

# KNOCKBROGAN EIAR

VOLUME II EIAR | Part 3

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# CHAPTER FOURTEEN

## CLIMATE

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# CHAPTER 14

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## CHAPTER 14 | CLIMATE

### 14.1 Introduction

This chapter assesses the likely climate impacts associated with the proposed largescale residential development situated in Knockbrogan, Bandon, Co. Cork.

Please refer to Chapter 2 – Project Description for the full development description. In summary, the subject application is for a large-scale Residential Development (LRD) comprising of the construction of residential units and all ancillary development works including footpaths, car and bicycle parking, drainage, bicycle and bin stores, lighting and landscaping/amenity areas at Knockbrogan, Bandon, Co. Cork. Access will be provided via the existing access road onto the Cork Road permitted under reference 21/4059.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

### 14.2 Expertise & Qualifications

This chapter was completed by Tanmay Gojamgunde. Tanmay is an environmental consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. He holds a MSc in Air Pollution Management and Control from the University of Birmingham and has also completed BTech in Environmental Engineering. As part of the MSc, he worked on ‘The Impact of bus-fleet electrification on air quality in Birmingham’ utilising advanced dispersion modelling tools and emission inventory toolkit. Prior to joining AWN, Tanmay contributed to several key environmental projects in India, including Delhi’s first air quality monitoring program (R ASMAN), air quality and traffic planning assessments with IIT Kanpur, and an Environmental Impact Assessment Report (EIAR) for an industrial district in Kanpur. He also specialises in conducting air dispersion modelling assessments of emissions, emission inventories, R programming and extends to broader aspects of environmental engineering.

This chapter was reviewed by Ciara Nolan. Ciara is a principal environmental consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 8 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda,

MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

#### 14.2.1 Aspects Relevant to this Assessment

During the construction phase engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO<sup>2</sup> and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. Impacts to climate are assessed against Ireland’s obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

Engine emissions from vehicles accessing the site have the potential to impact climate during the operational phase of the development through the release of CO<sup>2</sup>. Operational phase impacts will be long-term in duration. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase.

### 14.3 Methodology

#### 14.3.1 Relevant Guidance, Legislation & Policy

##### 14.3.1.1 Guidance

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

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

The assessment has referred to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2024);
- Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as Institute of Environmental Management & Assessment (IEMA)) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the ISEP 2022 GHG Guidance) (ISEP, 2022);
- ISEP Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the ISEP 2020 EIA Guide) (ISEP, 2020a);
- ISEP GHG Management Hierarchy (hereafter referred to as the ISEP 2020 GHG Management Hierarchy) (ISEP, 2020b);
- ISEP Principles Series: Climate Change Mitigation & EIA (ISEP, 2010);

- Carbon Management in Infrastructure and Built Environment - PAS 2080 (BSI, 2023); and
- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a).

14.3.1.2 Legislation

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

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023. The current Climate Action Plan is CAP25, published in March 2025 (Government of Ireland, 2025).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021) is to provide for the approval of plans “for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050”. The 2021 Climate Act also provides for “carbon budgets and a decarbonisation target range for certain sectors of the economy”. The 2021 Climate Act defines the carbon budget as “the total amount of greenhouse gas emissions that are permitted during the budget period”.

In relation to carbon budgets, the 2015 Act (as amended) states “a carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a ‘Budget Period’). The carbon budget is to be produced for 3 sequential budget periods (Table 14.1). The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions

that are permitted in different sectors of the economy during a budget period, and different ceilings may apply to different sectors. The sectoral emission ceilings for 2030 were published in the Climate Action Plan 2024 (CAP24) (Government of Ireland, 2023a) (Table 14.2).

Table 14 1 5-Year Carbon Budgets

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO <sub>2</sub> e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO <sub>2</sub> e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO <sub>2</sub> e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 14 2 Sectoral Emission Ceilings 2030

Sector	Baseline (MtCO <sub>2</sub> e)	Carbon Budgets (MtCO <sub>2</sub> e)		2030 Emissions (MtCO <sub>2</sub> e)	Indicative Emissions % Reduction in Final Year of 2025 – 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment – Residential	7	29	23	4	40
Built Environment – Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP24 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
<b>Total</b>	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets & 2030 Emission Reduction Targets	-	295	200	-	51

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### 14.3.1.3 Policy

#### 14.3.1.3.1 Greenhouse Gas Assessment Policy

In 2024, the Government published its Long-Term Strategy on Greenhouse Gas Emissions Reductions (Government of Ireland, 2024). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the CAP.

In December 2023, CAP24 was published, establishing key actions to deliver a 51% reduction in GHG emissions by 2030 (compared to 2018 levels) and achieve climate neutrality by 2050 (Government of Ireland, 2023a). The updated and current CAP25, published in April 2025, builds on the progress of the previous four iterations of the CAP, with CAP23 first publishing carbon budgets and sectoral emission ceilings, and reaffirms Ireland's climate ambition, with a focus on delivery, implementation and measurable outcomes, particularly ahead of the second carbon budget period (2026–2030). 2025 is the last year in the first 5-year carbon budget period. During the initial 5-year budget period the average annual reduction required was 4.8%, this increases to 8.3% in the second budget period (2026-2030). CAP25 retains the high-impact sectors where the biggest savings can be achieved, while emphasising public sector leadership and green procurement. These sectors include renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and land-use change.

CAP25 also includes targeted actions to decarbonise industrial heat and support the transition to carbon-neutral manufacturing processes. Public sector leadership is strengthened through a new Buying Greener: Green Public Procurement Strategy and Action Plan (2024–2027), the development of mandatory Climate Action Roadmaps, and enhanced emissions monitoring and reporting across government operations. To support innovation and ensure future economic resilience, IDA Ireland continues to attract and support businesses investing in climate technologies and low-carbon solutions.

CAP25 highlights a significant 17% reduction in electricity emissions in early 2024, with wind power supplying nearly 40% of Ireland's total electricity demand and over 100,000 rooftop microgenerators connected to the grid. Investments are ongoing in grid reinforcement, offshore wind development, and interconnectors with France and the UK to enhance renewable generation capacity. EirGrid, Enterprise Ireland and IDA Ireland have recently signed an MoU to collectively support offshore wind development in Ireland.

CAP25 also reinforces targets first outlined in CAP24 to reduce the embodied carbon of construction materials, with a 10% reduction by 2025 and 30% reduction by 2030 for materials produced and used in Ireland. Cement and high embodied carbon construction materials can be reduced through product substitution, reduced clinker content in cement and uptake of low-carbon construction methods, including those outlined in the Construction Industry Federation 2021 report Modern Methods of Construction (Construction Industry Federation, 2021). There also remains scope for the construction industry to use more timber in construction. In 2022, 24% of new construction in Ireland was built using timber frames to satisfy the demand for housing. Public bodies are now required under the Public Sector Mandate to use best practice project design to reduce embodied carbon; procure concretes with clinker replacements (lower carbon); and require that large construction projects produce a whole life cycle GHG emissions assessment.

Furthermore, CAP25 advances sector-specific measures in green procurement, electrification of transport and heat, and just transition (with the introduction of a Just Transition Commission) to support vulnerable communities. Transport emissions increased by 0.3%. Electric vehicles and the use of biofuels are stated as the best means of transport emission reductions in the medium term.

The Cork County Council Climate Action Plan 2024–2029 (CCC, 2024) sets out a comprehensive framework for climate mitigation and adaptation across Cork County, aiming to reduce greenhouse gas (GHG) emissions by 51% by 2030 (from a 2018 baseline) and to achieve climate neutrality by 2050. The plan aligns with national and EU climate objectives and is structured around a place-based approach, with a strong emphasis on community engagement and a just transition.

This Climate Action Plan sets a pathway for Cork County Council to actively translate national climate policy to local circumstances with the prioritisation and acceleration of evidence-based measures including to:

- Reduce its direct carbon emissions by 51% by 2030;
- Assist in the delivery of the climate neutrality objective at local and community levels; and
- Identify and support the development of a Decarbonising Zone (DZ) within the local authority area

The plan is built around five key thematic areas:

- Governance and Leadership;
- Built Environment and Infrastructure;
- Transport;
- Natural Environment, Biodiversity and Land Use; and
- Circular Economy and Resource Management.

#### 14.3.1.3.2 Climate Change Vulnerability Policy

The second National Adaptation Framework (NAF) (DECC, 2024) was published in June 2024 in line the five-year requirement of the 2015 Climate and Low Carbon Development Act. The plan provides a whole of government and society approach to climate adaptation in Ireland to reduce Ireland's vulnerability to climate change risks including extreme weather events, flooding, drought, loss of biodiversity, sea level rise and increased temperatures. Similar to the *“Just Transition”* when considering carbon emissions, the NAF aims for *“Just Resilience”* stating that *“a climate resilient Ireland will have a reduced reliance on fossil fuel, it will have widely accessible electrified public transport and will have transitioned towards sustainable agricultural practices such as agroforestry and organic farming”*.

In relation to the built environment the NAF states, in Chapter 3, *“deepening of adaptation considerations in the planning and building standards processes is considered the most appropriate way of increasing the resilience of the built environment”*. Within the NAF it mentions that there is a risk of damage to buildings and structures from severe weather events such as high winds and intense rainfall. New development should accommodate predicted future climate change impacts without requiring major redesign or redevelopment in the future which may be costly and inefficient. This will require facilitating innovative building design, new materials and standards (to accommodate hotter summers while withstanding changes in precipitation patterns and more intense storms for example) according to the NAF (DECC, 2024).

The National Climate Change Risk Assessment (NCCRA) was published in May 2024 (EPA, 2024b). The NCCRA was required to be developed under Action 457 from the 2021 CAP (Government of Ireland 2021). Action 457 seeks to *“further develop Ireland's national climate change risk assessment capacity to identify the priority physical risks of climate change to Ireland”*. The NCCRA uses definitions of the risk determinants from the Intergovernmental Panel on Climate Change (IPCC) Risk Framework (IPCC 2023):

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- **Hazard** - the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources
- **Exposure** - the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected
- **Vulnerability** - the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity
- **Risk** - the potential for adverse consequences for human or ecological systems.

When considering risk, the NCCRA assesses exposure and vulnerability for two future climate change scenarios or Representative Concentration Pathways (RCPs):

- RCP4.5 was selected as it represents a scenario aligned with the global temperature trajectory
- RCP8.5 was selected as it represents a high-emissions scenario and achieves the highest level of modelled temperature increases by the end of the century. Consequently, this scenario will result in the highest level of physical risk for Ireland, and the greatest requirement for adaptation.

These scenarios align with a conservative approach to assess risks to Ireland and assumes global emission reduction targets are not met. This aligns with the principle of precaution as stated in the NAF (DECC 2024). In addition to the future climate scenarios, the NCCRA assesses the risk from the future climate during the following timeframes:

- Present (~2030)
- Medium term (~2050)
- Long term (~2100).

The CCC Climate Action Plan 2024 - 2029 highlights the risks that climate change poses, with risks mainly associated with extreme weather events. The future risks of climate change hazards as identified and reproduced from the CCC Climate Action Plan 2024 - 2029 are shown in Figure 14-1.

The risk matrix below shows the predicted future (2050) change in risk with the hollow marker showing the current risk and the solid marker the future risk. The dotted line shows the change between the current and future risk. It is important to note that for the purposes of this CCRA, hazards have been assessed on an individual basis, but hazards can and often do occur in combination.

The risk of existing hazards such as river and coastal flooding and coastal erosion is likely to increase in the future because of changes in both hazard frequency as a result of climate change and impact due to changes in exposure and vulnerability. Heatwaves, droughts, and pluvial flooding, although already experienced in Cork County, are expected to occur more frequently due to climate change and with a greater impact on Cork County in the future. Although the frequency and impact of severe windstorms is thought to be unchanged in the future, these events will remain a risk for Cork County.

The future impact and frequency of groundwater flooding is also unchanged, meaning the future risk remains low. The impact of heavy snowfall and cold spells on Cork County remains constant, however, due to the potential decrease in hazard frequency, the overall risk of these hazards is likely to reduce in the future, resulting in less risk.

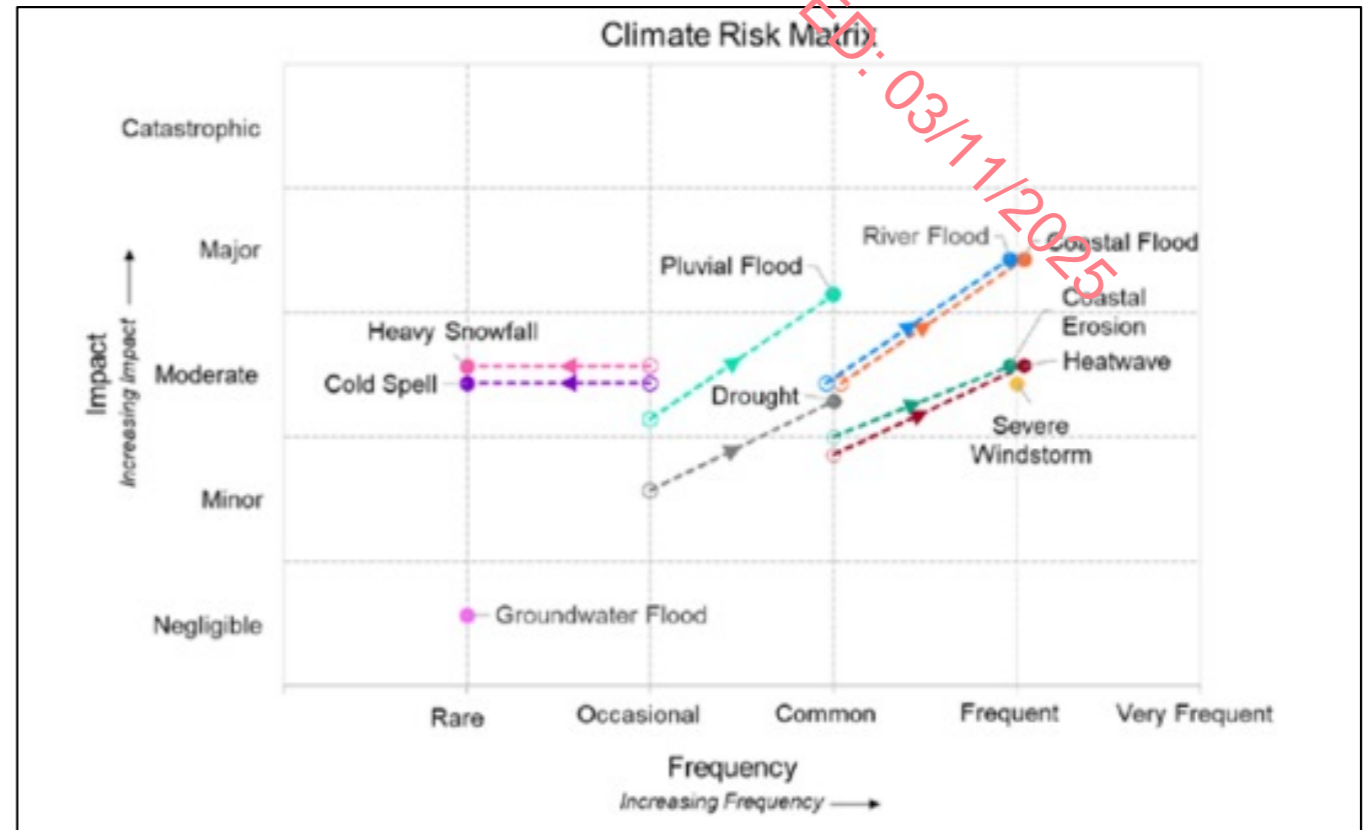


Figure 14.1 Current and Projected Climate Risk Matrix for Cork County (CCC, 2024)

### 14.3.2 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 14.5.1).

#### 14.3.2.1 Construction Phase

The GHG assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate. The reference study period (i.e. the assumed building life expectancy) for the purposes of the assessment is 60 years. Embodied carbon emissions are attributed to four main categories, taken from BS EN 15978. The categories are:

- **Product Stages (Category A1 to A3)** The carbon emissions generated at this stage arise from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and the associated carbon impacts that arise) from transforming the raw materials into construction products.
- **Construction (Category A4 to A5)** These carbon impacts arise from transporting the construction products to site, and their subsequent processing and assembly into the building.

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- **Use Stage (Category B1 to B7)** This covers a wide range of sources from the GHG emissions associated with the operation of the building (B1), maintenance (B2), repair (B3), refurbishment (B4) and replacement (B5) of materials, and operational energy use (B6) and water use (B7).
- **End of Life Stages (Category C1 to C4)** The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the demolition contractors. No “credit” is taken for any future carbon benefit associated with the reuse or recycling of a material into new products.

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2024) or an appropriate alternative tool. Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The purpose of the embodied carbon assessment is to engage the design team in the consideration of embodied carbon at an early stage in the development and mitigate embodied carbon. This engagement aims to ensure carbon savings are made and to assist in aligning the project to Ireland’s CAP goal of Net Carbon Zero by 2050.

The TII Online Carbon Tool (TII, 2024) has been commissioned by TII to assess GHG emissions associated with road or rail projects in Ireland. The TII Carbon Tool (TII, 2024) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), which can be applied to a variety of developments, not just road or rail. The tool aligns with PAS 2080.

For the building elements of the proposed development, the OneClick LCA 3D Designer tool was utilised. OneClick LCA is certified to EN 15978, EN 15978, ISO 21931 – 1 & ISO 21929, and data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. It allows users to assess the carbon impact of buildings at various stages of design. The tool includes a detailed product and material list based on Irish materials as well as materials from the UK and Europe. The OneClick LCA 3D Designer option allows for a high-level assessment of the embodied carbon impact of a development at early design stages when specific detailed design information is not known and is suitable for EIAR stage assessments.

Inputs into the tool include gross floor areas for the building types building frame type, number of above ground floors and building size and shape. The tool then makes necessary default assumptions based on these parameters and a typical build-up with the option to refine the default assumptions where project specific information is available. The tool allows for optioneering and optimization of the carbon impact, it highlights the key areas within the building with the highest carbon impact and provides options for lower carbon intensive materials.

The TII Carbon Tool was utilised to estimate the GHG emissions associated with the non-building elements of the proposed development including construction activities, land clearance activities and construction wastes.

Reasonable conservative estimates have been used in this assessment where necessary to provide an estimate of the GHGs associated with the proposed development.

### 14.3.2.2 Operational Phase

#### 14.3.2.2.1 Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO<sub>2</sub>) which will impact climate.

The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022b), 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, and also the climate assessment.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5 m or greater.

While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

There are a small number of road links that will experience a change of over 1,000 in the AADT during the operational phase due to the proposed development. As a result, a detailed assessment of traffic related carbon dioxide (CO<sub>2</sub>) emissions was conducted.

PE-ENV-01104 (TII, 2022a) states that road traffic related emissions information should be calculated using the TII Road Emissions Model (REM) online calculator tool (TII, 2025). The TII guidance (TII, 2022b) states that modelling should be conducted for the Base, Opening and Design Years for both the Do Nothing and Do Something scenarios. The output is provided in terms of CO<sub>2</sub>e.

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The *Default* fleet mix option was selected along with the *Intermediate Case* fleet data base selection for cars, the *ICE Sales Ban 2035* fleet data base for LGVs and the *EU Target* for the HGV fleet data base, as per TII Guidance (TII, 2025). The *Intermediate Case* assumes a linear interpolation between the *Business-as-Usual* case – where current trends in vehicle ownership continue and the *Climate Action Plan (CAP)* case – where adoption of low emission light duty vehicles occurs. The *ICE Sales Ban 2035* represents a sales ban on new combustion engine vehicles to be implemented by 2035, and the *EU Target* for HGV represents interim targets for emissions from sales of new HGVs.

Traffic flow information was obtained from HEGSONS Design Consultancy Limited (hereafter HEGSONS), the traffic engineers, for the purposes of this assessment. Data was provided for the Base Year 2025, Opening Year 2028 and Design Year 2043 (see Traffic and Transport Assessment for further details). Both the Do Nothing and Do Something scenarios are quantified to determine the degree of change in emissions due to the proposed development. A total of 2 no. scenarios were assessed, these include:

- The Do Nothing scenario – this scenario assumes the proposed development is not in place in future years but includes traffic associated with cumulative developments in the wider area.
- The Proposed scenario – this is the “Do Something” scenario and includes traffic from the Do Nothing scenario and traffic associated with the proposed development as well as traffic associated with cumulative developments in the wider area.

Further detail on the modelling scenarios can be found in the Chapter 6 Traffic and Transport and the Traffic and Transport Assessment prepared by HEGSONS and submitted with this planning application. The traffic data is detailed in Table 14.3. Only road links that met the TII scoping criteria were included in the modelling assessment.

Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type and project county location.

**Table 14 3 Traffic Data used in Operational Phase Climate Assessment**

Road Name	Speed (kph)	Base Year	Opening Year		Design Year	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
L2040 Old Macroom Road	50	15299 (977)	18158 (1159)	18473 (1179)	20636 (1317)	21899 (1398)
Bandon Bridge Road	50	18634 (1189)	21180 (1352)	21436 (1368)	24199 (1545)	25223 (1610)

14.3.2.2.2 Operational Phase Energy Use

The EU guidance (European Commission, 2013) also states indirect GHG emissions as a result of a development must be considered, which includes emissions associated with energy usage. Information on the incorporated design mitigation primarily in relation to the proposed energy strategy for the development was reviewed and used to inform this assessment. Several measures in relation to sustainable energy usage have been incorporated into the overall design of the development which will have the benefit of reducing the impact to climate where possible during operation.

14.3.2.3 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on ISEP guidance (ISEP, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA document *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

The 2022 ISEP Guidance (ISEP, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. Therefore, the significance of a project’s emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project’s residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project’s remaining emissions should be considered.

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The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland’s National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended TII significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII 2022a) states that professional judgement must be considered when contextualising and assessing the significance of a project’s GHG impact. TII reference the ISEP guidance (ISEP, 2022) which states that the crux of assessing significance is “not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”.

Significance is determined using the criteria outlined in Table 14.4 (derived from Table 6.7 of PE-ENV-01104 (TII 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland’s GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

**Table 14 4 Significance Criteria for GHGA**

Effects	Significance Level	Description
Significant Adverse	Major Adverse	<ul style="list-style-type: none"> <li>• The project’s GHG impacts are not mitigated.</li> <li>• The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and</li> <li>• No meaningful absolute contribution to Ireland’s trajectory towards net zero.</li> </ul>
	Moderate Adverse	<ul style="list-style-type: none"> <li>• The project’s GHG impacts are partially mitigated.</li> <li>• The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and</li> <li>• Falls short of full contribution to Ireland’s trajectory towards net zero.</li> </ul>
Not Significant	Minor Adverse	<ul style="list-style-type: none"> <li>• The project’s GHG impacts are mitigated through ‘good practice’ measures.</li> <li>• The project has complied with existing and emerging policy requirements; and</li> <li>• Fully in line to achieve Ireland’s trajectory towards net zero.</li> </ul>
	Negligible	<ul style="list-style-type: none"> <li>• The project’s GHG impacts are mitigated beyond design standards.</li> <li>• The project has gone well beyond existing and emerging policy requirements; and</li> <li>• Well ‘ahead of the curve’ for Ireland’s trajectory towards net zero.</li> </ul>
Beneficial	Beneficial	<ul style="list-style-type: none"> <li>• The project’s net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration.</li> <li>• The project has gone well beyond existing and emerging policy requirements; and</li> <li>• Well ‘ahead of the curve’ for Ireland’s trajectory towards net zero, provides a positive climate impact.</li> </ul>

Ireland’s carbon budgets can also be used to contextualise the magnitude of GHG emissions from the proposed development (TII, 2022a). The approach is based on comparing the net proposed development GHG emissions to the relevant carbon budgets (Government of Ireland, 2023a). With the publication of the Climate Action Act in 2021 and the Climate Action Plan 2025, sectoral carbon budgets have been published for comparison with the net GHG emissions from the proposed development over its lifespan. The aim of the carbon budgets is to ensure we are on a trajectory to meet the National Climate Objective of Net Zero by 2050.

### 14.3.3 Climate Change Risk Assessment

The assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (ISEP, 2020).

The baseline environment information provided in Section 14.5, future climate change modelling and input from other experts working on the proposed development (i.e. hydrologists) should be used to assess the likelihood of a climate risk.

First an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets (i.e. receptors) and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development-by-development basis.

- **Asset Categories:** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards:** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity:** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity:** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity:** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. For example, flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure:** It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure:** It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure:** It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability.

#### 14.3.3.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

$$Vulnerability = Sensitivity \times Exposure$$

The vulnerability assessment takes any proposed mitigation into account. Table 14.5 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the proposed development is not significant.

However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks. An assessment of construction phase CCRA impacts is only required according to the TII guidance (TII, 2022a) if a detailed CCRA is required.

**Table 14 5 Vulnerability Matrix**

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

The screening CCRA, detailed in Section 14.7.2.2, did not identify any residual medium or high risks to the proposed development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 14.8.

### 14.3.4 Site Surveys/Investigations

No surveys were required as part of the climate assessment.

## 14.4 Difficulties Encountered

There were no difficulties encountered in compiling this assessment.

## 14.5 Baseline Environment

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland’s current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

Climate impacts are assessed at a national level and in relation to national targets and sectoral emission ceilings. The study area for climate is the Republic of Ireland and the baseline is determined in relation to this study area.

### 14.5.1 Current GHG Baseline

Data published in July 2025 (EPA, 2025a), indicates that Ireland exceeded, without the use of flexibilities, its 2024 annual limit set under EU’s Effort Sharing Decision (ESD) (EU 2018/842) by 1.03 MtCO<sub>2</sub>e. However, the 2024 emissions represent the second consecutive year in which Ireland’s emission were below (-4.2%) 1990 levels. ETS (Emissions Trading Scheme) emissions decreased (-7.4%) and ESR (Effort Sharing Regulation) emissions decreased (-0.5%). Ireland’s target is an emission reduction of 626 kt of CO<sub>2</sub>e by 2030 on an average baseline of 2016 to 2018.

The EPA estimate that 2024 total national GHG emissions, excluding LULUCF, have decreased by 2.0% on 2023 levels to 53.75 Mt CO<sub>2</sub>e, with a 0.7 Mt CO<sub>2</sub>e (-8.9%) reduction in electricity industries alone. This was driven by a 39.6% share of energy from renewables in 2024 and the complete phase-out of peat for electricity generation. Manufacturing combustion and industrial processes decreased by 4.6% to 6.0 Mt CO<sub>2</sub>e in 2024 due to declines in fossil fuel usage. The sector with the highest emissions in 2024 was agriculture at 38% of the total, followed by transport at 21.7%. For 2024, total national emissions (including LULUCF) were 57.64 Mt CO<sub>2</sub>e (EPA, 2025a) (Table 14.6).

The current estimates of National greenhouse gas emissions (including LULUCF) in 2024 are 12.0% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021- 2024 Ireland has used 82.5% of the 295 Mt CO<sub>2</sub>e Carbon Budget for the five-year period 2021-2025. This leaves 17.5% of the budget available for 2025, requiring a substantial 10.3% annual emissions reduction for 2025 to stay within budget.

**Table 14 6 Trends in Total National GHG Emissions 2021 – 2024**

Sector Note 1	2021	2022	2023	2024	Total Budget (Mt CO <sub>2</sub> e) (2021-2025)	% Budget 2021-2025 Used	Annual Change 2023 to 2024
Electricity	9.89	9.69	7.57	6.95	40	85.25%	-8.19%
Transport	11.09	11.76	11.80	11.65	54	85.74%	-1.27%
Buildings (Residential)	6.87	5.75	5.35	5.61	29	81.31%	4.86%
Buildings (Commercial & Public)	1.44	1.45	1.39	1.49	7	82.43%	7.19%
Industry	7.09	6.62	6.31	6.01	30	86.77%	-4.75%
Agriculture	21.94	21.78	20.72	20.41	106	80.05%	-1.50%
Other Note 2	1.86	1.93	1.81	1.63	9	80.33%	-9.94%
LULUCF	4.63	3.98	3.89	3.89	–	–	0
<b>Total including LULUCF</b>	<b>64.82</b>	<b>62.99</b>	<b>58.83</b>	<b>57.64</b>	<b>295</b>	<b>82.81%</b>	<b>-2.04%</b>

Note 1 Reproduced from latest emissions data on the EPA website July 2025 (EPA, 2025).

Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste

### 14.5.2 Future GHG Baseline

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022a) and ISEP Guidance (ISEP, 2022) the future baseline is a trajectory towards net zero by 2050, “whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”.

The future baseline will be determined by Ireland meeting its targets set out in the CAP25, and future CAPs, alongside binding 2030 EU targets. The European Union (EU) enacted ‘Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013’ (hereafter referred to as the Regulation) (European Union, 2018) to meet the commitments under the Paris Agreement. The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its ETS and non-ETS greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and includes GHG emissions from transport, residential and commercial buildings and agriculture.

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In May 2025, the EPA released the report Ireland’s Greenhouse Gas Emissions Projections 2024-2055 (EPA, 2025), which includes total projected emissions and a breakdown of projected emissions per sector under the ‘With Existing Measures’ and ‘With Additional Measures’ scenarios. The EPA projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

14.5.3 Current CCRA Baseline

The region of the proposed development has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Cork Airport is the nearest, representative, weather and climate monitoring station to the proposed development with meteorological data recorded for the 30-year period from 1991 to 2020. The historical regional weather data for Cork Airport metrological station is representative of the current climate in the region of the proposed development. The data for the 30-year period from 1991 to 2020 indicates that the wettest months at Cork Airport Metrological Station were January, October and December, and the driest month on average was May (Met Éireann, 2025a). July was the warmest month with a mean temperature of 15.2 Celsius. January was the coldest month with a mean temperature of 5.7 Celsius.

Met Éireann’s 2023 Climate Statement (Met Éireann, 2024a) states 2023’s average shaded air temperature in Ireland is provisionally 11.20°C, which is 1.65°C above the 1961-1990 long-term average. Before this, 2022 was the warmest year on record; however, 2023 was 0.38°C warmer (see Figure 14-2).

