M1 Business Park - Zones A & F

Environmental Impact Assessment Report

Volume 2: Main Report

Client: M1 Vida Ltd

Date: March 2024

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Report Sign Off Page

CLIENT REF:	**GEO0003-1**		
DEVELOPMENT ADDRESS	**M1 BUSINESS PARK ZONES A & F,** **ROWANS BIG & ROWANS LITTLE, DUBLIN.**		
REVISION	**DATE**	**ORIGINATOR**	**REVIEWER**
DRAFT FOR CLIENT REVIEW	29/03/2024	TK/JB	EG
FINAL	10/04/2024	TK/JB	EG
REVISED FINAL	17/04/2024	TK/JB	EG

Consultants Involved in the Preparation of the EIAR

EIAR Chapter	Description	Consultant	Author	Credentials
Chapter 1	Introduction	Rowan	Elaine Gibson	MSc (Environmental Engineering)
Chapter 2	Project Description	Rowan	Blaine Cregan	MSc (Environmental Engineering)
Chapter 3	Consideration of Alternatives	Rowan	Elaine Gibson / Blaine Cregan	MSc (Environmental Engineering)
Chapter 4	Planning Context & the Need for the Development	Rowan / John Spain & Associates	Elaine Gibson / Blaine Cregan	MSc (Environmental Engineering) / MSc (Environmental Planning)
Chapter 5	Population and Human Health	Rowan	Jessica Boyd	MA Spatial Planning
Chapter 6	Biodiversity	Altemar	Bryan Deegan	M.Sc. Environmental Science
Chapter 7	Lands, Soils & Geology	Geosyntec	Stephen Coakley/ Thomas Vainio-Mattila	PhD Geology PGeo / MSc P Geo

Chapter 8	Hydrology & Hydrogeology	Geosyntec	Stephen Coakley/ Thomas Vainio-Mattila	PhD Geology PGeo / MSc P Geo
Chapter 9	Air Quality and Climate	Odour Monitoring Ireland	Brian Sheridan	Ph. D in Engineering Science
Chapter 10	Noise & Vibration	Patel & Tonra	Conor Tonra	PhD Physical Chemistry & IOSH Diploma in Environmental Noise.
Chapter 11	Landscape and Visual	Macroworks	Richard Barker	MA Landscape Architecture
Chapter 12	Road, Traffic and Transport	Clifton Scannell Emerson (CSEA)	Fernando Silva	BEng (Hons), MCIHT, MIEI, CREA-SP
Chapter 13	Waste Management	Rowan	Elaine Gibson	MSc (Environmental Engineering)
Chapter 14	Cultural Heritage	Charles Mount	Charles Mount	PhD Archaeology
Chapter 15	Material Assets	Rowan	Jessica Boyd	MA Spatial Planning

Chapter 16	Cumulative Impacts and Interaction of the Foregoing	Rowan	Elaine Gibson	MSc (Environmental Engineering)
Volume 3	Drawings & all other appendices	Multiple as referenced throughout	Multiple as referenced throughout	Multiple as referenced throughout

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1. Introduction

1.1. Introduction

This Environmental Impact Assessment Report (EIAR) presents the assessment of the potential environmental impacts and applicable mitigation measures associated with the development of the proposed provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and M1 motorway, referred to as “Zone A” and “Zone F”, within the townlands of Rowans Big and Rowans Little, Lusk, Co. Dublin, (hereafter referred to as the proposed development). The site location and proposed layout is shown in below in **Figure 1-1** and **Figure 1-2**.

Figure 1-1 Site Location Figure

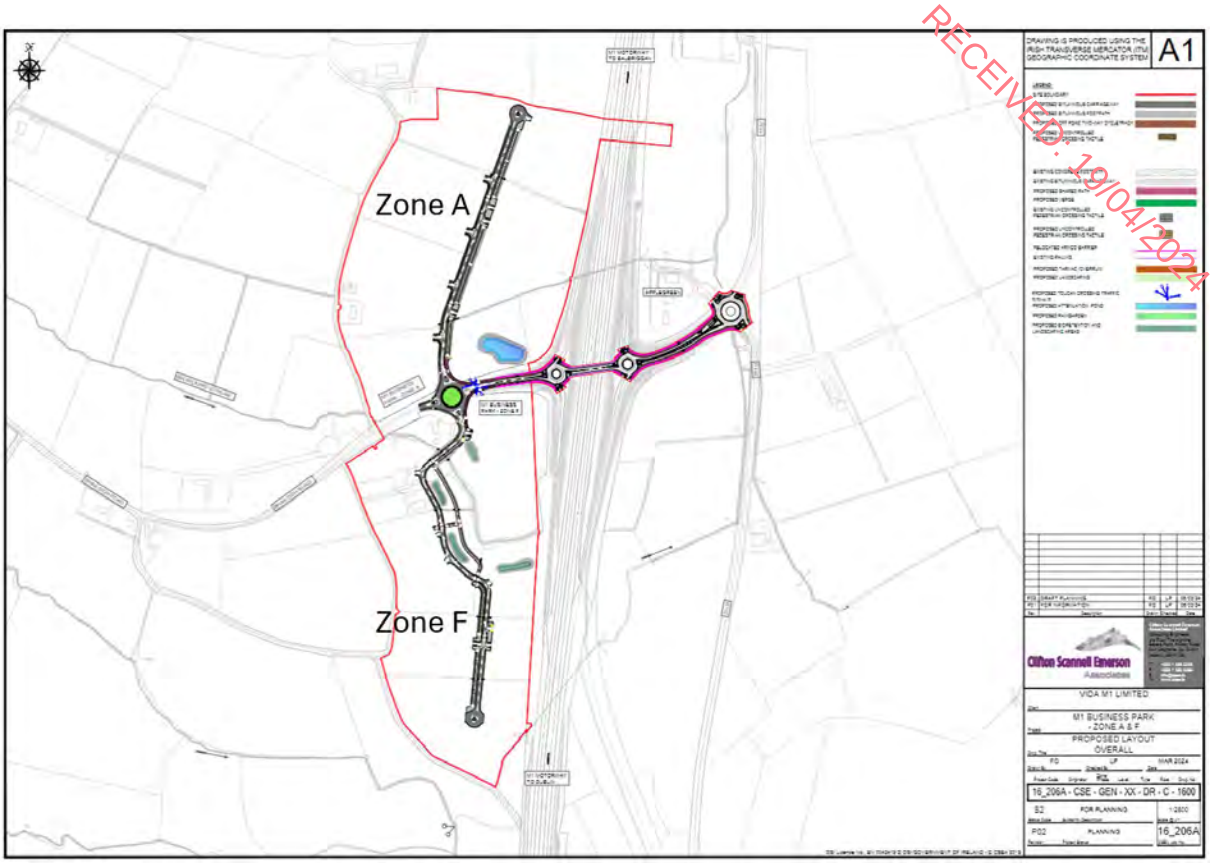


Figure 1-2 Proposed Development Layout as per attached Drawings 16_206A-CSE-GEN-XX-DR-C-1600 to 1606

The proposed development comprises the provision of the key civil infrastructure to facilitate the future development of the lands for a logistics/warehousing development. This development will become an extension of the existing M1 Business Park at Courtlough.

The Business Park Development proposals comprises of the demolition of all existing buildings on site, provision of internal roads and services infrastructure (surface water, foul and water supply) to facilitate the future development of the lands including public lighting, utility connections (power and telecommunications) and Sustainable Drainage Systems (SuDS). Provision of new access roads from 'Bhailsigh Road' (L1140) to Zone A and Zone F and new shared cycle and pedestrian routes over the M1 motorway via the (L1140) towards the R132. Upgrades and modifications to the existing roundabout along the L1140. All ancillary landscaping, road works, boundary treatments and site development works to support the development. All future developments will be subject to their own respective planning application approvals.

This EIAR has been prepared and submitted under the requirements of S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and has also been prepared in accordance with the Planning and

Development Act 2000 (as amended), the Planning and Development Regulations 2001 (as amended) and Article 94 and Schedule 6 of the Regulations which clearly details the information to be contained in an EIAR.

1.1.1. The Applicant

The applicant for the proposed project is Vida M1 Limited with its place of business located at 29 North Anne Street, Dublin 7.

1.1.2. The Consultants

Geosyntec Consultants Ltd. has contracted Rowan Engineering Consultants Ltd (Rowan) to deliver the EIAR for the proposed project.

1.1.3. Detailed Overview of the Proposed Project

The site is located in the townlands of Rowans Big and Rowans Little c. 5.5km northwest of the town of Lusk and c. 5.2km southwest of Balbriggan in Co. Dublin. The site encompasses approximately 34 hectares and is accessed by the Bhailsigh Road (L1140) off the M1 motorway at Junction 5. The site is primarily greenfield and was initially used for agricultural and farming activities, however, parts of the site contain some vacant dwellings. Lands in the vicinity of the proposed Project are generally used for agricultural activities.

The proposed development will consist of:

- Demolition of a single-storey 200-square-metre (m^2) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- Demolition of 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;
- Provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and M1 motorway, referred to as Zone A and F;
- Zone A and F lands are located north and south of Bhailsigh Road (L1140), respectively, which connect to Junction 5 of the M1 Motorway and are located in the townlands of Rowan's Big and Rowan's Little;
- Preparation of indicative Masterplan for Zone A and F which contains layouts of the future planned commercial properties, consisting of mixed-use, warehousing and distribution units including associated loading bays for HGVs, service compounds, ESBN substations and parking areas to service each commercial unit site, which would be subject to individual planning permission applications;

- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k to 105k-square-feet (ft^2) units with the potential to combine plots should larger units be required;
- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties; and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

The planning application is accompanied by an Environmental Impact Assessment Report, Appropriate Assessment Screening Report (AASR) and associated documents. A full project description is provided in **Chapter 2.**

1.1.4. Context & Need for the Proposed Project

The site will be used for key infrastructure to facilitate the development of the lands for a logistics/warehousing business park development. This development will become an extension of the existing M1 Business Park at Courtlough, which has seen progressive development over the past 20 years. The M1 Business Park lands are developed in part with existing warehouse and light industrial uses and represent a key established employment area in the region.

Fingal is strategically location within the Eastern and Midlands Regional Assembly, part of the Dublin City Region and within the Dublin–Belfast Economic Corridor, which places it in an ideal position from an economic perspective. National Strategic Outcomes (NSO) No. 5 of the National Development Plan indicates the need to build a strong economy, supported by

Enterprise, Innovation and Skills. In this regard, there is a need to create places that can foster enterprise and innovation and attract investment and talent. In addition, there is a need to invest in 'placemaking' to create places that are attractive to live, work, study, visit and invest in.

At a Regional Level, Regional Policy Objective 6.3 (Dublin -Belfast Economic Corridor) of the Regional Spatial and Economic Strategy for the Eastern Midlands Regional Assembly is to *"Support the effective planning and development of large centres of population and employment along the main economic corridor, in particular Drogheda and Dundalk."*, which further supports economic development at this location.

The need for the scheme is further identified in the Fingal Development Plan 2023-2029 in terms of Employment and Economic Needs which states:

> *"Policy EEP9 – Fingal As An Engine For Economic Growth*
>
> *Promote enterprise and employment throughout the County, including along the Dublin Belfast Economic Corridor, the Metro and Rail Economic Corridor, Swords, Blanchardstown and Balbriggan and work with the other Local Authorities to promote Fingal and the wider mid-eastern region as an engine for economic growth.*

The proposed development aligns with various Policies and Objectives highlighted in the Fingal Development Plan 2023-2029 which are briefly described below. The Need for the proposed development and alignment with the development plan is further detailed in the EIAR Chapter 4: Planning Context and Need for the Development.

Table 1-1: Project Need and alignment of Employment and Economic Objectives

Policy EEP1 – Overarching Policy for Employment and Economic Development
The lands are zoned for General Employment (GE) as highlighted in Section 2.1 and an indicative Masterplan has been developed for the future development of Zone A and F which forms part the M1 Business Park cluster.
Policy EEP2 – General Employment (GE) Lands
The proposal maximises the potential of GE lands, ensuring that they are developed for intensive employment purposes, where appropriate, and which are highly accessible, well designed, permeable and legible.
Policy EEP3 – Maximising Fingal's Economic Potential

The proposed development contributes to the economic potential of Fingal's unique strengths and advantageous position within the Eastern and Midlands region.
Policy EEP4 – Employment Intensive Land Uses
The proposed development makes provision for and is located adjacent to public transport networks and active travel links are proposed for this employment intensive land use zoning.
Policy EEP5 – Land Extensive Uses
Support the development of land extensive uses where appropriate, having regard to infrastructural, transport and environmental considerations and the need for orderly growth.
Policy EEP9 – Fingal As An Engine for Economic Growth
The proposed development will deliver economic development along the Dublin Belfast Economic Corridor and contribute the ambitions of Fingal as an engine for economic growth.
Objective EEO12 – Supporting Existing Clusters
Support existing successful clusters in Fingal, such as those in the ICT, pharmaceutical, aviation and agri-food sectors, and promote new and emerging clustering opportunities across all economic sectors within the County
Objective EEO14 – Permeability in General Employment Lands
Encourage high quality sustainable design, permeability and pedestrian and/ or cyclist friendly environments within general employment zoned areas.

1.1.5. Period of Consent

The applicant is requesting permission for a duration of 10 years. It is proposed to take the construction of project out under the two phases, which are indicative.

It is anticipated that the construction of the proposed development will be phased. The construction of the access roads will be progressed as the demand for the individual land parcels identified in the Masterplan increases over time. It is anticipated that Phase 1 will consist of a construction period of 8 months, with Phase 2 involving a construction period of 6 months as indicated in the indicative **Figure 1-3** below. Phase 1 would entail the construction

of all the services, utilities and drainage infrastructure required to service both Zone A and F in its entirety.

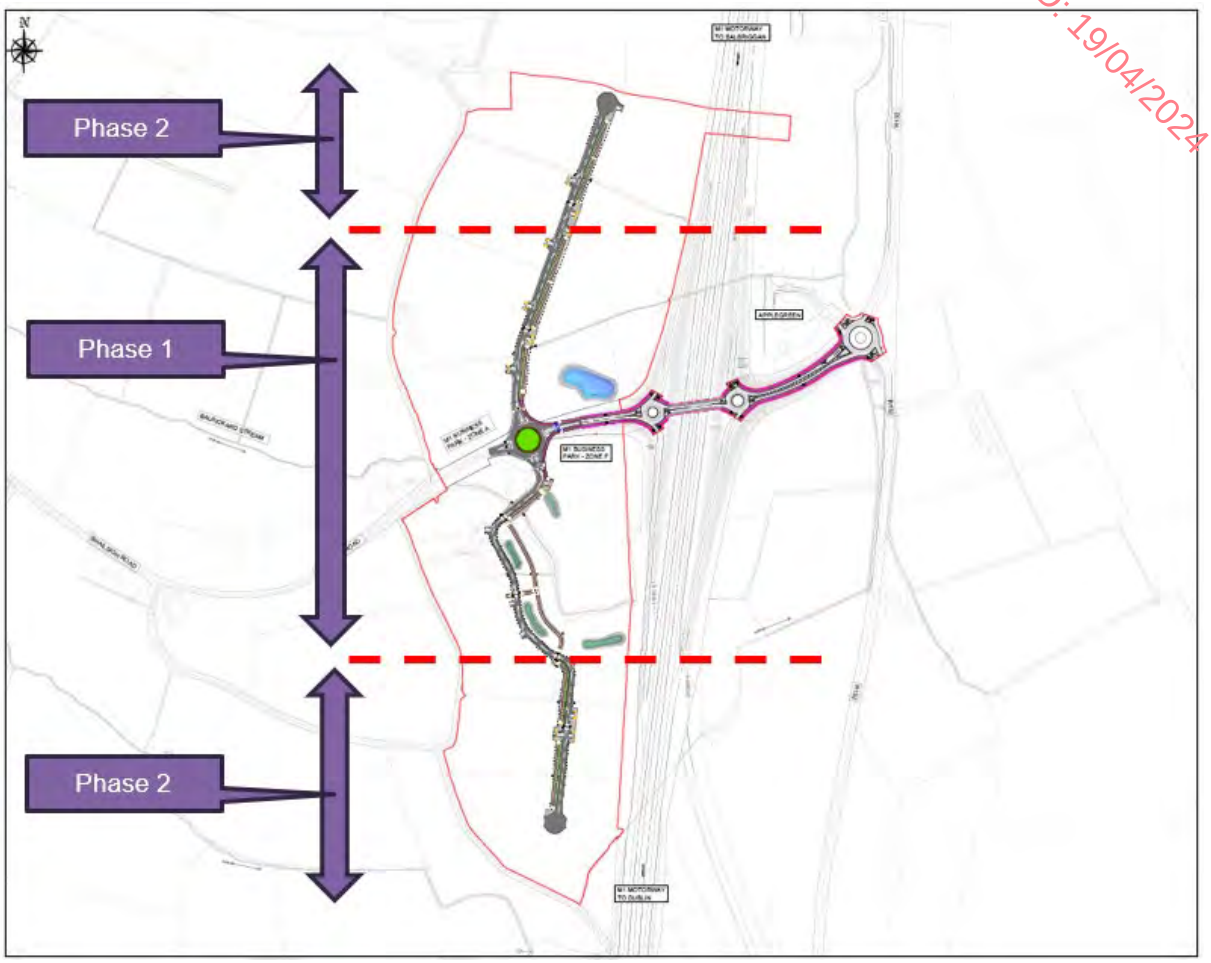


Figure 1-3 Indicative Construction Phasing

1.2. Environmental Impact Assessment

1.2.1. Overview of the EIA Process

Environmental Impact Assessment (EIA) is the process for anticipating the effects on the environment caused by a proposed development or project at a particular site. Where effects are unacceptable, design or other measures can be taken to avoid or reduce these effects to acceptable levels.

The initial EIA Directive has been in place since 1985 (85/337/EEC). This Directive along with three amendments was amalgamated into Directive 2011/92/EU in December 2011. Proposed changes to the Directive were adopted by the Council of the European Union in May 2014 (Directive 2014/52/EU), with a 3-year period to transpose the changes. These changes formed the first revision of Directive 2011/92/EU.

The EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) transpose the requirements of Directive 2014/52/EU into planning law in Ireland and came into effect from the 1st September 2018.

The EIA process for the proposed Project can generally be summarised as in **Table 1-2** below.

