refuge habitats shall be undertaken by those in charge of the maintenance and management of the development.</p>		<p>✓</p>

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
13	Chapter 5 – Landscape and Visual	Not applicable to this chapter		
14	Chapter 6 – Air Quality and Climate	Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m <sup>2</sup> *day) during the monitoring period between 28 - 32 days.	✓	
		There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.		✓
15	Chapter 7 – Noise and Vibration	There is a requirement to ensure that construction activities operate within the noise and vibration limits set out within this EIAR. There is also a requirement to undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded. Noise monitoring shall be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. It will be a requirement of the appointed contractor to undertake such noise monitoring during the relevant phases of the construction program.	✓	
15		Vibration monitoring shall be conducted in accordance with BS 6472 for human disturbance and BS ISO 4866:2010 for building damage. It will be a requirement of the appointed contractor to undertake such vibration monitoring during the relevant phases of the construction program.	✓	
16	Chapter 8 – Traffic	Not applicable for this Chapter.		
17	Chapter 9 – Land, Soils and Geology	A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site.	✓	
18	Chapter 10 – Water	Regular checks and maintenance of the proposed surface water drainage system should be implemented, as recommended in the Stormwater Impact Assessment Report (Atkins, 2022) (document. ref.: 5214419DG0012) submitted as part of this planning application.		✓
19	Chapter 11 – Cultural Heritage	There are a number of obligatory processes required as part of archaeological licence applications to the National Monuments Service and these will allow for monitoring of the successful implementation of the archaeological mitigation measures presented in Section 11.7.1. The archaeologist appointed to undertake licensed monitoring of the construction		

Item Ref.	Environmental Topic	Schedule of Environmental Commitments – Monitoring Requirements	Construction Phase	Operation Phase
19	Chapter 11 – Cultural Heritage	phase shall submit a method statement detailing the proposed strategy for archaeological supervision of ground works to the National Monuments Service as part of the license application. This will clearly outline the proposed extent of ground works and outline the consultation process to be enacted in the event that any unrecorded archaeological remains are identified, which may include preservation in situ by avoidance or preservation in record by archaeological excavation. The appointed archaeologist will compile a report on all archaeological Site investigations which will clearly present the results in written, drawn and photographic formats. Copies of this report will be submitted to the National Monuments Service and the National Museum of Ireland by the appointed archaeologist.	✓	
20	Chapter 12 – Material Assets	As detailed within the RWMP (Atkins, 2022) prepared as part of this planning application, the Contractor will be responsible for maintaining waste records and documentation for the full duration of the construction phase. The Contractor will track and monitor all waste volumes transported offsite. All waste records will be maintained onsite throughout the project and will be made available for viewing by the Client, Employer’s Representative and statutory consultees (WCC, DLRCC, EPA) as required.	✓	

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