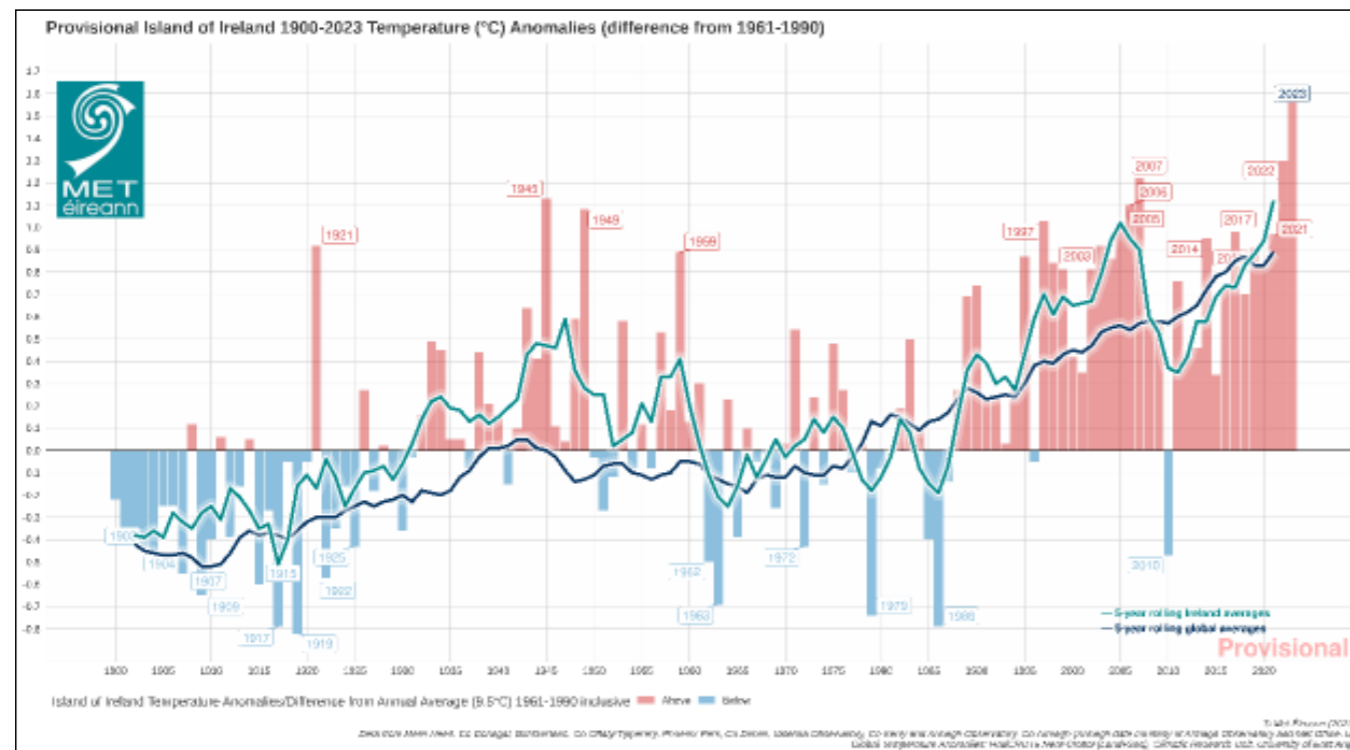


Figure 14 2 1900-2023 Temperature (°C) Temperature Anomalies (differences from 1961-1990)

2023 also had above average rainfall, this included the warmest June on record and the wettest March and July on record. Record high sea surface temperatures (SST) were recorded since April 2023 which included a severe marine heatwave to the west of Ireland during the June 2023. This marine heatwave contributed to the record rainfall in July.

Met Éireann’s 2024 Climate Statement (Met Éireann 2025b) states 2024’s average shaded air temperature in Ireland is provisionally 10.72°C, which is 1.17°C above the 1961-1990 long-term average or 0.55°C above the most recent 1991-2020 long-term average. This is the 4th warmest year on record with 2023 breaking previous records. Seven of the top ten warmest years have occurred since 2005. Record high sea surface temperatures (SST) were recorded in 2022, and in 2024 continued at or near record high levels. 2024 was overall drier than average, however there were many instances of heavy or intense rainfall which led to flooding events. This trend is predicted to continue with climate change with an increase in both dry periods and heavy rainfall events. Considering the extraordinary data, Met Éireann states that the latest Irish climate change projections indicate further warming in the future, including warmer winters. The record temperatures mean the likelihood of extreme weather events occurring has increased. This will result in longer dry periods and heavy rainfall events. Storm surges and coastal flooding due to sea level rise. Compound events, where coastal surges and extreme rainfall events occur simultaneously will also increase. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

14.5.4 Future CCRA Baseline

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

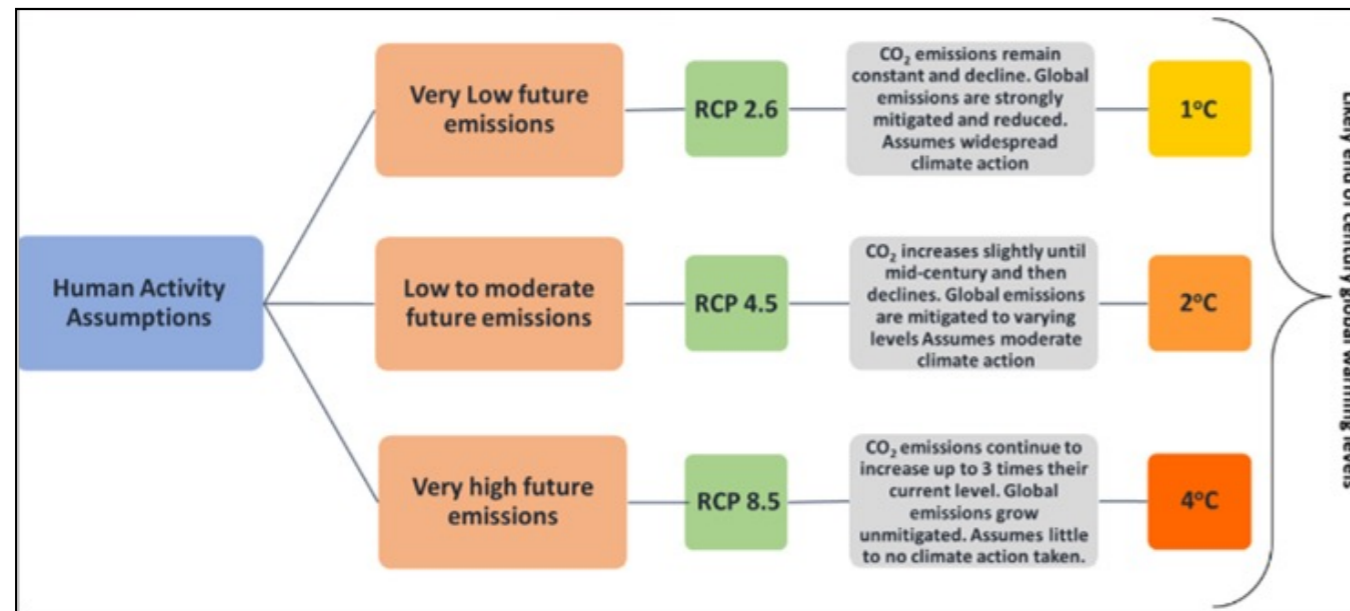
Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of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

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

TII’s Guidance document PE-ENV-01104 (TII 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate, while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023b) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research

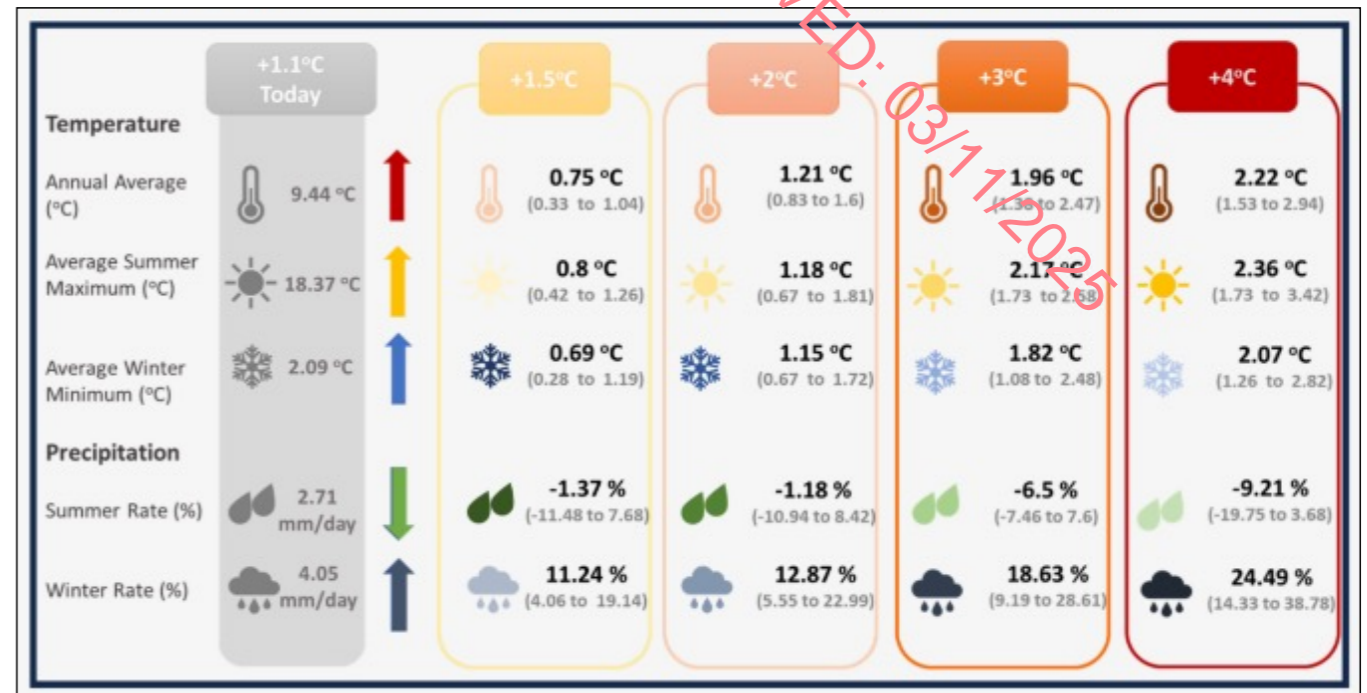
Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change, see Figure 14-3.



Source: TRANSLATE project Storymap (Met Éireann 2023)

Figure 14 3 Representative Concentration Pathways associated emission levels

TRANSLATE (Met Éireann, 2023b) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5°C, 2°C, 2.5°C, 3°C or 4°C. Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SSTs) (Met Éireann, 2023b). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24% (see Figure 14-4). Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.



Source: TRANSLATE project Storymap (Met Éireann, 2023b)

Figure 14 4 Change of climate variables for Ireland for different Global warming thresholds

The TRANSLATE research report (Met Éireann, 2024d) finds that night-time temperatures will warm more than day-time temperatures, with temperatures increases across all seasons but the highest in the summer (with an increase of 0.5°C to 3.5°C). Autumn is projected to have the highest increase in average minimum temperatures (with an increase of 1.1°C to 4.4°C). The variance is dependent on the scenario that is being reviewed. While these temperatures are projected across all of Ireland, they increase most in the east of the country compared to the west. With respect to rainfall, increases of 4% to 38% are projected, however this will not be spread across the year as during summer months there are projected decreases in rainfall beyond the 2°C warming scenario.

In January 2024 the EPA published Ireland's Climate Change Assessment Synthesis Report (EPA, 2024c) which contained four volumes:

- Volume 1: Climate Science: Ireland in a Changing World
- Volume 2: Achieving Climate Neutrality by 2050
- Volume 3: Being Prepared for Ireland's Future Climate
- Volume 4: Realising the Benefits of Transition and Transformation

This report reinforces the existing and future risks arising from climate change. Volume 1 (EPA, 2024c) states that under Early action, the temperature increase averaged across the island of Ireland relative to the recent past (1976 to 2005) would reach 0.91°C (0.44 to 1.10°C) by mid-century before falling back to 0.80°C (0.34 to 1.07°C) at the end of the century. Whereas under Late action, by the end of the century it is projected that the temperature increases could be 2.77°C (2.02 to 3.49°C). Heat extremes will become more frequent and more severe and cold extremes will become less frequent and less severe with further warming.

Precipitation was 7% higher over the period 1991 to 2020 than over the 1961 to 1990 period. The average future predicted increase in precipitation is <10% in annual mean accumulated. By 2100 projected additional rises in sea

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level range from 0.32 to 0.6m under early action to 0.63 to 1.01m under late action scenarios, with greater storm surges potentially effecting critical infrastructure along the coastline. Projections of changes in storminess are highly uncertain and translate into large uncertainties in future frequency and intensity of extreme waves.

Volume 3 (EPA, 2024c) discusses how water supplies will face growing pressures resulting in increased water demand and how options need to be developed, including potential new sources. The report states the key role of critical infrastructure for delivering public services, economic development and a sustainable environment. These are exposed to a range of climate extremes. Failures in critical infrastructure can cascade across other sectors and present a multi-sector risk due to climate change.

The report references the EPA’s *Critical Infrastructure Vulnerability to Climate Change* report (EPA, 2021a) as the most substantial research project in Ireland to date on climate change and critical infrastructure which assesses the future performance of Ireland’s critical infrastructure when climate is considered. The Critical Infrastructure Vulnerability to Climate Change report states with respect to water availability and quality, that flood risk and heatwaves have a medium vulnerability index and the underground supply network has a high vulnerability to snowstorms and cold spells. However, while the vulnerability is high, the exposure is likely to reduce due to future climate change resulting in less cold weather events. The risk assessment highlights the co-dependence of the water sector to the energy sector, and how vulnerability in the energy sector may have cascading impacts.

Volume 4 (EPA, 2024c) calls for system change, including a transformation of urban settings. Stating that meaningful urban transformation can create a better living environment while simultaneously reducing emissions.

The projections were echoed by the *Updated High-resolution Climate Projections for Ireland Research Report: 471* (EPA, 2024d) which was in broad agreement with previous research. The future autumn and winter months are projected to be up to 10% wetter, while summer is projected to be up to 8% drier.

## 14.6 The ‘Do Nothing’ Scenario

In the Do-Nothing scenario, the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

As the site is zoned for development, it is likely that in the absence of the proposed development a development of a similar nature would occur. Therefore, the predicted climate impacts within this report are likely to occur even in the absence of the proposed development.

## 14.7 Potential Significant Effects

### 14.7.1 Greenhouse Gas Assessment

#### 14.7.1.1 Construction Phase

The most significant proportion of GHG emissions tend to occur during the construction phase due to embodied carbon in construction materials and emissions from construction activities. Therefore, the assessment has been included in the construction phase assessment for the purposes of the EIAR. The assessment is broken down into the following stages as per Section 14.3.2.1

- Product stage (A1 – A3);
- Transportation to site (A4);
- Site operations (construction activities) (A5); and
- Material replacement & refurbishment (B4 – B5).

The construction phase GHG emissions comprise stages A1 – A5 which includes the construction materials, the transport of the materials to site and the construction activities or site operations. Ongoing material refurbishment and replacement throughout the lifetime of the development is included within category B4 – B5, these are default values based on the typical maintenance requirements for the chosen material types over the assumed 60-year lifetime.

The carbon assessment highlights the areas where the highest embodied carbon emissions occur, specifically as a result of building materials based on a typical build-up for the building type

The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget. The emissions are broken down into different assessment categories and these must be compared separately to the relevant sectoral emissions budgets, which are detailed Table 14-7. The relevant sectoral emissions for the proposed development comparison include the Industry sector, Transport sector, and Waste sector. The predicted emissions for the proposed development are annualised over the assumed 60-year lifespan and then compared to the relevant sector 2030 carbon budgets. Annualising the full carbon emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets.

The results of the GHGA are shown in Table 14.7, this includes both the outputs from the OneClick LCA tool and the TII Carbon Tool. Construction materials make up the majority of GHG emissions for the proposed development, accounting for approximately 77% of the total construction phase GHG emissions. Material replacement makes up the second highest contribution at 15% of the total. Material transport, waste and construction activities make up the remainder of the construction GHG emissions. The A5 and B4-B5 categories include carbon savings associated with waste material recycling or re-use.

It has been calculated that the total construction phase embodied carbon (including maintenance and replacement of materials over the development lifetime) for the proposed development will be 19,026 tonnes CO<sub>2</sub>e (see Table 14.7).

**Table 14 7 GHG Assessment Results**

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO <sub>2</sub> e)	Predicted GHG Emissions as % of Project Total	Relevant Sector for Carbon Budget Comparison
A1-A3	Materials	14,599	77%	Industry
A4	Material Transport	258	1%	Transport
A5	Site Clearance and Demolition	4	0.02%	Industry
	Excavations	47	0.24%	Industry
	Construction water use	996	5.24%	Electricity
	Construction site material waste	42	0.22%	Waste

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO <sub>2</sub> e)	Predicted GHG Emissions as % of Project Total	Relevant Sector for Carbon Budget Comparison
	Construction site material waste transport	6	0.03%	Transport
	Construction site waste	18	0.09%	Waste
	Landscaping and vegetation	-66	-0.35%	LULUCF
B4 - B5	Maintenance Material	2,785	15%	Industry
	Maintenance Material Transport	7	0.03%	Transport
	Maintenance Material Waste	331	1.7%	Waste
<b>Total</b>		<b>19,026</b>		

Figure 14-5 shows the GHG emissions for the proposed development per life-cycle stage based on the output from the OneClick LCA 3D Designer tool and the TII Carbon Tool combined.

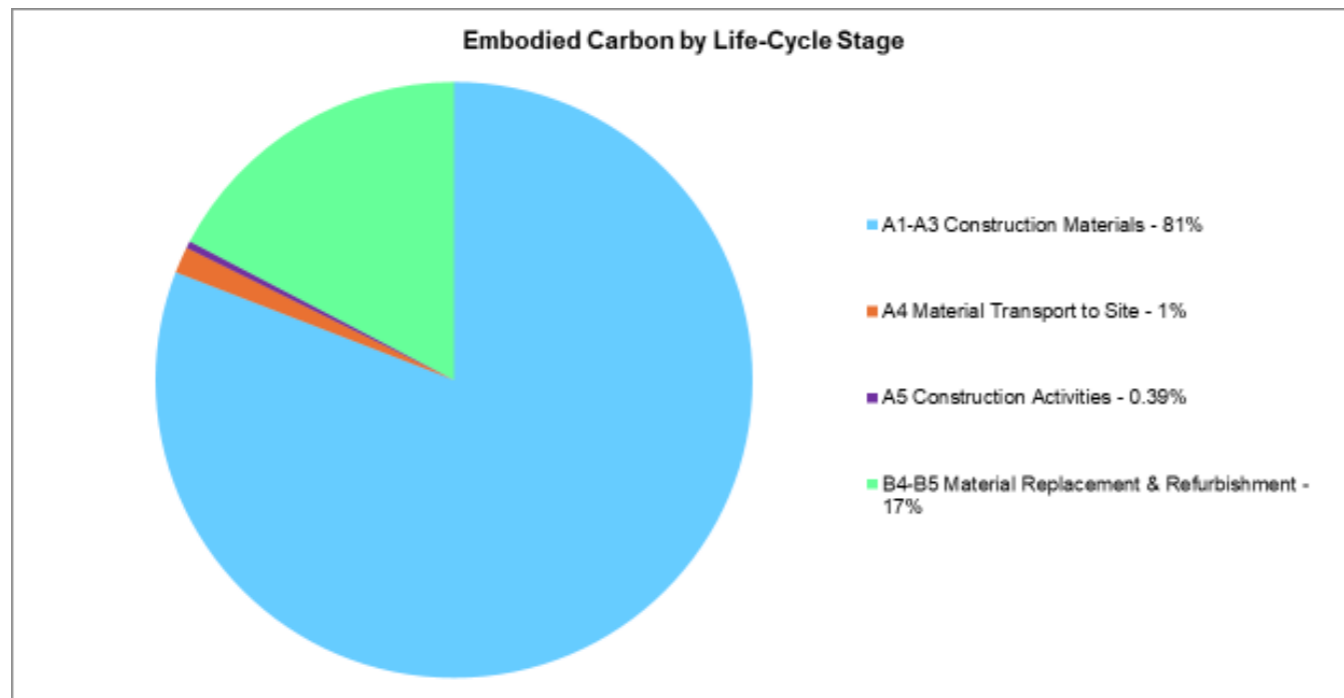


Figure 14 5 Embodied Carbon by Life-Cycle Stage

The total predicted GHG emissions (as shown in Table 14.7) can be averaged over the full lifespan of the proposed development to give the predicted annual emissions to allow for direct comparison with national annual emissions and targets.

In Table 14.8, GHG emissions have been compared against the carbon budget for the industry, transport, and waste sectors in 2030 (Government of Ireland, 2024), against Ireland’s total GHG emissions in 2024, and against Ireland’s EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO<sub>2</sub>e) (set out in Regulation EU 2018/842).

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The estimated total GHG emissions, when annualised over the 60-year proposed development lifespan, are equivalent to 0.0006% of Ireland’s total GHG emissions in 2024 and 0.001% of Ireland’s non-ETS 2030 emissions target. The estimated GHG emissions associated with transport-related activities are 0.0001% of the 2030 Transport budget, construction waste GHG emissions are 0.032% of the Waste budget, industry-related activities are 0.43% of the 2030 Industry budget.

Table 14 8 Estimated GHG Emissions Relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget (tCO <sub>2</sub> e)	Annualised Emissions	Development GHG	% of Relevant Target/Budget
Ireland's 2024 Total GHG Emissions (existing baseline)	57,640,000	317	Total GHG Emissions 0.0006%
Non-ETS 2030 Target	27,722,000	317	Total GHG Emissions 0.001%
2030 Sectoral Budget (Industry Sector)	4,000,000	17,389	Total Industry Emissions 0.43%
2030 Sectoral Budget (Transport Sector)	6,000,000	4	Total Transport Emissions 0.0001%
2030 Sectoral Budget (Waste Sector)	1,000,000	323	Total Waste Emissions 0.032%

14.7.1.2 Operational Phase

14.7.1.2.1 Operational Energy Usage

The proposed development has been designed to reduce the impact to climate where possible. Several measures have been incorporated into the design to ensure the operational phase emissions are minimised. The primary elements with respect to reducing climate impacts and optimising energy usage are summarised in Section 14.8.1.

14.7.1.2.2 Operational Traffic Emissions

There is the potential for increased traffic volumes to impact climate during the operational phase. To provide for a worst-case assessment and to assess potential cumulative impacts, the traffic data has included specific cumulative developments within the area (see Transportation Assessment prepared by HEGSONS for further details).

The predicted concentrations of CO<sub>2</sub>e for the future years of 2028 and 2043 are detailed in Table 14.9. These are significantly less than Ireland’s national 2028 and 2030 targets set out under EU legislation (targets beyond 2030 are not available) and the 2030 sectoral emissions ceilings. It is predicted that in 2028 the proposed development will increase CO<sub>2</sub> emissions by 16 tonnes CO<sub>2</sub>e. This equates to 0.00004% of the 2028 national emission ceiling or 0.0003% of the 2030 Transport sector emissions ceiling (see Table 14.9). Similarly low increases in CO<sub>2</sub> emissions are predicted to occur in 2043 with emissions increasing by 37 tonnes CO<sub>2</sub>e. This equates to 0.0001% of the 2030 national emission ceiling or 0.001% of the 2030 Transport sector emissions ceiling (Table 14.9).

In addition, bicycle parking and electric vehicle parking and charging infrastructure will be provided as part of the parking requirements at the proposed development which will promote the use of more sustainable methods of transport.

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Table 14 9 Traffic Emissions GHG Impact Assessment

Year	Scenario	CO2e (tonnes/annum)
2028	Do Nothing	966
	Do Something	982
2043	Do Nothing	634
	Do Something	671
Increment Change in 2028		16
<b>National Emission Ceiling 2028 (Tonnes) <sup>Note 1</sup></b>		<b>37,869,352</b>
Impact in 2028 (as % of national emissions ceiling)		0.00004%
<b>Transport Sector 2030 Emission Ceiling</b>		<b>6,000,000</b>
Impact in 2028 (as % of transport sector emissions ceiling)		0.0003%
Increment Change in 2043		37
<b>National Emission Ceiling 2030 (Tonnes) <sup>Note 1</sup></b>		<b>27,722,000</b>
Impact in 2043 (as % of national emissions ceiling)		0.0001%
Impact in 2043 (as % of transport sector emissions ceiling)		0.001%

Note 1 Target under Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council.

14.7.1.3 GHGA Significance of Effects

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland’s GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 14.8 has been considered when determining the significance of the proposed development’s GHG emissions. According to the TII significance criteria described in Section 14.3.2.3 and Table 14.4, the significance of the GHG emissions during the construction and operational phase is minor adverse. The proposed development aligns with the following GHG significance criteria as per Table 14.4:

- The project’s GHG impacts are mitigated through ‘good practice’ measures.
- The project has complied with existing and emerging policy requirements; and
- Fully in line to achieve Ireland’s trajectory towards net zero.

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase, which is **direct, long-term, negative** and **slight**, which is overall **not significant**.

14.7.2 Climate Change Risk Assessment

14.7.2.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 14.3.3 and Section 14.7.2.2, which states that there are no residual medium or high-risk vulnerabilities to climate change hazards. Therefore, a detailed CCRA is not required (TII, 2022a). However, consideration has been given to the proposed development’s vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 14.8:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow; and
- Major Storm Damage including wind damage.

14.7.2.2 Operational Phase

The sensitivity and exposure of the development to various climate hazards must first be determined to then determine the vulnerability of the proposed development to climate change. Flooding (coastal, pluvial, fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides and fog have been considered as climate hazards in the context of the proposed development.

The sensitivity of the proposed development to the climate hazards is assessed irrespective of the project location. Table 14.10 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per Table 14.5. The results of the vulnerability assessment are detailed in Table 14.10.

Table 14 10 Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The sensitivity and exposure of the area was determined with reference to a number of online tools and with input from the various discipline specialists on the project team. It was concluded that the proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low.

#### 14.7.2.2.1 Flooding

A Flood Risk Assessment (FRA) was undertaken by Brian O Kennedy & Associates and is submitted separately as part of this planning application. This document was reviewed to inform the climate change vulnerability assessment and assess the potential for flooding at the proposed development site.

The proposed development is located in Flood Zone C, which indicates flooding is not a risk for the site. Additionally, the risk remains “low” as the drainage design is considered sufficient to account for future climate change. The risk of overland water flow or exceedance of the proposed infrastructure has been considered and appropriate measures are incorporated into the design to mitigate against this risk. Additionally, sustainable drainage systems (SuDS) have been incorporated into the proposed development.

It can be concluded that overall, the proposed development has low vulnerability to flood risk.

#### 14.7.2.2.2 Extreme Wind, Fog, Lightning & Hail

In relation to extreme winds, the building shall be designed to the appropriate standards to account for the relevant wind loadings events for RCP4.5 and RCP8.5. If required as part of the building design, lightning protection shall be provided for. Hail and fog are not predicted to significantly affect the building due to its design.

It can be concluded that overall, the proposed development has low vulnerability to extreme wind, fog, lightning and hail.

#### 14.7.2.2.3 Wildfires

In relation to wildfires, the *Think Hazard!* tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR, 2025), indicates that the wildfire hazard is classified as medium for the Cork area. This means that there is between a 10% to 50% chance of experiencing weather that could support a hazardous wildfire that may pose some risk to life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions. These include increases in temperature and prolonged dry periods. However, due to the project location in a built-up, sub-urban area the risk of wildfire is significantly lessened, and it can be concluded that the proposed development is of low vulnerability to wildfires.

#### 14.7.2.2.4 Landslides

The Geological Society of Ireland (GSI) landslide susceptibility mapping database (GSI, 2025) was reviewed to inform the risk from landslides at the proposed development. Although there has been one historic landslide event 1.09 km north of the site, there have not been any historical landslide events in the immediate vicinity of the proposed development, and the area is of low susceptibility to future landslides. Therefore, the vulnerability of the proposed development to landslides is classed as low.

#### 14.7.2.2.5 Extreme Temperatures (Heat & Cold) & Drought

Extreme temperatures, both extreme heat and extreme cold, have the potential to impact the building materials and some related infrastructure and potentially landscape planting. However, the building materials selected at the detailed design and will be done with consideration of the likely future temperature ranges Ireland will experience under RCP4.5 and RCP8.5 up to 2100. Therefore, extreme temperatures are not considered a significant risk.

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

#### 14.7.2.2.6 Summary

Overall, the proposed development has at most low vulnerabilities to the identified climate hazards. Therefore, no detailed risk assessment is required.

#### 14.7.2.3 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the proposed development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development as a result of climate change are **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

#### 14.7.3 Cumulative Effects

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that “*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland’s trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland’s ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*”.

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area. Therefore, this impact assessment is cumulative.

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

#### 14.7.4 Summary

The following table summarises the identified likely significant effects on climate due to the proposed development before mitigation measures are applied.

**Table 14 11 Summary of Likely Significant Effects in the absence of mitigation**

Likely Significant Effect in accordance with EPA Terminology	Quality	Significance	Extent	Probability	Duration	Type
GHG emissions from construction materials & activities and operational energy usage	Negative	Significant (moderate adverse as per Table 14.4)	National	Likely	Long-term	Direct
Climate change and related vulnerability of the proposed development	Negative	Not significant - slight	Local	Likely	Long-term	Direct

## 14.8 Mitigation Measures

### 14.8.1 Incorporated Design Mitigation

A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (Section 14.7.2.2).

The design incorporates various mitigation measures to prevent or limit overland run-off which is of relevance for the vulnerability of the site to potential future flooding these measures have been considered when assessing the risk of future flooding as per Section 14.7.2.2.

- The development is divided into discrete sections for drainage and access. Internal roads run across contours – primarily falling towards phase 1 and the public roadway to the west. There are limited sections of roadway running directly downhill. This limits the gathering of surface water run-off in any specific area and limits the consequences of excessive build-up and discharge overtopping and surcharging an adjacent area
- The development has two separate exits into phase 1 and will have three separate connections each of both the surface and foul water systems into drainage pipework being installed in phase 1. The separate sections of sewers including separate discharge points, limits cumulative effects in the drainage systems.
- A detailed SuDS design has been adopted for the surface water system in accordance with the Cork County Development Plan the Greater Dublin Strategic Drainage Study and Code of Practice and SuDS manual CIRIA 753.
- Two separate attenuation chambers have been incorporated to attenuate water runoff to greenfield site rates. These chambers are underground sealed structures with lockable and sealed covers.
- Double gullies with individual connections to the drainage system are incorporated at appropriate surface water collection locations
- Raised kerbing or ramps are incorporated at specific locations to prevent excess surface water run-off entering lower areas.
- Raised kerbing is incorporated along all road edges on the downhill side of the roads running across the site.

In relation to operational energy usage the proposed development will be Nearly Zero Energy Building (NZEB) compliant in line with the Technical Guidance Part L (2022) of the Building Regulations requirements for the residential elements and Technical Guidance Part L (2022), Buildings other than Dwellings for the creche. The proposed development will achieve a BER and RER in line with the NZEB requirements which will reduce the operational phase energy usage and therefore, reduce the impact to climate.

These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Climate Action Plan.

### 14.8.2 Construction Phase Mitigation

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

- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Sourcing materials locally where possible to reduce transport related CO<sup>2</sup> emissions.
- Material choices and quantities will be reviewed during detailed design, to identify and implement any lower embodied carbon options, where feasible. For example, a 30% minimum clinker replacement in cement may be utilised in line with the requirements for public bodies.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lightning and hail through site risk assessments and method statements.

Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed e.g. the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest IPCC report.

### 14.8.3 Operational Phase Mitigation

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. These measures are outlined in Section 14.8.1 above as incorporated design mitigation. No further operational phase mitigation is proposed.

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## 14.9 Residual Impact Assessment

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII reference the ISEP guidance which states that the crux of assessing significance is “not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”. The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in Table 14.4 the residual impact of the proposed development in relation to GHG emissions is considered minor adverse, this equates to a **direct, long-term, negative** and **slight**, impact which is overall **not significant** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered **direct, long-term, negative** and imperceptible, which is overall **not significant** in EIA terms.