Table 1-2: Summary of the EIA Process

EIA Process Stage	Description
EIA Screening Is an EIA required?	Screening is the first stage of the EIA process, whereby a decision is made on whether or not a mandatory EIA is required. The EIA screening assessment was undertaken by the applicant and their agents and concluded that the proposed Project would fall within paragraph 11 of Part 2 of Schedule 5 of the Planning and Development regulations as; *10. Infrastructure projects* *(a) Industrial estate development projects, where the area would exceed 15 hectares.* *(b) (iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.* *14. Works of Demolition* *Works of demolition carried out in order to facilitate a project listed in Part 1 or Part 2 of this Schedule where such works would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.* *15. Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development, but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.* During the pre-planning consultation with Fingal County Council (FCC), it was agreed that the proposed Project requires the benefit of an EIAR to be progressed through

	the planning process - with a view to demonstrating that the proposed Project will not present any significant environmental impacts in the future.
EIA Scoping What issues should be considered in the EIAR	The EIAR Scoping report is attached as **Appendix 1**
Baseline Data Collection	A baseline of the existing environment on and around the site was established. This stage included a review of existing available information (desk based) and undertaking environmental surveys at the site. Field based surveys included biodiversity, landscape and visual, noise, cultural heritage, traffic and transport and hydrology (inc. flood risk) and hydrogeology. A number of engineering surveys of existing infrastructure was also undertaken as outlined in the subsequent chapters and per the Engineering and Planning Report presented in **Appendix 2** with associated Drawings presented within.
Impact Assessment	An assessment of the environmental impacts, dealing with the construction & operational phases of the proposed project, and the significance of associated effects was undertaken under each of the relevant disciplines as presented within Chapters 2 – 16 of this EIAR and appendices.
Mitigation	Mitigation measures to reduce the potential impacts of the proposed Project which cannot be avoided practically through design have been presented in the EIAR.
Consultation	As part of EIA scoping report (presented in **Appendix 1**) consultation was undertaken with the consultee's listed in **Table 1-3** below with responses received summarised.
Decision & Announcement	The public will be informed of the application and decision via the statutory planning process.
Monitoring	The continued measurement of potential effects on the environment through monitoring, provides assurance that

	the proposed systems and mitigation measures are operating as intended. Any planning conditions alongside the mitigation measures outlined in the EIAR will be incorporated in the Environmental Management Plan developed for the proposed Project.

1.2.2. EIA Scoping Report & Stakeholder Engagement

The EIA Scoping Report was issued in November 2023 for consultation with a number of consultees as listed in **Table 1-3** below. A pre - planning meeting and subsequent follow on meetings with Fingal County Council Departments were completed as detailed in **Table 1-3** below along with where these have been addressed in the EIAR document.

Table 1-3: Consultee Responses

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
Fingal County Council – Pre Planning Meeting	On the 13th December 2023 a Pre-Application Meeting was held with Fingal County Council, Stephen Diamond Associates (SDA), Scott Tallon Walker Architects (STWA), Clifton Scannell Emerson Associates (CSEA) and John Spain Associates (JSA). Pre-planning meeting minutes were requested to be forwarded from FCC but these were not received to date. The pre – planning reference no. is **PR739.**	The topics discussed were incorporated into the design of the project and follow up meetings took place with the relevant departments of the council as detailed below in this table.
Fingal County Council – Roads Department	As an outcome of pre planning meeting CSEA had a follow up meeting with James Johnson of Fingal County Council Roads Department on the 23/01/2024. The following were the key items discussed:	The requested changes from the pre – planning meeting were made in the design element of the project as reflected in the

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
	• Overall satisfied with the road design proposals; • Satisfied with proposed 3-metre-wide shared path public infrastructure connectivity from the proposed business park to Applegreen along Bhailsigh Road and the R132; • Satisfied with the 2-metre-wide pedestrian footpath on both sides of the road and segregated 3-metre-wide two-way cyclepath on the eastern side of the road in Zone A; • Satisfied with the 2-metre-wide pedestrian footpath and segregated 3-metre-wide two-way cyclepath alignment along the Middle Zone of the Riparian Corridor in Zone F; • Suggested the uncontrolled crossings at the individual entrances within Zone A and F have a different surface treatment colour or designed so that the motorist would be aware to yield to the cyclist and pedestrian crossing at these locations as they have priority at these crossings; • Accepted that a communal carpark for the business park, in both Zone A and F, to serve each business was not feasible as the Masterplan for the sites was only indicative and the end users are unknown at this stage;	design drawings attached to this planning application and as detailed within the Engineering & Planning Report attached in **Appendix 2** of this EIAR. The impact assessment of updated design are reflected throughout all chapters as required and particularly assessed within Chapter 11 Traffic & Transportation.
Fingal County Council – Water Services	As an outcome of pre planning meeting CSEA had a follow up meeting with Philip Grobler of Fingal County Council Roads Department on the	The requested changes from the pre – planning meeting were

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
	24/01/2024. The following were the key items discussed: • Overall satisfied with the drainage design proposals; • Consider alignment of stormwater pipeline in proposed footpath and relocate with proposed road width in case the roads were to be ever taken-in-charge by FCC; • Mention capacity of private existing WWTP in Zone B in Engineering Planning Report; • Include section details of SuDS features, i.e. Detention Basin, Raingardens, Attenuation Pond etc; • Consider the existing drainage ditches throughout Zone A and F and how they may be impacted by proposed development; • Satisfied with the on-site foul pumping station proposals to serve both Zone A and F and utilising the existing disused 200mmØ watermain which crosses under the M1 Motorway for the rising main to link in with the private existing foul drainage in Zone B on the eastern side of the M1 Motorway.	made in the design element of the project as reflected in the design drawings attached to this planning application and as detailed within the Engineering & Planning Report attached in **Appendix 2** of this EIAR. The impact assessment of updated design are reflected throughout all chapters as required and particularly assessed within Chapter 14 Material Assets.
Fingal County Council – Parks and Landscape	On 22nd February 2024 a Pre-Application Meeting was held with Fingal County Council Parks and Landscape Services Department, SDA, STWA, CSEA and JSA, with the following feedback	The requested changes and feedback received were made within the attached Landscape

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
Services Department.	provided by Parks Officer Gemma Carr with regard to the masterplan landscaping proposals for the M1 Business Park – Zone A & F: 1. Check the GeoHive Hub website for townland boundaries near/within the site; 2. Check Green Infrastructure Maps 14, 15 and 16 provided in the Fingal County Development Plan; 3. Prepare a Green Infrastructure Plan which should include for or demonstrate: a. Ecological Corridor, Riparian Corridor and Hedgerows showing links to each other b. Hedgerow Management Plan c. Otter Pass at crossings/culverts d. Bat Survey Report e. Nesting Bird Survey Report f. Tree Survey Report 4. Demonstrate no net canopy loss in relation to trees 5. Non-Native Trees are okay but Native are preferred 6. Gemma Carr advised on the possibility of ecological redressing along the Balrickard Stream embankments in Zone F where the natural embankments have been raised and requested that the following information be forwarded on, in order for the FCC Biodiversity Officer to review and assess:	Materplans for the proposed development, considered by the project Ecologist and Archaeologist and addressed as applicable with Chapter 6 Biodiversity and Chapter 13 Archaeology, Cultural Heritage and Architectural Heritage.

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
	a. Cross Sections/ Levels of Balrickard Stream within Zone F; b. Masterplan with Landscaping within Zone F; c. Bat Survey Report; d. Nesting Bird Survey Report; e. Tree Survey Report – focus on Tree Group 13# and 14# along stream embankment Stephen Diamond agreed to forward on a pack with the aforementioned information and plans in the coming days to the Parks Officer Gemma Carr and Biodiversity Officer for review and comment which was completed on the 7th March 2024. The pack contained: • Landscape Masterplan drawings detailing green infrastructure proposals for both the indicative masterplan and proposed planning application. Ref '23-598-SDA-PD-DR-001_Landscape Masterplan Site A & F with Indicative Architectural Layout' and '23-598-SDA-PD-DR-002_Landscape Masterplan Site A & F for Planning Application' and associated larger scale detailed plan drawings. • Site context image showing townland boundaries ref 'Site Context (Townland Boundaries)'.Note landscape masterplan drawings show the Rowans Big/Rowans	

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
	Little townland boundary extending east west through the southern sector of Site A which is proposed for removal. • Site Section drawings o 23-598-SDA-PD-DR-GF-201_Landscape Section 01 for Planning Application o 23-598-SDA-PD-DR-GF-202_Landscape Section 01 with Indicative Architectural Layout o 23-598-SDA-PD-DR-GF-203_Landscape Section 02 Site F o 23-598-SDA-PD-DR-GF-204_Landscape Section 02 with Indicative Architectural Layout • Balrickard Stream Invert Level, Top of Embankments levels and embankments slope drawing with data ref 'Existing Balrickard Stream Bank Slopes_Reference Plan' and 'Existing Balrickard Stream Bank Slopes_Data' • Tree Survey and Report prepared by CMK. Ref TM1001 DRAFT Arboricultural Assessment & Impact Report and TM1001 TREE SURVEY & CONSTRAINTS. Note Landscape plan drawings have been updated to include existing trees and hedgerows to illustrate connection of proposed green infrastructure e.g., native woodland, hedgerows, copse plantings and	

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
	wildflower meadow with existing vegetation; • All tree, hedgerow, copse and wildflower meadow species are native. Proposed planting specification is provided in the Planting Schedule & Soft Landscape Maintenance Schedule provided in drawing '23-598-SDA-PD-DR-002_Landscape Masterplan Site A & F for Planning Application'. • Ref below response on the Ecological survey information, bat survey, nesting bird survey etc: The EIAR team following our pre-planning discussions and set out below the EIAR team/ecologist response: *'Bird, bat, mammal and other flora and fauna surveys have been completed in order to fully assess impacts associated with the proposed development however reports have not been finalised at this stage for your review, these will be submitted as part of planning application submission.* *We did however discuss the suggested embankment reprofiling with the ecologist and from an initial review they did not feel this would have an overall benefit to the wildlife /biodiversity of the site, they felt the vegetation removal and groundworks required to achieve reprofiling could have more of an overall negative impact than the benefits to be*	

Consultee	Key Items Raised in the Response	Where this is Addressed in the EIAR
	gained from reprofiling. Some of the steep slopes also offer a different environment which adds to the ecological diversity of the site. They will of course consider the suggested reprofiling in full and present their findings within their final reports.' The project Archaeologists view on the townland boundary: *'The townland boundary isn't listed in the Record of Monuments or the Sites and Monuments Record, nor is it listed as a Protected Structure in the Fingal Co. Development Plan. I don't think the removal of the townland boundary would have archaeological significance. However, looking at the new Fingal Development Plan I see in Chapter 14 Development Management Standards, there is an objective DMSO172 that seeks the avoidance of 'detrimental impacts on historic townland boundaries. Should an historic townland boundary or section thereof be impacted a survey and photographic record should be undertaken prior to removal.'* *In order to comply with this objective, I will update the EIAR, indicating the impact on the boundary, and recommending a mitigation of preservation by record, i.e. a survey and photographic record.*' Feedback on the information pack submitted has not been received from the Parks and Services Department to date of submission of this EIAR.	

1.2.3. EIAR Guidance

In the development of the EIAR, the following guidance was consulted:

- Environmental Protection Agency (EPA), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Department of Housing, Local Government and Heritage, Environmental and Assessments and Planning in Ireland, Planning Leaflet 11 (DHLGH, 2022)
- Department of Housing, Planning and Local Government, Guidelines for Planning Authorities and An Bord Pleanala on carrying out Environmental Impact Assessment, (DHPLG, 2018).

In addition to these guidance documents for the EIAR, the assessment of each specialist environmental aspect addressed in the relevant sections has been undertaken with consideration to aspect specific guidance and best practice.

Rating of Environmental Effects

In developing the impact assessments, a key objective was to identify any 'significant effects' resulting from the proposed Project. Within this EIAR, the classification of effects has been undertaken with consideration of the EPA, *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022*).

Some of the technical assessments have given consideration to aspect specific guidance and best practice. Where this has occurred, these guidance documents are identified specifically within the individual sections.

1.2.4. EIAR Structure

The EIAR is the document which records the assessment and is typically structured to describe the existing environment, the potential impacts and describing any mitigation measures required to reduce or eliminate potential impacts.

The EIAR is presented in a grouped format structure. **Table 1-4** outlines the structure of this EIAR and a summary of what is included in each Chapter. The structure is provided as required under Article 94 / Schedule 6 of the Planning and Development Regulations 2001 (as amended).

Table 1-4: EIAR Structure

Chapter	Description
Volume 1	
Non Technical Summary	Presents a summary of the EIAR in non-technical language
Volume 2	

Chapter	Description
Chapter 1: Introduction, Chapter 2: Proposed Project Description, Chapter 3: Consideration of Alternatives and Chapter 4: Planning and Policy	Provides detail on: • Background to the proposed Project, • Need for the proposed Project, • Approach to and structure of the EIA, • Consideration of alternatives, • Consideration of planning policy.
Chapters 5 to 14:	Reporting of the EIA for each specialist environmental topic, including the introduction of the subject area, approach and methodology of assessment, a description of the existing environment, assessment of the potential impacts of the proposed Project, mitigation, monitoring proposals and potential significant residual effects. The following environmental aspects are assessed. • Chapter 5: Population and Human Health; • Chapter 6: Biodiversity; • Chapter 7: Lands, Soils and Geology; • Chapter 8: Water and Hydrology, Hydrogeology (inc. Flood Risk); • Chapter 9: Air Quality and Climate; • Chapter 10: Noise and Vibration; • Chapter 11: Landscape and Visual; • Chapter 12: Traffic and Transport; • Chapter 13: Waste Management • Chapter 14: Archaeological, Cultural Heritage; and Architectural Heritage • Chapter 15: Material Assets.
Chapter 15: Cumulative Impacts Assessment & Interaction of the Foregoing	Presents on the interactions with different environmental aspects and potential cumulative impacts associated with the proposed Project.
Volume 3	

Chapter	Description
Appendices	Supporting information and documentation for main report sections that includes Maps, Drawings, third party reports, reference documents etc.

1.2.5. Appropriate Assessment: Natura Impact Statement

The Birds Directive (79/409/EEC) and the Habitats Directive (92/43/EEC) provide legal protection for habitats and species of European importance. Article 2 of Directive 92/43/EEC requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 – 9 of the Directive provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as *Natura 2000*. Natura 2000 sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and also Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC). The terms “European site” replaced the term “Natura 2000 site” under the EU Environmental Impact Assessment and Habitats Regulations 2011 (S.I. No. 473 of 2011).

A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on European sites. Appropriate Assessment (AA), which is outlined in Article 6(3) of Directive 92/43/EEC, is the process which considers the possible effects of a plan or project on the European sites network.

In accordance with these requirements, the proposed Project has been assessed to consider whether there are likely significant effects from the proposed Project on European sites. The Stage 1 AA Screening Statement (AASS) identified potential pathways to a North-West Irish Sea SPA and an Natura Impact Statement (NIS) has been prepared which is attached in **Appendix 6**.

The NIS concluded that ‘*No significant effects are likely on Natura 2000 sites, their features of interest or conservation objectives. The proposed project will not will adversely affect the integrity of European sites’.*

The AASR and NIS and other supporting ecological reports are presented has been included in **Appendix 6** of this EIAR.

1.3. Planning Permission Application

The proposed Project is subject to a planning permission application and this EIAR presents an assessment of environmental impacts and applicable mitigation and is submitted in support of the planning application to Fingal County Council.

1.4. Difficulties Encountered

There were no specific difficulties encountered when carrying out this assessment.

2. Proposed Project Description

This Chapter has been prepared by Rowan Engineering Consultants (Rowan) and presents an overview on the construction and operational phases of the proposed Project.

2.1. Overview of the Proposed Project

The proposed development comprises the provision of the key civil infrastructure to facilitate the future development of the lands for a logistics/warehousing development. This development will become an extension of the existing M1 Business Park at Courtlough.

The Business Park Development proposals comprises of the demolition of all existing buildings on site, provision of internal roads and services infrastructure (surface water, foul and water supply) to facilitate the future development of the lands including public lighting, utility connections (power and telecommunications) and Sustainable Drainage Systems (SuDS). Provision of new access roads from 'Bhailsigh Road' (L1140) to Zone A and Zone F and new shared cycle and pedestrian routes over the M1 motorway via the (L1140) towards the R132. Upgrades and modifications to the existing roundabout along the L1140. All ancillary landscaping, road works, boundary treatments and site development works to support the development. All future developments will be subject to their own respective planning application approvals.

The proposed Project will consist of the following:

- Demolition of a single-storey 200-square-metre (m^2) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- Demolition of 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;
- Provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and M1 motorway, referred to as Zone A and F;
- Zone A and F lands are located north and south of Bhailsigh Road (L1140), respectively, which connect to Junction 5 of the M1 Motorway and are located in the townlands of Rowan's Big and Rowan's Little;
- Preparation of indicative Masterplan for Zone A and F which contains layouts of the future planned commercial properties, consisting of mixed-use, warehousing and distribution units including associated loading bays for HGVs, service compounds,

ESBN substations and parking areas to service each commercial unit site, which would be subject to individual planning permission applications;

- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k- to 105k-square-feet (ft²) units with the potential to combine plots should larger units be required;
- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties; and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

2.2. Site Location

The site is located in the townlands of Rowans Big and Rowans Little c. 5.5km northwest of the town of Lusk and c. 5.2km southwest of Balbriggan in Co. Dublin (see below). The site encompasses approximately 34 hectares and is accessed by the Bhailsigh Road (L1140) off the M1 motorway at Junction 5 as shown in **Figure 2-1** below.

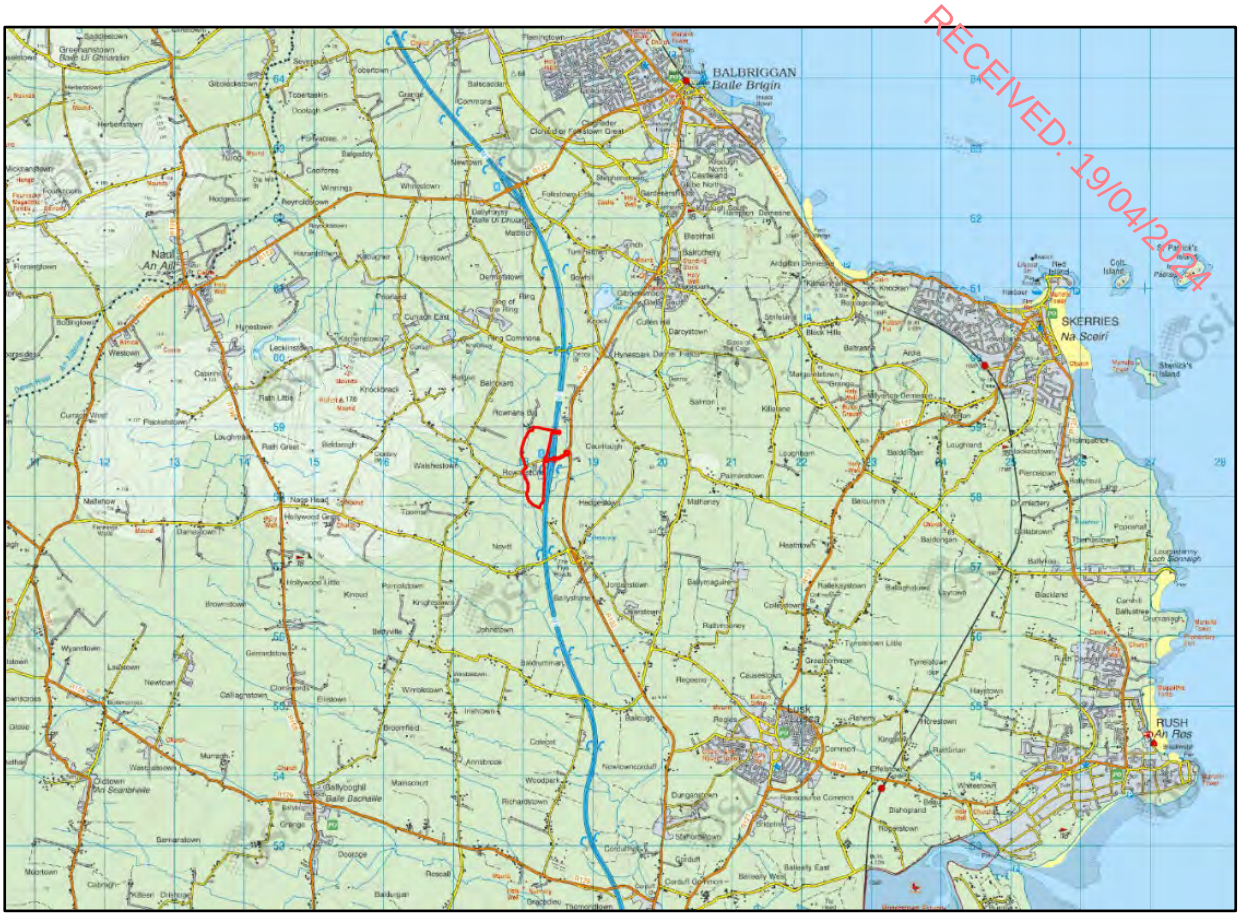


Figure 2-1: Site Location

2.3. The Existing Environment

The site is primarily greenfield and was initially used for agricultural and farming activities. The existing land-use of Zone A is agricultural, mainly used for growing grain crops, where Zone F is predominantly utilised as horse pastures. Existing agricultural buildings consisting of residential, warehouses, stores and stables are located on Zone F. Zone A contains a singular derelict residential building and a disused water storage reservoir and associated pump stations which was constructed c. 2001-2005. All existing buildings and structures within both zones are to be demolished are shown in Figure 2 2. Detailed survey drawings are presented in attached Drawings M1-STW-X-ZZ-DR-A-020004 -020007.

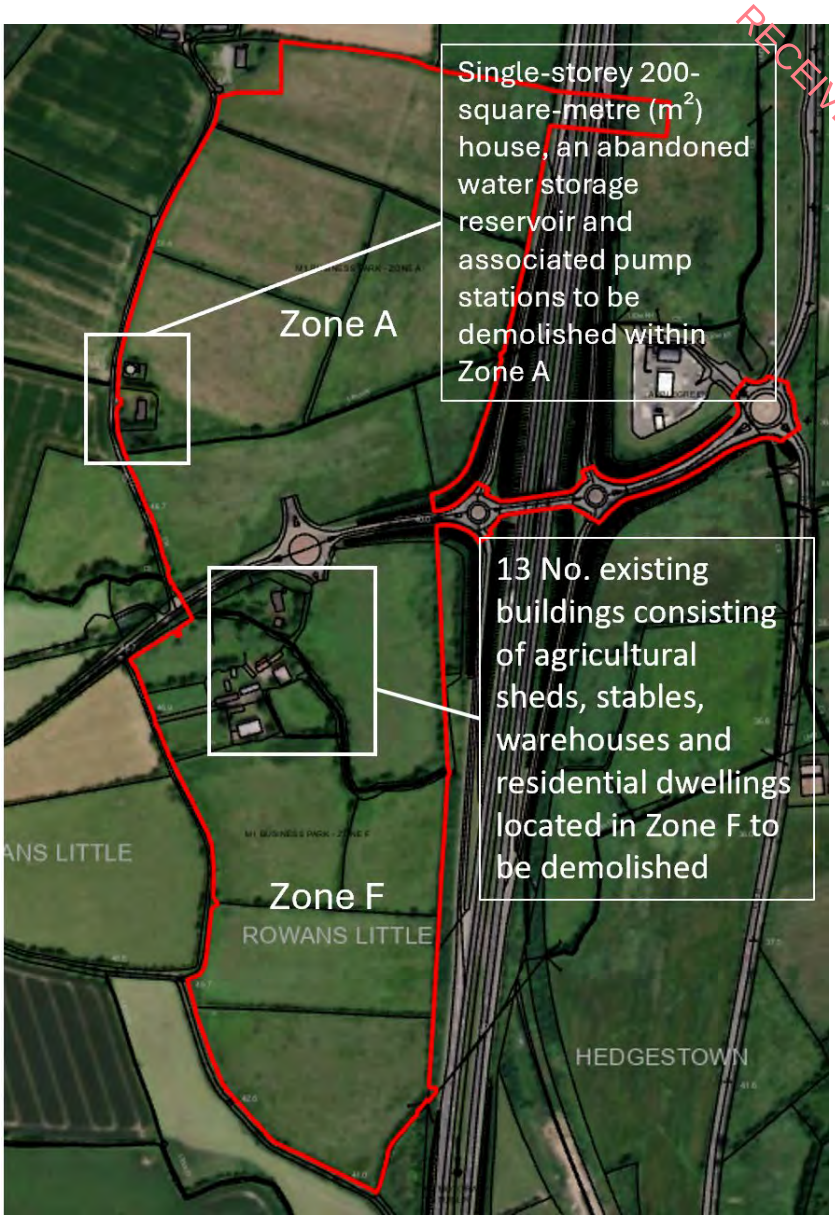


Figure 2-2: Existing Building within Zone A and Zone F to be demolished.

The topography of Zone A falls steeply from west-to-east towards the motorway with an average elevation difference of approximately 12.5m. The low point is located on the south-eastern corner of the site where an existing agricultural channel drains via a culvert underneath Bhailsigh Road (L1140) along the eastern boundary of Zone F to the Balrickard Stream (Environmental Protection Agency (EPA) Code 08B23). Zone A contains multiple agricultural drainage channels, two primary channels draining west-to-east which crosses underneath the M1 Motorway via existing culverts and secondary channels connecting the primary channels in a north-south direction. Refer to attached Drawing 16_206A-CSE-GEN-XX-DR-C-1504 for a layout of the site and topography. An aerial photo of the existing environment at Zone A taken in August 2023 is shown below in **Figure 2-3.**

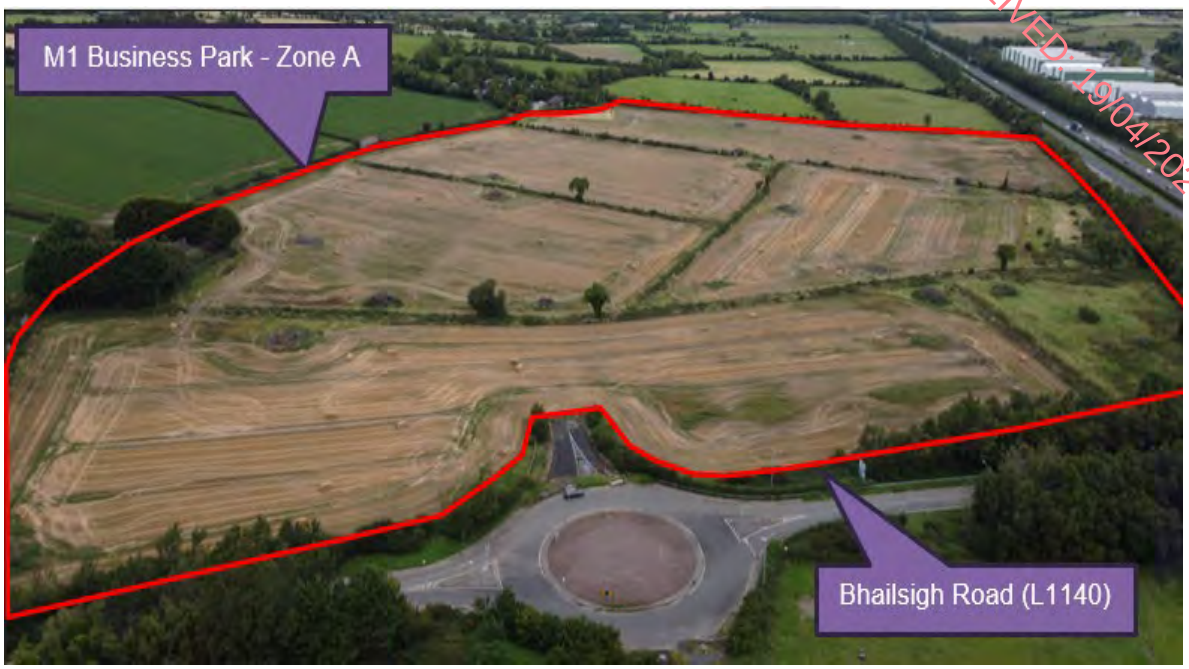


Figure 2-3; Aerial view of the existing environment at Zone A (taken August 2023)

The topography of Zone F is generally flatter compared to Zone A, with the northern half of the Zone F draining towards the Balrickard Stream. The stream crosses underneath Bhailsigh Road (L1140) via an existing 1m x 0.7m box culvert and drains through Zone F in a northwest-to-southeast direction for a distance of 260m, before turning east and crossing underneath the motorway via an existing 650mm diameter concrete culvert. An existing 7.7m wide agricultural stream crossing is located near the Zone F entrance which consists of a 1.2m x 0.7m box culvert with headwalls providing access to the agricultural and residential buildings. The southern half of Zone F is drained via existing agricultural drainage ditches, either draining to the Balrickard Stream or to a small unnamed stream located on the southern boundary of the site. Refer to attached Drawing 16_206A-CSE-GEN-XX-DR-C-1505 for a layout of the site and topography. An aerial photo of the existing environment at Zone F taken in August 2023 as shown below in **Figure 2-4.**

Figure 2-4: Aerial Photograph of existing environment at Zone F (Taken August 2023).

Figure 2-5 below shows the habitat sites onsite as classified by the Fossitt (2000) habitat classification guide. Chapter 6 Biodiversity provides a detailed description of each habitat onsite but can be summarised as: BC1 - Arable crops, GA1 – Improved Agricultural Land, WL1 – Hedgerow, WL2 – Treeline, BL3 – Built Land, GS2 – Dry Meadows and Grassy Verges, FW2 – Lowland Depositing River, WS3 – Ornamental / non – native shrubs, WS2 – Immature Woodland, WS1 – Scrub, FW4 – Drainage Ditch, WD2 – Mixed Broadleaf conifer Woodland, ED3/ ED1 - Recolonising bare ground/ Exposed sand, gravel or till.

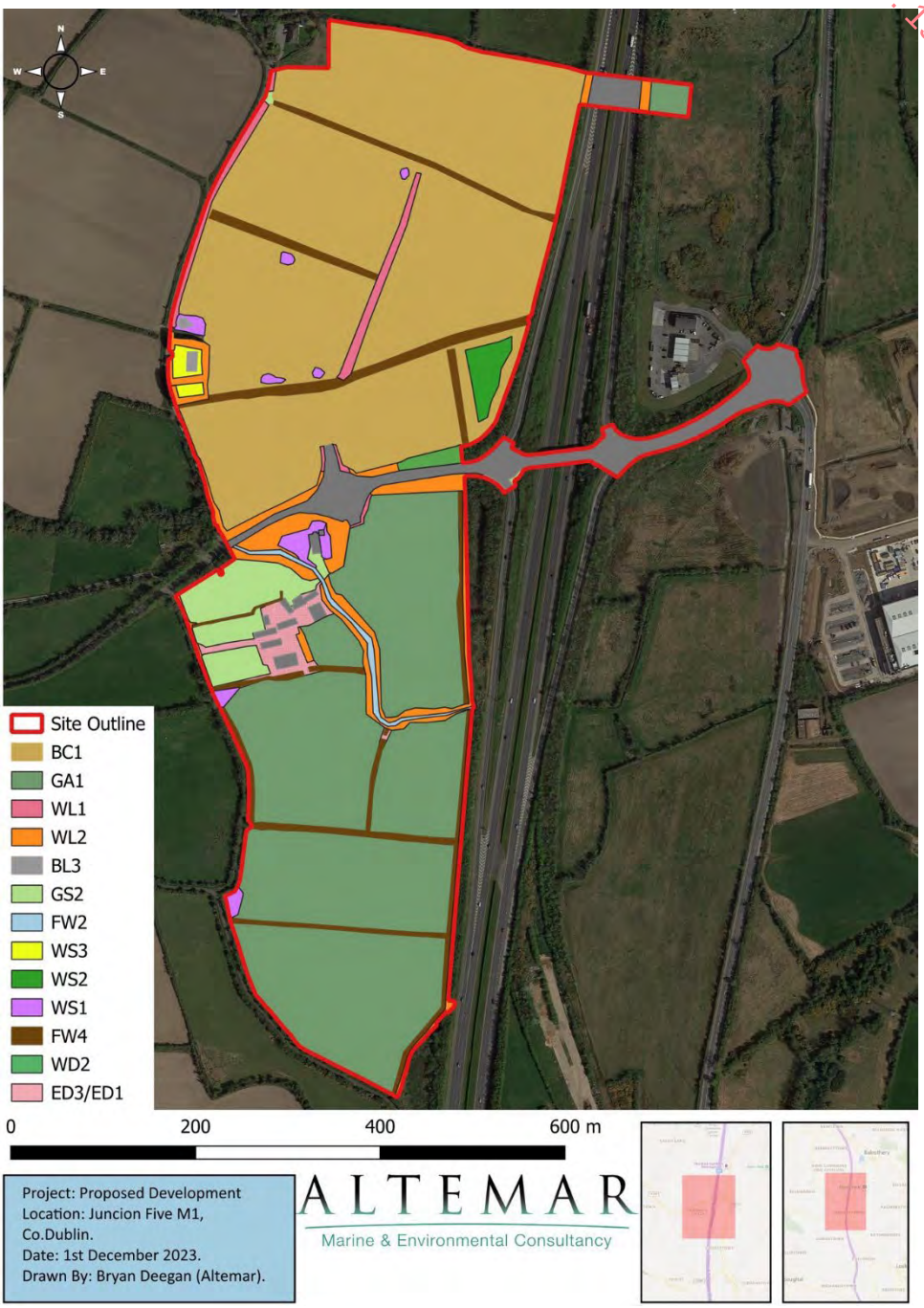


Figure 2-5: Fossitt (2000) Habitats on Site

2.4. Overview of the Operating Process

The attached CSEA Engineering Planning Report (Feb, 2024) provides a detailed breakdown of the proposed engineering works associated with the proposed development which has been summarised in the following sections. Please refer to the CSEA Engineering Planning Report (Feb, 2024) for full details.

It is anticipated that the construction of the proposed development will be phased. The construction of the access roads will be progressed as the demand for the individual land parcels identified in the Masterplan increases over time. It is anticipated that Phase 1 will consist of a construction period of 8 months, with Phase 2 involving a construction period of 6 months as indicated in the indicative Figure 2-5 below. Phase 1 would entail the construction of all the services, utilities and drainage infrastructure required to service both Zone A and F in its entirety.

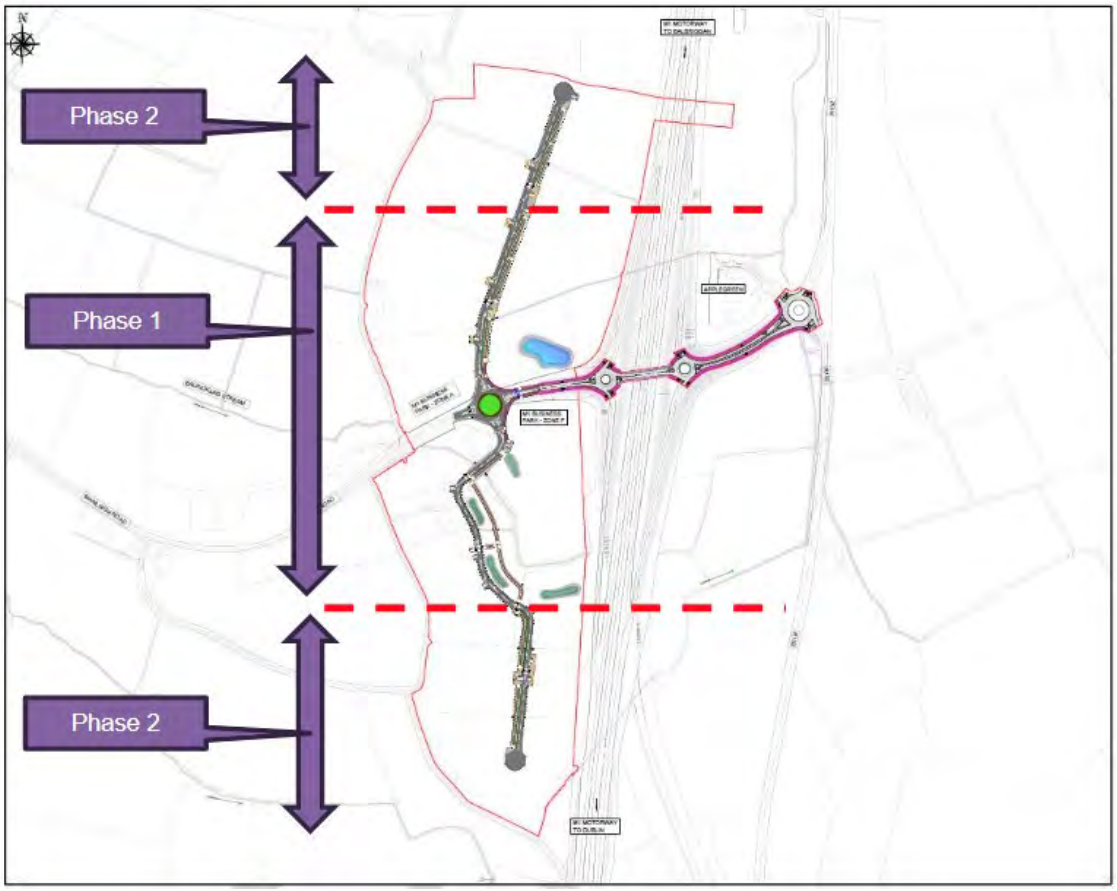


Figure 2-6 Indicative Construction Phasing

2.4.1. Site Preparation Activities

The following works will be completed to prepare the site, prior to construction of the proposed development:

Stakeholder Engagement with Existing Service Providers

Stakeholder engagement with service providers and division and management of existing services at the site including;

- Civil infrastructure consisting of main access roads including pedestrian/cycle paths.
- Watermains, surface water and foul drainage networks.
- Utility services including power and telecommunications.