### 14.9.1 Summary of Post-mitigation Effects

The following table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

**Table 14 12 Summary of Effects Post Mitigation**

Likely Significant Effect in accordance with EPA Terminology	Quality	Significance	Extent	Probability	Duration	Type
GHG emissions from construction materials & activities and operational energy usage	Negative	Slight (minor adverse as per Table 14.4)	National	Likely	Long-term	Direct
Climate change and related vulnerability of the proposed development	Negative	Not significant - slight	Local	Likely	Long-term	Direct

### 14.9.2 Cumulative Residual Effects

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that “the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland’s trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland’s ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative”.

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area. Therefore, this impact assessment is cumulative.

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As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

## 14.10 Risk of Major Accidents or Disasters

As detailed in Section 14.7.2.2, climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. However, the potential for flooding on site has been reviewed and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. All climate change related risks were categorised as ‘low’ as per Section 14.7.2.2.

## 14.11 Worst Case Scenario

Conservative assumptions have been used as part of this assessment. As a result, Section 14.7 details the worst-case impact for the proposed development.

## 14.12 Interactions

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

### 14.12.1 Land, Soils, Geology and Hydrology

The impact of flood risk has been assessed, and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change. The effect of the interactions between climate and land, soils, geology and hydrology are **direct, short-term, negative** and **imperceptible** during the construction phase and **direct, long-term, negative** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

### 14.12.2 Air Quality

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

### 14.12.3 Traffic and Transportation

During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO<sub>2</sub>, a greenhouse gas. The effects of the proposed development on climate are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the effects of the interactions between traffic and climate are considered to be **direct, short-term, negative** and **not significant** during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase, which is overall **not significant** in EIA terms.

14.12.4 Waste

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The effect of the interactions between waste and climate are considered to be direct, short-term, negative and not significant during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase, which is overall **not significant** in EIA terms.

14.13 Monitoring

Monitoring and reporting of the embodied carbon in the construction phase will be conducted. The aim of monitoring will be to seek further ways to minimise climate impacts. Monitoring will include contractual obligations, in line with the most recent Climate Action Plan and sectoral targets, for the successful tenderer to ensure that the proposed development stays in line with updated aims. Commitments to monitor GHG emissions during the construction phase will also be secured through the final Construction Environmental Management Plan (CEMP). Monitoring will include embodied carbon of construction materials, water usage, power and fuel usage, and waste generation (including reuse and recycling rates). Where monitoring shows that the proposed development is not meeting its targets, further mitigation will be put in place.

Monitoring should also include reviewing potential for extreme weather events which may cause damage during construction. Contractors' Environmental Management System (EMS) will include measures to address risks during such events i.e. flooding.

14.14 Summary of Mitigation and Monitoring

The following table summarises the Construction Phase mitigation and monitoring measures.

Table 14 13 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Proposed Mitigation	Proposed Monitoring
Impact of proposed development greenhouse gas emissions on climate.	<p>Construction Phase:</p> <ul style="list-style-type: none"> <li>Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.</li> <li>Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.</li> <li>Ensure all plant and machinery are well maintained and inspected regularly.</li> <li>Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.</li> <li>Sourcing materials locally where possible to reduce transport related CO2 emissions.</li> <li>Target embodied carbon rates for detailed design (LETI, 2020).</li> </ul>	Monitoring and reporting of embodied carbon of construction materials, water usage, power and fuel usage, and waste generation (including reuse and recycling rates).
Vulnerability of proposed development to future climate change.	<ul style="list-style-type: none"> <li>Contractor will be required to mitigate against the effects of extreme rainfall/flooding, extreme winds/storms, temperature extremes, fog, lightning and hail through site risk assessments and method statements.</li> <li>All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures.</li> </ul>	Monitoring to include reviewing potential for extreme weather events which may cause damage during construction. Contractors' Environmental Management System (EMS) will include measures to address risks during such events i.e. flooding.

The following table summarises the Operational Phase mitigation and monitoring measures.

Table 14 14 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Proposed Mitigation	Proposed Monitoring
Impact of proposed development greenhouse gas emissions on climate.	Incorporated design mitigation relating to operational energy usage. See Section 14.8.1 for further details.	No monitoring proposed.
Vulnerability of proposed development to future climate change.	Incorporated design mitigation regarding drainage design, landscaping requirements, building design. See Section 14.7.2.2 for further details.	No monitoring proposed.

### 14.15 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to climate. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is **not significant** in relation to GHG emissions and climate change risk.

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- Transport Infrastructure Ireland (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document
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# CHAPTER FIFTEEN

CULTURAL HERITAGE: ARCHAEOLOGY & BUILT HERITAGE

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# CHAPTER 15

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## CHAPTER 15 | CULTURAL HERITAGE: ARCHAEOLOGY & BUILT HERITAGE

### 15.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development, as described in Chapter 2 of the EIAR, on the cultural heritage resource. The cultural heritage resource encompasses several aspects of tangible constraints, such as archaeological sites and monuments and architectural heritage structures, as well as intangible assets such as historical associations, folklore, oral traditions, the arts and language.

This chapter should be read in conjunction with Chapter 2 of the EIAR which describes the proposed development.

### 15.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Peter Looney, John Cronin and Associates. Mr. Looney holds primary and postgraduate qualifications in archaeology (B.A. 2007 and MPhil. 2011, University College Cork) and has been approved as a licence eligible archaeologist by the National Monuments Service, Department of Housing, Local Government and Heritage. He has been involved in the preparation of Cultural Heritage chapters for EIARs for the following projects:

- Ennis, Co. Clare for MH Planning
- Castlelands, Mallow, Co. Cork for MH Planning

### 15.3 Proposed Development

Please refer to Chapter 2 – Project Description for the full development description. In summary, the subject application is for a large-scale Residential Development (LRD) comprising of the construction of 212 no. residential units and all ancillary development works including footpaths, car and bicycle parking, drainage, bicycle and bin stores, lighting and landscaping/amenity areas at Knockbrogan, Bandon, Co. Cork. Access will be provided via the existing access road onto the Cork Road permitted under reference 21/4059.

### 15.4 Methodology

The assessment was based on phased programmes of desktop research, field surveys and a geophysical survey of the proposed development site which were carried out in order to identify any features of cultural heritage significance likely to be impacted by the proposed development. The recorded and potential cultural heritage resource within a study area encompassing the area within the proposed development site and the surrounding lands extending for 1km in all directions from its boundary. This study area was reviewed in order to compile a comprehensive cultural heritage baseline for the location of the proposed development and surrounding lands which informed the assessment of potential impacts on any elements of the resource.

The following sections present an overview of the relevant legislation and guidelines and the methodology applied to determine the baseline cultural heritage environment within the study area and the assessment of potential effects on the cultural heritage resource.

#### 15.4.1 Relevant Legislation & Guidance

The guidelines relevant to the assessment include the *Architectural Heritage Protection: Guidelines for Planning Authorities* (Department of Arts, Heritage and Gaeltacht 2011) and the *Framework and Principles for the Protection of Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht and the Islands 1999). The assessment was also informed by the Environmental Protection Agency (EPA 2022) *Guidelines for Information to be Contained in EIAR and the International Council on Monuments and Sites (ICOMOS 2011) Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*.

The management and protection of cultural heritage in Ireland is achieved through a framework of national laws and policies which are in accordance with the provisions of the Valetta Treaty<sup>1</sup> (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<sup>2</sup>, 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 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.

The national legal statutes relevant to this assessment comprise:

- The Historic and Archaeological Heritage and Miscellaneous Provisions Bill 2023
- National Monuments Act 1930 (as amended);
- Heritage Act 1995 (as amended);
- National Cultural Institutions Act (1997); and
- Planning and Development Act 2000 (as amended).

The administration of national policy in relation to archaeological and architectural heritage resources is the responsibility of the National Monuments Service (NMS) and the National Built Heritage Service (NBHS) which are both currently based in the Department of Heritage Local Government and Heritage (DHLGH).

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was signed into law in October 2023. The DHLGH published an online guidance document in relation to this Act in November 2023<sup>3</sup> which provides

<sup>1</sup> <https://www.coe.int/en/web/culture-and-heritage/valletta-convention>

<sup>2</sup> <https://www.coe.int/en/web/culture-and-heritage/granada-convention>

<sup>3</sup> <https://www.archaeology.ie/about-us/corporate-information/news/commencement-of-certain-provisions-of-the-historic-and-archaeological-heritage-and-miscellaneous-provisions-act-2023/#:~:text=New%20heritage%2Drelated%20provisions%20within,Electoral%20Reform%2C%20Malcolm%20Noonan%20TD.>

an overview of its current status, and this is summarised hereafter. While the Act is now law most of its provisions will not enter into force until the Minister has made one or more “Commencement Orders”. This means that section 7 of the Act (which provides for the repeal of the National Monuments Acts 1930 (as amended) and related legislation) has not entered into force. Accordingly, the National Monuments Acts 1930 (as amended) remain fully in force and will continue to do so for the time being. The Act contains transitional provisions which will, if necessary, enable certain aspects of the existing National Monuments Acts (as amended) to continue in operation notwithstanding their repeal post-commencement of the Act while successor provisions are being brought fully into operation. This includes provisions enabling the Record of Monuments and Places to continue to have effect pending the establishment of a new Register of Monuments. A commencement order made on 31st May 2024, insofar as it relates to the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 (other than section 5), has come into operation. On 12th December 2024, further provisions of the Act came into operation, and these relate to historic wrecks and underwater archaeological objects, and also for Irish citizens (and a range of specified other persons), and vessels operating in international waters if they intend to engage in activities directed at underwater cultural heritage.

The National Monuments Act of 1930 (as amended), therefore, remains the primary means of ensuring the protection of the archaeological resource and includes 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 as well listing sites in the Register of Historic Monuments, the Record of Monuments and Places, the Sites and Monuments Record as well as 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 National Monuments 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 sites subject to Preservation Orders located within the study area.

The National Monuments (Amendment) Act, 1994 made provision for the establishment of the Record of Monuments and Places (RMP) which comprises the known archaeological sites within the State. The RMP, which is based on the earlier Register of Historic Monuments (RHM) and Sites and Monuments Record (SMR), provides county-based lists of all recorded archaeological sites with accompanying maps. All RMP sites receive statutory protection under the National Monuments Act 1994 and the DHLGH must be given two months’ notice in advance of any work proposed at their locations.

The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO in 2023 were also reviewed and none are located within County Cork.

The protection of the architectural heritage resource is provided for through a range of legal instruments that include the Heritage Act 1995 (as amended) and the Planning and Development Act 2000 (as amended). The Planning and Development Act 2000 requires all Planning Authorities to keep a ‘Record of Protected Structures’ (RPS) of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. As of the 1st of January 2000, all structures listed for protection in current Development Plans, have become ‘protected structures’. Since the introduction of this legislation, planning permission is required for any works to a protected structure that would affect its character. In addition, Local Authorities must provide for the preservation of places,

groups of structures and townscapes of architectural heritage significance through designation of Architectural Conservation Areas (ACAs).

The National Inventory of Architectural Heritage (NIAH) was established 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 relevant development plan for this project is the *Cork County Development Plan 2022-2028*. This development plan includes the following objectives in relation to the protection of the archaeological and architectural heritage resources:

**HE 16-2: Protection of Archaeological Sites and Monuments**

*Secure the preservation (i.e. preservation in situ or in exceptional cases preservation by record) of all archaeological monuments and their setting included in the Sites and Monuments Record (SMR) (see [www.archaeology.ie](http://www.archaeology.ie)) and the Record of Monuments and Places (RMP) and of sites, features and objects of archaeological and historical interest generally.*

**HE 16-4: Zones of Archaeological Potential in Historic Towns and Settlements**

*Proposed development works in Historic Towns and settlements, Zones of Archaeological Potential, Zones of Notification and the general historic environs in proximity to the zones, should take cognisance of the impact potential of the works, and all appropriate archaeological assessments employed to identify and mitigate the potential impacts.*

**HE 16-5: Zones of Archaeological Potential**

*Protect the Zones of Archaeological Potential (ZAPs) located within historic towns, urban areas and around archaeological monuments generally. Any development within the ZAPs will need to take cognisance of the upstanding and potential for subsurface archaeology, through appropriate archaeological assessment.*

**HE 16-6 Industrial and Post Medieval Archaeology**

*Protect and preserve industrial and post-medieval archaeology such as mills, limekilns, bridges, piers and harbours, water-related engineering works and buildings, penal chapels, dwellings, walls and boundaries, farm buildings, estate features, military and coastal installations. There is a general presumption for retention of these structures and features. Proposals for appropriate redevelopment including conversion should be subject to an appropriate assessment and record by a suitably qualified specialist/s*

**HE 16-9: Archaeology and Infrastructure Schemes**

*All large-scale planning applications (i.e. development of lands on 0.5 ha or more in area or 1km or more in length) and Infrastructure schemes and proposed roadworks are subjected to an archaeological assessment as part of the planning application process which should comply with the Department of Housing, Local Government and Heritage’s codes of practice. It is recommended that the assessment is carried out in advance, by an appropriately experienced archaeologist to guide the design and layout of the proposed scheme/development, safeguarding the archaeological heritage in line with Development Management Guidelines and also facilitating a viable development*

**HE 16-10: Management of Monuments within Development Sites**

Where archaeological sites are accommodated within a development it shall be appropriately conservation/ protection with provision for a suitable buffer zone and long-term management plan put in place all to be agreed in advance with the County Archaeologist.

**HE 16-11: Archaeological Landscapes**

To protect archaeological landscapes and their setting where the number and extent of archaeological monuments are significant and as a collective are considered an important archaeological landscape of heritage value.

**HE 16-12: Raising Archaeological Awareness**

As part of the Heritage Plan it is an objective to develop a management plan, if resources allow, for the archaeology of County Cork, which could include an evaluation of the Historic Character Assessment of Cork County helping to identify areas for tourism potential, and strategic research while also promoting best practice in archaeology and encouraging the interpretation, publication and dissemination of archaeological findings from the development application process.

**HE 16-13: Undiscovered Archaeological Sites**

To protect and preserve previously unrecorded archaeological sites within County Cork as part of any development proposals. The Council will require preservation in situ to protect archaeological monuments discovered. Preservation by record will only be considered in exceptional circumstances.

**HE 16-14: Record of Protected Structures**

- a) The identification of structures for inclusion in the Record will be based on criteria set out in the Architectural Heritage Protection Guidelines for Planning Authorities (2011).
- b) Extend the Record of Protected Structures in order to provide a comprehensive schedule for the protection of structures of special importance in the County during the lifetime of the Plan as resources allow.
- c) Seek the protection of all structures within the County, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. In accordance with this objective, a Record of Protected Structures has been established and is set out in Volume Two Heritage and Amenity, Chapter 1 Record of Protected Structures.
- d) Ensure the protection of all structures (or parts of structures) contained in the Record of Protected Structures.
- e) Protect the curtilage and attendant grounds of all structures included in the Record of Protected Structures.
- f) Ensure that development proposals are appropriate in terms of architectural treatment, character, scale and form to the existing protected structure and not detrimental to the special character and integrity of the protected structure and its setting.
- g) Ensure high quality architectural design of all new developments relating to or which may impact on structures (and their settings) included in the Record of Protected Structures.
- h) Promote and ensure best conservation practice through the use of specialist conservation professionals and craft persons.
- i) In the event of a planning application being granted for development within the curtilage of a protected structure, that the repair of a protected structure is prioritised in the first instance i.e. the proposed works to the protected structure should occur, where appropriate, in the first phase of the development to prevent endangerment, abandonment and dereliction of the structure.

**HE 16-15: Protection of Structures on the NIAH**

Protect where possible all structures which are included in the NIAH for County Cork, that are not currently included in the Record of Protected Structures, from adverse impacts as part of the development management functions of the County.

**HE 16-16: Protection of Non- Structural Elements of Built Heritage**

Protect non-structural elements of the built heritage. These can include designed gardens/garden features, masonry walls, railings, follies, gates, bridges, shopfronts and street furniture. The Council will promote awareness and best practice in relation to these elements.

**HE 16-18: Architectural Conservation Areas**

Conserve and enhance the special character of the Architectural Conservation Areas included in this Plan. The special character of an area includes its traditional building stock, material finishes, spaces, streetscape, shopfronts, landscape and setting. This will be achieved by;

- (a) Protecting all buildings, structures, groups of structures, sites, landscapes and all other features considered to be intrinsic elements to the special character of the ACA from demolition and nonsympathetic alterations.
- (b) Promoting appropriate and sensitive reuse and rehabilitation of buildings and sites within the ACA and securing appropriate infill development.
- (c) Ensure new development within or adjacent to an ACA respects the established character of the area and contributes positively in terms of design, scale, setting and material finishes to the ACA.
- (d) Protect structures from demolition and non sympathetic alterations.
- (e) Promoting high quality architectural design within ACAs.
- (f) Seek the repair and re-use of traditional shopfronts and where appropriate, encourage new shopfronts of a high quality architectural design.
- (g) Ensure all new signage, lighting advertising and utilities to buildings within ACAs are designed, constructed and located in such a manner they do not detract from the character of the ACA.
- (h) Protect and enhance the character and quality of the public realm within ACAs. All projects which involve works within the public realm of an ACA shall undertake a character assessment of the said area which will inform a sensitive and appropriate approach to any proposed project in terms of design and material specifications. All projects shall provide for the use of suitably qualified conservation architects/ designers.
- (i) Protect and enhance the character of the ACA and the open spaces contained therein. This shall be achieved through the careful and considered strategic management of all signage, lighting, utilities, art works/pieces/paintings, facilities etc to protect the integrity and quality of the structures and spaces within each ACA.
- (j) Ensure the protection and reuse of historic street finishes, furniture and features which contribute to the character of the ACA.

**HE 16-20: Historic Landscapes**

- a) Recognise the contribution and importance of historic landscapes and their contribution to the appearance of the countryside, their significance as archaeological, architectural, historical and ecological resources.
- b) Protect the archaeological, architectural, historic and cultural element of the historic/heritage landscapes of the County of Cork.
- c) All new development within historic landscapes should be assessed in accordance with and giving due regard to Cork County Councils 'Guidance Notes for the Appraisal of Historic Gardens, Demesnes, Estates and their Settings' or any other relevant guidance notes or documents issued during the lifetime of the Plan.

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### 15.4.2 Desktop Research and Site Surveys/Investigations

Documentary research on the recorded and potential cultural heritage resource within the study area was carried out in order to identify any recorded archaeological, architectural and other cultural heritage sites and features. This information has provided an insight into the development of the study area over time and also assisted in an evaluation of the potential presence of hitherto unrecorded cultural heritage sites or features within the proposed development site.

A series of archaeological field-walking inspections of the proposed development site was carried out during the compilation of this assessment in 2024 and 2025 and the results are detailed in Section 15.6.6 of this chapter. A geophysical survey of suitable lands with the proposed development site was also carried out by Dr Ger Dowling in August 2024 (under detection device licence no. 24R0381). The results of the geophysical survey are detailed in Section 15.6.7 of this chapter and a fully copy of the report is provided in Appendix 15.1.

The principal sources reviewed for the assessment of the recorded archaeological resource during desktop studies were the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) maintained by the National Monuments Service (NMS), Department of Housing, Local Government and Heritage (DHLGH). The current County Cork Record of Protected Structures (RPS) and structures listed in the National Inventory of Architectural Heritage (NIAH) were reviewed in order to assess the designated architectural heritage resource within the study area.

Other sources consulted in July 2025 as part of the assessment included the following:

- Cork County Development Plan 2022-2028 – This publication outlines the Council’s policies for the protection of the archaeological and architectural heritage resource within the county and includes the Record of Protected Structures (RPS) and Architectural Conservation Areas (ACAs).
- Archaeological Survey of Ireland (ASI): The National Monuments Service’s online Historical Environment Viewer ([www.archaeology.ie](http://www.archaeology.ie)) presents inventory descriptions for many (but not all) of the recorded sites in the area, as published in *Archaeological Inventory of County Cork. Volume 1: West Cork* (Dublin: Stationery Office, 1992) and also contains inventory descriptions for archaeological sites identified since the publication of that inventory. The recorded archaeological sites located within the study area are outlined in **Section 15.6.1** of this chapter.
- National Museum of Ireland Topographical Files: These files are archived in the museum premises at Kildare Street, Dublin and comprise a record of the known locations of the discovery of Irish archaeological objects. The file archive was inspected in July 2025 and it contains no entries for the location of the proposed development or its environs.
- UNESCO designated World Heritage Sites and Tentative List: A review was undertaken of the locations of the World Heritage Sites in Ireland and other significant sites included in a Tentative List (2023) nominated by Ireland for inclusion. There are no examples located within County Cork.
- The Database of Irish Excavation Reports: This database contains summary accounts of licensed archaeological excavations carried out in Ireland (North and South) from 1970 to present. Current data was accessed via [www.excavations.ie](http://www.excavations.ie) in July 2025.
- Heritage Council’s Heritage Map Viewer: This online mapping source ([www.heritagemaps.ie](http://www.heritagemaps.ie)) collates various cultural heritage datasets sourced from, among others, the National Monuments Service, National Museum of Ireland, Local Authorities, and the Office of Public Works.
- Literary Sources: Published literary sources consulted to assess the archaeological, historical, architectural heritage and folklore record of the study area are listed in **Section 15.17** of this chapter.

- Cartographic sources: Available cartographic depictions of the study area dating from the 17th century onward were reviewed and relevant extracts are presented in **Section 15.6.3** of this chapter.
- Aerial/Satellite/LiDAR imagery: A review of publicly accessible imagery from Tailte Éireann, Google Earth, and Bing Maps was carried out to appraise whether they revealed evidence for any unrecorded archaeological sites within the proposed development site or its environs. LiDAR datasets published on the Geological Survey Ireland’s Open Topographic Viewer website were also consulted and relevant image extracts are presented in **Section 15.6.4** of this chapter.
- 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.
- *National Museum of Ireland Topographical Files*: These files comprise a written and digital database which records known information in relation to the discovery locations of Irish archaeological artefacts, including those held in the museum’s

### 15.4.3 Consultation

A programme of archaeological test trenching is scheduled to be carried out within the proposed development site. The test trenching plan was provided to Annette Quinn, archaeologist with Cork County Council for review and she approved this plan in May 2025. An application for an excavation licence for this test trenching investigation will be made to the National Monuments Service (NMS). A report on the results of this site investigation will be submitted to the NMS, the Cork County Council Archaeologist, and the Planning Authority once onsite works have been completed.

### 15.4.4 Impact Assessment

The methodology used for the assessment of potential impacts has been informed by the Environmental Protection Agency (EPA) *Guidelines for Information to be Contained in EIAR* (2022), 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 used to assess impacts is provided to 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* 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
- Reversible: Effects that can be undone, for example through remediation or restoration

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Quality of 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 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.
- 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)
- Types of Effect on the cultural heritage resource can be direct, indirect or no predicted impact.
- Direct impact: 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 impact: where a cultural heritage site or its setting is located in close proximity to the footprint of the proposed development.
- No predicted impact: where the proposed development will not adversely or positively affect a cultural heritage site.

Other Types of Effect include:

- Cumulative: Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
- ‘Do-nothing Effects’ - The cultural heritage environment as it would be in the future should the 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.

The *Magnitude of Effect* is based on the degree of change, incorporating any mitigation measures, and is based on a consideration of the character, duration, probability and consequences (**Table 15-1**). The magnitude 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 descriptions of magnitudes presented in **Table 15-1** are based on guidance published in *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 16-7).

**Table 15 1: Magnitudes of Effect on Cultural Heritage Assets**

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</p> <p>Major changes to area 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 setting 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> <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;</p> <p>Very minor changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.</p>

The *Value/Sensitivity* assigned to cultural heritage assets for the purposes of this assessment are intended as indicators which contribute to a wider judgment based on the individual circumstances of each asset. Other than the level of legal designations, e.g., National Monuments and recognition as World Heritage sites, there is no formal grading or rating system for Irish archaeological monuments or architectural heritage structures. The non-statutory NIAH does apply a ranking system (Regional, National and International) to structures included in that inventory and, while these rankings do not confer a graduated level of statutory protection they have been utilised as a value indicator for NIAH-listed structures for the purpose of this assessment.

The criteria for assessing the value/sensitivity of archaeological and other cultural heritage assets as part of this assessment has been informed by the *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 14-16). The Value of known or potential cultural heritage assets are ranked according to the following scale: Very High, High; Medium; Low and Negligible (**Table 15-2**). Generally, the more criteria that are evident for a given asset, the higher in scale its respective Value is deemed to be. Criteria considered in addition to legal designations include condition / preservation; documentary / historical significance; group value; rarity; visibility in the landscape; fragility / vulnerability and amenity value. Archaeological sites which possess little, or no surface expressions may retain low-medium sensitivity to effects on their wider setting while levelled archaeological sites that retain no visible surface traces, including those that have been subject to full archaeological excavation, are typically not sensitive to setting effects. It is noted that archaeological sites, whether extant or levelled, have the potential to possess sub-surface attributes, including artefacts and other archaeological remains, which may possess values that cannot be discerned without recourse to archaeological excavation but are unlikely to be affected in the absence of direct effects.

The values assigned to the identified cultural assets within the study area were determined following the completion of the desktop study combined with site inspections and are identified in **Section 15.5** of this chapter.

**Table 15 2: Guidance Criteria For Assessing Value of Cultural Heritage Assets**

Indicative Value/ Sensitivity	Examples of Asset Types
Very High (International Significance)	World Heritage Sites (including Tentative List properties) Sites, buildings or landscapes of acknowledged international importance Intangible associations with individuals or innovations of global significance
High (National Significance)	Nationally designated sites, buildings and landscapes of significant quality, rarity, preservation and importance Undesignated assets of the quality and importance to be designated Assets that can contribute significantly to acknowledged national research objectives Archaeological Landscapes with significant group value Intangible associations with individuals or innovations of national significance
Medium (Regional Significance)	Designated or undesignated assets that can contribute significantly to regional research objectives, including buildings that can be shown to have exceptional qualities in their fabric or historical associations  Conservation Areas and historic townscapes containing buildings that contribute significantly to its historic character  Intangible associations with individuals or innovations of regional significance

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Indicative Value/ Sensitivity	Examples of Asset Types
Low (Local Significance)	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 Historic Townscape or built-up areas of limited historic integrity in their buildings and settings Intangible associations with individuals or innovations of local significance
Negligible	Assets with very little or no surviving archaeological interest Landscapes little or no significant historical interest  Buildings or urban areas of no architectural or historical note; buildings of an intrusive character
Unknown Potential	Assets whose importance has not been ascertained  Buildings with some hidden (i.e., inaccessible) potential for historic significance

The *Significance of Effects* is assessed based on a consideration of the Magnitude of the Impact (graded from High to Negligible, based on a consideration of character, duration, probability and consequences) combined with the Value (graded from High to Negligible, based on a consideration of significance/sensitivity) of the cultural heritage asset. The significance can be described as Profound, Very Significant, Significant, Moderate, Slight, Not Significant or Imperceptible (**Table 15-3** and **Table 15-4**).

**Table 15 3: Description of Significance of Effects (per EPA EIAR 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 15 4: Significance of Effects Matrix (based on EPA EIAR Guidelines 2022)

Magnitude of Impact	High	Not Significant/ Slight	Moderate/ Significant	Significant/ Very Significant	Very Significant/ Profound
	Medium	Not Significant	Slight	Moderate/ Significant	Significant/ Very significant
	Low	Not Significant/ Imperceptible	Slight/ Not Significant	Slight	Moderate
	Negligible	Imperceptible	Not Significant/ Imperceptible	Not Significant/ Slight	Slight
		Negligible	Low	Medium	High
Value/Sensitivity of Asset					

### 15.5 Difficulties Encountered

Localised areas of land within the proposed development site were disturbed and/or occupied by topsoil mounds associated with development works in adjoining fields and were not accessible during the geophysical survey. No other difficulties were encountered during the compilation of this assessment.

### 15.6 Baseline Environment

#### 15.6.1 Archaeological Context

##### 15.6.1.1 Overview

There are no recorded archaeological sites within the proposed development site while there are 37 examples located within the surrounding 1km study area (Table 15-5 and Figure 15-1). The closest of these sites to the proposed development site is a standing stone (CO110-024----), which is located c.80m to the south. One of the sites in the study area is a *redundant record*, this refers to a mill that was depicted on a single 17<sup>th</sup> century map, and it has not been determined whether it was ever built or was merely planned.

The proposed development is located c.310m outside the Zone of Archaeological Potential surrounding the historic core of Bandon town as defined by the National Monuments Service. The majority of the recorded archaeological sites within the 1km study area are located within Bandon town centre, which was established in the early 17<sup>th</sup> century, and as described below, these sites date to the post-medieval period and are located at approximate distances of 300m-900m from the proposed development site. As detailed in the following sections, a number of the recorded archaeological sites located outside of the town date to earlier periods and include two standing stones, a *fulacht fia*, an earthwork, a church site and two holy wells.

Table 15 5: Recorded Archaeological Sites in 1km Study Area

Monument No.	Monument Class	Townland	Condition	Distance from site
CO096-064001-	Church	Kilbrogan	Extant	610m to NW
CO096-064002-	Graveyard	Kilbrogan	Extant	580m to NW
CO110-019001-	Historic town	Coolfadda, Gully	Elements extant	585m to SW
CO110-019003-	Brewery	Gully	Extant	915m to SW
CO110-019005-	Graveyard	Gully	Extant	850m to SW
CO110-019006-	Church	Gully	Extant	840m to SW
CO110-019007-	Graveyard	Coolfadda	Extant	380m to SW
CO110-019008-	Church	Coolfadda	Extant	385m to SW
CO110-019009-	Bridge	Coolfadda, Gully	Extant	425m to SSW
CO110-019010-	Church	Cloghmacsimon	Extant	470m to SSW
CO110-019011-	Church	Knockbrogan	Extant	375m to SSW
CO110-019013-	Barracks	Coolfadda	Partially extant	560m to SW
CO110-019014-	Town defences	Gully	Elements extant	370m to SW
CO110-019015-	Earthwork	Coolfadda	Levelled	360m to SW
CO110-020----	Shambles	Coolfadda	Extant	500m to SW
CO110-021001-	Church	Kilbrogan	Levelled	660m to WNW
CO110-021002-	Ritual site - holy well	Kilbrogan	Extant	640m to WNW
CO110-021003-	Ritual site - holy well	Kilbrogan	Extant	635m to WNW
CO110-024----	Standing stone	Knockbrogan	Extant	80m to South
CO110-025001-	Brewery	Knockbrogan	Elements extant	340m to South
CO110-025002-	Gasworks	Cloghmacsimon	Elements extant	410m to South
CO110-026----	Standing stone	Cloghmacsimon	Extant?	740m to SSE
CO110-035----	Burial ground	Clogheenavodig	Levelled	840m to SSE
CO110-037----	Distillery	Moanarone	Extant	660m to SE
CO110-038----	Fulacht fia	Ballylangley	Appears removed	600m to E
CO110-091----	Cross - Market cross	Coolfadda	Appears removed	470m to SW
CO110-092----	Mill - unclassified	Coolfadda	Partially extant	605m to SW
CO110-093----	Redundant record	Coolfadda	n/a	545m to SW
CO110-094----	Prison	Coolfadda	Possible partially extant	430m to SSW
CO110-095----	Bridge	Coolfadda, Gully	Partially extant	435m to SSW
CO110-096----	Market-house	Gully	Levelled	685m to SW
CO110-097----	Mill - unclassified	Cloghmacsimon	Appears removed	820 m to SW
CO110-098----	Market-house	Coolfadda	Appears removed	475m to SW
CO110-099----	Bridge	Coolfadda, Gully	Removed	580m to SW
CO110-100----	Bridge	Gully	Extant	590m to SSW
CO110-101----	Bridge	Gully	Extant	560 m to SW
CO110-110----	House - 17 <sup>th</sup> century	Coolfadda	Extant	460m to SW

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CO110-038----

Class: *Fulacht fia*

Townland: *BALLYLANGLEY*

Description: *Spread of burnt material (min. diam. 10m) beside stream in flat waste ground beside main Cork/Bandon road; now very overgrown.*

#### 15.6.1.4 The 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 12<sup>th</sup> century (c. AD 400–1169). 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 ecclesiastical sites and associated features such as graveyards and holy wells. The early medieval church sites were morphologically similar to settlement sites of the period but are often differentiated by the presence of features such as church buildings, graves, stone crosses and shrines. While this period saw the emergence of the first phases of urbanisation around the large monasteries and Hiberno-Norse ports, the dominant settlement pattern continued to be rural-based and centred around enclosed earthwork farmsteads known as ringforts. These are the most common early medieval sites within the Irish landscape and comprise circular enclosures delimited by earthen banks formed by soils thrown up from a concentric external ditch. Their stone-built equivalents, which are concentrated in western counties, are known as cashels and comprise enclosures constructed with drystone walling. The ubiquity of these enclosures within the Irish landscape is attested to by the fact that their original Gaelic names (*rath, lios, dun, caiseal*) still form the roots of some of the most common place-name elements in the country. Archaeological excavations have demonstrated that the majority comprised enclosed farmsteads containing the foundations of domestic and agricultural buildings. The enclosures may form the visible element of wider farmlands (known as *airlise*) that may contain unrecorded, sub-surface archaeological features such as associated field systems, stockades, barns, mills and drying kilns. The ASI also designates certain archaeological sites with no diagnostic features which would allow accurate classification as 'enclosures'. While sites assigned this classification can theoretically date from any period from late prehistory onward, the potential exists that many may form the remains of ringforts.