Security:

- Security controls such as CCTV and alarm systems as required
- A site boundary in the form of hoarding or fencing will be established around each of the Zone A and F entrances in the interim until permanent accesses are established before any significant construction activity commences in that working area. The hoarding/fencing shall be 2.4m high to provide a secure boundary to what can be a dangerous environment for those that have not received the proper training and are unfamiliar with construction operations.

Ecology:

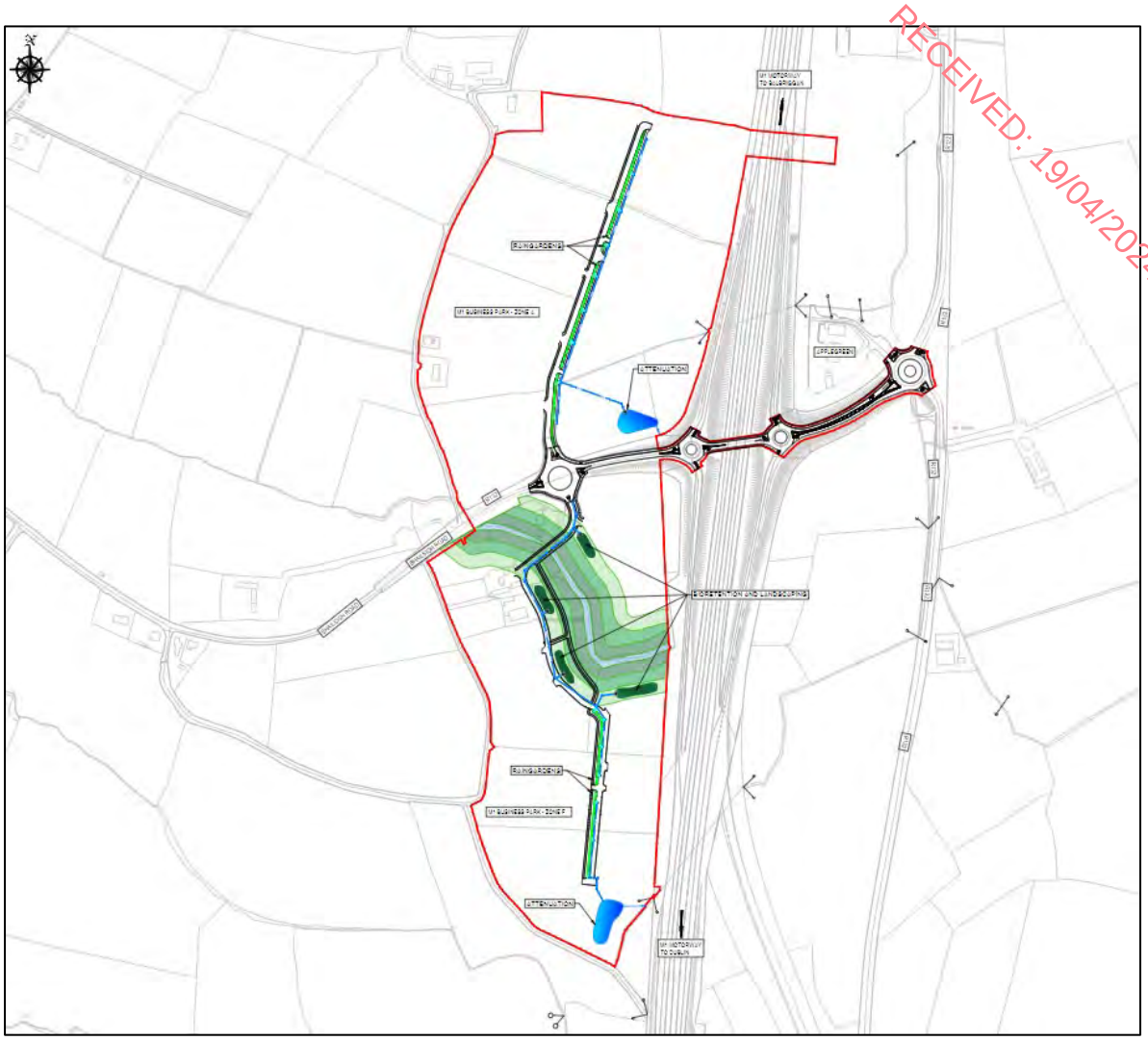
- Ecological buffer zones will be implemented on site where required and along the watercourse, the Balrickard Stream (EPA Code 08B23) which is a minor tributary of the Bracken River, which transverses Zone F to ensure proposals for development have no significant adverse impact on the habitats and species of interest.
- Terrestrial mammal - pre-construction inspection for terrestrial mammals of conservation importance
- Bats - Enhancement of the site with bat boxes is recommended due to the lack of roosting features in the area.
- Bats - pre-construction inspection and the control of light spill during construction. A post construction assessment of lighting will be required.
- Aquatic Biodiversity - Mitigation is needed in the form of control of silt and petrochemical and dust during construction. A pre-construction survey should be carried out for frogs.
- Bird Fauna - Mitigation is needed in the form of timing site clearance outside bird nesting season and control of noise during construction.

- Prior to construction the appointment of an ecologist to oversee enabling works and the implementation of mitigation measures will be carried out. No works will commence on site until the ecologist submits a letter to the local council authority to state that he/she has been appointed and has developed a Construction Environmental Management Plan which includes a) Phasing of the project, b) Full details of the works programme including methodologies for all works, surface water management and watercourse and pond works c) maps containing details of mitigation measures and any invasive species on site within 30m of site works including haul routes, site compounds etc. d) approval of the instream methodologies outlined by Inland Fisheries Ireland.
- Any in stream works to be carried out in full consultation with and to the advice of Inland Fisheries Ireland and the project ecologist.
- Wintering Birds - An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds will not be impacted.

Demolition of Existing Buildings

- Demolition of a single-storey 200-square-metre (m²) house, an abandoned water storage reservoir and associated pump station, all located on the western boundary of Zone A,
- Demolition of 10 No. existing agricultural sheds, stables, warehouses and unoccupied residential homes all located in Zone F.

Chapter 6 Biodiversity and the attached Construction Environmental Management Plan (EMP) in **Appendix 4** provides a detailed breakdown of the ecological controls to be put in place prior to and throughout the proposed project.



2.5. Proposed Restoration & Landscaping

A Landscape Masterplan (Drawing No. 23-598-SDA-PD-DR-002) for the planning application has been prepared which is presented in **Appendix 5**. A Landscape Masterplan (23-598-SDA-PD-DR-001) with indicative architectural layout is also attached in **Appendix 5**. This is indicative only and would be subject to individual planning applications.

2.6. Proposed Project Programme

The project will be undertaken in two phases as per the below;

It is anticipated that the construction of the proposed development will be phased. The construction of the access roads will be progressed as the demand for the individual land parcels identified in the Masterplan increases over time. It is anticipated that Phase 1 will consist of a construction period of 8 months, with Phase 2 involving a construction period of 6 months as indicated in the indicative Figure 2-2 below. Phase 1 would entail the construction

of all the services, utilities and drainage infrastructure required to service both Zone A and F in its entirety.

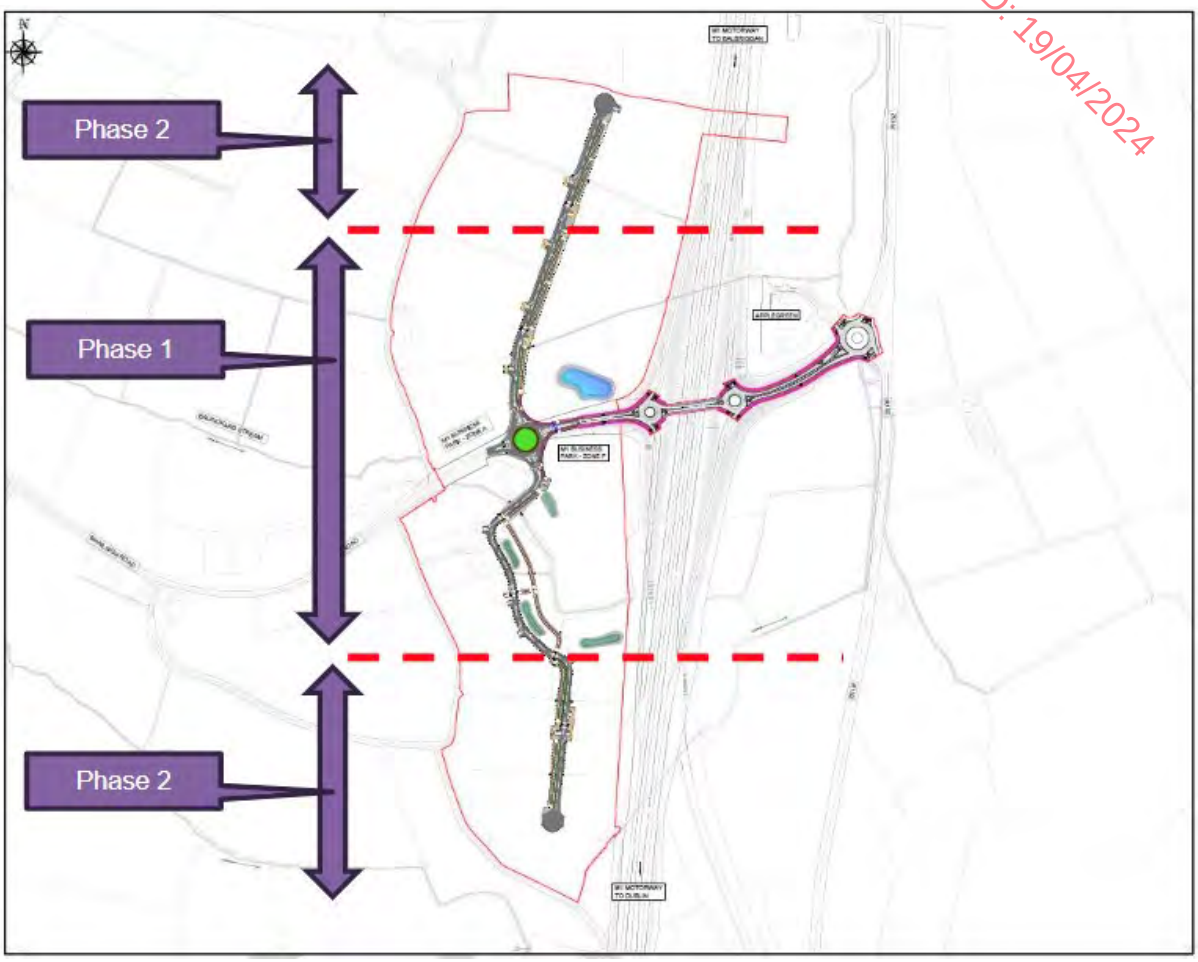


Figure 2-7: Indicative Construction Phasing

2.7. Site Infrastructure

Construction Phase

The proposed site infrastructure during the construction phase is likely to include:

- Site Access
- Proposed Wheelwash.
- Surface Water Management.
- Site Plant & Equipment.
- Site Office & Welfare Facilities
- Site Security and Boundary Proposals.
- Refuelling (Fuel and Oil Storage) and designated refuelling area.
- Hardstanding, Inspection and Quarantine Area

- Security controls such as CCTV and alarm systems as required

Operational Phase

The proposed site infrastructure during the operational phase will include:

- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k- to 105k-square-feet (ft^2) units with the potential to combine plots should larger units be required;
- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties; and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

Figure 2-7 below presents the proposed site infrastructure during the operational phase namely civil infrastructure to service the future-planned logistics/warehousing business park development.

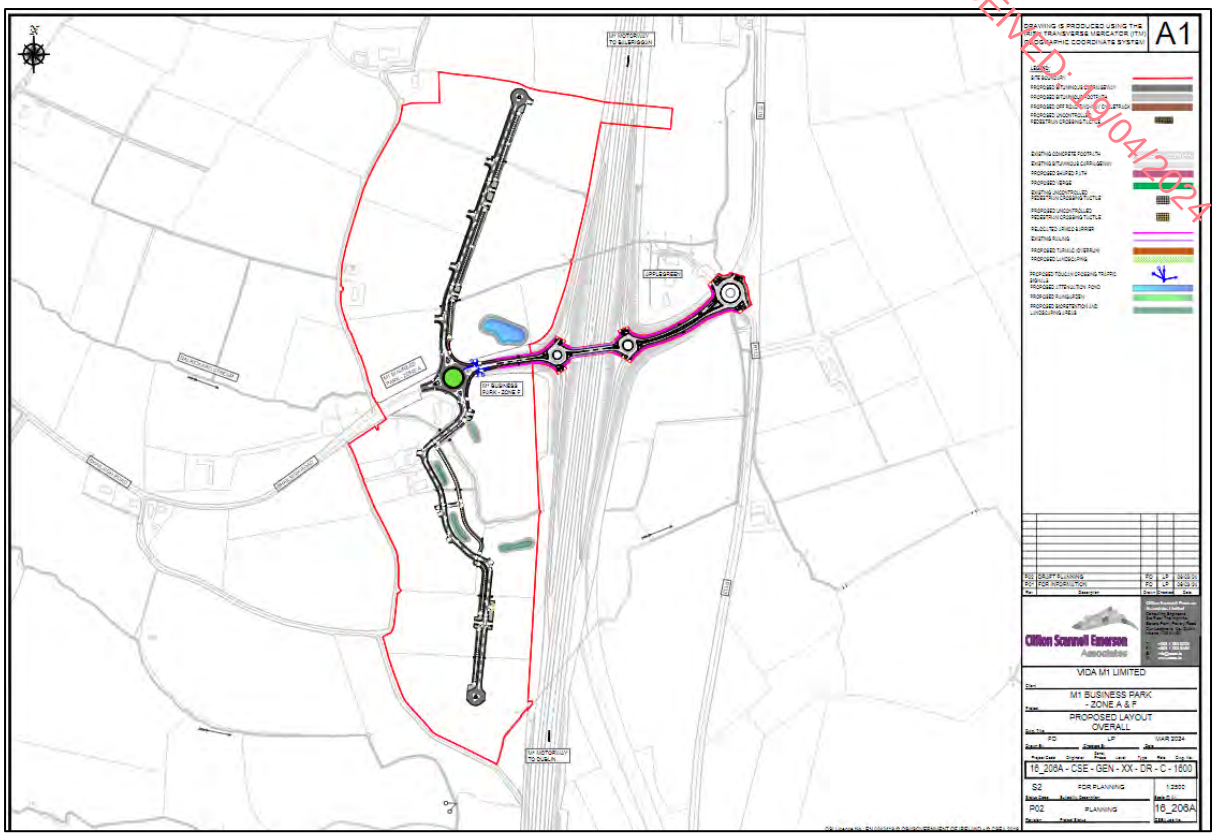


Figure 2-8: Proposed Site Layout

2.7.1. Site Access & Transport Routes

Construction Phase

All materials are transported to and from site via road transport using heavy goods vehicles (HGV's). The site accesses on to the L1140 Bhailsigh Road, as shown on attached Drawing (Site Layout & Level Overall, Drawing No: 16_206A - CSE - GEN - XX - DR - C – 1600).

Material/equipment being delivered to the site from the north/south would access the site via Junction 5 off the M1 motorway turning onto the L1140 and turning into the site.

A Traffic and Transport Assessment has been completed for the proposed development which is presented in Chapter 12 of this EIAR. The main conclusions of this study are summarised as follows:

- It was estimated that, on the busiest construction days, the site will attract/generate a total of 22 Light Vehicles (LV) trips per day (11 inbound in the morning and 11 outbound in the evening) and a total of 60 Heavy Vehicles (HV) trips per day (30 inbound and 30 outbound, spread throughout the day). It was conservatively assumed that 10 HV trips will occur during the network morning peak hour (5

inbound and 5 outbound) and 10 HV trips will occur during the evening peak hour (5 inbound and 5 outbound). All estimated LV trips were assumed to occur during the AM and PM peak hours.

Provided the mitigation measures and management procedures outlined in the Construction Environment Management Plan (CEMP), the Construction Management Plan (CMP), the Construction Traffic Management Plan (CTMP) and the Mobility Management Plan (MMP) are incorporated prior and during the construction phase, the residual impact upon the local receiving environment is predicted to be short-term in nature and slight negative in terms of magnitude.

As outlined in the attached CEMP the contractor will be required to implement the following minimum measures in relation to traffic and transportation during construction phase of the project:

- All trucks entering and exiting the site will be covered with tarpaulin.
- Adequate parking will be provided near the contractor's compounds to avoid queuing at the site entrances and prevent disruption to neighbouring roads. Construction vehicles will not be allowed to park on the public road either outside the site or on any of the approach roads leading to the site.
- All trucks entering the site will be restricted to suitable speed limits and will be directed to the relevant area by the Site Manager.
- Trucks required to wait on site will switch off engines to avoid unnecessary fuel usage and noise.
- All trucks exiting the site will be required to pass through a wheel wash. A lance will be provided to clean down the bodies and sides of the truck prior to leaving site.
- Roads outside the site will be visually inspected on a daily basis and power swept and washed as and when required.
- All site staff including truck drivers will be required to abide by the normal rules of the road.
- The contractor shall prepare a Detailed Construction Traffic Management Plan (CTMP) covering all construction stages that takes into account other potential construction works in the area. The CTMP will demonstrate how pedestrians, cyclists and motorised vehicles are prevented from passing through the sites and that measures are in place which ensure traffic is not disrupted.
- The CTMP will include a detailed consultation plan to deal with third party queries from both residents and commercial operators. The CTMP will require agreement with

both Fingal County Council and AnGarda Síochána prior to the commencement of construction.

- The contractor will appoint a single point of contact to facilitate the communication of the various traffic management plans and the preparation of a project specific website to aid communications would also be beneficial.
- As part of the CTMP a Mobility Management Plan will be prepared to ensure access to the site by sustainable travel modes is encouraged. The following measures will need to be considered within the Mobility Management Plan:
- The provision of facilities for construction staff.
- The provision of cycle and parking for construction staff.
- The promoting of car sharing among staff, including van pooling to travel between different work sections

All vehicles leaving the site will be cleaned by the wheel washing facility to prevent the spread of mud and dust on public roads.

This is addressed in more detail in the Traffic Chapter (Chapter 12) of this report and attached CEMP report.

Operational Phase

Even though the future-planned commercial buildings are not proposed under the subject application, the potential transport impacts associated with them were considered in this assessment. The TTA provided comprehensive review of all the potential transport impacts associated with the overall development during both construction and operational phases. The construction phase assessment specifically addressed the transportation effects associated with the construction of the proposed civil infrastructure outlined in this application, while the operational phase related to the potential future transportation impacts associated with the operation of the future-planned commercial buildings.

The analysis of the local road network has shown that both the existing and proposed upgraded junctions would operate within capacity for all assessed scenarios during both the AM and the PM peak hours even though changes to their operational capacity will be moderate. Therefore, it can be determined that the peak hour traffic effects during the operational phase of the future-planned commercial buildings will be ***brief*** in terms of duration – occurring only during the network peak hours and ***moderate negative*** in terms of magnitude. Outside the network peak hours, however, the traffic effects during the operational phase are likely to be ***permanent*** in terms of duration, but ***not significant*** in terms of magnitude.

Whilst the estimated increase in traffic over the baseline conditions is considered moderate, the proposed upgraded roundabout at the site entrance will have a ***significant positive*** impact in terms of quality, increasing safety for all users, and will be ***permanent*** in terms of duration.

The new roads extending within Zone A and Zone F sites and their associated facilities will also have a ***very significant positive*** and ***permanent*** impact on the safety and quality of all future users.

The provision of the new proposed shared active travel facility along the L1140 will improve connectivity and safety between the proposed development and the public transport facilities along R132 and will result in a ***very significant positive*** and ***permanent*** effect in terms of sustainable transport.

2.8. Site Facilities, Plant and Equipment

Construction Phase

Office and welfare facilities will be provided on site during the construction phase. Plant and equipment on-site during this phase will include:

- Site Access
- Proposed Wheelwash.
- Surface Water Management.
- Site Plant & Equipment.
- Site Office & Welfare Facilities
- Site Security and Boundary Proposals.
- Refuelling (Fuel and Oil Storage).
- Hardstanding, Inspection and Quarantine Area.

Wastewater treatment is not proposed onsite and chemical toilets would be suppled for site user facilities which would be emptied as required by a licensed contractor.

Operational Phase

Plant and equipment on-site during the operational phase will include:

- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k- to 105k-square-feet (ft^2) units with the potential to combine plots should larger units be required;

- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties; and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

Other plant and equipment are likely to l be located on-site during the development of the additional plots of land however this will be subject to separate planning applications.

2.8.1. Site Security and Boundary Proposals

A site boundary in the form of hoarding or fencing will be established around each of the Zone A and F entrances in the interim until permanent accesses are established before any significant construction activity commences in that working area. The hoarding/fencing shall be 2.4m high to provide a secure boundary to what can be a dangerous environment for those that have not received the proper training and are unfamiliar with construction operations.

During the construction stage there will be fencing along the site perimeters in addition to the existing hedgerows and treelines surrounding the site, these will be maintained and improved where required so the site is secure from people and livestock.

Regular inspections of the site will be undertaken by the site manager and any repairs required at the site perimeters repaired immediately.

An additional 10m woodland buffer planted as part of the landscape masterplan will develop and surround the perimeter of the site.

2.9. Operating Hours

Construction Phase

The proposed working hours for the site activities during the construction phase subject to agreement with the planning authority are:

- Monday – Friday: 07:00-19:00hrs; and,
- Saturday: 08:00-17:00hrs (Approval required by the Employers Representative)

Operational Phase

The proposed working hours for the site activities during the operational phase will be subject to a sperate planning application but for the purposes of the EIAR assessment where impact assessment of the operational stage was considered required (for example Traffic & Transport) it has been assumed operation hours will be 24 hours to allow access to the future planned commercial properties, consisting of mixed-use, warehousing and distribution units including associated loading bays for HGVs and service compounds.

2.10. Roles and Responsibilities

2.10.1. Construction Phase

A detailed project organisation and responsibilities are outlined within the attached Construction Environmental Management Plan (CEMP) within **Appendix 4** and can be summarised as follows:

Employer

The Employer is responsible for ensuring that the competent parties are appointed to undertake construction activities and that sufficient resources are made available to facilitate the appropriate management of risks to the environment.

Employers Representative

The Employers Representative (ER) appointed by the Employer will be responsible for the monitoring compliance with the CEMP. The ER may be required to appoint a temporary or permanent specialist(s) with appropriate experience as required to implement on site procedures and monitoring construction on behalf of the Employer i.e. competent experts in biodiversity, architecture, archaeology and heritage, noise, vibration, dust, waste, land, soils, contamination and/or water.

Employer's Ecological Clerk of Works

The Employer's Ecological Clerk of Works (ECoW) appointed by the Employer will be responsible for monitoring compliance with the CEMP and other relevant regulations, and conduct inspections and audits as highlighted in this document. The Employer's ECoW will liaise with the Employer, ER and other relevant stakeholders to obtain the necessary approvals of Construction Method Statements and the CEMPs which will be prepared by the appointed contractor. Further details on the ECoW responsibilities are highlighted in **Appendix 6** of this report.

Project Manager

The overall responsibility lies with the Contractor's Project Manager, whose responsibility it will be to approve key personnel required for employment on the project. The Project Manager shall liaise with the Site Environmental Manager (SEM) throughout the project construction phase.

The Project Manager will lead the operations in/on the site and will be responsible for the management and control of the activities and will have overall responsibility for the implementation of the CEMP.

The Project Managers main duties and responsibilities in relation to the CEMP include liaising with the Project Team in assigning duties and responsibilities in relation to the CEMP to individual members of the main contractor's project staff.

Site Environmental Manager

The main duties and responsibilities of the SEM include, but is not limited to the following:

- Liaise with the Project Manager during the finalisation of the CEMP to assign individual duties and responsibilities bearing in mind the overall organisational structure, the nature of the Environmental Commitments and requirements and the proposed development.
- Ensuring that the CEMP is finalised, implemented and continuously updated.
- Liaise with ECoW and the ER on all Method Statements, any alternations to live documents and any other works to ensure protection of environmental receptors identified in the EIAR.
- Being familiar with the information in the pre-construction surveys, construction requirements, planning approval conditions and all relevant method statements.
- Being familiar with the contents, environmental commitments and requirements continued within the reference documentation listed in this CEMP.
- Being familiar with the baseline data collated during the compilation of the EIAR.

- Assisting Management in liaising with the ER/ECoW and the provision of information on environmental management during the construction of the Project.
- Assigning duties and responsibilities in relation to the CEMP, to individual members of the main contractor's project staff.
- Overseeing, ensuring coordination and playing a lead role in third-party consultations required statutorily, contractually and in order to fulfil best practice requirements.
- Liaising with the ER/ECoW in the approving of site-specific construction method statements.
- Bring any legal constraints that may occur during certain tasks to the attention of the relevant stakeholders.
- Hold copies of all permits and licenses provided by waste contractors.
- Ensuring that any operations or activities that require certificates of registration, waste collection permits, waste permits, waste licences, etc have appropriate authorisation.
- Gathering and holding documentation with respect to waste disposal.
- Keeping up to date with changes in environmental best-practices, legislation and advising staff of such changes and incorporating them into the CEMP.
- Liaising with contractors and consultants prior to works.
- Procuring the services of specialist environmental consultants as required.
- Ensuring that all specialist environmental consultants are legally accredited and proven to be competent.
- Coordinating all the activities of the specialist environmental contractors.
- Ensuring that Environmental Induction Training is carried out on all personnel on site and ensuring that toolbox talks include aspects of Environmental Awareness and Training.
- Responsible for notifying the relevant statutory authority when environmental incidents occur and producing the relevant reports as required.
- Ensuring that all relevant works have (and are being carried out in accordance with) the required permits, licenses, certificates and planning permissions.
- Liaising with the designated licence holders and specific agent defined in the licence with respect to licences granted pursuant to the European Commission (EC) (Natural Habitats) Regulations 1997.
- Carrying out regular documented inspections and audits of the site to ensure that work is being carried out in accordance with the environmental control measures and relevant site-specific method statements.
- Preparation of the Emergency Incident Response Plan.

- Responsible for reviewing all environmental monitoring data and ensuring that they all comply with stated guidelines and requirements. and
- Liaising with management in preparing and inspection of site-specific method statements for activities where there is a risk of pollution or adverse effects on the environment.

Site Manager

The Contractor's Site Manager will be appointed to oversee the day-to-day management of working areas within the site and ensure effective, safe, planned construction activities are delivered on an ongoing basis to the highest standards practically possible. The Site Manager will be a suitably qualified, competent and experienced professional that will oversee site logistics, communicate regularly with site staff, accommodate project-specific inductions for staff on site and ensure that all work is compliant with the relevant design standards and Health and Safety legislation.

Environmental Specialist Appointed by Contractor

To fulfil its obligations under the CEMP and to support its Site Environmental Manager, the contractor will be responsible for engaging suitably qualified and experienced professionals including where necessary the following (i.e. depending on the scope of the contract) competent experts:

- Archaeologist;
- Ecologist;
- Aquatic Ecologist/Geohydrologist;
- Noise and Vibration Specialist;
- Air Quality and Dust Specialist;
- Land, Soils, and Contamination Specialist; and
- Water Specialist

2.10.2. Operational Phase

Roles and responsibilities during the operational phase will be determined as required once the business park development becomes operational and commercial activities commence at the site.

2.11. Vulnerability to Major Accidents or Disasters

With the introduction of EIA Directive 2014/52/EC and the transposition of the Directive through the EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018), there is a requirement to consider the "*expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned*".

The proposed Project involves the construction of key infrastructure to facilitate the future development of the lands for a logistics/warehousing business park development. It is not expected that the proposed Project would result in significant adverse environmental impacts.

When the site is operational, it will operate in accordance with the requirements of the:

- Mitigation measure as outline within the EIAR and any subsequent planning conditions;
- In line with the proposed Landscape Masterplan and proposed SuDs features
- Legislative requirements and environmental best practise.

An Emergency Response Procedure (ERP) and spill/leakage protocol are also detailed in the attached CEMP. In summary, the ERP includes the following:

- Contact the Emergency Response Agencies and the EPA to communicate the incident details;
- Deploy the necessary resources to deal with the incident;
- Notify the relevant bodies as required i.e. FCC, Inland Fisheries Ireland;
- Initiate appropriate corrective actions to deal with the incident;
- Initiate appropriate preventative actions to prevent reoccurrences of the incident; and,
- Comply with the requirements of the EIAR and any subsequent planning permissions in relation to the investigation, notification, management and reporting.

Risks of accidents on site will be managed through compliance with best practise and health and safety legislation requirements.

2.11.1. Vulnerability to Climate Change

This EIAR has been undertaken with consideration of the EPA publication, *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)*. This

guidance document states that the list of environmental factors which needed to be addressed under Directive 2011/92/EU included climate. The amended Directive requires the vulnerability of a project to climate change to also be addressed, particularly 'the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge.

The vulnerability of the proposed project to climate change is assessed below.

Flood Risk and Rainfall

Increased flood risk is one of the most significant effects of climate change.

Chapter 5, Climate Action, of the Draft Fingal County Development Plan (2023-2029), identifies a rise to the average air and ocean temperature, increased rainfall, more extreme rainfall events, more flooding, occurrences of drought and rising sea levels, as well as degraded ecosystems as climate changes that are already evident.

Consideration has been given as part of the proposed Project to the likely environmental impacts that may arise in association with unplanned events such as floods, etc.

The vulnerability of the site to flood risk was considered in the Flood Risk Assessment (FRA) undertaken for the EIAR. The FRA concluded that while watercourses and open channel drains flows through and adjacent to the site, there is little out-of-bank flooding within the proposed development boundary. In relation to Flood Zones as defined by the OPW guidelines, the majority of the site lies in Flood Zone C with parts shown to lie in Flood Zone A and Zone B. No other significant flood mechanisms exist at the site.

The OPW Guidelines and Fingal SFRA require site-specific FRAs to consider increased flood risk to the proposed development under climate change (CC) scenarios. OPW guidance suggests using a Mid-Range Future Scenario, which represents a 20% increase in flood flows and / or 0.5 m increase in mean sea level, where applicable. An estimation of the effect of climate change on flooding at the site was been derived from the detailed site-specific hydraulic model by adding 20% to the present day design flows.

The FRA conclude there was little change in flood extents as a result of climate change and no new areas of out-of-bank flooding.

A number of watercourse and drainage system measures are proposed within the FRA in order to reduce the risk of blockage at downstream culverts and screens and maintain the capacity of the channels and to ensure that proposed SuDS features perform in line with their proposed design standards.

High intensity rainfall events during the operational phase may give rise to increased sediment mobilisation and overland flow which will discharge to the proposed surface water drainage onsite and discharge to the attenuation pond, rain gardens and bioretention and landscape area Full Surface Water Layout Plans are presented in attached engineering Drawings (16_206A CSE GEN XX DR C 1700 -1720). As detailed in the attached Engineering Planning Report the surface water drainage proposed has been designed to cater for the proposed civil infrastructure as well as future developments. An allowance for climate change has been include in the design criteria of the surface water drainage systems in line with InfoDrainage™Ultimate 2024 software.

Future warehouse development onsite would need to demonstrate how surface water runoff would be collected, attenuated and treated using suitable SuDS and/or Nature-base Solutions prior to discharging into the main surface water networks which services Zone A and F.

High Wind Speeds

Unplanned events such as high-speed winds would have the potential to generate dust. Any construction works will be ceased during excessively high winds.

Dust suppression techniques will be enabled during construction activities on site as required, with visual inspections and dust deposition monitoring undertaken on site when the site is active i.e., during construction operations (Refer to the CEMP **Appendix 4** for full details).

Widespread planting across the site as shown on the attached Landscape Masterplan should also limited dust generation once species have sufficiently developed.

Other climate change factors beyond flood risk, high rainfall and high wind speeds are unlikely to have a significant effect on the proposed development.

3. Consideration of Alternatives

3.1. Introduction

This chapter has been compiled by Rowan Engineering Consultants Ltd (Rowan) as informed by the applicant and other disciplines to outline the alternatives considered during the planning process of the proposed development.

Potential alternatives to the proposed Project were given consideration during the early planning stages and are detailed in this chapter.

3.2. "Do-Nothing" Alternative

The "do nothing" alternative involves maintaining the site in its current undeveloped state, a greenfield site.

Reasons why it was considered that the "do nothing" alternative was not a preferred option are:

- It was considered that permitting the proposed Project is supportive of the local economy, developing an appropriately zoned (Zoning Objective GE - General Employment) vacant greenfield site to a commercial business park provides future commercial resources and employment opportunities in a rural area outside of the main urban centres of the region,
- Not utilising the available capacity of the site, in an environmentally sustainable manner, is not supportive of the local economy and the local commercial sectors that would benefit from a business hub in this region. This would be considered an overall negative impact on the local community.

3.3. Alternative Locations

The consideration of alternative locations for the proposed development was conducted. It was determined that the current proposed location was most suitable to facilitate the development.

Reasons why it was considered that the current proposed location is the most suitable option are:

- The sites current Zoning Objective GE - General Employment within Fingal Development Plan 2023-2029 and location near existing similar land use make its an ideal location.
- The sites location adjacent to the existing M1 motorway provides excellent transport routes and the road infrastructure and capacity to service the sites future development of

warehouse units. The Traffic Chapter within this report provides a full assessment of the existing infrastructure, proposed upgrades and assesses the impacts of the proposed development in detail.

- There are a number of existing utility service providers with infrastructure already in the area which can be connected to, to service the future warehouse development. This reduces potential environmental impacts from the proposed development and as considerable extension and rerouting of services across vast areas is not required.

3.4. Alternative Layouts, Designs and Processes

A number of site layouts have been considered as part of the project as detailed below.

3.4.1. Layout for Site A & F with buildings aligned with Gas Main and a reduced offset from the Riparian Corridor.

As presented in Figure 3-1 below (Drawing no. 20023 20220119) M1 Business Park - Site Layout Option Site A)

This layout for Site A, aligned the main estate road with the gas main. This approach was taken due to the uncertainly regarding the depth of the Gas Main prior to onsite investigations and considered the site in isolation. The brief required a mix of unit sizes with double yards for the larger units. The site layout was also developed before a full topographical survey had taken place. The units to the West were laid out with the yards to the rear of the building as per the guidance under the Fingal Development Plan.

Figure 3-1 Alternative Layout for Site A with buildings aligned with Gas Main and a reduced offset from the Riparian Corridor.

As presented in **Figure 3-2** below (Darwing no. 20023 20220119 M1 Business Park - Site Layout Option Site F

The layout for Site F takes a similar approach to that outlined for Site A above, however Site F has the added consideration of a substantial existing Riparian Corridor. We took a conservative approach to the Riparian Corridor, given the existing vegetation at the top of the bank did not allow us to determine the location of its edge with sufficient accuracy. Therefore, the Riparian Corridor was set out as a 10m offset from the drip-line of the trees that ran along the top of the bank, increasing the Riparian Corridor Width. A mixture of units was proposed, with a greater variety than those on Site A due to the smaller plots left over given the location of the Gas Main and the Riparian Corridor.

Figure 3-2: Alternative Layout for Zone F with buildings aligned with Gas Main and a reduced offset from the Riparian Corridor.