An earthwork (CO110-019015-) within the study area may date to the early medieval period.

CO110-019015-

Class: *Earthwork*

Townland: *COOLFADDA*

Description: *This record refers to a 'Danish entrenchment or fort' recorded by O Ríordáin (1932, 18-19) and Smith (1815, 237) as being the location on which the Church of Ireland Church (CO110-019008-) was erected. This possible earthwork was referred to in the 'Archaeological Inventory of County Cork - vol. 1 West Cork' (1992, 369) under the entry (no. 3344) for the Church of Ireland church (CO110-019008-).*

Some of the churches and graveyards within the study area may also have their origins in the early medieval period.

#### 15.6.1.5 Late and Post-Medieval Periods

The arrival of the Anglo-Normans in the late 12<sup>th</sup> century broadly marks the advent of the Irish high medieval period which continued to c.1400 and was followed by the late medieval period which extended to c.1550. 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 throughout the country, often within the environs of Anglo-Norman manorial centres which were defended by masonry castles. By the 15<sup>th</sup> century the native Irish chieftains and lords began to construct tower-house castles within their own landholdings as centres of territorial control. There are no known archaeological sites dating to the late or high medieval periods located within the study area and there is also little historical information on the settlement and land-use patterns within the study area during these periods.

The centuries following 1550 comprise the post-medieval period which continued into the middle of the 19<sup>th</sup> century and the period thereafter is often described as early modern. The first century of the post-medieval period was a turbulent time in Ireland history and saw a prolonged period of wars between the 1560s and 1603 with further conflicts arising during the Cromwellian Wars (1649–53). This period saw the extensive dispossession of forfeited Gaelic lands and the final disintegration of the Gaelic order in the early 17<sup>th</sup> century followed the Battle of Kinsale (1601), the conclusion of the Nine Years War (1603) and the Flight of the Earls (1607).

The town of Bandon was established in the early 17<sup>th</sup> century and the existing town developed from two separate early 17<sup>th</sup>-century unenclosed settlements located on either side of the river, with Bandon Bridge on the south bank and Coolfadda on the north bank. These two settlements were purchased by Richard Boyle, Earl of Cork, in 1613 who oversaw the construction of town walls between 1620 and 1627. The town walls stood until 1689 when they were partially demolished by Jacobite forces, and the former northeast corner is the nearest section to the proposed development site which is located c.370m to the northeast. The historic town (CO110-019001-) and town defences (CO110-019014-) are both recorded archaeological sites, while many other sites in the town that were associated with of the economic, industrial, religious and social history of the settlement have also been listed as recorded archaeological sites and date from the 17<sup>th</sup> century onward (Table 15.5).

CO110-019001-

Class: *Historic town*

Townland: *COOLFADDA, GULLY*

Description: *On N and S banks of Bandon river, walled town created in early decades of 17<sup>th</sup> century under the patronage of Richard Boyle, Earl of Cork. The town today is largely of 19<sup>th</sup>-century character; apart from Christ Church (3344) no buildings of 17<sup>th</sup> century survive; however, sections of town wall can still be traced. No remains of wall on N side of river apart from short section to rear of house on E side of North Main Street and possibly the core of the N boundary wall to graveyard at Christ Church. South of river are more extensive remains: two runs of E wall (for 22m and 11.5m) between St. Patrick's Hill and Casement Road; most of S wall replaced by later wall on same line but probable original section (L c. 20m) on steps up to Catholic Church from Market Street; another stretch (L 24.3m) along E side of Church Street; E, S and W boundary wall of St Peter's Church (3351) on line of wall and batter at base of S wall may be original feature; best preserved sections are two lengths of W wall as it approaches river to N: running due S from river bank 18m stretch (wall thickness 2.75m) to 5.5m gap, then 70m stretch (wall thickness 3.5m) running in SW direction; the wall itself is low (H c. 1m) with narrow walls (H c. 1.5m; thickness c. 0.45m) along inner and outer edge forming narrow walkway. No defensive features are preserved and no trace of town's gates (CO110-019002-). (Connolly 1985, 55-60; MacCarthy-Morrogh 1986, 55-62; O'Flanagan 1988, 1-16)*

CO110-019014-

Class: *Town defences*

Townland: *GULLY*

Description: *(same description as CO110-019001- : Historic town, as outlined above)*

15.6.1.6 Database of Irish Excavation Reports

The Excavation Database ([www.excavations.ie](http://www.excavations.ie)<sup>4</sup>) contains summary accounts of all licenced archaeological investigations carried out in Ireland (North and South) from 1970 onwards. The database contains a total of 5 no. of entries of archaeological excavations (including test excavations) undertaken within the townland of Knockbrogan, County Cork, two of which encountered archaeological material. Both entries in which archaeological remains were recorded relate to an earlier phase of the proposed development scheme. In 2021 ahead of the earlier phase of the proposed development located to the west of the subject site, archaeological testing (Licence No. 21E0699) was carried out subsequent to a geophysical survey (Detection Device Licence no. 21R0195). Following on from this programme of testing, four separate areas of excavation were opened (Licence No. 23E0791). Two of these areas, B and C contained cut features and artefacts including pottery sherds and stone tools. Radiocarbon dates from both areas place the activity at this site within the Late Bronze Age period. More recently in the area to the northwest of the proposed development a programme of archaeological testing (License No. 24E0360) was carried out ahead of a residential development with nothing of archaeological significance being found. All licences and descriptions from the database are presented in **Table 15-6** below.

**Table 15 6: Details of archaeological excavations in Knockbrogan townland, from excavations.ie**

Licence No. & Author	Description Name
21E0699 Pádraig Dunne	<p><i>Eighteen archaeological test trenches, totalling 981m in length, were excavated at a land parcel (proposed housing development site) within Knockbrogan townland, Bandon, County Cork. These works were carried out subsequent to a programme of geophysical survey within the site (detection device licence 21R0195). In general, the ploughsoil within the excavated trenches consisted of a dark-brown sandy clay with occasional modern inclusions present to the base, including sherds of modern ceramics, glass and other modern detritus. The ploughsoil was up to 0.7m deep towards the lower slopes of the fields and 0.4m deep along upper slopes of the fields. The underlying natural subsoil consisted of a mottled, orange/brown clayed sand with frequent bands of gravel, shale and localised bedrock outcrops. It was highly disturbed in places, presumably due to a combination of ploughing and land improvement works. The upcast ploughsoil from all the excavated trenches was scanned by a discriminating detection device (21R0249) and no potential archaeological artefacts were uncovered.</i></p> <p><i>In total, 10 potential archaeological features were identified in five of the excavated test trenches (Trenches 1, 9, 11, 12, and 15). Manual investigation revealed post-medieval pottery sherds of potential 17<sup>th</sup>/18<sup>th</sup>-century date within the upper surfaces of two potential features: curvilinear feature T11/F01; and linear feature T12/F01. The remaining potential features consisted of an alignment of five possible post-/stake-holes in the centre of T15 and an isolated hearth at the eastern end of the trench. Another isolated possible pit feature was uncovered at the southern end of T9, towards the south-eastern corner of the proposed development site.</i></p>

<sup>4</sup> Correct as of 28 July 2025

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*An archaeological excavation at Knockbrogan, Bandon, County Cork followed the discovery of several discrete features of archaeological potential within the site during a programme of geophysical survey (21R0195), and a subsequent programme of archaeological testing (21E0699). The geophysical survey identified several anomalies that were considered to potentially be archaeological in nature.*

*Four areas with features of archaeological potential were identified during the programme of test trenching and these were investigated and excavated in October 2023. These are referred to as Areas A, B, C and D.*

*Artefacts – all Area B*

*The stone artefacts recovered from Area B were an incomplete saddle quern (23E0791:3) and a perforated stone disc (23E0791:2). The saddle quern is of a type that was in use throughout the Neolithic and Bronze Age, but most frequently associated with Late Bronze Age sites. The perforated stone object may not have been a completed piece, and instead be a roughout that was never finished. It is similar to stone objects that have been identified from Late Bronze Age sites including Knockadoon, Lough Gur, County Limerick and Ballyveelish, County Tipperary. Its most likely intended purpose was as a spindle whorl for use in the production of yarn.*

*Area B*

*110 cut features were excavated in Area B, consisting of pits, post- and stake-holes, all within an area of 10m x 7m. No occupation layers survived, which could have given an indication of the interior of any potential structures. In addition, a range of east-to-west orientated furrows cut into the level at which the features were found and may have destroyed other more shallow features.*

23E0791  
Peter Looney

*There was without doubt some form of at least temporary structure or structures within the site, though it is not certain exactly what form this may have taken. A number of potential circular and rectangular shapes can be feasibly seen by connecting three or more of the cut features.*

*Artefacts recovered from Area B, consisting of pottery and two stone artefacts, gave a preliminary prehistoric date range for the site during the excavation.*

*Area C*

*A smaller collection of features, two pits and two stake-holes, were excavated in Area C, c. 75m to the east of the activity in Area B. No artefacts were recovered from that Area, meaning that a general date range for the activity was difficult to estimate during the excavation.*

*Radiocarbon Dates*

*Radiocarbon dates were returned from samples taken during the excavation, two from Area B and one from Area C. Though small in number, the three dates returned were all close, dating to the Late Bronze Age (988- 832 cal BC, 987- 831 cal BC, 1000- 890 cal BC – 2 sigma). From the radiocarbon dates, it is likely that the activity in Areas B and C was contemporary and that the activity at the site during the Late Bronze Age was short-lived. This may represent a temporary camp and the material culture was domestic in nature and related to settlement.*

*Three charcoal samples were analysed from samples taken at Areas B and C. Three native Irish tree taxa were identified with oak the most commonly occurring, followed by hazel and with a single example of ash identified.*

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23E0791  
Peter  
Looney

Three charcoal samples were analysed from samples taken at Areas B and C. Three native Irish tree taxa were identified with oak the most commonly occurring, followed by hazel and with a single example of ash identified.

Artefacts – all Area B

The stone artefacts recovered from Area B were an incomplete saddle quern (23E0791:3) and a perforated stone disc (23E0791:2). The saddle quern is of a type that was in use throughout the Neolithic and Bronze Age, but most frequently associated with Late Bronze Age sites. The perforated stone object may not have been a completed piece, and instead be a roughout that was never finished. It is similar to stone objects that have been identified from Late Bronze Age sites including Knockadoon, Lough Gur, County Limerick and Ballyveelish, County Tipperary. Its most likely intended purpose was as a spindle whorl for use in the production of yarn.

The pottery, 70 sherds in total, was all recovered from the same pit in Area B and all representative of the same vessel (23E0791:4-73). The entire vessel was not present. The vessel is consistent with Late Bronze Age pottery in Ireland. It had a simple rim and likely a flat base, though the intersection of body and base was not present. The pottery had a coarse fabric and no decoration was identifiable. This pottery is similar to pottery found in Late Bronze Age sites.

The presence of pottery is an indication of food storage or preparation at the site, though no charred food remains were identified on any of the pottery sherds. The saddle quern indicates the processing of grain for food production, while if the perforated stone object is a spindle whorl, this indicated the processing of yarn for clothing of other purposes.

The pottery and the two stone tools are all consistent with the Late Bronze Age radiocarbon dates returned for the site and together indicate that the archaeological features at the site represent a single and brief phase of activity at the site in the Late Bronze Age.

Remainder of site area

The potential features that had been identified during testing in Areas A and D were investigated and deemed to not be archaeological in nature, while no additional archaeological features were identified during the monitoring of topsoil removal in the remainder of the site.

Conclusion

This Late Bronze Age site contributes to our understanding of the time period in the Bandon area. There are dated, contemporary sites in the wider area, including at Clashanimud Hillfort, while there are also closer features that may be contemporary, these consist of standing stones and fulachtaí fia. Settlement or camp sites such as this site at Knockbrogan are less prominent in the landscape and are generally not identifiable without significant archaeological investigations. In the case of this site, the excavation followed a programme of archaeological geophysics and then test trenching. It is plausible that many more sites similar to this may be located within the wider area.

24E0360  
Peter  
Looney

A programme of archaeological test trenching was carried out at the location of a proposed residential development site at Cork Road in the townland of Knockbrogan, Bandon, County Cork. The works entailed the archaeological excavation of 23 trenches with a combined length of 1,125m, some of which targeted anomalies identified from a geophysical survey (detection device licence 23R0537) that was undertaken at the site.

Natural subsoil was identified at a depth of between 0.2m and 0.65m below modern surface level within the excavated trenches. Twelve of the trenches targeted anomalies that had been identified from the geophysical survey of the site, though none of these anomalies were found to relate to archaeological features. While evidence of agricultural activity was revealed in all of the excavated trenches, nothing of archaeological significance was encountered during the testing programme.

24E0901,  
24R0437  
Magda  
Lynne

The groundworks associated with the Bandon FRS – Hydrometric Station were subject to archaeological monitoring, which included the excavation of a pipe trench. The material removed measured up to 0.9m. To facilitate the work, the upper portion of the embankment was removed, and sandbags were used to restrict the water level within the groundworks area. Riverbed gravels with small and large water-rolled pebbles measuring between 0.15-0.2m in depth were removed onto the bedrock. Subsequently, a breaker was used. The area of groundworks and spoils removed was scanned with a metal detector, a Garrett

ATX; there were no responses requiring further investigation.

The work is now complete. No further archaeological mitigation is required.

02E0030  
Máire Ní  
Loingsigh

Testing took place at this site outside the north-east angle of Bandon town wall as part of an application to construct three dwelling-houses. Three trenches were excavated to depths of 0.6–1m along the lines of the house foundations. The fill of these trenches consisted entirely of redeposited modern rubble and debris mixed with topsoil. This material probably dates from levelling of the site in the last quarter of the 20th century.

15.6.2 Architectural Heritage

There are no designated architectural heritage structures located within the proposed development site and there are no structures of any date within its boundary. Additionally, no buildings within the boundary of the proposed development are depicted on the reviewed historic Ordnance Survey maps (Section 15.6.3). The closest building to the proposed development site that is listed by the National Inventory of Architectural Heritage (NIAH) is located c.150m outside of the site boundary.

The proposed development site is not located within an Architectural Conservation Area (ACA) as per the Cork County Development Plan 2022-2028. There are seven ACAs within the environs of Bandon, including the Knockbrogan East Conservation Area, which is located c.210m to the south of the proposed development site. There are 188 structures listed by the NIAH within 1km of the proposed development site, the majority of which are to the southwest within the centre of Bandon town. There are also 49 no. protected structures, as listed in the Cork County Development Plan 2022-2028, located in the 1km study area. A total of 38 no. of these correspond to structures also listed by the NIAH (Table 15-7). Figure 15.2 provides an overview of the location of these architectural heritage constraints in relation to the proposed development and detailed mapping of these constraints have been published online and are available for review on the Heritage Council’s ‘Heritage Maps Viewer’<sup>5</sup>.

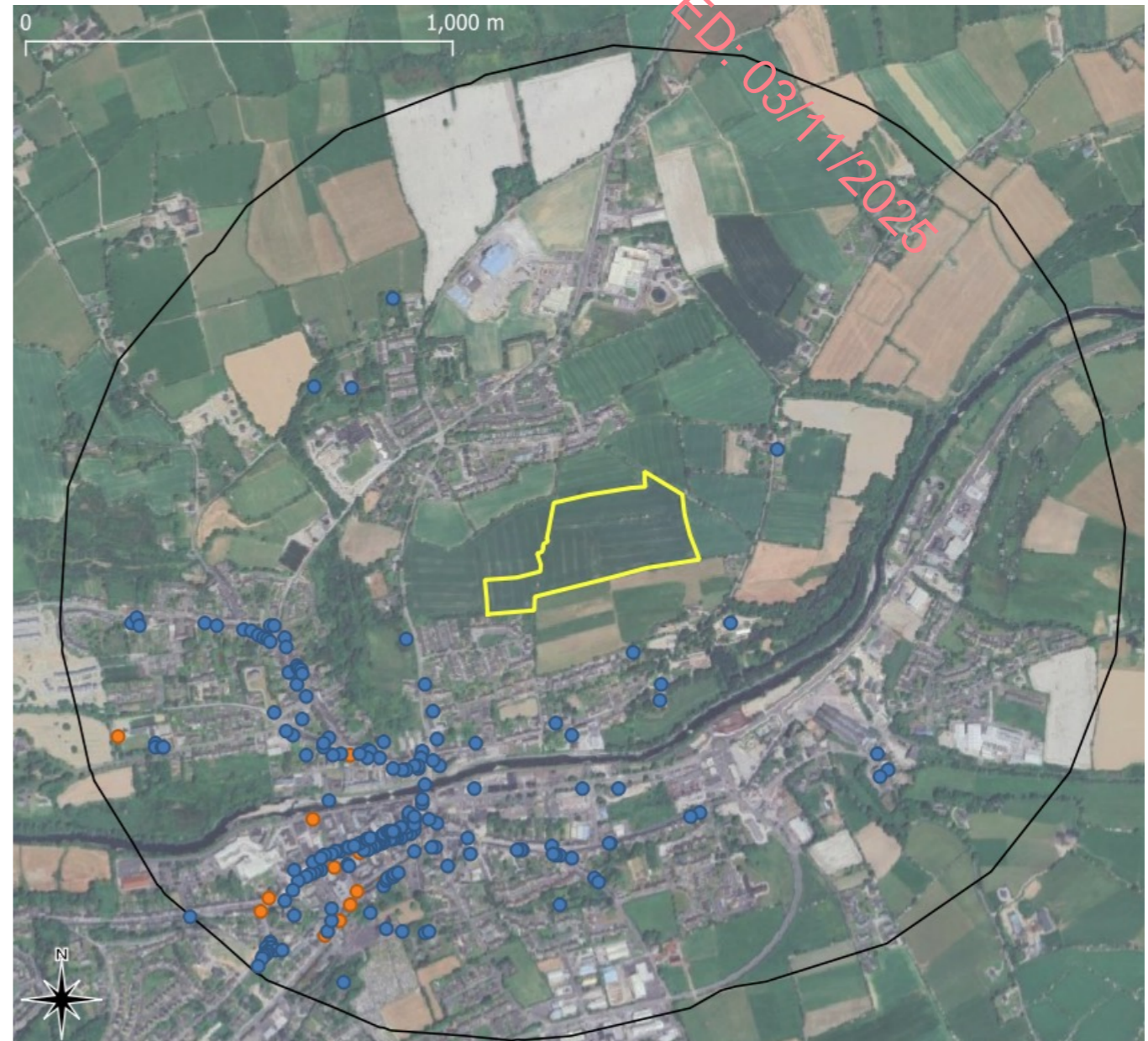


Figure 15 2: NIAH listed sites within study area (blue dots) Protected Structures that are not also NIAH-listed are marked by orange dots

<sup>5</sup><https://www.heritagemaps.ie/>

Table 15 7: Designated architectural heritage structures within 100m of site

RPS no.	NIAH	Name	Distance from development
n/a	20844001	Presentation Convent chapel, Convent Hill	830m to West
n/a	20844002	Post box, Convent Hill	820m to West
n/a	20844003	Presentation Convent, Convent Hill	815m to West
n/a	20844004	House, 25 Convent Hill	665m to West
n/a	20844005	House, 20 Convent Hill	635m to West
n/a	20844006	House, 14 Convent Hill	570m to West
n/a	20844007	Post box, Convent Hill	555m to West
n/a	20844008	House, 7 Convent Hill	545m to West
n/a	20844009	House, 4 Convent Hill	530m to West
n/a	20844010	House, 2 Convent Hill	520m to West
n/a	20844011	House, 1 Convent Hill	515m to West
n/a	20844012	House, 10 Kilbrogan Hill	490m to WSW
n/a	20844013	House, 5 Kilbrogan Hill	480m to WSW
n/a	20844014	Cobbles/flags/paving/kerbing, Kilbrogan Hill	460m to WSW
962	20844016	House, Hamilton High School, Allen Square	835m to WSW
962	20844017	House, Hamilton High School, Allen Square	835m to WSW
962	20844018	House, Hamilton High School, Allen Square	825m to WSW
962	20844019	House, Hamilton High School, Allen Square	825m to WSW
n/a	20844020	House, 2 Kilbrogan Place	510m to West
n/a	20844021	House, 1 Kilbrogan Place	500m to West
n/a	20844022	House, 21-22 Kilbrogan Hill	480m to West
976	20844023	Kilbrogan House, 20 Kilbrogan Hill	480m to West
n/a	20844025	House, 13E Kilbrogan Hill	465m to WSW
n/a	20844026	House, 14E Kilbrogan Hill	460m to WSW
n/a	20844027	House, 13 Kilbrogan Hill	455m to WSW
n/a	20844028	House, 12 Kilbrogan Hill	460m to WSW
n/a	20844029	Water pump, Emmet Row	470m to SW
n/a	20844032	House, 15 North Main Street	425m to SW
n/a	20844033	House, 14 North Main Street	425m to SW
1368	20844034	Gates/railings/walls, West Cork Heritage Centre, North Main Street	420m to SW
701	20844035	Church/chapel, West Cork Heritage Centre, North Main Street	385m to SW
n/a	20844038	Bandon Post Office, Seán Hales Place	360m to SW
n/a	20844039	Seán Hales Monument, Seán Hales Place	379m to SW

RPS no.	NIAH	Name	Distance from development
n/a	20844040	House, Glen View, Cork Road	200m to West
n/a	20844042	House, Cork Road	220m to SW
n/a	20844043	House, 1 Knockbrogan Park Lower	260m to SW
n/a	20844044	House, 6 Cork Road	320m to SW
n/a	20844045	House, 15 Watergate Street	305m to South
n/a	20844048	Watergate National School, 3 Watergate Terrace	270m to South
n/a	20844052	House, Summerhill, Lovell's Hill	180m to South
n/a	20844053	Country house, Ardnacarrig House, Lovell's Hill	160m to SE
n/a	20844054	Gate lodge, Ardnacarrig House, Lovell's Hill	270 m to South
n/a	20844055	House, Eversleigh, Watergate Street	305m to South
n/a	20844058	Miller's house, The Haven, Watergate Street	305m to South
n/a	20844061	Church/chapel, Riverside Hall, Watergate Street	375m to SSW
n/a	20844062	School, Allin Institute, Seán Hales Place	365m to SSW
952	20844063	Bandon Bridge	425m to SSW
n/a	20844064	Store/warehouse, Glasslinn Road	410m to South
n/a	20844065	Bridge	505m to SSW
n/a	20844067	House, 21 Oliver Plunkett Street	555m to South
n/a	20844069	House, 39 Oliver Plunkett Street	550m to South
n/a	20844070	Railway station, Glasslinn Road	455m to South
n/a	20844071	1916 Rising Monument, Connolly Street	585m to South
n/a	20844072	House, 1 Connolly Street	585m to South
n/a	20844073	House, 14 Connolly Street	575m to South
n/a	20844074	House, 13 Connolly Street	575m to South
n/a	20844075	House, 2 Parnell Street	585m to South
n/a	20844076	House, 13 Parnell Street	645m to South
n/a	20844077	House, 15 Parnell Street	645m to South
n/a	20844078	The Manse, Parnell Street	690m to South
n/a	20844079	House, Glasslyn, 35 Oliver Plunkett Street	575m to South
n/a	20844080	House, 34 Oliver Plunkett Street	575m to South
n/a	20844081	House, 23 Oliver Plunkett Street	555m to South
n/a	20844082	House, 22 Oliver Plunkett Street	555m to South
n/a	20844083	House, 20 Oliver Plunkett Street	555m to South
n/a	20844084	House, D.P. McSweeney, Oliver Plunkett Street	525m to South
n/a	20844085	House, 1 Shannon Lodge	560m to SSW
n/a	20844086	House, 2 Shannon Lodge	565m to SSW

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RPS no.	NIAH	Name	Distance from development
n/a	20844087	House, 5 Casement Road	600m to South
n/a	20844088	Presbytery/parochial/curate's house, Catholic Church of the Immaculate Conception and Saint Patrick, Saint Patrick's Place	760m to SSW
n/a	20844089	Presbytery/parochial/curate's house, Catholic Church of the Immaculate Conception and Saint Patrick	755m to SSW
941	20844090	Catholic Church of the Immaculate Conception and Saint Patrick	775m to SSW
n/a	20844091	House, Belle View	930m to SSW
973	20844097	House, P. Keohane, New Road	840m to SW
n/a	20844098	House, New Road	815m to SW
956	20844099	Church/chapel, Ballymodan National School, Saint Patrick's Quay	680m to SSW
n/a	20844100	Gates/railings/walls, Catholic Church of the Immaculate Conception and Saint Patrick	750m to SSW
992	20844101	House, 6 Saint Patrick's Quay	665m to SSW
n/a	20844102	House, 5 Saint Patrick's Quay	660m to SSW
n/a	20844103	House, 4 Saint Patrick's Quay	650m to SSW
n/a	20844104	House, 3 Saint Patrick's Quay	645m to SSW
n/a	20844105	House, 2 Saint Patrick's Quay	645m to SSW
n/a	20844106	Gates/railings/walls, Catholic Church of the Immaculate Conception and Saint Patrick	770m to SSW
n/a	20844107	Bridge	580m to SSW
n/a	20844108	Water pump, Bridge Lane	530m to SSW
n/a	20844109	House, 100 South Main Street	545m to SSW
n/a	20844110	House, 99 South Main Street	550m to SSW
n/a	20844111	Shop/retail outlet, 96 South Main Street	560m to SSW
n/a	20844112	House, 95 South Main Street	565m to SSW
n/a	20844113	House, 94 South Main Street	565m to SSW
n/a	20844114	House, 93 South Main Street	570m to SSW
n/a	20844115	House, 92 South Main Street	570m to SSW
n/a	20844116	House, Crowley, 90 South Main Street	585m to SSW
n/a	20844117	House, T. O'Leary, 89 South Main Street	590m to SSW
n/a	20844118	House, 88 South Main Street	595m to SSW
n/a	20844119	House, O'Farrell, 87 South Main Street	595m to SSW
n/a	20844120	House, O'Farrell, 86 South Main Street	600m to SSW
n/a	20844121	House, 85 South Main Street	605m to SSW
n/a	20844122	House, 84 South Main Street	610m to SSW
n/a	20844123	House, 83 South Main Street	620m to SSW

RPS no.	NIAH	Name	Distance from development
n/a	20844124	House, 82 South Main Street	625m to SSW
n/a	20844127	House, 1 Market Street	670m to SW
n/a	20844128	House, 2 Market Street	675m to SW
n/a	20844129	House, South Main Street	715m to SW
1192	20844130	House, 67 South Main Street	720m to SW
1191	20844131	House, 66 South Main Street	730m to SW
1190	20844132	House, Old Bank House, South Main Street	735m to SW
n/a	20844133	House, Saint Patrick's Place	785m to SW
n/a	20844134	House, 64-65 South Main Street	745m to SW
944	20844135	House, 62 South Main Street	765m to SW
1392	20844136	Gates/railings/walls, Saint Peter's Church (Ballymodan)	825m to SW
945	20844137	Saint Peter's Church (Ballymodan)	840m to SW
n/a	20844138	Officer's house, 3 Hill View	920m to SW
n/a	20844139	Officer's house, 4 Hill View	925m to SW
970	20844140	Arch, Kingston Buildings	940m to SW
n/a	20844141	House, Portal House, Kingston Buildings	930m to SW
n/a	20844142	House, Kingston Buildings	925m to SW
n/a	20844143	Woodgreen House, Kingston Buildings	920m to SW
n/a	20844144	Barracks, 1 Kingston Buildings	945m to SW
1197	20844145	Barracks, 2 Kingston Buildings	950m to SW
1196	20844146	Barracks, 3 Kingston Buildings	955m to SW
1195	20844147	Barracks, 4 Kingston Buildings	960m to SW
960	20844148	Saint Fintan's National School, Chapel Street	985m to SW
703	20844156	Clubhouse, The Lodge, O'Mahoney Avenue	1000m to SW
699	20844163	Hotel, 39 South Main Street	750m to SW
n/a	20844164	House, 35 South Main Street	710m to SW
975	20844165	Allied Irish Bank, 20 South Main Street	615m to SW
n/a	20844167	House, 26 South Main Street	655m to SW
n/a	20844168	House, 27 South Main Street	660m to SW
n/a	20844169	House, Murray's, 28 South Main Street	675m to SW
n/a	20844170	House, 31 South Main Street	690m to SW
n/a	20844171	House, 18 South Main Street	600m to SSW
n/a	20844172	House, 17 South Main Street	600m to SSW
949	20844173	House, Scannell's Medical Hall, 16 South Main Street	595m to SSW
n/a	20844175	House, 11 South Main Street	575m to SSW

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RPS no.	NIAH	Name	Distance from development
n/a	20844176	House, 10 South Main Street	570m to SSW
947	20844177	Bank of Ireland, 9 South Main Street	560m to SSW
n/a	20844178	House, 8 South Main Street	560 m to SSW
462	20844179	House, 5 South Main Street	545m to SSW
n/a	20844180	House, 4 South Main Street	545m to SSW
946	20844181	House, Hickey's, 1 South Main Street	535m to SSW
n/a	20844182	House, 7 Bridge Street	510m to SSW
659	20844183	House, 6 Bridge Street	500m to SSW
n/a	20844185	House, Bridge Street	510m to SSW
n/a	20844186	House, Bridge Street	525m to SSW
951	20844187	Bandon Methodist Church, Bridge Street	465m to SSW
n/a	20844188	Cobbles/flags/paving/kerbing, MacSwiney Quay	455m to SSW
813	20844190	House, 1 Saint Finbarr Place	500m to SSW
n/a	20844191	House, Bridge House, Seán Hales Place	395m to SW
n/a	20844192	House, Seán Hales Place	390m to SW
971	20844193	House, 3 North Main Street	415m to SW
n/a	20844194	House, North Main Street	395m to SW
n/a	20844195	House, 2 North Main Street	410m to SW
n/a	20844196	House, 4-4A North Main Street	420m to SW
n/a	20844197	House, 7 North Main Street	425m to SW
n/a	20844198	House, 89 North Main Street	440m to SW
n/a	20844199	Gates/railings/walls, North Main Street	445m to SW
n/a	20844200	House, 81 North Main Street	475m to SW
942	20844201	Bandon Town Hall, North Main Street	490m to SW
943	20844202	Bandon Courthouse, North Main Street	500m to SW
n/a	20844203	Floraville House, Mill Place	535m to SW
n/a	20844204	Bank/financial institution, Bandon Masonic Hall, Emmet Row	490m to SW
n/a	20844205	House, Emmet Row	540m to SW
700	20844206	Market building, The Shambles, Allen Square	500m to SW
n/a	20844207	Foot bridge	570m to SW
412	20844209	House, J. Lyons and Sons, 3 South Main Street	540m to SSW
n/a	20844211	House, 14 Bridge Street	505m to SSW
n/a	20844212	House, 6 South Main Street	550m to SSW
n/a	20844213	House, 7 South Main Street	555 m to SSW
n/a	20844219	Office	620m to SE

RPS no.	NIAH	Name	Distance from development
n/a	20844220	Mill (water)	660m to SE
n/a	20844221	Distillery	660m to SE
n/a	20844223	Water pump, Allen Square	550m to SW
n/a	20844224	Building misc, Allen Square	545m to SW
n/a	20844225	Water pump, Glasslinn Road	430m to South
n/a	20844228	Water pump, Ballymodan Place	790m to SW
n/a	20844233	Water pump, Oliver Plunkett Street	570m to South
n/a	20844234	House, 30 South Main Street	680m to SW
n/a	20844235	Brewery, D.P. McSweeney, Oliver Plunkett Street	565m to South
n/a	20844236	House, 1 Saint Patrick's Quay	640m to SSW
n/a	20844238	House, 32 South Main Street	690m to SW
n/a	20844239	House, 23 South Main Street	640 m to SW
n/a	20844240	House, 22 South Main Street	635 m to SW
974	20844241	House, 21 South Main Street	630m to SW
621	20909620	Church/chapel, Kilbrogan Catholic Chapel	610m to NW
n/a	20911035	Gate lodge, Mount Grellan House	610m to NW
n/a	20911037	Rectory/glebe/vicarage/curate's house, Mount Grellan House	550m to NW
n/a	20911038	Farm house, Knockbrogan Farm	255m to ENE
955	n/a	Ball alley, Hamilton High School	910m to WSW
1370	n/a	17 <sup>th</sup> Century Timber Framed House, 83 North Main Street	460m to SW
948	n/a	(Formerly "Downing Outfitter") Lily Beauty Shopfront & Townhouse	635m to SW
1194	n/a	Old Mill Building	630m to SW
864	n/a	House, 7 Cavendish Quay	675m to SSW
957	n/a	Market Street Bridge	715m to SSW
958	n/a	Townhouse, 3 Saint Patrick's Place	750m to SSW
950	n/a	The wool store	795m to SSW
972	n/a	3-Storey Townhouse (adjacent to Keohanes Shop)	845m to SSW
953	n/a	Bandon Shopping Centre	690m to SW
961	n/a	3-Storey Townhouse	835m to SW
959	n/a	Wall (Surrounding possible Bridewell/Mill)	875m to SW

15.6.3 Cartographic Review

The cartographic sources examined for the study area comprised the first edition 1:10,560 (6-inch) Ordnance Survey (OS) map (published 1845) (Figure 15-3) and the 1:2,500 (25-inch) OS map (published 1902) (Figure 15-4). The online archive for the 17<sup>th</sup> century Down Survey mapping was consulted but the available map shows little detail on the area<sup>6</sup>. The proposed development site is shown as an area of vacant farmland containing sub-rectangular fields on both the 6-inch and 25-inch edition OS maps and no potential unrecorded archaeological sites or other features of potential cultural heritage interest, such as vernacular structures or demesne lands, are depicted within its boundary.