3.4.2. Layout for Site A with buildings aligned with Gas Main and Larger Scale Units

As presented in **Figure 3-3** (Drawing no. 20023 202207) M1 Business Park - Site Layout Option Site A

This layout follows on from the principles of previous scheme, however it looks at larger units with larger yards which at the time of the proposals was what the market was looking for. From an engineering perspective site attenuation is also considered together with cycle provision and service / ESB compounds.

Each of the layouts above had been proposed based on the Fingal Development Plan 2017 – 2023.

Figure 3-3: Alternate Layout Zone A aligned with Gas Main and Larger Scale Units

3.4.3. Sites to the East of the Motorway

Following the publication or the Fingal Development Plan 2023-2029 and the increase in the width of the Riparian Corridor. The proposed developments of sites C and E to the East of the motorway have been put on hold. The increased width of the Riparian Corridor reduces the developable land considerably, particularly on Site E, where the resulting units become economically unviable. The increase in the Riparian Corridor to Site C, increased the width of the crossing required and pushes the resulting building deeper into the site away from the existing building line to the North.

3.4.4. Current Indicative Masterplan Layouts

The current proposed masterplan layouts for Site A and F were undertaken following a full site survey and gas main depth survey. The layouts have been designed based on the Fingal Development Plan 2023-2029 adhering to the increased Riparian Corridor width.

The location of the road to Site A has changed to run perpendicular to the fall of the site to enable a surface which has a shallower gradient and to facilitate a potential future connection into the sites to the North. The buildings also respect the steep fall from West to East across the site, reducing the amount of cut and fill and environmental erosion required if the yards were at the rear. The yards to the units to the West of the Site are situated in front of the buildings, contrary to the guidance in the Development Plan, but necessary due to the steep falls. To mitigate this, the proposed offices within the buildings are arranged looking into the site, creating a campus like environment.

The proposed site layout and landscape plan was deemed the preferred solution as it had the best use of the lands and likely the least environmental impact and allowed considerable establishment of the riparian corridor within Zone F.

3.5. Alternative Mitigation Measures

Alternative mitigation measures were considered. The proposed mitigation measures within each of the relevant chapters were deemed the preferred solution.

Reasons why the proposed mitigation measures were deemed the preferred solution are:

- The proposed mitigation measures have been selected based on the site specific information gathered by specialist consultants who are experts in their field.
- The selected mitigation measures represent the most reasonable, practical and effective options for avoiding, eliminating or reducing as much as possible any potential negative impact from the proposed development.

4. Planning and Policy Context

This Chapter sets out the planning history associated with the proposed Project site. Additionally, the Chapter includes a review of national, regional and local policy relevant to the proposed Project development.

4.1. Planning History of the Site

There is previous planning history associated with the proposed site. The planning application history for the site is summarised in **Table 4-1** below, as sourced from Fingal County Council's Online Planning Portal.

Table 4-1: Previous Planning Applications made on the Lands.

Planning Reference	Decision Date	Decision	Details
F20A/0107	12/06/2020	Refused	Retention Permission for replacement and erection of a freestanding advertising sign measuring 6000mm X 4050mm.
F05A/0510	07/06/2005	Grant	Development to consist of display of 2 no. non-illuminated site development signs for a period of two years
F01A/0777	18/02/2002	Split decision	Demolition of 2 no. habitable dwelling houses and the construction of a light industrial/warehousing development totalling 86,778 sq. metres approximately, including ancillary offices and staff facilities over two floors; new pedestrian and vehicular access/egress points; internal circulation roads and service areas; 860 no. car parking spaces; ESB Mv substations and all associated site development and landscaping works on three land parcels totalling 31.31 hectares (75.35 acres).

F01A/0541	NA	Withdrawn	Demolition of 2 no. habitable dwelling houses and the construction of a science and technology park of 76.861 sq. m. approximately incorporating science and technology based industries, telemarketing, data processing, software development and information technology uses, including associated offices in 10 no. buildings ranging in height from 4 storeys to 4 storeys plus set back penthouse floor; a local facilities building incorporating leisure, restaurant and local shop uses; a creche; water storage tanks and pumping station; ESB sub stations; a new roundabout junction from the public road to the south and site access; internal circulation roads and service areas; 2,190 no. car parking spaces.
F95B/0257	01/11/1995	Grant	Detached double garage

These planning applications (presented as blue dots) can be seen in **Figure 4-1** below.

4.2. Planning Policy and Development Context

The following sections provides details of the relevant planning policy context relating to the proposed development.

4.2.1. National Planning Framework (NPF): Ireland 2040 Our Plan

The National Planning Framework (NPF) 2040 outlines high level strategic planning and development guidance for the country to the year 2040, with a view to that growth being sustainable from an environment, economic and social perspective.

The proposed Project site is located in what is defined as the Eastern and Midland Region. The NPF acknowledges the need for a more balanced and sustainable pattern of development in the Region "*with a greater focus on addressing employment creation, local infrastructure needs and addressing the legacy of rapid growth*".

The Framework identifies 10No. National Strategic Outcomes around which the '*policy actions and investment'* are focused to deliver on these proposed outcomes. Specifically, National Strategic Outcome 3 refers to *'Strengthened Rural Economies and Communities'* and National Strategic Outcome 5 refers to *'A Strong Economy supported by Enterprise, Innovation and Skills'* which are both relevant to the proposed development.

Chapter 5 of the Framework recognises the importance of Ireland's rural communities and the need to plan for their future growth in a sustainable manner. Chapter 9 of the Framework discusses the importance of protecting the quality of Ireland's environment from key national environmental challenges. This chapter discusses green infrastructure which can provide a range of uses, goods and services and make the best use of land, help manage competing demands and can complement other sectors. Green infrastructure is also stated as being valuable for carbon capture, which will assist in meeting climate mitigation and adaptation goals and national biodiversity targets.

Some of the National Policy Objectives relevant to the proposed development are listed below.

National Policy Objective 23 states:

> *'Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism.'*

National Policy Objective 10b states:

> *'Regional and Local Authorities to identify and quantify locations for strategic employment development, where suitable, in urban and rural areas generally.'*

National Policy Objective 18a states:

> *'To support the proportionate growth of and appropriately designed development in rural towns that will contribute to their regeneration and renewal, including interventions in the public realm, the provision of amenities, the acquisition of sites and the provision of services.'*

National Policy Objective 27 states:

'Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages.'

National Policy Objective 58 states:

'Integrated planning for Green Infrastructure and ecosystem services will be incorporated into the preparation of statutory land use plans.'

National Policy Objective 72a states:

'Planning authorities will be required to apply a standardised, tiered approach to differentiate between i) zoned land that is serviced and ii) zoned land that is serviceable within the life of the plan.'

National Policy Objective 72c states:

'When considering zoning land for development purposes that cannot be serviced within the life of the relevant plan, such lands should not be zoned for development.'

National Policy Objective 73c states:

'Planning authorities and infrastructure delivery agencies will focus on the timely delivery of enabling infrastructure to priority zoned lands in order to deliver planned growth and development.'

A number of aims are identified in relation to the environment (captured under the below headings). The Government will address these issues as part of the National Planning Framework and within the remit of the European and National legislation.

- *'Resource Efficiency and Transition to a Low Carbon Economy,*
- *Protecting, Conserving and Enhancing our National Capital,*
- *Creating a Clean Environment for a Healthy Society'.*

Specifically, **National Policy Objective 52** states:

'The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital.'

The proposed Project was considered supportive of the NPF, in that it is supportive of the local economy and facilitates the development of the rural economy in a location zoned (Zoning

Objective GE - General Employment) appropriately for strategic employment development. The proposed development supports the proportionate growth of and appropriately designed development in a more rural area that will contribute to the regeneration and renewal of the area. The proposed development seeks to ensure the integration of safe and convenient alternatives to vehicular transport in the design by prioritising walking and cycling accessibility to the site in the form of segregated cycle tracks and pedestrian footpaths and integrating green areas where physical activity is facilitated. The development seeks to integrate a range of Green Infrastructure habitats into the development which will support and enhance the ecosystem of the site. The development also seeks to conserve the natural resources of the area.

4.2.2. Regional, Spatial and Economic Strategy (RSES) 2019-2031: Eastern and Midland Regional Assembly

This Strategy was developed by the Eastern and Midland Regional Assembly and covers 9 counties and 12 county councils (4 within Dublin), of which Fingal County Council is included. The Strategy describes itself as a '..*strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives. At this strategic level it provides a framework for investment to better manage spatial planning and economic development throughout the Region*.'

The main statutory purpose of the RSES is to support the implementation of the NPF and the '*economic policies and objective of the Government'*. The RSES provides a long-term strategic planning framework for the Eastern and Midland region.

It addresses a range of areas relevant to the development of the Region including presenting a growth strategy and drivers for economic growth whilst also giving consideration to key areas such as the environment, quality of life, people and connectivity within the Region.

Some of the Regional Strategic Outcomes relevant to the proposed development are listed below.

Regional Strategic Outcome 3 states:

> '*3. Rural Communities: Support sustainable rural development and strengthen rural networks, economies and communities. Manage urban generated growth in areas under strong urban influence and encourage sustainable growth in areas that have experienced decline or stagnation.'*

Regional Strategic Outcome 4 states:

'4. Healthy Communities: Protect and enhance the quality of our built and natural environment to support active lifestyles including walking and cycling, ensure clean air and water for all and quality healthcare and services that support human health.'

Regional Strategic Outcome 10 states:

'10. Enhanced Green Infrastructure: Identify, protect and enhance Green Infrastructure and ecosystem services in the Region and promote the sustainable management of strategic natural assets such as our coastlines, farmlands, peatlands, uplands woodlands and wetlands.'

Regional Strategic Outcome 11 states:

'11. Biodiversity and Natural Heritage: Promote co-ordinated spatial planning to conserve and enhance the biodiversity of our protected habitats and species including landscape and heritage protection.'

Regional Strategic Outcome 12 states:

'*12. A Strong Economy Supported by Enterprise and Innovation: To build a resilient economic base and promote innovation and entrepreneurship ecosystems that support smart specialisation, cluster development and sustained economic growth.'*

The proposed Project was considered supportive of the RSES, in that it is supportive of the sustainable development of the region, while strengthening the regions rural network, economy and community. The proposed development has been designed to enhance the quality of our built and natural environment to support active lifestyles including walking and cycling with the inclusion of segregated cycle tracks and pedestrian footpaths.

4.2.3. Regional Planning Guidelines for the Greater Dublin Area 2010-2022

The Regional Planning Guidelines (RPGs) is a policy document which outlines the proposed direction for future growth within the Greater Dublin Area (GDA), taking into account national planning policy and giving it effect at a regional level.

The Greater Dublin Area is defined as the '*geographical area of Dublin City, Dun Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Meath, and Wicklow and incorporates the regions of both the Dublin Regional Authority and the Mid-East Regional Authority*.'

The Planning and Development Act, 2000 requires these regional authorities to make Regional Planning Guidelines in respect of the whole of the combined area of their regions, to provide a strategic planning framework for the long-term sustainable development of the area.

The Guidelines refers to the preservation of the environment and that the '*conservation of diminishing natural resources are key principles inherent within sustainable development..'.*

The RPGs refer to a number of key Regional Planning Policies. The delivery of the policies of the RPGs works towards achieving the potential of the GDA as the key regional driver for the State.

Some of the Regional Planning Policies relevant to the proposed development are listed below.

Strategic Policy EP1 states:

'That the Dublin Gateway is recognised as an international driver of enterprise within the GDA and is supported by regionally designated strategic employment centres, serving the urban and rural hinterlands. These economic growth areas which take advantage of nationally important transport hubs and corridors, and shall provide the focal point for diverse regional enterprise and economic clustering activity, by: steering population growth and economic critical mass to designated RPG strategic growth centres of the identified economic areas or gateway region; capacity building in skills, innovation and education; critical infrastructural investment in ICT, public transport, water services; integrating high quality social and amenity provisions to create an attractive landscape and working environment; providing energy security supported by green and renewable technologies; rationalised planning approaches to employment based land use zoning and enterprise objectives.'

Strategic Policy EP2 states:

'To seek sustainable economic growth across the GDA, by the promotion of identified core economic areas across the GDA in both the Dublin and Mid East Regions to facilitate new employment opportunities for existing populations and seek to reduce the volume of unsustainable long-distance commuting.'

Strategic Policy RP1 states:

'To protect and support rural villages and countryside through careful management of physical and environmental resources and appropriate sustainable development; recognising and responding through appropriate Development Plan policies to the strong urban driven demand for resources in rural areas of the GDA, and also the importance of protecting and encouraging the necessary social infrastructure needed to sustain rural communities.'

Strategic Policy RP2 states:

'To support the continuing viability of agriculture, horticulture and other rural based enterprises within rural areas and to promote investment in facilities supporting rural innovation and

enterprise with special emphasis on the green economy, within the context of sustainable development, appropriateness and the management of environmental resources.'

Strategic Policy GIP1 states:

'To ensure that all aspects of the built heritage including archaeological, industrial, and architectural heritage, and those buildings which are home to protected species, are suitably protected, enhanced, sensitively reused/ integrated into new development works and incorporated in development plans, records of protected structures, heritage plans and site specific projects & developments.'

Strategic Policy GIP2 states:

'To protect and conserve the natural environment, including in particular nationally important and EU designated sites such as Special Protection Areas, Candidate Special Areas of Conservation and proposed Natural Heritage Areas, protected habitats and species, and habitats and species of local biodiversity value. This policy also includes new or extended ecological sites that are notified or designated in the lifetime of the RPGs. Appropriate measures to protect Natura 2000 sites should be identified at the initial stages of all planning processes and included as a material consideration in order to inform future development.'

Strategic Policy GIP3 states:

'To ensure alignment between the core objectives of the Water Framework Directive, (including River Basin Management Plans and POMS affecting the Greater Dublin Area) and other related plans such as County Development Plans and related Local Area Plans; Habitat and Species Protection Plans under the Habitats Directive, Water Services Investment Programme, Nitrates Action Programme; and Flood Management Plans.'

Strategic Policy GIP6 states:

'To ensure the protection, enhancement and maintenance of the natural environment and recognise the economic, social, environmental and physical value of green spaces through the development of and integration of Green Infrastructure (GI) planning and development in the planning process.'

Strategic Policy SIP2 states:

'That quality of life forms a central part of planning policy in supporting good spaces, good places and that social activities and the arts form a core part in making good places.'

The proposed Project was considered supportive of the RPGs, in that it is supportive of the local economy and sustainable economic growth. Developing an appropriately zoned (Zoning

Objective GE - General Employment) vacant greenfield site to a commercial business park provides future commercial resources and employment opportunities in a more rural area within the GDA region and facilitates new employment opportunities for the existing population of the region. The proposed development seeks to facilitate economic growth in an area which takes advantage of a nationally important transport corridor, specifically the M1 motorway. The development proposes to create a 'good space' where both social and commercial activities are facilitated that recognises the economic, social, environmental and physical value of green spaces through the development of and integration of Green Infrastructure. The development also seeks to conserve the natural resources of the area which is a key principle of the RPGs.

4.2.4. Fingal Development Plan (FDP) 2023-2029

The Fingal Development Plan (FDP) 2023-2029 was made on 22nd February 2023 and came into effect on 5th April 2023. The Development Plan sets out the framework to guide future development within Fingal working towards a more sustainable County, where sufficient homes are available for citizens of Fingal and the creation of a more socially integrated and resilient County. The Plan is a strategic document which envisages Fingal as an integrated network of vibrant socially and economically successful urban settlements and rural communities, strategic greenbelts and open countryside, supporting and contributing to the economic development of the County and the Dublin City Region.

The Plan is underpinned by a strategic vision intended to guide the sustainable future growth of Fingal. At the core of the vision is healthy placemaking, building cohesive and sustainable communities, where Fingal's cultural, natural and built environment is protected.

Land Use Zoning

The site is zoned as Zoning Objective GE - General Employment, in the FDP, as outlined in **Figure 4-2** below, which aims to provide opportunities for general enterprise and employment.

The objective vision of Zoning Objective GE is to facilitate opportunities for compatible industry and general employment uses including appropriate sustainable employment and enterprise uses, logistics and warehousing activity in a good quality physical environment. General Employment areas should be highly accessible, well designed, permeable and legible.

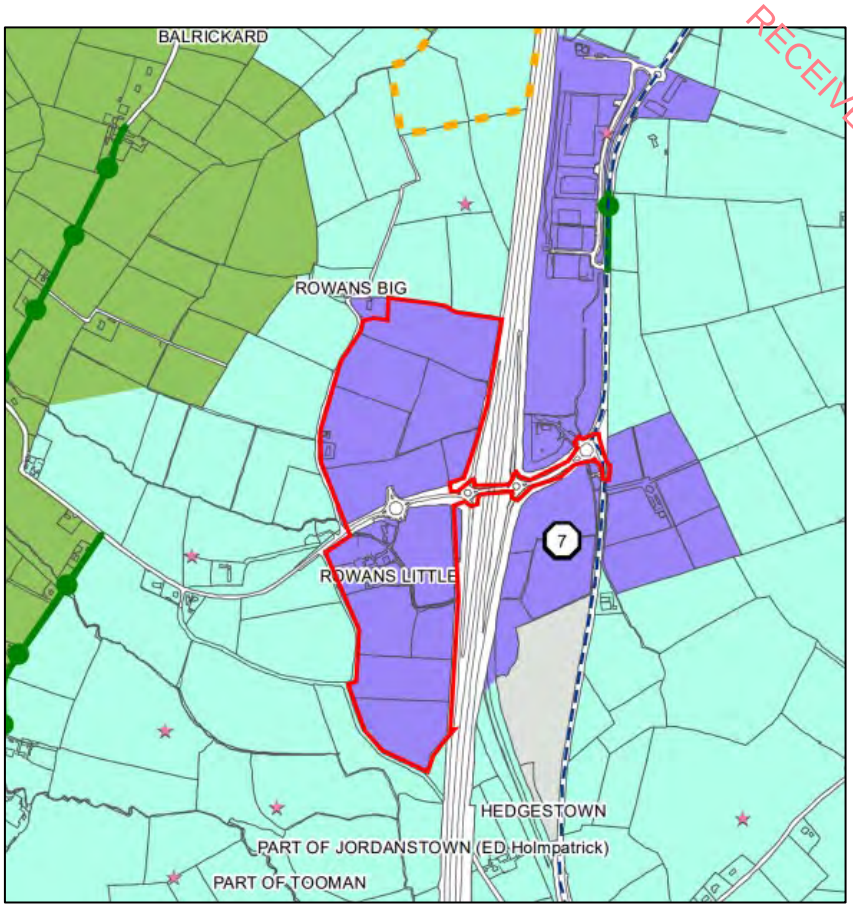


Figure 4-1: Zoning map from Fingal Development Plan 2023-2029

The following uses are permitted in principle under this zoning objective:

"Builders Provider/Yard, Civic Waste Facility, Enterprise Centre, Food, Drink and Flower Preparation/Processing, Fuel Depot/Fuel Storage, High Technology Manufacturing, Industry – General, Industry – Light, Logistics, Office Ancillary to Permitted Use, Open Space, Petrol Station, Research and Development, Restaurant/Café, Retail – Local < 150 square meters net floor area, Road Transport Depot, Sustainable Energy Installation, Telecommunications Structures, Training Centre, Utility Installations, Vehicle Sales Outlet – Small Vehicles, Vehicle Sales Outlet – Large Vehicles, Vehicle Servicing/Maintenance Garage, Warehousing, Waste Disposal and Recovery Facility (Excluding High Impact), Wholesale".