Figure 15 3: 1st edition 6-inch OS map (published 1845) centered over the location of the proposed development

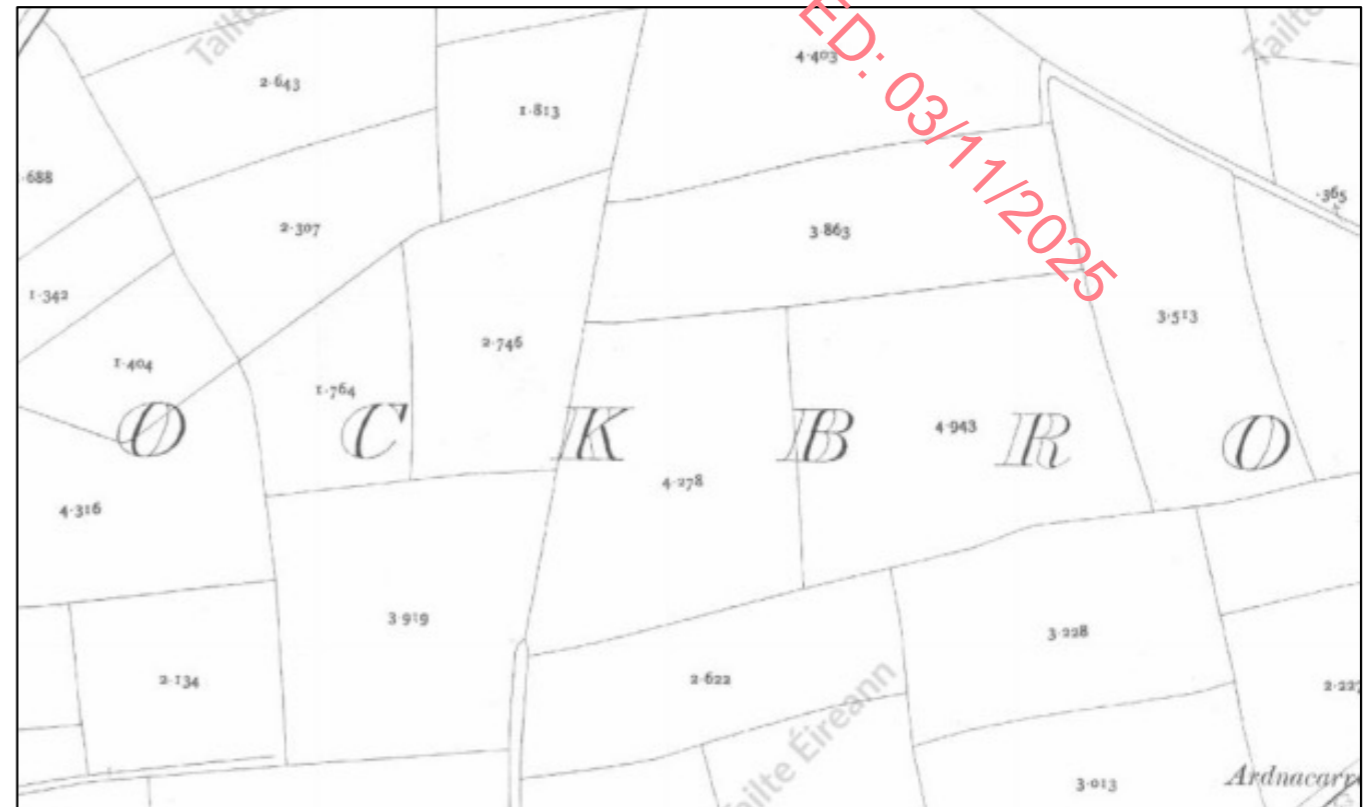


Figure 15 4: Extract from the 25-inch OS map (published 1902) of the proposed development

15.6.4 Review of Aerial/Satellite/LiDAR Imagery

A review of publicly accessible aerial, satellite and LiDAR sources published by Tailte Éireann, Google Earth, Bing Maps and the Geological Survey of Ireland (LiDAR) was undertaken in order to assess if any traces of potential unrecorded archaeological sites were visible within the proposed development site. The reviewed aerial/satellite images, from 1995 to 2023 all show the lands within the proposed development site occupied by vacant, enclosed pasture fields and no evident traces of any potential unrecorded archaeological sites were noted. A section of the southwest end of the proposed development site extends into the coverage of publicly accessible LiDAR imagery datasets<sup>7</sup>. Nothing of potential archaeological significance was visible on this imagery, which shows linear cultivation activity in line with the orientation of the current field boundaries within the coverage area in the southwest corner of the proposed development.

<sup>6</sup> <https://downsurvey.tchpc.tcd.ie/down-survey-maps.php#bm=Kinealmeky&c=Cork>

<sup>7</sup> <https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b7c4b0e763964070ad69bf8c1572c9f5>



Figure 15 5: Aerial image of site from January 2023 (Google Earth), in use for agriculture

### 15.6.5 Undesignated Cultural Heritage Assets

While encompassing the archaeological and designated architectural heritage resource, cultural heritage also includes various undesignated assets such as settlements, demesne landscapes, vernacular structures, townland boundaries, folklore, placenames and historical events. There are no extant vernacular buildings, or structures of any date, located within the proposed development site and it does not form part of a historic demesne landscape.

Townlands are the smallest unit of land division in the Irish landscape and many preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The layout and nomenclature of Irish townlands was recorded and standardised by the work of the Ordnance Survey in the 19<sup>th</sup> century. The Irish translations of the townlands names often refer to natural topographical features, but name elements may also give an indication of the presence of past human activity within the townland, e.g. *dun*, *lios* or *rath* indicate the presence of a ringfort while temple, saggart, termon or kill record an association with a church site. The Irish origins and translations for the townlands within the study area were sought from [www.logainm.ie](http://www.logainm.ie).

The site is entirely within the townland of Knockbrogan. The name of Knockbrogan *Cnoc Brógáin*, translates directly as 'Brogan's hill'. This refers to the topography of the area, and while it may offer the name of someone historically related to the area (Brogan) it does not give any information on archaeological features within the townland. The earliest recorded use of the name (on logainm.ie) is from 1618 as *Cnockbrogane*.

The townland to the north, Kilbrogan (*Cill Brógáin*), also relates to Brogan, though in this case the name does indicate an association with an archaeological site. *Cill* refers to a church and there are two recorded church sites within the townland (CO096-064001- and CO110-021001-). The latter site is recorded as a church, but the ASI description notes that no surface trace exists and that it is regarded locally as the monastery of Kilbrogan. These recorded churches are located c.610m to the northwest and 660m to west-northwest of the proposed development site respectively. Kilbrogan is also the name of the parish in which Knockbrogan is located, indicating the stature of the church in the wider area. The name Kilbrogan was recorded as early as 1481.

None of the field boundaries within or bounding the proposed development site are townland boundaries.

The Schools' Collection of the National Folklore Collection (on Duchas.ie) includes two entries that contain references to Knockbrogan. One of these entries contains the following text:

*Below here now in Kilbrogan is the oldest Protestant place of worship in Ireland, but not the oldest steeple. And when they were sinking the ground for this Church they could not find any foundation and they went over to Knockbrogan and brought all the headstones away and in spite of the poor Catholics they made the foundation with these.<sup>8</sup>*

The church mentioned as the oldest Protestant place of worship in Ireland is Christ Church on North Main Street in Bandon (CO110-019008-, built in 1610), this is in the townland of Coolfadda and in this case, Kilbrogan refers to the parish (rather than to the townland of Kilbrogan, which lies to the north of Knockbrogan). It is not clear from the text where in Knockbrogan the headstones may have been removed. There is no recorded graveyard or other ecclesiastical site within the townland of Knockbrogan (apart from a Presbyterian (Scots) church of 1843 CO110-019011-). The location from which the headstones were removed may have been erroneously attributed to Knockbrogan townland (the church in Kilbrogan townland being the likely intended), alternatively, there may have been a graveyard within the townland, which following the removal of the headstones, was not included on the Ordnance Survey maps and consequently never recorded by the Archaeological Survey of Ireland.

The other entry<sup>9</sup> that mentions Knockbrogan relates to the fact that this townland may have had a shared owner (Lee) with three other townlands and also contains the following text in relation to the placename:

*Knockbrogan is Cnoc brogáin - Hill of Brogan is Árd na Cairrge. The height of Rock - a road now applied to Doctor Mac Donalds residence.*

### 15.6.6 Field Surveys

The proposed development site was visited on a number of occasions during the compilation of this assessment. The lands within the boundary of the proposed development are in agricultural use (Figure 15-5), although some areas have been disturbed and used for soil stockpiling in relation to a development that is underway in adjoining lands to the west.

<sup>8</sup> <https://www.duchas.ie/en/cbes/4921647/4887639>

<sup>9</sup> <https://www.duchas.ie/en/cbes/4921650/4887782>

The terrain within the proposed development site slopes gradually to moderately down to the south and overlooks the valley in which Bandon town is situated and where the River Bandon flows eastwards.

The field boundaries consist primarily of low earthen banks below hedges and interspersed trees. An overhead powerline crosses the site in a generally east to west direction.

Prior to a site inspection conducted in July 2024, the crops within fields on the proposed development site had been harrowed, though this appeared to be a form of weed control rather than in advance of any intended seeding.

No potential features of archaeological or architectural heritage significance were identified within the proposed development site during any of the field surveys.



Plate 1: Facing east across site, July 2024



Plate 2: Facing north within site, July 2024



Plate 3: Facing west within site, July 2024

### 15.6.7 Geophysical Survey

A geophysical survey of suitable lands with the proposed development site was carried out by Dr Ger Dowling in August 2024 (under detection device licence no. **24R0381**). An area in the northern portion of the proposed development site was disturbed and under mounded topsoil at the time of the survey and was, therefore, unavailable for the geophysical survey. The survey also included an area to the west that is not part of this application. The conclusion of the report on that geophysical survey stated;

*The geophysical survey at Knockbrogan **did not reveal any anomalies of obvious archaeological potential**. A number of **'pit-type' anomalies** [1–5] were mapped by the survey, though in the absence of supporting evidence, an archaeological interpretation for these is tentative. The principal anomalies identified by the survey reflect past agricultural activity. Alongside different episodes of former cultivation, the investigation revealed the levelled remains of field boundaries recorded on early historical maps. Other probable relict land divisions of relatively modern date were also discovered and although not depicted on early cartographic sources, these can be seen, in most instances, to append to historically-attested examples. Several possible field drains/pipes are also discernible in the dataset.*

Four numbered 'pit-type' anomalies were identified within the boundary of the proposed development assessed in this chapter, 2-5 as per **Figure 15-7** (anomaly 1 is outside the boundary of the proposed development).

2. Possible pit/spread, may contain burnt/fired material in its fill. Archaeological interpretation is cautious.
3. Possible pit/spread (c.5m in length NE–SW). May contain burnt or fired material in its fill, such as such as might be associated with a hearth- or oven-type archaeological feature. Tentative interpretation. A modern origin also possible.
4. Possible pit/spread, may contain burnt/fired material in its fill.
5. Possible pit/spread, may contain burnt/fired material in its fill.

Of these potential archaeological features, number 4 was under mounded topsoil during the most recent site inspection.



Figure 15 6: Greyscale image of Geophysical Survey results, including area to west outside subject site (after Dowling, 2024)



Figure 15 7: Interpretative image of Geophysical Survey results, including area to west outside subject site (after Dowling, 2024)

### 15.6.8 Summary

There are no National Monuments in State Care located within the surrounding 1km study area. There are no recorded archaeological sites within the proposed development site, and no extant examples are located within 80m of its boundary (Table 15-5). There are 37 recorded archaeological sites located within the surrounding study area, and none comprise types with potential visually sensitive alignment attributes, such as megaliths or stone circles. The majority of these are within Bandon town and date from the time of the town's establishment in the early 17th century and during subsequent centuries. The study area contains a number of recorded archaeological sites which provide evidence for activity in the area in the Bronze Age and Early Medieval periods. Bronze Age activity was also identified during an excavation to the west of the proposed development site (see Section 15.6.1.6).

While no evidence for potential unrecorded archaeological sites within the proposed development boundary was identified during the desktop study and field surveys undertaken as part of this assessment, the potential for the presence of unrecorded, sub-surface archaeological sites within green field lands cannot be discounted. The geophysical survey did not identify any features of obvious archaeological sites within the proposed development site apart from four potential 'pit-type' features.

There are no protected structures, curtilage features or NIAH-listed buildings or lands located within the proposed development site. There are 49 protected structures, which are of likely medium-high value, located within the

surrounding 1km study area. A total of 38 of these are also listed by the NIAH, which lists a total of 188 structures in the area. The majority of these architectural heritage structures are located in the centre of Bandon town which is located to the south and west of the proposed development site. In addition, the proposed development site is not located within an Architectural Conservation Area.

### 15.7 The 'Do Nothing' Scenario

A 'Do Nothing Scenario' will see the continued use of the lands within the proposed development site as an area of agricultural lands and this will have no predicted effect on the known cultural heritage resource within the study area.

### 15.8 Potential Significant Effects

#### 15.8.1 Demolition Phase

The proposed development will not require any demolition works that will result in any effects on the known cultural heritage resource.

#### 15.8.2 Construction Phase

There are no recorded archaeological sites within the proposed development site. The construction phase of the proposed development will, therefore, have no predicted direct or indirect effects on the known archaeological resource. While there was no evidence for any unrecorded archaeological sites within the proposed development site identified during the desktop study, field inspection or geophysical, the potential for the survival of unrecorded, sub-surface archaeological features and artefacts within its boundary cannot be discounted. Four 'pit-type' anomalies were identified from the geophysical survey and have the potential to represent archaeological features. As the existence, nature and extent of any unrecorded archaeological features or artefacts within the proposed development site are unknown; the significance of any potential construction phase impacts cannot be quantified but construction phase ground excavation works will have the potential to result in permanent, direct, negative effects, potential moderate-significant, on any such remains and this will require mitigation (see Section 15.9).

There are no designated architectural heritage structures located within the proposed development lands or within 150m of its boundary and it contains no undesignated structures of architectural heritage interest. In addition, the proposed development site is not located within, or in the immediate vicinity of, an Architectural Conservation Area. The construction phase of the proposed development will, therefore, result in no predicted direct or indirect effects on the architectural heritage resource.

There are no undesignated vernacular structures, demesne lands, or historic settlements located within the proposed development site and no intangible attributes, such as historical or folklore associations, were noted during the assessment. The construction phase of the proposed development will, therefore, have no predicted effects on any undesignated cultural heritage assets.

In conclusion, no likely significant effects on the known cultural heritage resource will arise as a result of the construction phase of the proposed development. The potential does exist for moderate-significant direct effects on any unrecorded archaeological remains within the proposed development site and this will require mitigation (see Section 15.9).

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### 15.8.3 Operational Phase

As detailed in **Section 15.8.2**, there are no recorded archaeological sites or architectural heritage structures located within the proposed development site. There are also no extant/unexcavated archaeological sites located within 80m of the proposed development while there are no designated architectural heritage structures located within 150m of its boundary. There are two standing stones (CO110-024---- and CO110-026----) of potential Bronze Age date located within the surrounding 1km study area. A review of the locations of these monuments revealed that they are on opposite sides of the Bandon River and are set c.750m apart. These upright stones, which measure 1.22m and 1.8m in height, are both set on hillslopes and their heights and landscape settings means that they do not form highly visible features within the wider landscape. There has been extensive modern development within the environs of both standing stones, as well as in the lands between their locations, and they retain no potential inter-visibility attributes. In addition, the proposed development site is not situated within the lands between their locations. The proposed development will, therefore, not result in any predicted effects on any sightline attributes that potentially may have previously formed an aspect of the original functions of these two monuments. The review of the locations, settings and functions of the other known cultural heritage constraints within the surrounding study area did not reveal any examples that rely on sightlines or intervisibility with other constraints within the wider landscape that may have formed aspects of their original functions. The operational phase of the proposed development will, therefore, result in no predicted negative direct or indirect effects on the setting of known cultural heritage constraints within the surrounding study area.

Following the successful implementation of archaeological mitigation measures presented in **Section 15.9**, it is predicted that no effects will arise in relation to the potential archaeological resource within the proposed development site during the operational phase.

In conclusion, no likely significant effects on the cultural heritage resource will arise during the operational phase of the proposed development.

### 15.8.4 Cumulative Effects

A review of the Cork County Council planning enquiry system was carried out in relation to the cultural heritage context of the following developments within the wider environs of the proposed development site.

*Application 21/4059 and ABP-31268922: Castle Rock Homes (Bandon) Limited*

This approved housing development is located to the proposed development to the west and will entail the construction of a residential development of 65 no. units and a two storey crèche with ancillary surface car park, bicycle parking racks, bin stores and all associated site development works. There are no recorded archaeological sites or architectural heritage structures at the location. A programme of advance archaeological test trenching and excavation works at this development site identified two areas of Bronze Age activity (see **Section 15.6.1.6**)

*Application 24/5147: Castle Rock Homes (Bandon) Limited*

Castle Rock Homes (Bandon) Ltd submitted an application on June 19, 2024, for the provision of a crèche adjacent to a Phase 1 application. This crèche proposes a childcare space for 85 no. children. A review of the location of this development revealed that it contains no recorded cultural heritage constraints.

*Application 24/5216 and ABP-320810: Castle Rock Homes (Midleton) Ltd.*

This approved housing development is located adjacent to the west of the proposed development and will entail

the construction of 95 residential units and all associated site works. Access will be provided onto the Cork Road. There are no recorded archaeological sites or architectural heritage structures at the location. In granting planning permission, An Bord Pleanála did not attach any conditions relating to archaeology.

*Application 23/6540: Cork Road Structures Limited.*

This approved housing development is located to the northwest of the proposed development and will entail the construction of a residential development consisting of 77 no. dwelling houses and a single storey creche facility with ancillary surface car park, bicycle parking racks, bin stores and all ancillary development works. There are no recorded archaeological sites or architectural heritage structures at the location. Archaeological test trenching was undertaken at this development site and did not identify any archaeological remains (see **Section 15.6.1.6**). Two anomalies of archaeological potential identified during an advance geophysical survey were unavailable for investigation during test trenching due to close proximity of overhead powerlines. Cork County Council included a planning condition that groundworks in proximity to those two anomalies were to be archaeologically monitored.

*Application 234015 and ABP-319115 24*

In January 2024, Cork County Council granted permission for the construction of a residential development of 20 no. apartments including the demolition of structures and all ancillary site works including bicycle and car parking, bin storage, landscaping and boundary treatments at Watergate Street, Knockbrogan, Bandon, Co. Cork. This development is located within a historic brewery listed as a recorded archaeological site (CO110-025001-) and includes the retention and reuse of historic buildings. An Archaeological and Built Heritage Impact Assessment of this development detailed a number of mitigation measures including supervision of construction works by suitably qualified built heritage and archaeological specialists as well as the compilation of detailed historic building surveys.

*Conclusion*

As detailed in **Sections 15.8.2** and **15.8.3**, the proposed development will not result in any predicted direct or indirect adverse effects on the known cultural heritage resource during the construction and operational phases. Given the absence of any such predicted effects, combined with its distance from the above developments, it is concluded that the proposed development will not result in any significant adverse cumulative effects on the cultural heritage resource in combination with the reviewed developments.

### 15.8.5 Summary

The proposed development will not result in any predicted significant adverse construction, operation or cumulative effects on the known cultural heritage resource.

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

**Table 15 8 Summary of Construction Phase Likely Significant Effects in the absence of mitigation**

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Loss of any unrecorded, sub-surface archaeological features that may exist within the proposed development site	Potential negative	Potential moderate-significant	unknown	Low to moderate	Potential permanent	Potential direct

## 15.9 Mitigation Measures

### 15.9.1 Incorporated Design Mitigation

There are no recorded archaeological sites or architectural heritage structures located within the proposed development site that would need to be mitigated by avoidance as part of the design.

### 15.9.2 Demolition Phase Mitigation

There are no recorded archaeological sites or architectural heritage structures located within the proposed development site that would need to be mitigated during the demolition phase.

### 15.9.3 Pre-construction and Construction Phase Mitigation

A test trenching programme is scheduled to be undertaken within the proposed development site. This test trenching programme was submitted to Ms Annette Quinn, Executive Archaeologist with Cork County Council, for review and she approved it on 26<sup>th</sup> May 2025. An application for an excavation licence for this test trenching investigation will be made to the National Monuments Service (NMS). A report on the results of this site investigation will be submitted to the NMS, the Cork County Council Archaeologist, and the Planning Authority once onsite works have been completed.

This test trenching programme will target the potential 'pit-type' anomalies identified in the geophysical survey (see **Section 15.6.7**). It will also investigate other areas within the proposed development in which no anomalies were identified. The test trenches will cover a total of 10% of the available lands within the proposed development site. In the event that any sub-surface archaeological features are identified during these site investigations, their locations will be recorded and securely cordoned off while the NMS are notified of the discovery and consulted to determine further mitigation measures, which may entail preservation in situ by avoidance or preservation by record through a systematic archaeological excavation.

In the areas that are currently under mounded soil in the north of the proposed development site, the potential exists that any previously unrecorded sub-surface archaeological features in this area may remain undisturbed. These current existing stockpile areas may not be suitable for test trenching due to the presence of substantial areas of mounded soil, and the removal of these mounds and underlying topsoil material will, therefore, be archaeologically monitored (under licence from the National Monuments Service) during the construction phase.

There are no structures/features of architectural or cultural heritage significance located within the proposed development site or its close environs and, therefore, no other mitigation measures are required.

### 15.9.4 Operational Phase Mitigation

Following the successful implementation of the archaeological mitigation measures during the pre-construction phase, as detailed in **Section 15.9.3**, no operational phase mitigation measures will be required for the cultural heritage resource.

## 15.10 Residual Impact Assessment

### 15.10.1 Demolition Phase

The proposed development will not require any demolition works that will result in any residual effects on the known cultural heritage resource.

### 15.10.2 Construction Phase

The proposed development site and its close environs do not contain any extant recorded archaeological sites or designated architectural heritage structures and no residual impacts on these elements of the cultural heritage resource are predicted. The mitigation measures presented in **Section 15.9.3** will provide for either the preservation *in situ* of any currently unknown archaeological features within the proposed development site or the proper and adequate recording of this resource by full archaeological excavation. Preservation *in situ* shall allow for a negligible magnitude of impact resulting in a potential not significant/imperceptible significance of effect in the context of residual impact on the unrecorded archaeological resource. Preservation by record shall allow for a high magnitude of impact, albeit ameliorated by the creation of a full and detailed archaeological record, the results of which shall be publicly disseminated. This shall result in a potential slight/moderate range of significance of effect in the context of residual impacts on the unrecorded archaeological resource.

### 15.10.3 Operational Phase

Following the successful implementation of archaeological mitigation measures during the pre-construction phase, as detailed in **Section 15.9.3**, no residual effects on the cultural heritage resource are predicted to arise during the operational phase of the proposed development.

### 15.10.4 Cumulative Residual Effects

No cumulative residual effects on the cultural heritage resource are predicted to arise.

## 15.11 Risk of Major Accidents or Disasters

No predicted risks of major accidents or disasters are predicted to arise from any potential effects on the cultural heritage resource.

## 15.12 Worst Case Scenario

If the proposed development were to proceed without the implementation of the mitigation measures detailed in **Section 15.9.3**, then construction phase ground works will have the potential to result in direct adverse effects on any unrecorded, sub-surface archaeological remains that may exist within the boundary of the proposed development site.

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### 15.13 Interactions

No adverse effects on the cultural heritage resource are predicted to occur during the construction or operation phases as a result of interactions with other environmental aspects assessed in this EIAR.

### 15.14 Monitoring

There are a number of obligatory licence application and reporting processes required be undertaken as part of applications to the NMS for licences to carry out archaeological site investigations, and these will allow for monitoring of the successful implementation of the mitigation measures detailed in **Section 15.9.3**. Reports on all archaeological site investigations will be submitted to the NMS, the National Museum of Ireland and the Planning Authority upon completion of onsite works which will clearly describe the results in written, mapped and photographic formats.

### 15.15 Summary of Mitigation and Monitoring

The following Table summarises the pre-construction and construction phase mitigation and monitoring measures.

**Table 15 11 Summary of Construction Phase Mitigation and Monitoring**

Likely Significant Effect	Mitigation	Monitoring
Potential direct effects on any unrecorded sub-surface archaeological remains	Pre-construction phase test trenching	Licence application to the NMS and submission of a report on the site investigations to the NMS and Cork County Council Archaeologist upon completion of onsite works. This report will include details on any required additional mitigation measures for identified archaeological remains which will be formulated in consultation with the NMS and Cork County Council Archaeologist
Potential direct effects on any unrecorded sub-surface archaeological remains in areas unavailable for advance test trenching	Archaeological monitoring of topsoil removal during construction phase	Licence application to the NMS and submission of a report on the site investigations to the NMS and Cork County Council Archaeologist upon completion of onsite works. This report will include details on any required additional mitigation measures for identified archaeological remains which will be formulated in consultation with the NMS and Cork County Council Archaeologist

### 15.16 Conclusion

There are no recorded archaeological sites within the proposed development site and no examples with surviving surface traces are located within 80m of its boundary. There are also no Protected Structures, curtilage features or NIAH-listed buildings located within the proposed development site. There are 49 Protected Structures within the surrounding 1km study area, most of which are located in Bandon town, to the west and south of the site. In addition, the proposed development site is not located within, or in the immediate vicinity of, an Architectural Conservation Area.

No previously unrecorded archaeological sites or structures of architectural heritage interest were identified within the proposed development site during the desktop research and field surveys carried out as part of this assessment.

The proposed development will not result in any likely significant direct or indirect negative effects on the known cultural heritage resource during the construction and operation phases. In addition, no likely significant residual effects on any potential unrecorded, sub-surface archaeological remains that may exist within the boundary of the proposed development are predicted to arise following the successful implementation of the mitigation measures detailed in Section 15.9 of this chapter.

### 15.17 References and Sources

Cork County Council’s Record of Protected Structures, available at

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# CHAPTER SIXTEEN

## RISK OF MAJOR ACCIDENTS AND DISASTERS

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# CHAPTER 16

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## CHAPTER 16 | RISK OF MAJOR ACCIDENTS AND DISASTERS

### 16.1 Introduction

This chapter of the EIAR assesses the vulnerability of the proposed Knockbrogan largescale residential development, situated in Knockbrogan, Bandon, Co. Cork, to major accidents and disasters (MA&D). It includes an assessment of the potential of the proposed development to cause an increased risk of MA&D, and the likely significant adverse effects arising from potential MA&D.

This assessment is a review of major accident hazards and disasters based on the engineering design, drawings and documentation.

### 16.2 Expertise & Qualifications

This chapter of the Environmental Impact Assessment Report has been prepared by Matthew Michie a Senior Environmental Consultant at AWN Consulting Limited. Matthew holds an MChem and a MSc (Physical Chemistry). Matthew has 6 years' experience in environmental consulting and process safety, and has been involved in numerous EIARs for a range of projects including commercial, residential, industrial, pharmaceutical and data centre developments.

#### 16.2.1 Scope of Assessment

In brief, Major Accidents are events that threaten serious environmental effects to human health, welfare and / or the environment and require the use of resources beyond those of the operator to manage, and disasters are external hazards, either natural or anthropogenic, with the potential to cause a Major Accident.

This assessment will provide an overview of the regulatory requirements to identify and assess MA&Ds. It will take into consideration the materials, operations and location of the Proposed Development. MA&Ds Risk Events relevant to the Proposed Development will be identified and evaluated.

### 16.3 Methodology

The analysis of the predicted impacts of the proposed development on human health and the environment during construction and operation are presented in this Chapter. The risk assessment identifies and quantifies risks focusing on potentially significant adverse effects of the development on the environment, deriving from its vulnerability to risks of relevant major accidents and/or disasters. The approach to identifying and quantifying risks associated with the proposed development by means of a sites specific risk assessment is derived from the *EPA Guidelines on the Preparation of an EIAR* (EPA, 2022) and all other documents outlined above.

Assessment methods quantify and predict the magnitude and significance of impacts.

The methods employed for assessment and evaluation of the environmental topics for this Chapter have been:

1. Schedule 6 of the Planning and Development Regulations, 2001, as amended:
 

“a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met.

Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events”.
2. Geospatial Analysis (cumulative impacts only – used to identify planning permissions/applications and Seveso Establishments within a 5 km radius).
3. Flood Risk Assessment following The Planning System and Flood Risk Management Guidelines for Planning Authorities published by the OPW in 2009 (OPW Guidelines).

The risk assessment identifies and quantifies risks focusing on potentially significant adverse effects of the development on the environment, deriving from its vulnerability to risks of relevant major accidents and/or disasters. The approach to identifying and quantifying risks associated with the proposed development by means of a sites specific risk assessment is derived from the EPA Guidelines on information to be contained in EIAR (EPA, 2022).

The criterion for categorising impact is derived from the EPAs Guidance on Assessing and Costing Environmental Liabilities (2014). In this guidance, the risk assessment methodology commences with the establishment of risk classification criteria followed by risk analysis based on these criteria. Risk classification tables are required in order to evaluate and rank the risks compared with each other. They form the basis for rating the likelihood of an event occurring and the consequence of impact if the event occurs. The approach used in this assessment is summarised as follows and has been derived from relevant guidance as described above:

- Identification of hazardous substances which could be present over the lifecycle of the Proposed Development, including flammable substances, materials harmful to the environment and materials harmful to human health.
- Consideration of the quantities and storage arrangements associated with these substances and the prospective operations at the Proposed Development involving these materials.
- Identification of potential MA&D Risk Events associated with these materials and operations. Assessment of the vulnerability of the Proposed Development to disasters as a result of, for example, location, infrastructure, climatic conditions and geological events.
- Where credible MA&Ds Risk Events and Disasters are identified, the reasonable worst-case consequence of a of each Risk Event is assessed in qualitative terms, based on factors including receptors which could be affected, and mitigation measures already in place (see Table 16 1)
- The likelihood and consequence ratings are combined to form a risk score for risk evaluation (see Table 16 2)

Table 16 1 Risk Classification – Likelihood

Rating	Category	Description
1	Very low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very high	Very high chance of hazard occurring

Table 16 2 Risk Classification - Consequence

Rating	Category	Description
1	Trivial	Small number of people affected, no fatalities No contamination to environment
2	Minor	Single fatality: limited number of people affected; a few serious injuries Localised contamination effects of short duration
3	Moderate	Significant number of people in affected area impacted with multiple fatalities Contamination effects widespread or of extended duration
4	Major	5 to 50 fatalities, up to 100 serious injuries Heavy contamination, localised effects, or extended duration
5	Massive	Large numbers of people impacted with a significant number of fatalities (>50), injuries in the hundreds Very heavy contamination, widespread effects of extended duration

The risks are then ranked according to their own risk score (1-5) in a colour coded matrix able which allows risks to be easily displayed and prioritised. The colour codes are as follows and indicated in Table 16 3 below:

- Red – high level risks requiring priority action (overall risk scores of 15-25);
- Yellow – medium-level risks requiring action, but not as critical as red-coded risks (overall risk scores of 8-12); and
- Green (light and dark) – low-level risks requiring continuing awareness and monitoring on a regular basis (overall risk scores of 1-6).

Table 16 3 Example Risk Matrix

		Consequence				
		Trivial	Minor	Moderate	Major	Massive
Likelihood ↑	Very High	Low	Medium	High	High	High
	High	Low	Medium	Medium	High	High
	Medium	Low	Low	Medium	Medium	High
	Low	Low	Low	Low	Medium	Medium

16.3.1 Legislative Context and/or Source of Guidance

Alongside the legislation, policy, and guidance outlined in Chapter 1, the following relevant legislation, policy, and guidance has informed the preparation of this chapter:

- EPA ‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports’ (2022),
- EPA ‘Advice Notes on Current Practice in the Preparation of Environmental Impact Statements’ (2018),
- Health and Safety Authority Guidance on Technical Land-Use Planning Advice, for planning authorities and COMAH establishment operators (2023)
- Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015
- HSA Guide to the COMAH Regulations 2015 (S.I. No. 209 of 2015)
- Building Regulations (Part A Amendment) Regulations 2012 (as amended) (SI No. 138 of 2012)
- Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) (hereafter referred to as the Safety, Health and Welfare (Construction) Regulations) (S.I. No. 291 of 2013)
- A Framework for Major Emergency Management. Guidance Document 10 (DECLG 2015)

The EPA Guidelines, 2022, state that:

*“To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other legislation e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.*

*The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive facilities. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required.”*

16.3.2 Major Accidents

For the purpose of this assessment, the definition of a ‘Major Accident’ is taken from the guidelines on Major Accidents and Disasters within EIA published by Institute of Environmental Management and Assessment (IEMA, 2020).

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*“A major accident is an event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and / or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e., contractors) to manage”. Major accidents can be caused by disasters resulting from both man-made and natural hazards. A disaster is a man-made / external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident. In general, major accidents and / or disasters should be considered as part of an assessment where the development has the potential to cause the loss of life, permanent injury and/or temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration”.*

For the purposes of this assessment, the definition of ‘Vulnerability’ is as follows (IEMA, 2020):

*“Vulnerability – describes the potential for harm as a result of an event, for example due to sensitivity or value of receptors. In the context of the EIA Directive, the term refers to ‘exposure and resilience’ of the proposed development to the risk of a major accident and / or disaster. Vulnerability is influenced by sensitivity, adaptive capacity, and magnitude of impact; and Significant environmental effect (in relation to a major accident and / or disaster assessment) – includes the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration.”*

### 16.3.3 Background to Control of Major Accident Hazards Involving Dangerous Substances (COMAH) Regulations

The Seveso III Directive (2012/18/EU) requires Member States to apply land-use or other relevant policies to ensure that appropriate distances are maintained between residential areas, areas of substantial public use and the environment, including areas of particular natural interest and sensitivity and hazardous establishments. For existing establishments, Member States are required to implement, if necessary, additional technical measures so that the risk to persons or the environment is maintained at an acceptable level.

The purpose of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations (S.I. 209 of 2015) (COMAH Regulations) is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The HSA is the Competent Authority in Ireland as defined by Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, (COMAH Regulations 2015) which implement the Seveso III Directive in Ireland. The HSA is responsible for ensuring that the impacts of facilities which fall within the remit of this legislation are considered with respect to land use planning. This is achieved through the provision of technical advice to planning authorities.

The COMAH Regulations do not apply to the Proposed Development as the Proposed Development will not store significant quantities of hazardous materials which are in excess of the defined COMAH thresholds set out in Schedule 1 of the COMAH Regulations.

### 16.3.4 Natural Disasters

For the purpose of this assessment, the definition of a ‘Disaster’ is as follows (IEMA, 2020):

*“a natural hazard (e.g. earthquake) or a man-made external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.”*

### 16.4 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

### 16.5 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development description in Chapter 2 of this EIAR.

The Proposed Development is a non-COMAH site and the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2015 (COMAH Regulations 2015) does not apply.

#### 16.5.1 Hazardous Materials

##### 16.5.1.1 Construction Phase

##### *Flammable Gas Cylinders*

Construction and maintenance activities may require welding which can be carried out using compressed gases such as acetylene. There is the potential for a release of flammable gas, including an explosive depressurisation event, for example due to accidental damage to a gas cylinder, pressure regulator, or associated pipework. The released gas could be ignited, resulting in a fire or explosion. The potential impacts of which could include harm to persons due to thermal radiation and damage to property.

##### *Concrete*

There is the potential for an accidental release of concrete into the soil, or surface water during the construction Proposed Development. Concrete is not classified hazardous in accordance with the Chemical, Label and Packaging (CLP) Regulations (EC No. 1272/2008); however, concrete paste is alkaline (pH 10-14); therefore the potential impacts if concrete enters the environment via a release to water, include:

- Raising the pH causing harm to aquatic ecosystems
- Cause sedimentation on aquatic beds, which could harm flora and fauna.

Containment systems to intercept any material released will be developed within a Construction Phase Environmental Management Plan (CEMP). Therefore, it is not considered credible that a release of concrete could lead to a consequence that meets the criteria of a Major Accident and will not be considered further in this assessment.

*Fuel Storage*

Small quantities of diesel will be present on-site for use in construction vehicles. Diesel has flammable and environmental hazards.

Diesel is classified as an ignition category 3 substance, following the criteria in the Guidance on Technical Land Use Planning (HSA, 2023); therefore, it has an ignition probability of 0. Therefore, flammable hazards associated with diesel are not credible and will not be considered further in this assessment.

Due to the small quantities of diesel involved, it is not considered credible that a spill of diesel would meet the criteria for a Major Accident and it will not be considered further in this assessment.

*Natural Gas*

The proposed project will not require any gas connections. Neither is there any existing gas infrastructure within the vicinity of the proposed development.

16.5.1.2 Operational Phase

The proposed project will not require any gas connections. Neither is there any existing gas infrastructure within the vicinity of the proposed development.

The Proposed Development is a residential scheme; therefore, there will be no hazardous material stored at the Proposed Development during the operational phase.

16.6 Baseline Environment

16.6.1 Seveso Establishments

Seveso establishments have a “consultation distance” which is defined as “a distance or area relating to an establishment, within which there are potentially significant consequences for human health or the environment from a major accident at the establishment” (COMAH Regulations).

There are no Seveso establishments within 5km of the Proposed Development; therefore, there are no constraints to the Proposed Development at this location from nearby Seveso establishments.

16.6.2 Flood Risk

Brian O Kennedy & Associates Engineers and Architects completed a Flood Risk Assessment (FRA) for the Proposed Development. The FRA concluded the following:

- The proposed development is located in Flood Zone C (<0.1% annual exceedance probability (AEP)) for river and coastal flooding
- The nearest flood level risk, of the Bandon River to the proposed development, is 18.71 m AOD. The lowest point of the proposed development is 56.5m AOD.

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It is concluded that the risk of flooding to the proposed development will be minimal; therefore, the likelihood of a flood impacting the Proposed Development is unlikely and not significant.

16.6.3 Seismic Activity

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics, Dublin Institute for Advanced Studies, has been recording seismic events in Ireland since 1978 (www.dias.ie). This network consists of several seismometers that are located throughout Ireland. Figure 16 1 illustrates historical and recorded seismic events since 1980.

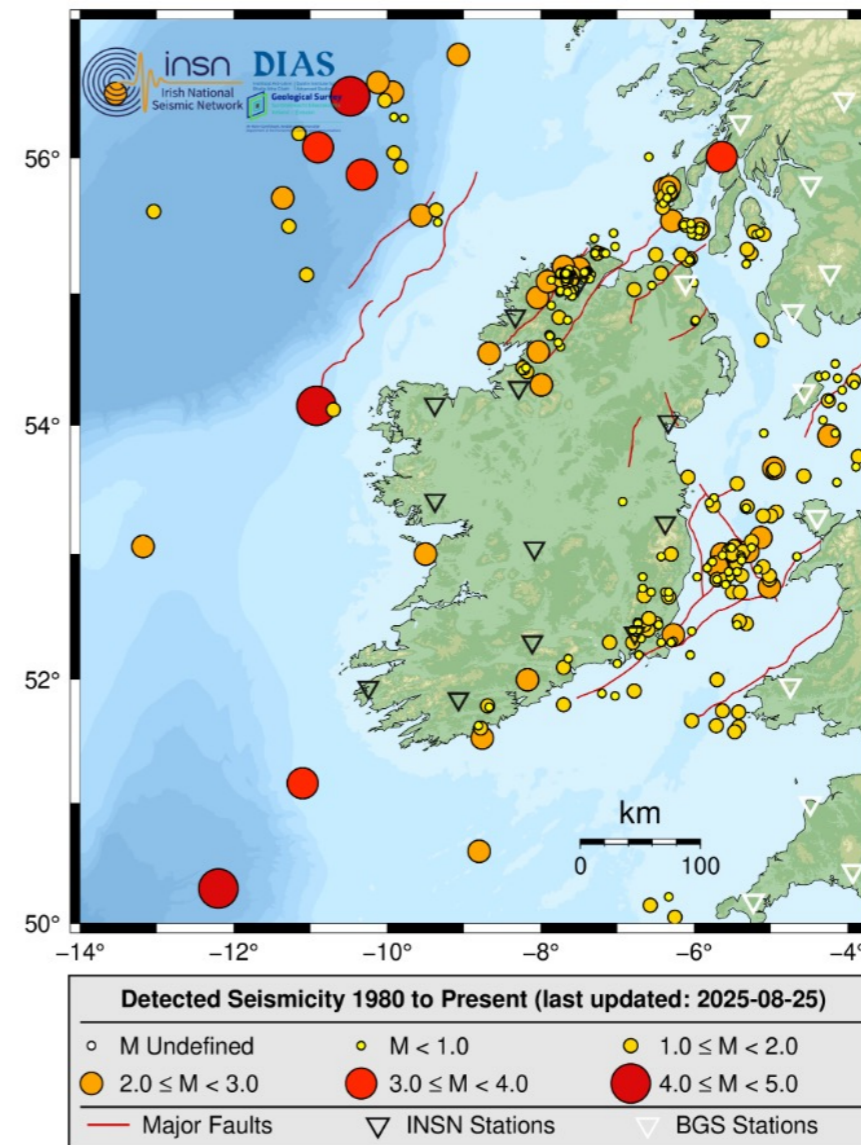


Figure 16 1 Ireland Seismic Activity Map

Seismic activity and earthquake risk in Ireland are generally considered to be low. This is because Ireland is located on the western edge of the Eurasian Plate, which is a tectonic plate that is not known for its seismic activity. However, earthquakes can still occur in Ireland, although they are typically small and have little impact.

It can be seen in **Figure 16 1** that there is has been some small seismic activity recorded in the vicinity of the Proposed Development. The maximum magnitude of an earthquake in the vicinity of the Proposed Development was 2.1 and occurred in 1981. Earthquakes <2.5 in magnitude are not usually felt, but are recorded by seismographs.

It is concluded that the likelihood of seismic activity impacting the Proposed Development is unlikely and not significant.

**16.6.4 Landslides**

Much of the Earth’s surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly increased by man’s activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a are a natural hazard that can occur. These can cause damage to property, infrastructure, and the natural environment, and can also pose a risk to human life.

In general, risk of landslides in Ireland is generally considered to be low, as the country is not located in a region with high seismic activity or large mountain ranges. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

The landslide susceptibility map identifies areas which are subject to landslides and is measured from low to high. The landslide susceptibility map considers the location of landslides and what causes them (slope, soil type and the impact of the flow of water). illustrates the landslide susceptibility map in the vicinity of the Proposed Development.

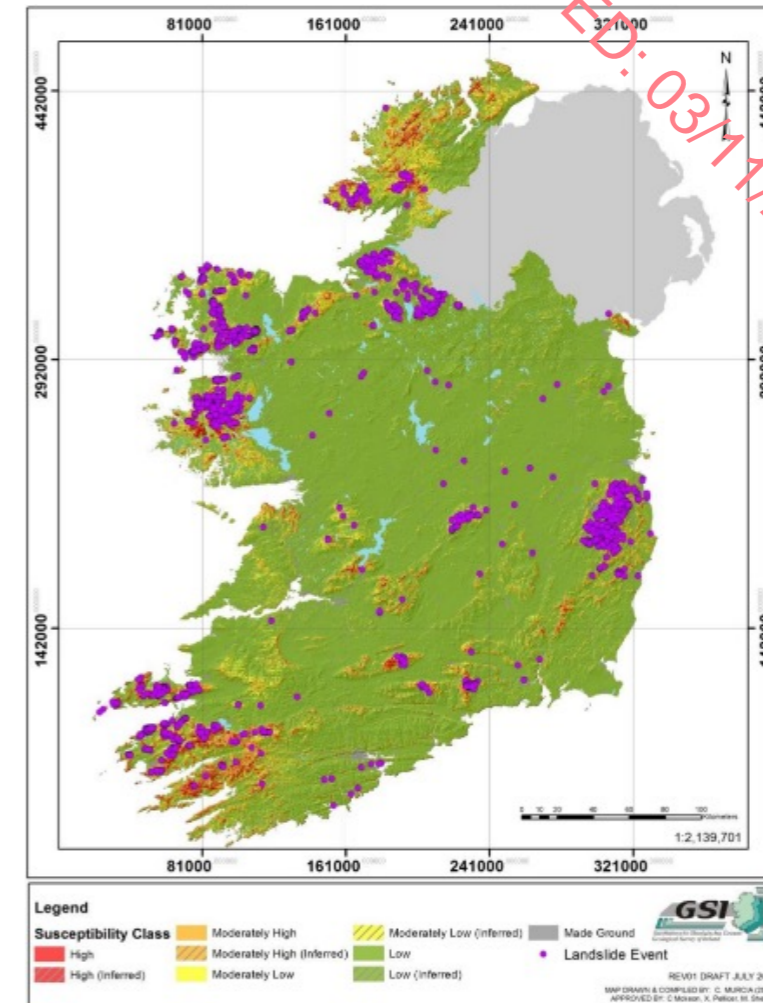


Figure 16 2 Landslide Susceptibility Map (GSI Ireland)

It can be seen in Figure 16 2, that the Proposed Development and the surrounding area have a low susceptibility of landslides. Therefore, the likelihood of a landslide impacting the Proposed Development is unlikely and not significant.

**16.7 Predicted Impacts**

The potential impacts of the construction and operational phases of the Proposed Development are outlined below.

**16.7.1 Do Nothing Scenario**

The EIA Directive requires the following to be described relating to the future receiving environment (the ‘Do Nothing’ scenario):

*“an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”.*

Under a ‘do-nothing’ scenario there is no known or anticipated change to the Major Accidents and Disasters risk at the Proposed Development site.

16.7.2 Construction Phase

General construction activities will include ground preparation, excavation, construction of structures. These activities will require the use of vehicles and tools. The hazards associated with activities include the potential for vehicle impact, particularly during reversing and vehicle overturning. The controls around this work will be managed by appropriate risk assessments to control the risks to people, the environment and also to the existing operational areas.

A site-specific Construction Environmental Management Plan (CEMP) and a Health and Safety Plan will be produced by the Construction Contractor, covering the construction and commissioning of the Proposed Development. The CEMP will be prepared to ensure compliance with relevant health and safety legislation including the Safety, Health and Welfare at Work Act.

The following scenarios have been identified that could impact the construction phase of the project:

- Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater, or surface waters.
- Compressed Gas Cylinder release
- Storm events resulting in structural damage and/or pollution to groundwater and surface waters.
- Flooding

The impact and likelihood of these scenarios is assessed in Table 16 4. There are no likely impacts to the Proposed Development or to off-site receptors during the construction phase in relation to major accidents and disasters.

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Table 16 4 Assessment of Major Accidents and Disasters for Construction Phase

Risk ID	Major Accident Scenario	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
C1	Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater or surface waters	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	The Proposed Development will be constructed, and operated in accordance with all relevant planning, building and environmental licencing codes (Building Regulations, 2012).  The engineering design of the facilities will take operation at future climatic conditions into account.	1	All construction activities will be suspended during extreme weather events.	2
C2	Storm events (including lightning) resulting in structural damage and/or pollution to groundwater and surface waters	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	The engineering design of the Proposed Development will incorporate lightning mitigation. This will be assessed in accordance with recognised industry standards such as EN/ IEC 62305.	1	All construction activities will be suspended during extreme weather events.	2
C3	Flooding	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	A Flood Risk Assessment was prepared in accordance with ‘The Planning System and Flood Risk Management -Guidelines for Planning Authorities’ issued by the Department of Environment, Heritage and Local Government in November 2009.  It was concluded that the Proposed Development is within Flood Zone C.	1	The flood risk assessment concluded that there is no flood risk to the site.	2

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Risk ID	Major Accident Scenario	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
C4	Flash fire, Explosion or Jet fire following compressed gas cylinder release (e.g. acetylene for welding)	Human Health	3	<p>There is potential for harm to persons on-site in the vicinity of the hazardous gas release.</p> <p>Detailed method statements, plans and assessments will be produced to carry out compressed gas activities safely.</p> <p>A Site Emergency Response Plan will be developed prior to the commencement of operations and will include detailed procedures in the event of a major accident.</p>	1	<p>European Industrial Gases Association standard procedures will be used for the storage and use of gas cylinders.</p> <p>When not in use, cylinders will be stored in external, well-ventilated areas and when in use, appropriately certified equipment will reduce the potential for ignition if a flammable gas is accidentally released.</p> <p>in us</p>	3

16.7.3 Operational Phase

In the scoping phase for this EIAR the potential for impacts to human health and impacts to the environment were assessed.

The following scenarios have been identified that could impact the operational phase of the project:

- Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater, or surface waters.
- Compressed Gas Cylinder release
- Storm events resulting in structural damage and/or pollution to groundwater and surface waters.
- Flooding

The impact and likelihood of these scenarios is assessed in Table 16 5. There are no likely impacts on the project or to off-site receptors during the construction phase in relation to major accidents and disasters.

Table 16 5 Assessment of Major Accidents and Disasters for Operational Phase

Risk ID	Major Accident Scenario	Impact	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score
O1	Flooding	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	<p>A Flood Risk Assessment was prepared in accordance with 'The Planning System and Flood Risk Management -Guidelines for Planning Authorities' issued by the Department of Environment, Heritage and Local Government in November 2009.</p> <p>It was concluded that the Proposed Development is within Flood Zone C.</p>	1	<p>The flood risk assessment concluded that there is no flood risk to the site.</p>	2
O2	Extreme Weather (e.g. heat, cold, wind and storms, resulting in result structural damage)	Human health, biodiversity, soils and geology, hydrology and hydrogeology	2	<p>Increases in extreme weather could potentially result in the operational instability of equipment such as and electrical apparatus, which is sensitive to temperature and humidity.</p> <p>Failure of these systems due to extreme temperatures could result in operational interruptions at the Proposed Development but would be unlikely to cause an incident which has the potential to result in a major accident or disaster.</p> <p>Increasing atmospheric wind speeds could cause structures to become unstable. In a worst-case event, these structures could fall and/or collapse resulting in harm to people in the vicinity. The structural engineering design of the facilities will calculate wind loading and other requirements based on industry standard guidance and methods.</p>	1	<p>The Proposed Development will be constructed, and operated in accordance with all relevant planning, building and environmental licencing codes (Building Regulations, 2012).</p> <p>The engineering design of the facilities will take operation at future climatic conditions into account.</p>	2

#### 16.7.4 Demolition

There will be no demolition as part of the proposed development.

#### 16.7.5 Cumulative Effects

Cumulative effects relate to the potential effects of the proposed development in combination of the potential effects of other developments (referred to as 'cumulative developments') within the surrounding area.

During the construction phase, since there are no likely impacts on the project or to off-site receptors, the cumulative impacts, of major accidents and disasters, are considered imperceptible and neutral to the proposed development and to cumulative developments in the surrounding area.

During the operational phase, since there are no likely impacts to off-site receptors, the cumulative impacts, of major accidents and disasters, are considered imperceptible and neutral to the proposed development and to cumulative developments in the surrounding area.

There are no expected impacts from developments in the vicinity of the Proposed Development, from a major accidents and disasters perspective, as such, there are no significant cumulative effects with the Proposed Development from a major accidents and disasters perspective.

### 16.8 Mitigation Measures

The Proposed Development has been designed in line with good industry practice, and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design and in accordance with planning and legislative requirements. As no likely significant effects were identified, no additional mitigation measures are proposed.

### 16.9 Residual Impacts

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented. As no likely significant effects were identified, no additional mitigation measures are proposed. Therefore, residual effects are not relevant for this assessment.

### 16.10 References

Institute for Environmental Management and Assessment (IEMA) Major Accidents and Disasters in EIA – A Primer (IEMA, 2020)

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

S.I. No. 209/2015 - Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015.

A Framework for Major Emergency Management. Guidance Document 10 (DECLG, 2015)

Building Regulations (Part A Amendment) Regulations 2012 (as amended) S.I. No. 138/2012

Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended) S.I. No. 291 of 2013

Guidance on Assessing and Costing Environmental Liabilities, Environmental Protection Agency (2014)

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# CHAPTER SEVENTEEN

INTERACTIONS OF THE FOREGOING

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# CHAPTER 17

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## CHAPTER 17 | INTERACTIONS OF THE FOREGOING

### 17.1 Introduction

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter considers the significant interactions of impacts between each of the separate disciplines.

In practice many impacts have slight or subtle interactions with other disciplines. This chapter highlights in **Table 17.1** (located at the end of this section) those interactions which are considered to potentially be of a significant nature. Discussions of the nature and effect of the impact is primarily undertaken within each of the relevant chapters, while this chapter identifies the most important potential interactions.

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants with input from the lead author of each assessment.

### 17.2 Population and Human Health

During the construction phase, the following aspects have potential to interact with population and human health:

- **Material Assets – Traffic and Transport** Construction traffic creates potential incidents, including an increase in pollutants which may affect air quality. This could lead to potential impacts on health and safety.
- **Land and Soils:** There is a potential risk of dust generated from excavation and stockpiling of soil during the construction phase of the proposed development posing a human health risk in the absence of standard avoidance and mitigation measures.
- **Material Assets – Waste:** The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers.
- **Hydrology and Hydrogeology** The construction phase could result in potential pollution events which could impact water quality and therefore human health of the surrounding population.
- **Noise and Vibration:** The construction phase could give rise to increased noise and vibration which may impact on the amenity of existing local residents.
- **Air Quality:** Construction activities may impact the local air quality which has the potential to impact human health.
- **Landscape and Visual:** The construction phase would result in the presence of construction equipment on site which may result in visual changes.

During the operational phase, the following aspects have potential to interact with population and human health:

- **Landscape and Visual:** There will be permanent visual changes to the landscape which may impact the residential dwellings in the surrounding area.
- **Traffic and Transport:** At operational stage, the development will result in increased traffic which has the potential to impact negatively on local residents and receptors.

The potential significant impacts to Population and Human Health have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

### 17.3 Landscape and Visual

During the construction phase, the following aspects have potential to interact with landscape and visual:

- Add text as appropriate

During the operational phase, the following aspects have potential to interact with landscape and visual:

- Add text as appropriate

### 17.4 Material Assets: Traffic and Transport

Chapter 6 assesses the likely impact on Traffic and Transport arising from the proposed development. During the construction phase and operational phases, the following aspects have potential to interact with traffic and transport:

- **Population and Human Health:** The construction of proposed development will result in increased construction traffic (including but not limited to HGV) and traffic using the road network, particularly in the vicinity of site. The increased traffic during the construction and operation phase will result in indirect impacts related to air quality and noise levels on human health.
- **Biodiversity:** The proposed development will result in increased traffic and transportation within the study area. These increases have the potential to negatively impact on biodiversity through temporary habitat fragmentation, increased noise and light disturbance, pollution, and mortality.
- **Water (Hydrology and Hydrogeology):** There is a potential for contaminated run off from the machinery on site during construction. The increased traffic and transportation levels associated with the proposed works increase the risk of hydrological contamination via diffuse and point sources such as road runoff or oil/fuel spills. During the operational phase, water quality can be impacted with any accidental release of oils, fuels, and chemicals, hydraulic fluids etc. from road service vehicles, trains etc.
- **Air Quality:** The generation of road traffic due to construction and operational phases has the potential to impact air quality including an increase in the emissions of particulate matter, nitrogen oxides and Green House Gases.
- **Noise and Vibration:** The construction of proposed development will result in an increase in the traffic volumes on local roads due to road closures and diversions and an increase in HGV movements around construction compounds and along haul routes.

The potential significant impacts to Traffic and Transport have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

### 17.5 Material Assets: Built Services

Chapter 7 assesses the likely impacts on Services and Infrastructure arising from the proposed development. During the construction phase and operational phase, the following aspects have potential to interact with built services:

- **Water and Hydrology:** The likely interactions between Material Assets and other environmental factors include interactions between the proposed drainage and wastewater arrangements and Chapter 10: Water and Hydrology of this EIAR.

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The potential significant impacts to Built Services have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

## 17.6 Material Assets: Waste

Chapter 8 assesses the likely impacts on Waste arising from the proposed development. During both the construction and operational phases, the following aspects have potential to interact with waste:

- Population and Human Health: Waste has the potential to cause impact to human health via potential nuisance (E.g. odour, vermin, litter);
- Traffic and Transport: Waste has the potential to impact traffic and transport through the movement of HGVs associated with waste export or collection;
- Soils and Water: Waste has the potential to impact soils and water through possible leachate or surface runoff from waste storage areas (if poorly contained);
- Air Quality: Waste has the potential to impact air quality from dust or emissions during C&D waste handling;
- Noise and Vibration: Waste has the potential to impact noise and vibration from vehicle movements or waste handling on site.

The potential significant impacts to Waste have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

## 17.7 Land and Soils

Chapter 9 assesses the likely impacts on Land and Soils arising from the proposed development. During the construction phase, the following aspects have potential to interact with land and soils:

- Biodiversity: Dust emissions have the potential to settle on plants causing impacts to local ecology.
- Hydrology and Hydrogeology: Surface water runoff interaction with excavated soils can also have an effect on water quality in the area, with chemicals or suspended solids having an effect on soil fertility and contamination.

The potential significant impacts to Land and Soils have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

## 17.8 Hydrology and Hydrogeology

Chapter 10 assesses the likely impacts on Hydrology and Hydrogeology arising from the proposed development. During the construction phase and operational phase, the following aspects have potential to interact with water & hydrology:

- Biodiversity: Dust emissions have the potential to settle on plants causing impacts to local ecology.
- Land and Soils: Surface water runoff can also have an effect on soil quality in the area, with chemicals or suspended solids having an effect on soil fertility and contamination.