The proposed development comprises of the provision of the key infrastructure to facilitate the future development of the lands for logistics/warehousing units. It is noted that 'Logistics' and 'Warehousing' are permitted in principle under the sites zoning objective (GE) as per the FDP. The authorisation of the proposed Project was seen as supportive of the FDP. The proposed Project will result in the area being developed into a business park and being suitable for future commercial use, within its location in the rural community.

Employment and Enterprise

The following objectives and policies of the FDP in relation to employment uses are considered to be of relevance:

- **Policy EEP3** – *'Maximising Fingal's Economic Potential' Maximise the economic potential of Fingal's unique strengths and advantageous position within the Eastern and Midlands region.'*
- **Policy EEP5** – *'Land Extensive Uses' Support the development of land extensive uses where appropriate, having regard to infrastructural, transport and environmental considerations and the need for orderly growth.'*
- **Objective EEO4** – *'Space Extensive Uses' Ensure that space extensive uses are located within appropriate locations which do not compromise labour intensive opportunities on zoned lands, adjacent to public transport nodes or within existing built-up compact growth areas.'*

The proposed development which comprises essential infrastructure for the future development of the lands for a logistics/warehousing development on employment lands located within close proximity to high quality road infrastructure is considered to be in line with the above employment policies and objectives. The successful development of the proposed Project was thus seen as supportive of the FDP.

Demolition of Existing Buildings

The following policy of the FDP is noted in relation to the demolition of existing buildings and is considered to be of particular relevance:

- **Policy CAP8** – *'Retrofitting and Reuse of Existing Buildings' Support the retrofitting and reuse of existing buildings rather than their demolition and reconstruction where possible.'*

It is proposed to demolish all the existing vacant dwellings on site and their associated outbuildings. It is submitted that these building have been vacant for a significant period of time and would need serious upgrades and modifications to bring them back to a habitable standard. It is considered that the demolition of these buildings is necessary to allow the site to come forward for employment uses as zoned under the FDP. Furthermore, residential use would be contrary to the zoning objective for the lands. The successful development of the proposed Project was thus seen as supportive of the FDP.

Green Infrastructure

The following objectives and policies of the FDP in relation to green infrastructure are considered to be of particular relevance:

- **Policy GINHP19** – *''Ecological Buffer Zones' Protect the functions of the ecological buffer zones and ensure proposals for development have no significant adverse impact on the habitats and species of interest located therein.'*
- **Objective SPQHO91** *''Retention of Hedgerows and Other Distinctive Boundary Treatments' Ensure the retention of hedgerows and other distinctive boundary treatments in rural areas. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary/provision of agreed species of similar length will be required within the site.'*
- **Objective GINHO13** – *''Wetlands' Seek the creation of new wetlands and/or enhancement of existing wetlands through provision for Sustainable Drainage Systems (SuDS) where appropriate.'*
- **Objective IUO26** – *''Riparian Corridors' Establish riparian corridors free from new development along all significant watercourses and streams in the County:*
  - *Ensure a minimum 10m wide riparian buffer strip measured from the top of the bank either side of all watercourses. This minimum 10m wide riparian buffer strip applies to lands within development boundaries, i.e., within designated settlement boundaries (as per Fingal County Council's Settlement Hierarchy set out in Chapter 2, Planning for Growth, Table 2.20).*
  - *A minimum 48m wide riparian buffer strip is required in all other areas outside of development boundaries.*
  - *Where lands encompass urban and rural areas, a transitional approach from the urban riparian requirements to the rural riparian requirements may be appropriate and will be assessed on a case-by-case basis.*
  - *Notwithstanding the above, cognisance must be taken of Flood Zone A and B, as outlined in the SFRA.'*

See also Chapter 14 Development Management Standards (Section 14.20.5 Riparian Corridors) and the Site-Specific Flood Risk Assessment attached in **Appendix 8.**

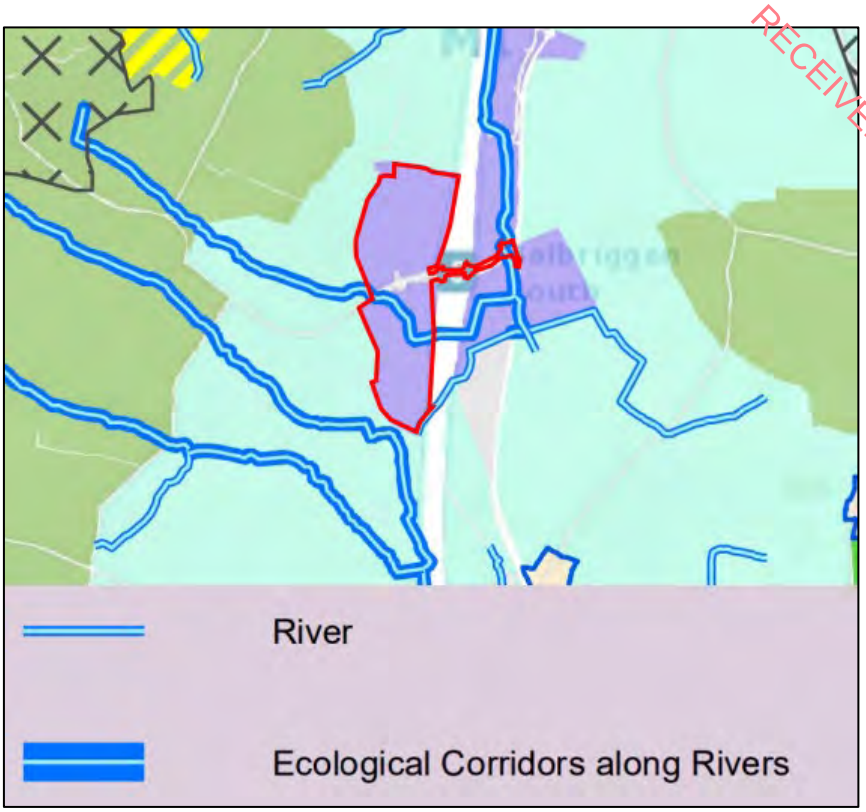


Figure 4-2: Green Infrastructure Map 2 of Fingal Development Plan 2023-2029

As shown on the Green Infrastructure Map in **Figure 4-3** above, a watercourse transverses Zone F. This watercourse is designated as an ecological corridor. In response to the ecological corridor destination, a riparian corridor is proposed in line with the FDP guidance to avoid any negative impacts on the watercourse.

There are a number of hedgerows located throughout the site which will need to be removed to accommodate the development of the site. However, the existing hedgerows along the perimeter will be retained where possible and extensive native planting as per the attached Landscape Masterplan plan is proposed.

In line with the FDP, sustainable drainage (SuDS) will be the primary drainage source for surface water. It is proposed to provide Green Infrastructure in the form of ponds, raingardens and wetlands throughout the site including within the buffer zone of the riparian corridor. The successful development of the proposed Project was thus seen as supportive of the FDP.

Road Upgrades

The following objectives and policies of the FDP in relation to road upgrades are considered to be of particular relevance:

- **Policy CMP32** – *"Sustainable Roads Infrastructure' Prioritise changes to existing roads infrastructure that underpins sustainable development, maintains road safety and network efficiency.'*

A section of the LL140/R132 is included within the site boundary to provide upgrades to the road to make the site more accessible for pedestrians and cyclists. The applicant is aware that these lands are outside of their ownership, and they would seek a letter of consent from Fingal County Council to provide these improvement works in any future application. The successful development of the proposed Project was thus seen as supportive of the FDP.

4.2.5. Planning for Watercourses in the Urban Environment 2020: Inland Fisheries Ireland

The Guidelines outline an integrated watercourse protection strategy, developed by Inland Fisheries Ireland (IFI) through consultation with a wide range of experts in the area. Development management standards, policies and objectives should be set per watercourse. These could be mapped in County Development Plans, Local Area Plans & masterplans and integrated with flood risk, Natura 2000 designated sites, habitat and amenities mapping. **Figure 4-4** outlines the three buffer subzones located adjacent a surface water body.

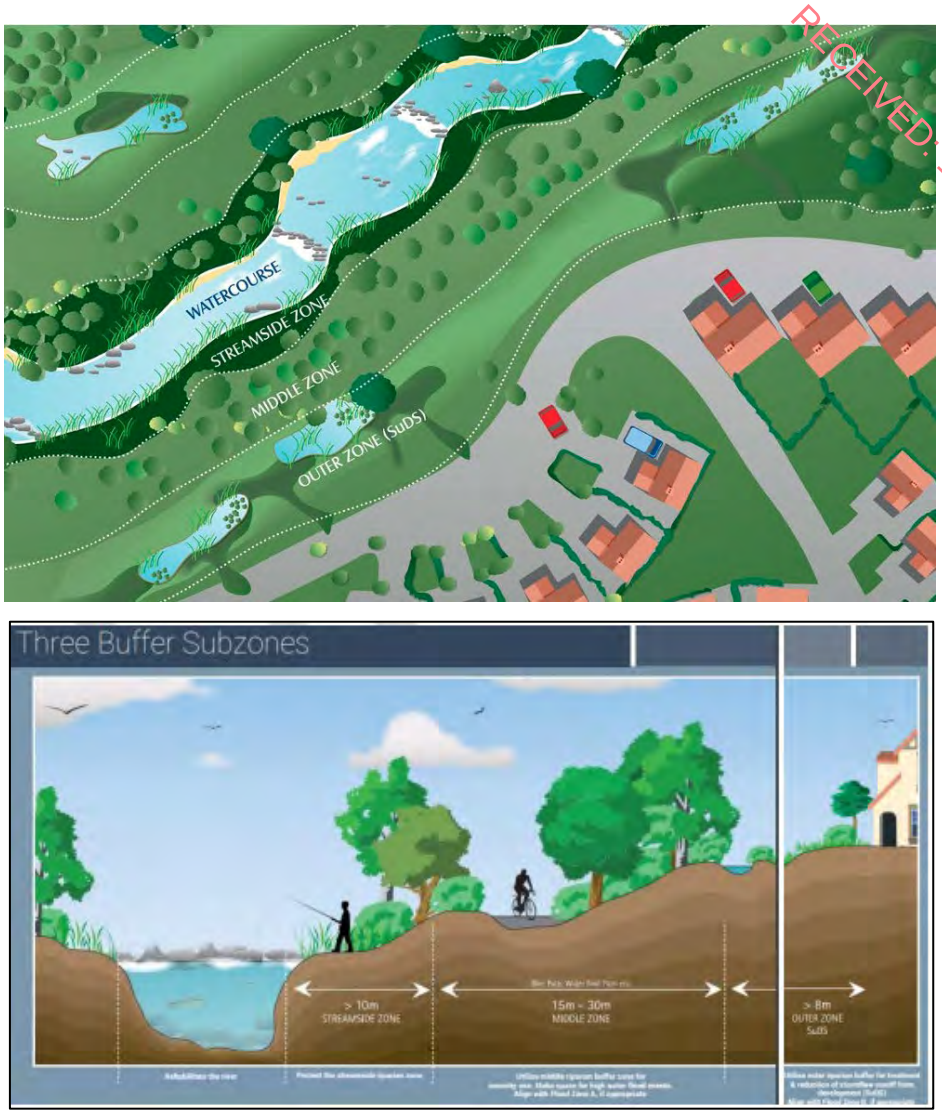


Figure 4-3: Inland Fisheries Ireland document showing the three buffer subzones.

The Guidelines recommend a buffer zone width for larger river channels (>10m), is 35m to 60m, and for smaller channels (<10m), is 20m or greater.

Zone F is subject to an ecological corridor policy in the 'Ecological Buffer Zone' (see Policy GINHP19 above). The layout of the proposals has been developed having regard to the policy of the FDP and the IFI Guidelines. The ecological corridor including buffer zone taken from the development master plan can be seen in **Figure 4-5** below. The successful development of the proposed Project was thus seen as supportive of the FDP and IFI Guidelines.

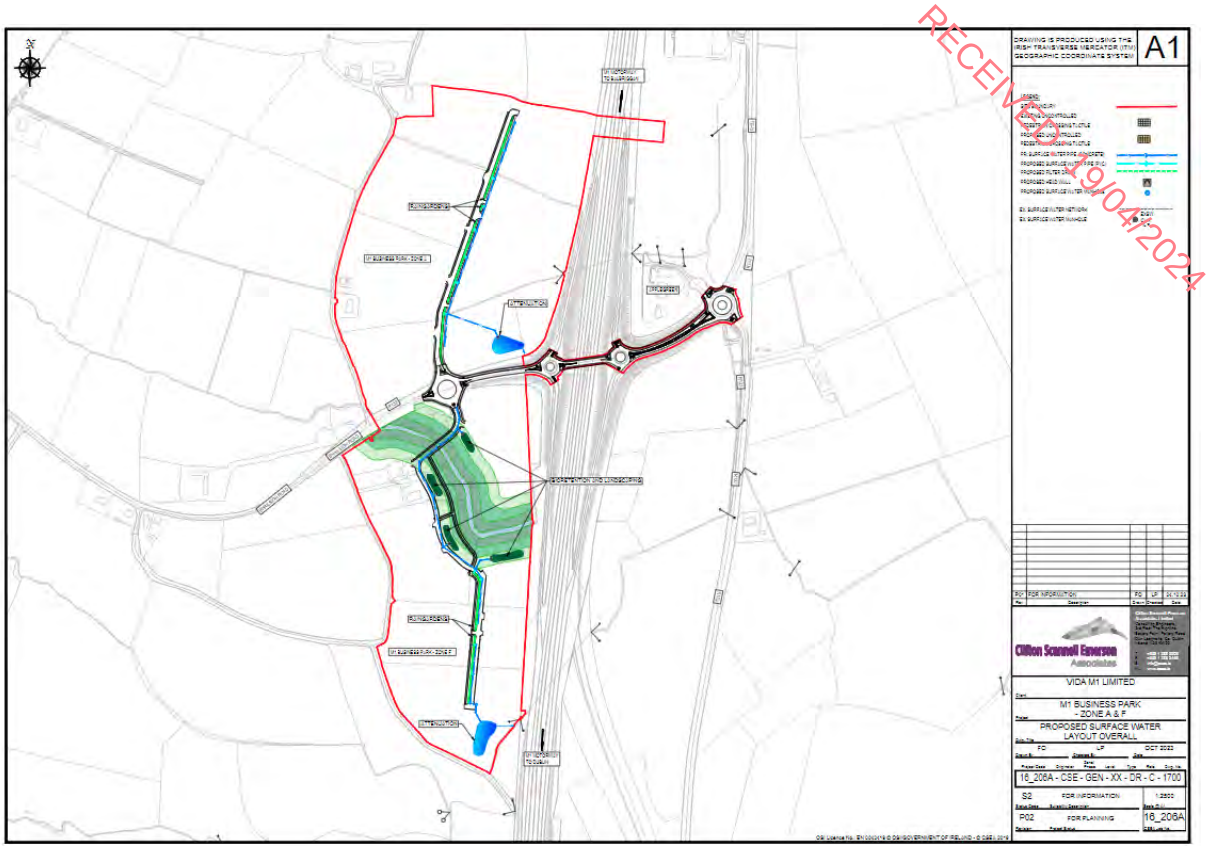


Figure 4-4:The proposed riparian corridors and buffer zones with Zone F.

5. Population and Human Health

5.1. Introduction

This Chapter of the EIAR has been compiled by Rowan Engineering Consultants Ltd. (REC). This Chapter assesses the potential effects of the proposed Project on the people in the surrounding community during the construction and operation phase.

5.2. Methodology

The following sources were consulted in order to identify, map and assess the potential impact to the surrounding population from the proposed Project:

- National and Regional Planning Policy;
- Fingal Development Plan (FDP) 2023 - 2029;
- Midland Regional Planning Guidelines 2010 - 2022 (RPG's);
- Greater Dublin Area Regional Planning Guidelines 2010 - 2022 (RPG's);
- Fingal County Council (FCC): https://www.fingal.ie/;
- Fingal's Local Economic and Community Plan (LECP) 2023 - 2028;
- Fingal's Local Economic and Community Plan (LECP) 2016 - 2020;
- Central Statistics Office (CSO): https://www.cso.ie/en/databases/; and,
- All Ireland Research Observatory: http://airo.maynoothuniversity.ie/.

A visit of the site and surrounding environment was also undertaken to support understanding and inform the identification of local resources and amenities.

5.3. Baseline Conditions

5.3.1. Land Use

The proposed development site is located within the townlands of Rowans Big and Rowans Little (Electoral Division Lusk) c. 5.5km northwest of the town of Lusk and c. 5.2km southwest of Balbriggan in Co. Dublin. The site encompasses approximately 34 hectares and is accessed by the Bhailsigh Road (L1140) off the M1 motorway at Junction 5.

The proposed development site is primarily greenfield and was initially used for agricultural and farming activities, however, parts of the site contain some vacant dwellings. Lands in the vicinity of the proposed Project are generally used for agricultural activities. Some light industrial activity occurs close to the site's eastern boundary at the other side of the M1 motorway at M1 business park. Existing warehouse and light industrial activities occur at this area, representing an established employment within in the region.

Current businesses operating from M1 Business Park include Fyffes, Applegreen, Kube Kitchens & Interiors, Murdock Builders Merchants, Shed factory, Danann Air and Ace Express Freight.