The potential significant impacts to Hydrology and Hydrogeology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

## 17.9 Biodiversity

Chapter 11 assesses the likely impacts on Biodiversity arising from the proposed development. During the construction and operational phases, the following aspects have potential to interact with biodiversity:

- Land and Soils: Excavations and site clearance works could adversely impact the integrity and the quality of the trees and hedgerows onsite, and subsequently impacting on fauna species such as birds and bats.
- Hydrology and Hydrogeology: The ecological status of the Bandon River will not be impacted with the implementation of the appropriate mitigation measures as outlined in this EIAR.
- Noise and Vibration: Fauna is often sensitive to acoustic disturbances. However, given the disturbance to the Site and close proximity to construction works, it is considered likely that fauna in the vicinity of the Site has been habituated to elevated acoustics.

The potential significant impacts to Biodiversity have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

## 17.10 Noise and Vibration

Chapter 12 assesses the likely impact on Noise and Vibration arising from the proposed development. During the construction and operational phases, the following aspects have potential to interact with noise and vibration:

- Traffic and transport: With increased traffic movements, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be negative, long term and imperceptible.

The potential significant impacts to Noise and Vibration have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

## 17.11 Air Quality

Chapter 13 assesses the likely impacts on Air Quality arising from the proposed development. During the construction phase the following aspects have potential to interact with Air Quality:

- Population and Human health: An adverse air quality impact during the construction phase can cause health and dust nuisance issues. There is a low risk of dust-related human health impacts during the construction phase of the proposed development.
- Climate: Air Quality and Climate have interactions as the emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts.
- Land and Soils: Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land and Soils in the form of dust emissions.

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- Biodiversity: Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects.
- Traffic and Transport: 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.

During the operational phase the following aspects have potential to interact with Air Quality:

- Population and Human Health: Vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health. However, the increased number of vehicles associated with the proposed development will not cause a significant change in air pollutant emissions in the locality.
- Climate: Air Quality and Climate have interactions as the emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts.
- Traffic and Transport: The impact of the interactions between Traffic and Air Quality are considered to be long-term, direct, negative and not significant during the operational phase.

The potential significant impacts to Air Quality have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

### 17.12 Climate

Chapter 14 assesses the likely impacts on Climate arising from the proposed development. During the construction and operational phase, the following aspects have potential to interact with Climate:

- Land and Soils: The impact of flood risk has been assessed, and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change.
- Air Quality: Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts.
- Traffic and Transport: During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO<sub>2</sub>, a greenhouse gas.
- Waste: Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling.

The potential significant impacts to Climate have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

### 17.13 Cultural Heritage - Built Heritage Architectural and Archaeology

Chapter 15 assesses the impacts on Cultural Heritage arising from the development. The potential significant impacts to Cultural Heritage have been considered within the relevant discipline and mitigation measures outlined where required. No adverse effects on the cultural heritage resource are predicted to occur during the construction or operation phases as a result of interactions with other environmental aspects assessed in this EIAR.

### 17.14 Conclusion

Table 17-1 below provides an overview of the above interactions. Potential interactions are presented by an 'X'. Columns without an 'X' indicates that no interaction is expected. An 'X' in the columns headed 'C' represent interactions expected in the construction phase while an 'X' in the columns headed 'O' represent interactions expected in the operational phase.

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Table 17 1 Interactions with Potential for Significant Impacts Before the Implementation of Mitigation Measures

Interaction	Population & Human Health		Landscape		Material Assets- Traffic		Material Assets- Built Services		Material Assets: Waste		Land & Soils		Hydrology & Hydrogeology		Biodiversity		Noise & Vibration		Air Quality		Climate		Cultural Heritage	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Population & Human Health			X	X	X	X					X		X					X		X		X		
Landscape & Visual																								
Material Assets- Traffic	X	X											X	X	X	X	X	X	X	X				
Material Assets- Built Services													X	X										
Material Assets: Waste	X	X			X	X					X	X						X	X	X	X			
Land & Soils													X	X	X	X								
Hydrology and Hydrogeology												X	X			X	X							
Biodiversity												X	X	X	X			X	X					
Noise & Vibration																								
Air Quality	X	X			X	X					X				X							X	X	
Climate					X	X			X	X	X	X								X	X			
Cultural Heritage																								

Con. - Construction Phase | Op. - Operational Phase | ✓ - Potential Significant Interaction | ✗ - No Significant Interaction

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# CHAPTER EIGHTEEN

## SUMMARY OF PROPOSED MITIGATION MEASURES





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# CHAPTER 18

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## CHAPTER 18 | SUMMARY OF PROPOSED MITIGATION MEASURES

### 18.1 Introduction

A key objective of the Environmental Impact Assessment process is to identify likely significant environmental impacts at the pre-consent stage and where necessary to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR summarises the proposed mitigation measures set out in Chapters 4 to 15.

All the mitigation measures proposed within the individual specialists' assessments will be incorporated into the Construction and Environmental Management Plan (CEMP) prior to works commencing on-site.

**Table 18.1 Summary of Incorporated Design Mitigation Measures**

Aspect	Mitigation
Population & Human Health	<p>The proposed development complies with the Building Regulations which provide for the safety and welfare of people in and about buildings. The Building Regulations cover matters such as structure, fire safety, sound, ventilation, conservation of fuel and energy, and access, all of which safeguard users of the buildings and the health of occupants.</p> <p>The proposed design provides for the segregation of pedestrians and bicycle traffic from motorised traffic. The design also incorporates the principles of universal design and the requirements of Part M of the Building Regulations so that the development will be readily accessible to all, regardless of age, ability or disability.</p> <p>The integration of energy efficient measures into the design will provide for healthier living standards for future occupants, less dependence on fossil fuels and associated improved air quality. The availability of on the doorstep public open space, amenity spaces, and a highly accessible layout across the scheme will encourage sustainable modes of outdoor access for a wide age group.</p>

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Landscape & Visual	<ul style="list-style-type: none"> <li>The key landscape assets of the site—the external and internal boundary hedgerows, trees and tree groups - would be largely retained, forming the skeleton of the open space network. The ecological function and landscape value (visual amenity and screening) of the hedgerows would thus be retained. The photomontages show that the retained hedgerows and trees would be effective in softening and partially screening the proposed buildings in views from the surroundings.</li> <li>The retained vegetation would be supplemented by new planting, most notably the 'ecological buffers' inside the northern and southern boundaries - and specifically a broad belt of woodland planting inside the south west boundary at the interface with the Radharc an Bhaile estate. This is where the proposed development is closest to existing houses, and on a level above those houses; therefore, additional landscape/visual buffering is required in this area.</li> <li>The proposed species mixes of the new planting have been selected to support native pollinators and strengthen local ecosystems, with the objective to achieve net biodiversity gain (see p. 25 of the Landscape and Green Infrastructure Report by Simon Ronan Landscape Architects, August 2025).</li> <li>The proposed building typologies and design (two storey terraced and semi-detached houses of render, with stone detailing, and pitched slate roofs) were selected for two main reasons: (1) to avoid excessive visibility/visual impact on the hilltop site (compared to denser, taller typologies), and (2) to reflect the established pattern and character of development in the area. This is in accordance with Objective HE-16-21 of the CCDP, which states: "Encourage new buildings that respect the character, pattern and tradition of existing places, materials and built forms and that fit appropriately into the landscape".</li> </ul>
Material Assets: Traffic & Transport	<p>During the design stage the following mitigation measures were proposed for the development;</p> <ul style="list-style-type: none"> <li>Suitable Lighting of all junctions with lighting columns being positioned at the back of the footways.</li> <li>The connection of the proposed development footpaths to the existing footpath network to ensure connectivity to the wider area.</li> <li>The provision of bicycle stands and dedicated cycle routes through the development to encourage cycling.</li> <li>Charging points for electric vehicles are being provided.</li> <li>Development of a Mobility Management, submitted as part of this application, which outlines the mobility strategy for the proposed development and includes measures for guiding the delivery and management of coordinated mobility management initiatives.</li> <li>Identification of upgrade works as part of the proposed development.</li> </ul>
Material Assets: Built Services	<p>No incorporated design mitigation measures are proposed as part of the proposed development</p>

Material Assets: Waste	No incorporated design mitigation measures are proposed as part of the proposed development
Land & Soils	No incorporated design mitigation measures are proposed as part of the proposed development
Hydrology and Hydrogeology	No incorporated design mitigation measures are proposed as part of the proposed development
Biodiversity	<p>A comprehensive Landscape Plan has been developed by Simon Ronan Landscape Architects for the Proposed Development, which includes compensation for the loss of vegetation onsite. Please refer to the Landscape Concept Report for full details submitted as part of the planning application;</p> <p>The Proposed Development has been designed to retain the majority of the hedgerow / treelines onsite, as outlined in Landscape Plan;</p> <p>The Landscape Management Plan and ecological enhancement measures for the Proposed Development will be implemented as part of the works;</p> <p>All boundary trees and hedgerow / treelines that are to be retained will be protected from unnecessary damage; and,</p> <p>The Proposed Development has been designed to include a range of SuDS measures</p>
Noise & Vibration	No incorporated design mitigation measures are proposed as part of the proposed development
Air Quality	No incorporated design mitigation measures are proposed as part of the proposed development

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Aspect	Mitigation
Climate	<p>The design incorporates various mitigation measures to prevent or limit overland run-off which is of relevance for the vulnerability of the site to potential future flooding these measures have been considered when assessing the risk of future flooding as per Section 14.7.2.2 of Chapter 14.</p> <ul style="list-style-type: none"> <li>The development is divided into discrete sections for drainage and access. Internal roads run across contours – primarily falling towards phase 1 and the public roadway to the west. There are limited sections of roadway running directly downhill. This limits the gathering of surface water run-off in any specific area and limits the consequences of excessive build-up and discharge overtopping and surcharging an adjacent area</li> <li>The development has two separate exits into phase 1 and will have three separate connections each of both the surface and foul water systems into drainage pipework being installed in phase 1. The separate sections of sewers including separate discharge points, limits cumulative effects in the drainage systems.</li> <li>A detailed SuDS design has been adopted for the surface water system in accordance with the Cork County Development Plan the Greater Dublin Strategic Drainage Study and Code of Practice and SuDS manual CIRIA 753.</li> <li>Two separate attenuation chambers have been incorporated to attenuate water runoff to greenfield site rates. These chambers are underground sealed structures with lockable and sealed covers.</li> <li>Double gullies with individual connections to the drainage system are incorporated at appropriate surface water collection locations</li> <li>Raised kerbing or ramps are incorporated at specific locations to prevent excess surface water run-off entering lower areas.</li> <li>Raised kerbing is incorporated along all road edges on the downhill side of the roads running across the site.</li> </ul> <p>In relation to operational energy usage the proposed development will be Nearly Zero Energy Building (NZEB) compliant in line with the Technical Guidance Part L (2022) of the Building Regulations requirements for the residential elements and Technical Guidance Part L (2022), Buildings other than Dwellings for the creche. The proposed development will achieve a BER and RER in line with the NZEB requirements which will reduce the operational phase energy usage and therefore, reduce the impact to climate.</p>
Cultural Heritage	There are no recorded archaeological sites or architectural heritage structures located within the proposed development site that would need to be mitigated by avoidance as part of the design.

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Table 18.2 Construction Mitigation

Aspect	Mitigation
Population & Human Health	<p>A Construction and Environmental Management Plan (CEMP) and Resource Waste management Plan (RWMP) for the proposed development are included in the planning application documentation. The CEMP and RWMP will be further updated by the contractor, agreed with Cork County Council prior to commencement, and implemented by the selected contractor after any consent is received.</p> <p>All construction personnel will be required to understand and implement the requirements of the CEMP and RWMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.</p> <p>The CEMP provides for a construction phase management structure to ensure that environmental protection and mitigation measures are put in place. The CEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The CEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority.</p> <p>All construction personnel will attend induction and training classes as required to ensure that CEMP is effectively implemented. The CEMP will comply with all appropriate legal and best practice guidelines for construction sites.</p>
Landscape & Visual	<p>The most effective mitigation for the negative landscape and visual effects of construction is site hoarding. However, this is only effective for ground level activity. When buildings under construction rise above ground level they are exposed and unsightly, as are the materials stockpiles, vehicles, etc. typical of a construction site. Some negative effects are therefore unavoidable in the construction phase. Nonetheless, to minimise the effects, it is recommended that site hoarding be erected around the site – where this is compatible with the protection of the boundary vegetation.</p> <p>Good practice in site management can reduce unnecessary visual impacts. These may include (a) considered layout of the construction site with regard to the most sensitive visual receptors, (b) dust control (e.g. water sprays to avoid dust plumes; spraying of vehicles before site departure to avoid dirtying roads), (c) waste control (e.g. netting/covering of storage bins/areas; regular site inspection for litter), and (d) considered positioning of security lighting.</p> <p>A Construction Environmental Management Plan (CEMP) has been prepared and submitted with the LRD application. The CEMP includes measures – or a framework for the agreement of measures - such as those identified above.</p> <p>A Tree Protection Plan and Tree Appraisal and Arboricultural Assessment have been prepared by GEOTREE and submitted with the LRD application. These include measures for the protection of the site hedgerows and trees during construction.</p>
Material Assets: Traffic & Transport	<p>Traffic impacts during the construction stage will be mitigated through the implementation of a Construction Traffic Management Plan (CTMP), which will be agreed with CCC. A Framework CTMP, which sets out the principles to be followed, is included as part of the application package.</p> <p>The following measures will reduce the magnitude of HGV impacts on the adjoining road network:</p> <ul style="list-style-type: none"> <li>• The re-use of excavated materials generated on-site will reduce the total volume of imported material thereby reducing traffic generation.</li> <li>• Adequate storage space on site will be provided to accommodate all cut material.</li> <li>• Defining delivery times to site will avoid background traffic peak periods. Trucks will be equipped with dust covers when carrying dust producing materials to reduce the environmental impact of this activity. HGV deliveries will be scheduled (as far as possible) outside of peak periods on the network, which have been identified as 08:00 – 09:00 and 16:30 – 17:30.</li> <li>• Construction stage site staff starting at 07:00 and ending at 18:00 will avoid the recorded peak periods.</li> <li>• Site Staff encouraged to car-pool and to use public transport.</li> <li>• Wheel washing facilities will be provided on site, which will reduce the amount of dust and debris transferred to local roads. In addition, a road sweeper will be employed as required to ensure that the local road network is not unduly affected.</li> <li>• Specific haulage routes will be identified and agreed with the Local Authority prior to commencement of construction.</li> <li>• Construction Traffic Management Plan will be developed and implemented when appropriate, ie during the delivery of materials.</li> <li>• Warning Signs and Advanced Warning Signs will be installed at appropriate locations in advance of the construction works. Signs will be placed along the length of the route, warning all road users, and local residents, of the presence of slow moving and turning HGV traffic. In addition, warning signs will be placed in advance of the Site Access junction, to warn drivers approaching from both directions.</li> <li>• All site staff parking will be accommodated on-site within the designated site compound. No parking of site vehicles will be facilitated on the public road.</li> <li>• All site vehicles are to be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol, or diesel. Spill kits will be available on site. It will be the responsibility of the main contractor to ensure that all vehicles delivering to the site are suitably licensed to use the public road and equipped for this activity.</li> </ul>

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Aspect	Mitigation
Material Assets: Built Services	<p>The following mitigation measures will be taken to avoid unplanned disruptions to any services within the site during construction of the proposed development:</p> <ul style="list-style-type: none"> <li>• The proposed development will comply with the provisions of the Construction Environmental Management Plan.</li> <li>• Water metering will be provided during the construction phase to record consumption.</li> <li>• All new services will be constructed and provided in strict accordance with the codes of practise of the relevant utility companies and new connections to have an agreed permit for the works where required.</li> <li>• To minimise impact of the wastewater/water infrastructure required for the development, best practice construction practices should be adhered to, and Uisce Eireann procedures followed.</li> <li>• Temporary measures such as silt traps will be put in place to limit the rate of surface water run-off from site.</li> <li>• The quality of surface water run-off to be managed and ensure the run-off from the site does not result in excessive siltation of the receiving drainage channels.</li> <li>• Excavations are to be kept to a minimum, with excavated material stockpiled for reuse or removed off-site following removal of waste material regulations.</li> <li>• The contractor will also be obliged to put measures in place to ensure that there are minimal or no interruptions to existing services and that all services and utilities are maintained, unless this has been agreed in advance with the relevant service provider and local authority.</li> <li>• All watermains will be cleaned and tested in accordance with Uisce Eireann guidelines and standards prior to connection to the public watermain.</li> <li>• All works in the vicinity of the local authority will be compliant with any requirements or guidelines.</li> <li>• Road opening licences will be applied for and a temporary traffic management plan to be implemented when connecting utilities in the public road.</li> </ul>
Material Assets: Waste	<p>To manage waste arisings and material usage during the construction phase, a range of embedded and active mitigation measures will be implemented. These measures are aimed at avoiding the generation of waste where possible, maximising the beneficial reuse of site-won materials, and ensuring that all waste is handled in compliance with legal and environmental standards.</p> <p>The key mitigation measures are as follows:</p> <p><b><u>Balanced Earthworks and On-Site Reuse of Material</u></b></p> <ul style="list-style-type: none"> <li>• The development has been designed to achieve a cut-and-fill balance, with approximately 35,762 m<sup>3</sup> of cut material offset by a 35,246 m<sup>3</sup> fill requirement;</li> <li>• Fractured subsoil will be crushed on-site for reuse as granular sub-base in roads, footpaths, and hardstanding areas;</li> <li>• Topsoil stripping (ca. 21,270 m<sup>3</sup>) will be retained entirely on-site for landscaping, berm formation, and open space finishing;</li> <li>• This material management approach will avoid the need for off-site disposal or importation of material, minimising transport emissions and haulage impacts; and,</li> <li>• In the event that surplus excavated material arises during construction, it will be subject to appropriate waste classification in accordance with EPA Waste Classification Guidance to determine if it is hazardous or non-hazardous [4]. Where material is deemed non-hazardous and suitable for beneficial reuse, it may be managed as a by-product under Article 27 of the European Communities (Waste Directive) Regulations 2011, subject to EPA notification. This ensures full compliance with regulatory requirements while supporting the principles of the waste hierarchy and circular economy.</li> </ul> <p><b><u>Preparation and Implementation of a Resource and Waste Management Plan (RWMP)</u></b></p> <ul style="list-style-type: none"> <li>• A site-specific RWMP will be finalised by the main contractor in accordance with the EPA's 2021 Best Practice Guidelines and the Waste Management Act 1996 (as amended);</li> <li>• The plan will:             <ul style="list-style-type: none"> <li>• Identify all likely waste types and estimated quantities;</li> <li>• Specify on-site waste segregation, storage, and labelling protocols;</li> <li>• Set targets for reuse, recycling, and recovery rates; and,</li> <li>• Include procedures for monitoring, record-keeping, and reporting.</li> </ul> </li> </ul> <p><b><u>Use of Authorised Contractors and Facilities</u></b></p> <ul style="list-style-type: none"> <li>• All waste will be collected by contractors holding a valid Waste Collection Permit issued by the NWCPO; and,</li> <li>• All off-site movements of waste will be documented via waste transfer forms and sent only to authorised treatment, recovery, or disposal facilities.</li> </ul>

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Aspect	Mitigation
Material Assets: Waste	<p><b><u>Waste Handling, Storage, and Segregation on Site</u></b></p> <ul style="list-style-type: none"> <li>• Dedicated, clearly marked waste storage areas will be established for:                             <ul style="list-style-type: none"> <li>• Timber, metal, plastic, concrete, and mixed recyclables;</li> <li>• General residual C&amp;D waste;</li> <li>• Any potentially hazardous materials (e.g. paints, adhesives).</li> </ul> </li> <li>• Containers will be weatherproof, lockable, and regularly emptied to prevent overflow, odour, or windblown litter; and,</li> <li>• Waste will be removed from site on a regular basis to avoid stockpiling and fire risk.</li> </ul> <p><b><u>Prevention of Hazardous Waste Generation and Cross-Contamination</u></b></p> <ul style="list-style-type: none"> <li>• Materials with hazardous properties (e.g. adhesives, paints, treated timber) will be:                             <ul style="list-style-type: none"> <li>• Used only as required;</li> <li>• Stored in bunded, ventilated locations; and,</li> <li>• Segregated from non-hazardous waste streams.</li> </ul> </li> <li>• If hazardous waste is generated, it will be labelled, tracked, and removed by a licensed hazardous waste contractor.</li> </ul> <p><b><u>Training and Site Induction</u></b></p> <ul style="list-style-type: none"> <li>• All construction personnel and subcontractors will receive site waste management training, including:                             <ul style="list-style-type: none"> <li>• Waste segregation procedures;</li> <li>• Storage area use; and,</li> <li>• Spill prevention and response.</li> </ul> </li> <li>• The Site Manager or Environmental Officer will oversee compliance with the RWMP and ensure all subcontractors adhere to the agreed protocols.</li> </ul> <p><b><u>Article 27 Notifications (as required)</u></b></p> <p>Where site-won material is proposed for reuse and meets the definition of a by-product (not waste) under Article 27 of the European Communities (Waste Directive) Regulations 2011, a submission will be made to the EPA for confirmation of status.</p>
Land & Soils	<p>In order to reduce impacts on the land, soils and geological environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:</p> <ul style="list-style-type: none"> <li>• Control of soil excavation and export from site.</li> <li>• Sources of fill and aggregates for the Proposed Development.</li> <li>• Fuel and chemical handling, transport and storage; and</li> <li>• Control of water during construction.</li> </ul> <p><b><u>Construction Environmental Management Plan</u></b></p> <p>The CEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, Resource Manager and Ecological Clerk of Works, where relevant. All personnel working on the Site will be trained in the implementation of the procedures.</p>

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Aspect	Mitigation
Land & Soils	<p><b><u>Soil Excavation, Removal and Infill</u></b></p> <p>There will be a need for soil excavation on-site. The earthworks will include the excavation of level platforms and foundations for building and the importation of stone material for access roads, etc. 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.</p> <p>All excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred.</p> <p>Contractors should prepare and adhere to a method statement indicating the extent of the areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.</p> <p><b><u>Sources of Engineering Fill and Aggregates</u></b></p> <p>All imported fill and aggregate that may be required for the Proposed Development will be sourced from reputable suppliers. All suppliers will be vetted for:</p> <ul style="list-style-type: none"><li>• Aggregate compliance certificates/declarations of conformity for the classes of material specified for the Proposed Development.</li><li>• Environmental Management status; and</li><li>• Regulatory and Legal Compliance status of the Company</li></ul> <p><b><u>Cement/Concrete Works</u></b></p> <p>Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.</p> <p>No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within any riparian or buffer zone. Wash-outs will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer as already agreed with Uisce Éireann (Irish Water).</p> <p><b><u>Fuel and Chemical Handling</u></b></p> <p>The following mitigation measures will be taken at the construction stage in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or water quality impacts:</p> <ul style="list-style-type: none"><li>• Designation of a bunded refuelling areas on the site if refuelling cannot be undertaken off site.</li><li>• Provision of spill kit facilities across the site.</li><li>• Where mobile fuel bowsers are used, the following measures will be taken:<ul style="list-style-type: none"><li>• Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use.</li><li>• The pump or valve will be fitted with a lock and will be secured when not in use.</li><li>• All bowsers to carry a spill kit and relevant operatives must have spill response training.</li><li>• Portable generators or similar fuel containing equipment will be placed on suitable drip trays.</li></ul></li></ul> <p>In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:</p> <ul style="list-style-type: none"><li>• Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area.</li><li>• Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.</li><li>• All drums to be quality approved and manufactured to a recognised standard.</li><li>• If drums are to be moved around the site, they will be secured and on spill pallets; and</li><li>• Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.</li></ul> <p><b><u>Environmental Procedures</u></b></p> <p>There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage all types. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.</p>

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Aspect	Mitigation
Land & Soils	<p><b><u>Soil Excavation, Removal and Infill</u></b></p> <p>There will be a need for soil excavation on-site. The earthworks will include the excavation of level platforms and foundations for building and the importation of stone material for access roads, etc. 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.</p> <p>All excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred.</p> <p>Contractors should prepare and adhere to a method statement indicating the extent of the areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.</p> <p>Sources of Engineering Fill and Aggregates</p> <p>All imported fill and aggregate that may be required for the Proposed Development will be sourced from reputable suppliers. All suppliers will be vetted for:</p> <ul style="list-style-type: none"> <li>• Aggregate compliance certificates/declarations of conformity for the classes of material specified for the Proposed Development.</li> <li>• Environmental Management status; and</li> <li>• Regulatory and Legal Compliance status of the Company</li> </ul> <p><b><u>Cement/Concrete Works</u></b></p> <p>Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.</p> <p>No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within any riparian or buffer zone. Wash-outs will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer as already agreed with Uisce Éireann (Irish Water).</p> <p><b><u>Fuel and Chemical Handling</u></b></p> <p>The following mitigation measures will be taken at the construction stage in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or water quality impacts:</p> <ul style="list-style-type: none"> <li>• Designation of a bunded refuelling areas on the site if refuelling cannot be undertaken off site.</li> <li>• Provision of spill kit facilities across the site.</li> <li>• Where mobile fuel bowsers are used, the following measures will be taken:             <ul style="list-style-type: none"> <li>• Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use.</li> <li>• The pump or valve will be fitted with a lock and will be secured when not in use.</li> <li>• All bowsers to carry a spill kit and relevant operatives must have spill response training.</li> <li>• Portable generators or similar fuel containing equipment will be placed on suitable drip trays.</li> </ul> </li> </ul> <p>In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:</p> <ul style="list-style-type: none"> <li>• Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area.</li> <li>• Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.</li> <li>• All drums to be quality approved and manufactured to a recognised standard.</li> <li>• If drums are to be moved around the site, they will be secured and on spill pallets; and</li> <li>• Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.</li> </ul> <p><b><u>Environmental Procedures</u></b></p> <p>There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage all types. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.</p>

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Aspect	Mitigation
Hydrology & Hydrogeology	<p><b><u>Construction Environmental Management Plan</u></b></p>
	<p>The CEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, Resource Manager and Ecological Clerk of Works, where relevant. All personnel working on the Site will be trained in the implementation of the procedures.</p>
	<p><b><u>Suspended Solids</u></b></p>
	<p>As there is potential for run-off to indirectly discharge to a watercourse (Bandon River and eventually Upper Bandon Estuary), in order to manage the potential impact associated with sediment and sediment runoff the following mitigation measures will be implemented during the construction phase.</p> <ul style="list-style-type: none"> <li>• During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the excavation site which limits the potential for any offsite impacts.</li> <li>• Silt reduction measures on site will include a combination of silt traps and hydrobrakes measures.</li> <li>• Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.</li> <li>• Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.</li> <li>• Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.</li> <li>• Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.</li> <li>• Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.</li> </ul>
	<p><b><u>Cement/Concrete Works</u></b></p>
	<p>Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil and aquifer.</p>
	<p>Wash-outs will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker.</p>
	<p>The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. Relevant personnel working on the site will be suitably trained in the implementation of the procedures.</p>
	<p><b><u>Hydrocarbons and other construction chemicals</u></b></p>
	<p>The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water (and groundwater) systems:</p>
	<ul style="list-style-type: none"> <li>• Designation of bunded refuelling areas on the site;</li> <li>• Provision of spill kit facilities across the site;</li> <li>• Where mobile fuel bowsers are used, the following measures will be taken:             <ul style="list-style-type: none"> <li>• Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;</li> <li>• The pump or valve will be fitted with a lock and will be secured when not in use;</li> <li>• All bowsers to carry a spill kit and relevant operatives must have spill response training;</li> <li>• Portable generators or similar fuel containing equipment will be placed on suitable drip trays.</li> </ul> </li> </ul>

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Aspect	Mitigation
Hydrology & Hydrogeology	<p>In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:</p> <ul style="list-style-type: none"> <li>• Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;</li> <li>• Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.</li> <li>• Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;</li> <li>• All drums to be quality approved and manufactured to a recognised standard;</li> <li>• If drums are to be moved around the Site, they will be secured and on spill pallets; and</li> <li>• Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.</li> </ul> <p><b><u>Wastewater Management</u></b></p> <p>Foul wastewater arising from the site will be managed and controlled for the duration of the construction works.</p> <p>Foul water from the offices and welfare facilities on the site will be collected in portable sanitary facilities and disposed of appropriately by licenced contractor.</p> <p>The construction contractor will implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the site will be suitably trained in the implementation of the procedures.</p> <p><b><u>Surface Water and Ground water flow and quantity</u></b></p> <p>Surface water discharge from the site will be managed and controlled for the duration of the construction works until the surface water drainage system of the Proposed Development is complete.</p> <p>The construction contractor will be required to manage suspended solids during the construction phase and will be permitted to discharge treated construction water to the established stormwater network.</p> <p>The construction activities will require surface water management to prevent pollution and degradation of habitats from a chemical spill or run off containing excessive suspended solids that complies with guidelines and best practices such as “Control of Water Pollution from Construction Sites and Guidance for Consultants and Contractors” (CIRIA 532, 2001)</p>
Biodiversity	<p>The following mitigation measures will be incorporated and adhered to in order to ensure that the proposed works do not result in any contravention of wildlife legislation:</p> <ul style="list-style-type: none"> <li>• All activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EIAR will be fully adhered to;</li> <li>• The Site manager shall ensure that all personnel working onsite will be trained and made aware of the mitigation measures detailed within this EIAR;</li> <li>• An Ecological Clerk of Works (‘ECoW’) will be appointed for the construction works and will be available should protected or notable species be encountered during operations at the Site; and,</li> <li>• In advance of works, all Site personnel will receive a toolbox talk regarding the mitigation measures outlined in the CEMP and EIAR. Everybody working onsite must understand the role and authority of the ECoW. An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works, to ensure that all works will be completed in line with the CEMP and all wildlife legislation.</li> </ul> <p><b><u>Protection of Water Quality</u></b></p> <p>During the Construction Phase, all works will comply with all relevant legislation and best practice to reduce potential environmental impacts of the works. Furthermore, as a precautionary principle, the following mitigation measures will be put in place to ensure that water quality will be protected within the vicinity of the Site and further downstream. The measures that will be put in place to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below. Therefore, in order to ensure that the proposed works do not have an impact on the River Bandon and the downstream river network, surface water mitigation measures will be implemented. These procedures will be communicated to all relevant site staff. Construction stage works will be undertaken in accordance with an approved CEMP.</p> <p>The following best practice guidelines will be followed, which are based on Inland Fisheries Ireland and NRA, now known as the TII guidance documents:</p> <p><b><u>General Mitigation Measures for the Protection of Water Quality</u></b></p> <p>The following mitigation measures will be put in place to ensure that water quality is protected within the River Bandon and subsequently the wider river network downstream of the Site. These measures will be put in place to remove the risk from potential contamination and will include emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances, as outlined below. These procedures will be communicated to all relevant site staff.</p>

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Aspect	Mitigation
Biodiversity	<p>Sediment control measures will be put in place to prevent suspended solids in runoff from entering the River Bandon. These measures include the following:</p> <ul style="list-style-type: none"> <li>• The proposed working area will be clearly defined, and construction activities will be carefully planned to minimise ground disturbance;</li> <li>• Existing vegetation will be retained where possible and runoff will be diverted away from stripped areas;</li> <li>• The works area onsite will be sprayed during periods of dry weather in order to suppress dust migration from the Site;</li> <li>• Weather conditions will be considered when planning construction activities to minimise risk of runoff from the proposed works;</li> </ul> <p>The following mitigation measures will be implemented during the proposed works to minimise the likelihood of oil/fuel release to surface water during refuelling of plant and equipment:</p> <ul style="list-style-type: none"> <li>• Prior to any works commencing, all construction equipment will be checked to ensure that they are mechanically sound to avoid leaks of oil, fuel, hydraulic fluids and grease;</li> <li>• Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;</li> <li>• The Appointed Contactor will put in place a specific, step-by-step refuelling procedure which will be communicated to all relevant employees on-site;</li> <li>• Only designated trained operators will be authorised to refuel plant on-site;</li> <li>• Refuelling of plant and machinery will be completed in a controlled manner using drip trays (bund container trays) in a dedicated refuelling area;</li> <li>• All oil stored onsite for construction vehicles will be kept in a lock and bund protected area;</li> <li>• Bunds for the storage of hydrocarbons and chemicals during construction will have a holding capacity of 110% of the volume to be stored and will be regularly inspected for leaks and signs of damage; and,</li> <li>• Procedures and contingency plans will be set up to deal with emergency accidents or spills. Only emergency breakdown maintenance will be carried out on-site.</li> </ul> <p>The proposed measures to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below:</p> <ul style="list-style-type: none"> <li>• Adequate spill kits, including absorbent booms and other absorbent material, will be maintained on-site;</li> <li>• All contractor workers will be appropriately trained in the use of spill kits;</li> <li>• Any spillages will be cleaned up immediately and disposed of correctly; and,</li> <li>• Any sediments impacted by contamination will be excavated and stored in appropriate sealed containers for disposal offsite in accordance with all relevant waste management legislation.</li> </ul> <p>Therefore, following the implementation of the above mitigation measures, it is concluded that the works required for the Proposed Development will not adversely affect the water quality within the River Bandon and therefore, will not adversely affect the wider river network downstream of the Site.</p> <p><b><u>Protection Measures for Trees and Root Systems</u></b></p> <p>During the Construction Phase, any boundary hedgerows/treelines to be retained will be protected for the duration of the construction activities on site and in accordance with BS 5837. All retained hedge/treeline will be protected from unnecessary damage, and care will be taken to protect these features from both direct and indirect disturbance. The following protection measures will be adhered to during the works:</p> <ul style="list-style-type: none"> <li>• Trees, treelines and hedgerows to be retained and located within close proximity to the construction areas will be fenced off by effective construction proof barriers before construction works commence. These barriers will remain in place for the duration of the works to prevent accidental disturbance and define the limits of the construction area;</li> <li>• Care will be taken to prevent any damage/disturbance to root systems through the implementation of a buffer zone/construction exclusion zone of unexcavated ground will be maintained along the retained features;</li> <li>• Where machinery access has to encroach treeline/hedgerow features that are being retained, a root protection area will be established. Additionally, suitable ground protection will be put in place to prevent any significant soil compaction or root damage. This should take the form of suitable ground protection mats or cellular confinement system capable of supporting appropriate weight;</li> <li>• All weather notices will be erected on the fences and fencing will be inspected on a regular basis during the construction process;</li> <li>• Trench digging or other excavations works will not be permitted within close proximity to retained trees and hedgerows unless approved and supervised by the project ECoW;</li> <li>• No materials, equipment or machinery will be stored within close proximity to retained treelines/hedgerows;</li> <li>• Notice boards, wires, etc. will not be attached to any trees; and,</li> <li>• Site offices, materials and contractor parking will be outside of the Construction exclusion zone.</li> </ul>

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Aspect	Mitigation
Biodiversity	<p>Following the completion of the construction works, the project ECoW will assess the retained trees and hedgerow to ensure that the above mitigation measures have been complied with. As part of the Landscape Plan prepared for the Proposed Development, additional planting will take place throughout the Site</p> <p><b><u>Protection Measures for Species</u></b></p> <p><b><u>Breeding Birds</u></b></p> <ul style="list-style-type: none"> <li>• In order to ensure that no disturbances occur to breeding birds that may potentially use the Site or the adjacent lands, the following mitigation measures will be put in place:</li> <li>• As per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or ditches will be restricted during the nesting and breeding season for birds and wildlife, from 1st March to 31st August;</li> <li>• Therefore, any vegetation clearance required within the Site will take place outside of the nesting bird season (1st March to 31st August). Vegetation clearance is restricted as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000;</li> <li>• In the event that works need to be undertaken within the main breeding season, the following measures will be implemented:             <ul style="list-style-type: none"> <li>• Prior to the works commencing, consultation with the NPWS will be undertaken by the ECoW; and,</li> <li>• Prior to the vegetation removal, the ECoW will inspect the Site.</li> </ul> </li> <li>• All vegetation clearance works will be undertaken in a systematic way under the direction of the ECoW; in the unlikely event that birds nest within the active working area during the Construction Phase, works within the area will stop, and the project ECoW will be consulted;</li> <li>• During the construction phase, annual breeding bird monitoring will be undertaken by the project ECoW to ensure no impacts occur to breeding birds within the vicinity of the Site</li> </ul> <p><b><u>Measures for Non-volant Mammals</u></b></p> <p>Given the presence of onsite habitats with features that have the potential to support sheltering, foraging and commuting mammals such as badger and hedgehogs and in order to ensure that the works in relation to the Proposed Development will not have significant impacts on terrestrial mammals, general construction procedures and mitigation measures will be undertaken. These mitigation measures are in line with the NRA (now TII) guidance for badgers [15]. These include the following measures:</p> <ul style="list-style-type: none"> <li>• Should construction works be required outside of daylight hours, the appointed project ECoW will be consulted as required;</li> <li>• All vegetation clearance will be undertaken in a systematic way to allow any potential species that may be utilising these areas to disperse naturally as works progress;</li> <li>• New drainage infrastructure will be laid in sections and backfilled; • Waste will be kept contained in a designated area to avoid animals becoming trapped in litter;</li> <li>• Where deep excavations will be required on-site, appropriate measures to protect mammals from ingress will be installed; and,</li> <li>• If unidentified burrows are identified within the works area during construction, the project ECoW will be contacted for advice, and any works that have the potential to impact on these species will cease until appropriate mitigation measures are in place.</li> </ul> <p>Construction noise can also impact species such as badger, which include disturbance, behavioural impacts, stress, and displacement from feeding grounds. In order to ensure that impacts can be avoided, the following mitigation measures will be implemented during the construction phase:</p> <ul style="list-style-type: none"> <li>• In advance of works, all Site personnel will receive a Site induction or toolbox talk which will include reference to measures detailed in the CEMP;</li> <li>• Activities and deliveries to the Site to occur only during permitted hours;</li> <li>• Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines;</li> <li>• Management of deliveries and vehicles to minimise vehicles idling onsite;</li> <li>• All plant where possible shall be low noise rated. Careful selection of quiet plant and machinery to undertake the required work, where available;</li> <li>• Minimise the drop height of materials;</li> <li>• Start-up plant and vehicles sequentially rather than all together;</li> <li>• Noise construction works will be limited to 8am to 6pm on weekdays;</li> <li>• Positioning of hoarding and enclosures around noisy works or plant as required; and,</li> <li>• Handling of all materials will take place in a manner which minimises noise emissions.</li> </ul>

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Aspect	Mitigation
Biodiversity	<p>Given the location of the Proposed Development in a semi-urban area and the relatively high levels of human activity, any species utilising the area are likely to be habituated to elevated noise levels or will avoid this area. It is therefore concluded that, provided the above mitigation measures will be followed during the construction works, no impacts will occur</p> <p><b>Nocturnal Species</b></p> <p>All temporary lighting installed within the Proposed Development site will be completed with sensitivity for local wildlife while still providing the necessary lighting for human usage during construction.</p> <ul style="list-style-type: none"> <li>• Therefore, appropriate lighting, as detailed below, should be used during construction:</li> <li>• Construction should be limited to daylight hours in order to minimise adverse effects on nocturnal fauna;</li> <li>• Light Emitting Diodes ('LED's') will be used, and the brightness will be set as low as possible;</li> <li>• Lighting will be kept to the minimum necessary for health and safety purposes;</li> <li>• Lighting will only be utilised during working periods where required and will be shut down during non-working periods;</li> <li>• Lighting will be directed away from landscaped areas and retained sections of hedgerows, treelines;</li> <li>• LED luminaires will be used because they are highly directional, lower intensity, good colour rendition and dimming capability;</li> <li>• Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;</li> <li>• The use of specialist bollards or low-level downward directional luminaires should be considered in bat-sensitive areas to retain darkness above;</li> <li>• Column heights should be carefully considered to minimise light spill;</li> <li>• The shortest column height allowed should be used where possible;</li> <li>• Only luminaires with an upward light ratio of 0% and with good optical control should be used;</li> <li>• Luminaires should always be mounted on the horizontal, i.e. no upward tilt;</li> <li>• Any external security lighting should be set on motion-sensors and short (1min) timers; and,</li> <li>• Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.</li> </ul> <p>Monitoring of light levels along the treelines and hedgerow areas will be undertaken pre-construction, during-construction and post-construction to identify any areas where light spill is affecting background levels. Where monitoring detects that light spill is affecting these habitat areas, remedial measures will be implemented to ensure that background light levels are maintained.</p> <p><b>Invasive Species</b></p> <p>A medium-impact invasive species Sycamore (<i>Acer pseudoplatanus</i>), was identified on the Site. However, high-impact invasive species have been recorded within 2km of the Site [19].</p> <p>To mitigate against the unintentional introduction of invasive species during construction, the following biosecurity measures will be implemented. These measures are in line with NRA (now TII) Guidance for the Management of Noxious Weeds and Non-Native Invasive Plant Species [</p> <ul style="list-style-type: none"> <li>• All vehicles, machinery and any other equipment that may be used for the works will be washed prior to its use on-site to prevent the import of plant material and seeds;</li> <li>• Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed;</li> <li>• Any vehicles and machinery that are not clean will not be permitted entry to the Site;</li> <li>• All materials to be imported to the Site, including additional planting, will be sourced from a reputable supplier and records of all material / supplies to Site will be maintained; and,</li> <li>• In advance of works, all site personnel will receive an induction regarding invasive species.</li> </ul>

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Aspect	Mitigation
Noise & Vibration	<p>The assessment detailed in Section 12.9.1.1 of Chapter 12 has found that predicted construction noise levels do not exceed the threshold whereby a significant impact would be likely. Therefore, while the contractor should employ best practice noise control measures, specific mitigation measures are not necessary.</p> <p>Aside from this, best practice noise control measures are highlighted so as to reduce the risk of unnecessary excessive noise generation:</p> <ul style="list-style-type: none"> <li>• limiting the hours during which site activities likely to create high levels of noise vibration are permitted;</li> <li>• establishing channels of communication between the contractor/developer, Local Authority and residents;</li> <li>• appointing a site representative responsible for matters relating to noise and vibration; and</li> <li>• monitoring levels of noise and/or vibration during critical periods and at sensitive locations.</li> <li>• selection of plant with low inherent potential for generation of noise and/ or vibration;</li> <li>• erection of barriers as necessary around items such as generators or high duty compressors;</li> <li>• situate any noisy plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary</li> </ul>
Air Quality	<p>The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRC (2022)), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.</p> <p><u>Communications</u></p> <p>Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.</p> <p>The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.</p> <p><u>Site Management</u></p> <ul style="list-style-type: none"> <li>• During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.</li> <li>• A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out.</li> </ul> <p><u>Preparing and Maintaining the Site</u></p> <ul style="list-style-type: none"> <li>• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.</li> <li>• Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.</li> <li>• Avoid site runoff of water or mud.</li> <li>• Keep site fencing, barriers and scaffolding clean using wet methods.</li> <li>• Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.</li> <li>• Cover, seed or fence stockpiles to prevent wind whipping.</li> <li>• Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.</li> </ul> <p><u>Operating Vehicles / Machinery and Sustainable Travel</u></p> <ul style="list-style-type: none"> <li>• Ensure all vehicles switch off engines when stationary - no idling vehicles.</li> <li>• Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.</li> <li>• Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).</li> <li>• Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.</li> <li>• Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)</li> </ul>

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Aspect	Mitigation
Air Quality	<p><u>Operations</u></p> <ul data-bbox="477 468 2730 646" style="list-style-type: none"> <li>• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.</li> <li>• Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.</li> <li>• Use enclosed chutes and conveyors and covered skips.</li> <li>• Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.</li> <li>• Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.</li> </ul>
	<p><u>Waste Management</u></p> <ul data-bbox="477 705 1038 732" style="list-style-type: none"> <li>• Avoid bonfires and burning of waste materials.</li> </ul>
	<p><u>Measures Specific to Earthworks</u></p> <ul data-bbox="477 791 2730 1142" style="list-style-type: none"> <li>• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.</li> <li>• Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.</li> <li>• Only remove the cover in small areas during work and not all at once.</li> <li>• During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.</li> <li>• Measures Specific to Construction</li> <li>• Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.</li> <li>• Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.</li> <li>• For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.</li> </ul>
	<p><u>Measures Specific to Construction</u></p> <ul data-bbox="477 1201 2730 1291" style="list-style-type: none"> <li>• Avoid scabbling (roughening of concrete surfaces) if possible.</li> <li>• Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.</li> </ul>
	<p><u>Measures Specific to Trackout</u></p> <ul data-bbox="477 1350 2237 1680" style="list-style-type: none"> <li>• A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.</li> <li>• Avoid dry sweeping of large areas.</li> <li>• Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.</li> <li>• Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.</li> <li>• Record all inspections of haul routes and any subsequent action in a site logbook.</li> <li>• Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.</li> <li>• Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).</li> <li>• Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permit.</li> <li>• Access gates to be located at least 10 m from receptors where possible.</li> </ul>
	<p><u>Monitoring</u></p> <ul data-bbox="477 1738 2730 1864" style="list-style-type: none"> <li>• Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.</li> <li>• Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.</li> </ul>

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Aspect	Mitigation
Climate	<p>Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. The following measures to reduce the embodied carbon of the construction works are:</p> <ul style="list-style-type: none"> <li>• Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.</li> <li>• Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.</li> <li>• Ensure all plant and machinery are well maintained and inspected regularly.</li> <li>• Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.</li> <li>• Sourcing materials locally where possible to reduce transport related CO2 emissions.</li> <li>• Material choices and quantities will be reviewed during detailed design, to identify and implement any lower embodied carbon options, where feasible. For example, a 30% minimum clinker replacement in cement may be utilised in line with the requirements for public bodies.</li> </ul> <p>In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lightning and hail through site risk assessments and method statements.</p> <p>Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed e.g. the EU Commission Technical Guidance on Adapting Buildings to Climate Change (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest IPCC report.</p>
Cultural Heritage	<p>A test trenching programme is scheduled to be undertaken within the proposed development site. This test trenching programme was submitted to Ms Annette Quinn, Executive Archaeologist with Cork County Council, for review and she approved it on 26th May 2025. An application for an excavation licence for this test trenching investigation will be made to the National Monuments Service (NMS). A report on the results of this site investigation will be submitted to the NMS, the Cork County Council Archaeologist, and the Planning Authority once onsite works have been completed.</p> <p>This test trenching programme will target the potential 'pit-type' anomalies identified in the geophysical survey (see Section 15.6.7 of Chapter 15). It will also investigate other areas within the proposed development in which no anomalies were identified. The test trenches will cover a total of 10% of the available lands within the proposed development site. In the event that any sub-surface archaeological features are identified during these site investigations, their locations will be recorded and securely cordoned off while the NMS are notified of the discovery and consulted to determine further mitigation measures, which may entail preservation in situ by avoidance or preservation by record through a systematic archaeological excavation.</p> <p>In the areas that are currently under mounded soil in the north of the proposed development site, the potential exists that any previously unrecorded sub-surface archaeological features in this area may remain undisturbed. These areas will not be available for test trenching due to the presence of substantial areas of mounded soils, and the removal of these mounds and underlying topsoil material will, therefore, be archaeologically monitored (under licence from the National Monuments Service) during the construction phase.</p> <p>There are no structures/features of architectural or cultural heritage significance located within the proposed development site or its close environs and, therefore, no other mitigation measures are required.</p>

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Table 18.3 Operational Mitigation

Aspect	Mitigation
Population & Human Health	The proposed development is a high-quality design that incorporates generously sized units with integrated energy efficiency measures and an abundance of open space. The impact assessment section did not identify likely significant environmental impacts on population and human health arising from the operational phase of the proposed development. Accordingly, mitigation measures are not proposed.
Landscape & Visual	The design of the proposed development incorporates all necessary mitigation measures for operational phase impacts. No further operational phase mitigation measures are required.
Material Assets: Traffic & Transport	<p>During the Operational Phase Mitigation measures proposed during the operational stage are as follows;</p> <ul style="list-style-type: none"> <li>• Provision of bike parking spaces above minimum requirements, including dedicated cargo bike spaces.</li> <li>• Opting for fewer car parking spaces than the maximum allowed under the Cork County Council Development Plan. This reduction, coupled with initiatives promoting cycling as a viable alternative mode of transport, will significantly contribute to sustainability by diminishing reliance on private cars while fostering increased usage of more eco-friendly transportation options, notably cycling and bus services for commuting.</li> <li>• Enhancing pedestrian and cyclist connectivity within the development and its adjacent residential areas to public transport and public parks.</li> <li>• Establishing a dedicated pedestrian and cycle facility throughout the development.</li> <li>• Installing cycle priority crossings within the development.</li> <li>• Ensuring all footpaths within the development adhere to Part M compliance standards, incorporating crossing points in accordance with DMURS and Traffic Management Guidelines.</li> <li>• Implementation of a number of initiatives and active monitoring within the development to promote modal change.</li> <li>• Phasing of the proposed development to allow for future infrastructure improvements to be implemented outside of the control of the applicant.</li> </ul>
Material Assets: Built Services	<p>The following section discusses the mitigation approaches that will be followed during the operational phase of the development:</p> <ul style="list-style-type: none"> <li>• All new foul and surface water drainage pipes to be pressure tested and CCTV surveyed to identify any possible defects.</li> <li>• Water conservation measures to be implemented, which include water metering, rainwater capture, low flush and efficiency attachments.</li> <li>• Ensure that all hydro brakes are designed to limit the flow of water from the development to the greenfield run-off rate.</li> <li>• All water main pipes to be pressure tested in accordance with Uisce Eireann details.</li> <li>• All water mains will be cleaned and tested in accordance with Uisce Eireann guidelines and standards prior to connection to the public water main.</li> </ul>
Material Assets: Waste	<p>Waste generation during the operational phase of the Proposed Development will be typical of a large residential development and will primarily consist of MSW from individual households. Although the scale and character of this waste are not expected to result in significant environmental effects, several measures will be implemented to prevent nuisance, ensure regulatory compliance, and support national waste policy objectives.</p> <p><b>Provision of Compliant Waste Infrastructure at Unit Level</b></p> <ul style="list-style-type: none"> <li>• Each dwelling will be provided with sufficient space to store three standard wheeled bins: one each for dry recyclables, organic waste, and residual waste, in accordance with the requirements of the Cork County Council (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws 2019.</li> <li>• Bin storage areas will be:             <ul style="list-style-type: none"> <li>• Located within the curtilage of each dwelling;</li> <li>• Discretely screened or enclosed to minimise visual impact;</li> <li>• Accessible for residents and for kerbside presentation; and,</li> <li>• Sized to accommodate either 240L or 360L bins depending on household size.</li> </ul> </li> </ul>

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Aspect	Mitigation
Material Assets: Waste	<p><b><u>Waste Collection Access and Layout Integration</u></b></p> <ul style="list-style-type: none"> <li>All internal roads, turning areas, and home zones have been designed to accommodate domestic refuse collection vehicles, based on autotrack analysis and standard bin-lift requirements.</li> <li>Residents will present bins kerbside in line with local waste collection schedules. No communal storage or bring bank facilities are proposed or required.</li> </ul> <p><b><u>Design Measures to Prevent Nuisance</u></b></p> <ul style="list-style-type: none"> <li>Bin storage locations are set back from public paths and positioned to avoid conflict with windows, entrances, or public open spaces;</li> <li>Proper ventilation and screening are integrated into the design to prevent odours, vermin attraction, or wind-blown litter; and,</li> <li>In the event of missed collections or excessive accumulation (e.g. over public holidays), contingency arrangements may be implemented by waste collection providers.</li> </ul> <p><b><u>Long-Term Alignment with Circular Economy Targets</u></b></p> <ul style="list-style-type: none"> <li>The layout and waste infrastructure have been designed to support long-term compliance with the waste hierarchy (prevention, reuse, recycling, recovery, disposal) and national policy under the National Waste Management Plan for a Circular Economy (2024–2030); and,</li> <li>By facilitating source segregation at household level and ensuring high-quality collection access, the development supports increased recycling rates, diversion of biodegradable waste from landfill, and improved circular resource flows.</li> </ul>
Land & Soils	<p><b><u>Emergency Response Procedures</u></b></p> <p>There should be comprehensive emergency response procedures and standard operating procedures to respond to an onsite fuel spillage. All employees should be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures</p> <p><b><u>Fuel Storage</u></b></p> <p>The provision of spill kit facilities and training of operatives in use of same; should be undertaken at the operational stage in order to manage any leaks from fuel storage and vehicles resulting in soil and/or groundwater quality impacts</p> <p><b><u>Increase in hard stand</u></b></p> <p>A significant proportion of the development area will be covered in hardstand. This provides protection to the underlying soil and aquifer but also reduces local recharge in this area of the aquifer. Surface water and Ground water management and mitigation measure are discussed in further detail in Chapter 10 (Hydrology and Hydrogeology).</p>
Hydrology and Hydrogeology	<p><b><u>Surface water and groundwater</u></b></p> <p>To mitigate potential contamination from surface water runoff, which may originate from roads and hardstanding areas, a sustainable drainage system (SuDS) will be implemented. This system is designed to minimize the risk of contaminants, such as hydrocarbons, entering the stormwater drainage network and subsequently impacting surface water bodies like the Bandon River and Upper Bandon Estuary, as well as groundwater bodies, including the Bandon GWB underlying the site.</p> <p>The surface water drainage strategy integrates various measures, including attenuation ponds, rainwater harvesting, permeable paving and downstream defenders. These features will effectively manage surface water flows, directing them to an underground attenuation pond and infiltration tanks to maximize their storage potential. Flow control devices will be installed downstream of the pond outlet pipes to ensure that surface water runoff is stored efficiently before entering the receiving environment.</p> <p><b><u>Surface water and ground water flow and quantity</u></b></p> <p>The proposed incorporation of hardstand areas and SuDS design measures may slightly reduce local groundwater recharge and increase runoff if not properly managed, potentially causing flooding and affecting downstream environments. However, the overall impact on the groundwater regime is expected to be insignificant due to the site's small area relative to the total aquifer, and construction will avoid areas with localized flooding to mitigate flood risks.</p> <p>To mitigate these risks, the design of the development and its drainage infrastructure will ensure that runoff rates are restricted to those of greenfield conditions. The development will incorporate SuDS and an underground attenuation system, with a design that up to and including the 100-year plus climate change allowance and discharge surface water to the downstream network at an appropriately determined rate. The proposed surface water management strategy aims to prevent surcharging during a 1 in 2-year storm events up to and including the 1 in 100 years plus allowance for climate change.</p> <p>Furthermore, there are no proposed surface water or groundwater abstractions, eliminating potential impacts on the quantity of surface water or groundwater resources.</p>

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Aspect	Mitigation
	<p><b>Protection of Water Quality</b></p> <p>The additional hard surfacing onsite will result in an increase in surface water runoff. However, a new network of pipework with SuDS features and attenuation storage structures will be implemented. This is in line with Objective 11-10 of the CCDP [37]. This will prevent potential pollutants from surface water runoff, such as hydrocarbons, flowing down and entering the River Bandon.</p> <p>The following individual SuDS measures are considered appropriate for this particular development and will be incorporated:</p> <ul style="list-style-type: none"> <li>• Drained swale;</li> <li>• Filter drains;</li> <li>• Permeable paving;</li> <li>• Petrol, oil interceptor grit trap; and,</li> <li>• Attenuation tank.</li> </ul> <p>The SuDS design reflects the layout and topography of the Site:</p> <ul style="list-style-type: none"> <li>• Permeable paving has been incorporated in the external hardstanding of all dwellings. Soakaways have also been incorporated to accommodate roof water run off – both of these measures will intercept surface water at sources;</li> <li>• Permeable paving has been incorporated into the ‘homezone’ areas in front of house numbers 15 to 26, 43 to 62 and 187 to 198 comprising 2,657m<sup>2</sup>;</li> <li>• Filter drains have been incorporated into select areas to address the potential for rainwater exceedance scenario;</li> <li>• Swales have been incorporated where gradients allow. The swales will be appropriately planted to enhance biodiversity gains. The swales will serve specific areas of road run-off by drainage from road gullies. These areas will deliver a high level of water treatment;</li> <li>• Due to the sloping nature of the Site the incorporation of Detention Basins and / or Retention Basins is not feasible.</li> </ul> <p>For full details, please refer to the Engineering Infrastructure Report prepared by Brian O Kennedy &amp; Associates Ltd (‘BOK’) submitted as part of this planning application</p>
Biodiversity	<p><b>Protection of Fauna</b></p> <p>The lighting strategy involves avoiding excessive lighting. The following measures have been incorporated into the lighting design:</p> <ul style="list-style-type: none"> <li>• Avoidance of excessive lighting;</li> <li>• Lighting has only been installed where necessary for public safety; • Sensitive lamp design to reduce light reflectance;</li> <li>• Lighting will be aimed only where it is needed, with upward lighting shielded and a preference for downward directional focus;</li> <li>• Light Emitting Diodes (‘LED’s’) will be used, and the brightness will be set as low as possible;</li> <li>• Lighting will be directed away from landscaped areas and retained sections of mixed broadleaved woodland;</li> <li>• Hoods/cowling will be installed, and this will greatly reduce back spillage of lighting; and,</li> <li>• Lighting will be turned down / off when not required;</li> <li>• Use of bat-sensitive lighting in the form of ‘warm white’ ≤3000°K luminaires. Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats; and</li> <li>• Lighting has been designed and selected with specific shutters and filters to minimise any potential for back spills into the sensitive locations.</li> </ul> <p>Following the installation of the lighting for the Proposed Development, the ECoW will undertake a further Site inspection in order to check the lighting patterns and lux levels along the Site boundaries to ensure that there will be no impacts to bats or other nocturnal species.</p> <p><b>Ecological Linkages</b></p> <p>As part of the Proposed Development, the majority of existing linkages across the Site, will be protected and enhanced with additional hedgerow / tree planting. Taking the above into consideration, it is recommended that, where possible, existing ecological corridors be protected and enhanced. The following measures are recommended for the protection of hedgerow/treeline ecological corridors:</p> <ul style="list-style-type: none"> <li>• A post-construction inspection of hedgerow / treelines to determine the health of the plants;</li> <li>• Where dead trees are identified - removal of dead trees and replacement with new suitably sized native tree species; and,</li> <li>• Where sparse areas are identified – additional supplementary planting of native tree species should be undertaken</li> </ul>

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Aspect	Mitigation
Biodiversity	<p><b><u>Habitat Connectivity</u></b></p> <p>Habitat connectivity is generally known as the degree to which the environment facilitates or obstructs species movement and other ecological processes. The Site forms part of a wider ecological framework, where existing hedgerow networks play a vital role in linking surrounding agricultural lands and supporting regional biodiversity. These linear habitats function as wildlife corridors, providing food sources, shelter, and nesting opportunities for birds, small mammals, and pollinating insects. There are opportunities within the Site to increase the habitat connectivity and support local biodiversity of the local area, such as:</p> <ul style="list-style-type: none"> <li>• Maintaining hedgerow/treelines onsite; and,</li> <li>• Planting additional hedgerows</li> </ul> <p><b><u>Habitat Environment</u></b></p> <p>Habitat creation and enhancement measures will be implemented in order to increase opportunities for a variety of wildlife that are appropriate to the Site. Habitat loss will be compensated for through the creation of new habitats within the Proposed Development. These areas will provide new treelines, hedge line, scrub, wildflower and grassland habitat, which will help to compensate for the habitat lost. The Site boundaries will receive additional natural planting to enhance the existing and retained scrub and woodland habitats. Soft landscaping plan is proposed within Site including for newly created soft landscaped areas and detail planting schedules and required maintenance with the benefit of biodiversity in mind during the Operational Phase.</p> <p><b><u>Landscape Plan</u></b></p> <p>A comprehensive Landscape Plan and report has been prepared by Simon Ronan Landscape Architects and has been submitted as part of this planning application. The following will take place as part of the Landscape Plan:</p> <ul style="list-style-type: none"> <li>• Woodland tree planting;</li> <li>• Street trees, small feature trees and podium trees;</li> <li>• Wildflower &amp; shrub planting;</li> <li>• Woodland understory &amp; shade-loving plants;</li> <li>• Native Meadow; and,</li> <li>• Hedgerow planting.</li> </ul> <p><b><u>Fauna Enhancement</u></b></p> <p><b><u>Bats</u></b></p> <p>Given the levels of activity recorded during the onsite surveys, it is proposed to install artificial bat boxes within the Site. Artificial bat boxes will be erected on suitable mature trees within the Site. Artificial bat boxes can provide vital roosting places in habitats devoid of natural roosting opportunities. Bat boxes can also provide additional suitable roosting habitats for bats in an area.</p> <p><b><u>Birds</u></b></p> <p>A variety of bird nest boxes designed to attract a variety of nesting bird species will be erected on suitable trees within the Site. The creation of a nesting habitat, along with the creation of a species rich habitat, will encourage an abundance of invertebrate life (a potential food source) and will be beneficial to local birds. General bird boxes designed to cater for a variety of species will be used, the number and location of which will be specified by an ecologist.</p> <p><b>Hibernacula and Habitat Piles</b></p> <p>Hibernacula and habitat piles are valuable habitats and support a range of biodiversity, including insects, amphibians and small mammals. These habitats act as refuges and hibernation sites for amphibians as well as a host of other species of invertebrates and small mammals. The objective is to create a diversity of habitats within the Proposed Development.</p> <p><b><u>Insect Hotels</u></b></p> <p>Insect hotels should be positioned in areas sheltered from wind and rain and with access to sunlight. The artificial shelters should be placed 1.5m off the ground to reduce access to insect predators. Insect hotels can be free-standing or attached to existing features such as trees, posts or walls.</p>

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Aspect	Mitigation
Biodiversity	<p><u>Visible Biodiversity</u></p> <p>In order to promote biodiversity within the Site, consideration could be given to the creation of visible landmarks that draw attention to the importance of biodiversity while also attracting the interest of the residents. Biodiversity landscape features could be installed within the Site and promote a green image for the area.</p> <p><u>Interpretive signboards</u></p> <p>Biodiversity awareness of the onsite biodiversity should be emphasised and encouraged where appropriate. Actions to educate residents on the local biodiversity should be supported and promoted. This can be through the placement of interpretive signboards within the Site outlining biodiversity measures and species that can be found onsite.</p>
Noise & Vibration	There are no mitigation measures proposed for either noise or vibration during the operational phase.
Air Quality	No site-specific mitigation measures are proposed for the operational phase as impacts are predicted to be not significant.
Climate	The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. These measures are outlined in Section 14.8.1 of Chapter 14. No further operational phase mitigation is proposed.
Cultural Heritage	Following the successful implementation of the archaeological mitigation measures during the pre-construction phase, as detailed in Section 15.9.3 of Chapter 15, no operational phase mitigation measures will be required for the cultural heritage resource.