5.3.2. Tourism, Local Resources and Amenities

Numerous tourist attractions are in close proximity to the proposed development site, including; Hollywood Lakes Golf Club located c. 3.5km southwest, Balbriggan Golf Club located c. 3.8km northeast, Ardgillan Castle and Demesne located c. 4.5km northeast and Lusk Round Tower located c. 5.2km southeast.

Additionally, hiking and seaside amenities exist along nearby coastal towns which include Balbriggan, Skerries and Rush.

A number of surface water features occur in the region including Knock Lake, which is a proposed Natural Heritage Area (pNHA), located c. 2.3km northeast from the proposed development site, and Naul Reservoir is located c. 4.3km northwest of the site. The upper reaches of the Balrickard Stream (EPA Code 08B23) flows through Zone F, the southern portion of the site.

The aforementioned surface water bodies offer scenic touristic regions for water sports, fishing and recreation. The Bog of The Ring, a scenic pNHA, is located c. 1.1km north of the site. Rogerstown Estuary, an area of great scenic amenity which is classified as a Special Protection Area (SPA), Special Area of Conservation (SAC) and a pNHA is located c. 7.9km southeast of the site.

With regard to human health, it should be noted that the site overlies Bog of The Ring Public Water Supply Source Protection Area (SO - Outer Protection Area). Additionally, Skerries wastewater treatment plant is located c. 5.6km northeast of the site.

The surrounding environment is currently serviced with other community resources and amenities, including the following:

- Local businesses including shopping facilities, local industries, service stations, pubs;
- Post Offices located at Lusk, Rush, Skerries and Balbriggan;
- Garda Stations at Lusk, Skerries and Balbriggan;
- Health and Community Centres;
- A range of Gaelic Athletic Association Clubs (GAA) including Man O'War GFC, Round Towers GAA, Ballyboughal GFC, Clann Mhuire GFC, O'Dwyers GAA, Skerries GAA and St. Maur's GAA;
- North Beach Tourist Caravan & Motor Home Park;

- Bracken Court Hotel;
- Children's preschool/creche facilities; and,
- Educational and Religious centres.

There are a number of detached residential dwellings located along the Bhailsigh Road (L1140) to the west and along the R132 to the east of the proposed development site. These are serviced by private septic tanks and percolation areas.

Tourism is one of Fingal's most important economic drivers and is an important indigenous sector within the region. In terms of generating revenue and employment, visitors to Fingal generate a €500 million spend, which sustains a total of 20,000 jobs (one in four jobs in Fingal) across all sectors transport, retail, entertainment, and other services (Fingal County Council).

5.3.3. Population, Employment and Economy

The population of Ireland stood at 5,149,139 in April 2022, signifying a growth of 8.1% from the previous Census in 2016. Fingal's population increased by 11.6% from 2016 to 2022, with a population of 330,506, thus representing an additional 34,000 people in the area. In accordance with these figures, Fingal County constitutes 6.4% of Ireland's population, and is the third most populated county in the state.

Fingal's population increased by more than a third (37.7%) from 2006 to 2022; a growth rate surpassing any county in Ireland. From the previous 2016 Census, the fasted growing Electoral Divisions within Fingal were Balgriffin and The Ward, where population increases were recorded at 77.8% and 37.9% over the 6 year period, respectively.

The figure below illustrates population growth in both Fingal and the state from 2006 to 2022.

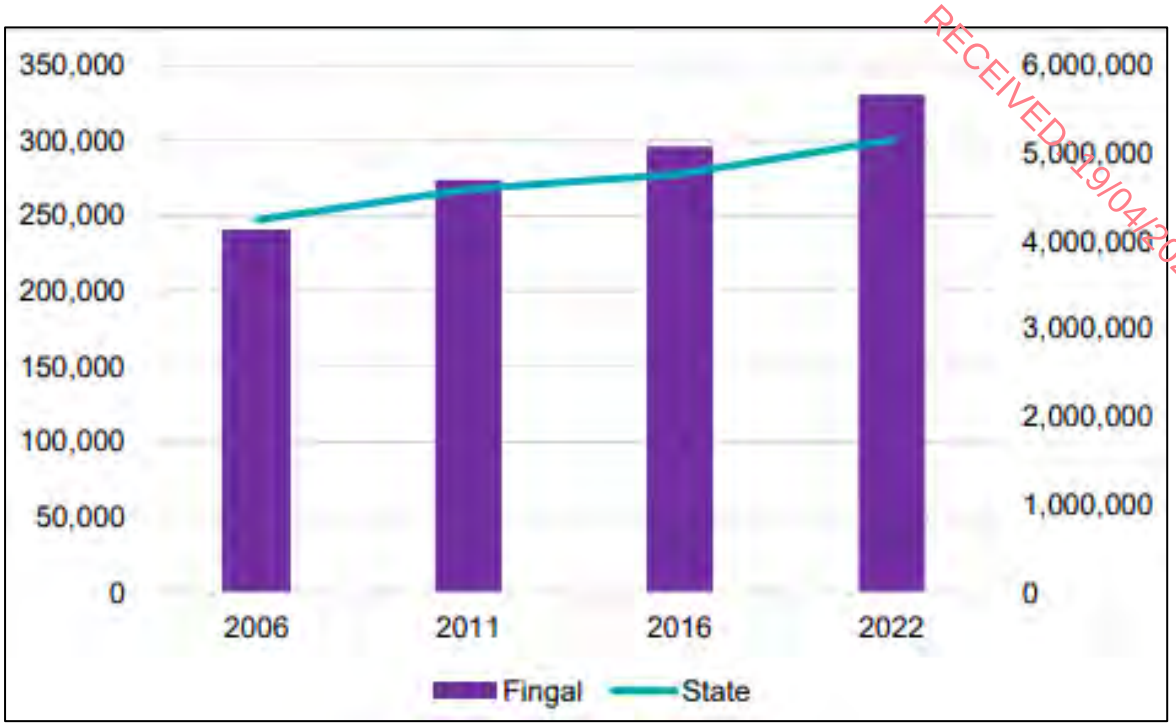


Figure 5-1: Fingal's population in context with Ireland. Source: CSO (Adapted from Fingal LECP Socio-Economic Profile)

The surrounding townlands of Rowans Big, Rowans Little and Walshestown are within the electoral division of Lusk while Balrickard to the north of the site is within the electoral division of Hollywood and Courtlough to the east of the site is within the electoral division of Balbriggan Rural. All electoral divisions have observed population increases from April 2016 to April 2022 (census periods). This is detailed in **Table 5-1** below.

Table 5-1: Population change

Area	April 2016	April 2022	% change
Lusk	9,623	10,774	+ 12%
Hollywood	1,397	1,476	+ 5.7%
Balbriggan Rural	16,495	19,347	+ 17.3%
Fingal	296,020	330,506	+ 11.6%

These regions exhibited similar trends to Fingal as a whole which experienced an increase of c. 11% from 2016 to 2022.

In terms of employment, the total at work in Fingal increased from 2016 to 2022. This is detailed in **Table 5-2** below.

Table 5-2: Total at Work in Fingal (2016-2022)

Area	April 2016	April 2022	% change
Fingal	149,386	165,814	+ 11%

As of 2022, Fingal held one of the highest percentages of the population of those employed as 'professional workers', while nationally, 22.6% of the population were noted in the cohort of professional workers.

Additionally, non-manual workers accounted for 40% of Fingal's workforce, being the largest proportion of non-manual workers in Ireland; non-manual workers account for 36.6% of the national population. Employers and Managers comprise 18.1% of Fingal's socio-economic breakdown, thus signifying the County's entrepreneurial status. Cork City and Dublin City were the only other Local Authorities which comprised higher percentages in this grouping.

With regard to education, levels throughout Ireland and Fingal have steadily improved over the years. In 2022, those educated to primary and secondary level were approximately 26.7% and 31.7% for Fingal and the state, respectively. Although Fingal posed a lower percentage of those educated to primary and secondary level in comparison with the state, this represents Fingal's higher educational accomplishment levels. For example, 31% of Fingal's population were educated to degree level, in comparison to 28% nationally.

In 2022, those educated further than degree level had risen by over a third in Fingal from 2016, with 36.1% obtaining a Bachelor Degree, 34.8% obtaining a postgraduate degree and 36.3% obtaining a PhD.

In terms of employment, high increases have been noted since 2011 for Fingal, together with the state. Fingal comprised the highest labour force participation rate in Ireland, standing at 65.6% in 2022, which was notably higher than the average for the state (61.2%). On the other hand, unemployment rates in Fingal aligned with the national average in 2022, recorded at 5.1%.

Fingal is supported by a strong supply of zoned land and is characterised by numerous key economic clusters, including key sectors such as; agri-food, Information and Communication Technology (ICT), aviation, healthcare, pharmaceuticals, financial services, tourism, retail and hospitality. These sectors collectively generate substantial contributions towards econmic activity and employment in the overall Dublin region annually.

The upcoming Fingal Local Economic and Community Plan (LECP) 2023 - 2028 focuses on how Fingal can grow sustainably and inclusively. The LECP will shape the development of Fingal over the next six years. The vision of the upcoming LECP is "*to make Fingal a vibrant, sustainable, progressive and climate resilient county, underpinned by inclusive, healthy, empowered communitie and a dynamic economy.*"

The LECP 2023-2028 sets out 9 overarching goals for economic and community development in Fingal. The goals relevant to the proposed development are listed as follows:

- ***Goal 1.1***: Support the development of strategic infrastructure;
- ***Goal 1.2***: Provide a supportive business environment that encourages innovation and attracts, retains and grows businesses sustainably
- ***Goal 4.1***: Protect the heritage of Fingal and ensure quality amenities for all
- ***Goal 6.1***: Re-imagine towns and villages through collaboration and inclusivity.

The Fingal LECP has not yet been released, for this reason, the previous LECP 2016-2020 is also referred to below. The LECP sets out 10 overarching goals with the most relevant to the development listed as follows:

- ***Goal G1:*** *Increase economic activity and employment creation through innovation and collaboration. This goal is designed to support and encourage the development of sustainable networks and strategies that will boost competitiveness, investments and job creation.*
- ***Goal G2:*** *Develop a communication and support structure for SME's and retail businesses. This will be designed to support SME's, and promote their contribution to local economic growth.*
- ***Goal G3:*** *Stimulate entrepreneurial culture, innovation and growth. The outcome of this goal will be a more developed eco-system for start-ups, micro businesses and small business, thereby improving business success rates and sustainable growth opportunities.*
- ***Goal G4:*** *Maximise job creation opportunities by activating the potential within local communities. This will provide for an enhanced equality of access to job opportunities for hard-to-reach communities. It will also seek to reduce levels of educational disadvantage, improve the supply of essential skills and, therefore, result in reduced levels of unemployment.*
- ***Goal G5:*** *Increase participation in social cultural and economic activities to improve, well-being and quality of life. Increased community participation levels in health, social, cultural and economic activities will act as a vehicle for improving the quality of life for*

all. Specific supports for groups who are facing social and economic barriers to full participation.

- ***Goal G8:*** *Create distinct visitor attractions by sensitively optimising the natural assets of the county, and building an enterprise and community infrastructure to drive and expand the visitor potential. This will support the development and enhancement of local amenities, resulting in increased visitor numbers and expanded sectoral employment potential.*

With regards to Rural Employment Objectives, the goals relevant to this development are listed below:

- **Goal G9:** *Re-generate towns and villages, and increase the resilience of the local economy. This goal will underpin the development of vibrant towns and villages that are actively supported by an engaged business community, and are strategically marketed through an enhanced 'sense of place'.*
- **Goal G10:** Support the sustainability of rural communities through the development of a resilient economy. The goal will provide for targeted territorial development and resilient rural communities with the capacity to strategically develop their local economy.

5.4. Predicted Impacts – Construction Phase

5.4.1. Population, Employment & Economy

The proposed development works under the planning permission application will result in construction-based activities. During the construction phase, there will be an increase in the daily number of persons working in the immediate area, in the region of 15-50 construction staff employed at the site involved in construction activities.

It is anticipated that the construction of the proposed development will be phased. The construction of the access roads will be progressed as the demand for the individual land parcels identified in the Scott Tallon Walker Masterplan increases over time. It is anticipated that Phase 1 will consist of a construction period of 8 months, with Phase 2 involving a construction period of 6 months as indicated in the indicative Figure 1-3 above. Phase 1 would entail the construction of all the services, utilities and drainage infrastructure required to service both Zone A and F in its entirety.

The impact would be considered both short-term, neutral and imperceptible on population growth from the construction phase. The construction of the proposed Project is programmed for c. 14 months.

Results for the 2022 census from the CSO, indicate that c. 313,921 persons are currently employed in Ireland in skilled trades occupations in the construction sector. Some benefits to the local economy would be expected in terms of the provision of direct employment and the increased spend by construction staff, using local businesses for items such as fuel and food. This impact would be considered short-term for the duration of the works on site and positive.

It is considered that the proposed Project is supportive of the local economy, however, given the scale of the proposed Project and the number of associated construction staff, the impact, whilst positive would be considered short-term and not significant.

5.4.2. Tourism, Community Resources and Amenity: Nuisance (Dust, Noise and Traffic Generation)

There is the potential for some impacts on local residences and the wider community, amenities and resources resulting from potential increases in noise, traffic and the generation of dust and noise emissions from construction activities.

However, any tourism, community resources and amenity are located sufficiently far away from the proposed Project in the larger urban centres such as Lusk and Balbriggan, so it is considered that there would be no impact on these.

With regard to local residences on the Bhailsigh Road (L1140) and the wider community, there is potential for impacts arising from increased traffic flows, concerns of road safety and the generation of dust and noise emissions whilst the proposed construction phase is active. Nonetheless, the Traffic and Transport Assessment completed found that the access route could safely support increased traffic, operating well within capacity during both the AM ad PM peak hours. No relevant changes in queue lengths or delays were recorded during the Traffic and Transport Assessment.

It was estimated that, on the busiest construction days, the site will attract/generate a total of 22 Light Vehicles (LV) trips per day (11 inbound in the morning and 11 outbound in the evening) and a total of 60 Heavy Vehicles (HV) trips per day (30 inbound and 30 outbound, spread throughout the day). It was conservatively assumed that 10 HV trips will occur during the network morning peak hour (5 inbound and 5 outbound) and 10 HV trips will occur during the evening peak hour (5 inbound and 5 outbound). All estimated LV trips were assumed to occur during the AM and PM peak hours.

All nearby junctions were assessed and noted to have available capacity to accommodate additional construction traffic therefore impacts are likely to be low.

Additionally, vehicle and wheel washing will be deployed at the site entrance to prevent mud being carried out onto the public road as well as reducing dust onsite.

Overall, these potential impacts would be considered short-term, adverse and with mitigation measures, not significant.

5.5. Predicted Impacts – Operational Phase

5.5.1. Land Use

The development of the vacant greenfield site to a commercial business park provides some positive benefits from a land use perspective, with the provision of future commercial resources and employment opportunities in the area. In addition, the future commercial use of the site will allow for the relocation of certain uses in urban centres to a more suitable location, for those lands to be better utilised while providing employment in a more rural location outside of these main urban centres. The loss of some arable grassland resulting from the development is not deemed significant due to its low ecological value and the abundance of this habitat in the wider region.

On this basis, the potential impacts would be considered positive, long-term and significant.

The topics including land use, soils and geology and landscape and visual are detailed in their respective chapters 7 and 11 respectively.

5.5.2. Population, Employment and Economy

It is considered that the proposed Project is supportive of the local economy, developing a vacant greenfield site to a commercial business park provides future commercial resources and employment opportunities in a rural area outside of the main urban centres of the region. It is expected that the proposed Project will result in the development of approximately 1,300 additional jobs and higher employment rates for the area when the proposed masterplan is fully developed.

This is considered an overall positive, long-term and significant impact.

In this EIAR, the potential for human health effects is addressed under the specific topics that might lead to such effects. The topics include air quality, noise and vibration, traffic and transport and are detailed in Chapters 9, 10 and 12 respectively.

5.5.3. Tourism, Community Resources and Amenity

It is considered that as the majority tourism and community resources based in the local region are located sufficiently far away from the development in the larger urban centres such as Lusk and Balbriggan, there would be no impact on the amenity of these resources.

The proposed development would improve community resources and amenity in the local area and provide positive benefits with the provision of future commercial resources and employment in the area. In addition, the future commercial use of the site will allow for the relocation of certain uses in urban centres to a more suitable location, while providing employment and resources in a rural setting. This would support the sustainability of rural communities through the development of a resilient local economy.

The development would support in building enterprise and community infrastructure to drive and expand the visitor potential of the region. This will support the development and enhancement of local amenities, resulting in increased visitor numbers and expanded sectoral employment potential.

This is considered an overall positive, long-term and significant impact.

5.5.4. Human Health Impacts

In this EIAR, the potential for human health effects is addressed under the specific topics that might lead to such effects. The topics include air quality, noise and vibration, traffic and transport and are detailed in Chapters 9, 10 and 12 respectively.

5.6. Potential Cumulative Impacts

There many positive impacts associated with the proposed development in terms of economy and employment. Other operational business park developments are likewise contributing in a similar positive manner.

Any cumulative (adverse) impacts for the local communities, amenities and tourism resources would be associated with the potential for additional disruption in terms of noise, dust, traffic and visual amenity.

However, after mitigation has been applied during the construction and operation of the proposed development impacts are deemed to be imperceptible to low. Therefore, no cumulative effects are identified to population and human health.

With regard to the wider indicative masterplan currently proposed no specific mitigation measures are currently envisaged as required for the operational phase of the proposed development with respect to population and human health, with any impacts of the development considered positive. It is however noted that little detail is currently available on the businesses to occupy the proposed warehouses, these developments will be subject to subsequent planning applications and should be assessed in detail at the stage of planning application to ensure unit specific mitigation measures are identified.

5.7. Mitigation Measures

5.7.1. Construction Phase

Impacts relating to dust, traffic, noise and vibration are addressed fully in the respective chapters of this EIAR. It is noted that an CEMP (**Appendix 4**) has been prepared setting out a framework in relation to the management of environmental nuisances when the proposed Projects construction phase is operational.

The CEMP will be updated as required prior to the commencement of the works on site as part of the construction phase. Compliance with the CEMP will be mandatory for the appointed contractor including sub-contractors and other relevant personnel involved in the development works at the site.

The CEMP details the mitigation measures that will be implemented on site during the construction phase, to minimise environmental impacts and specifically relating to dust emissions will include:

- Vehicles delivering materials with dust potential will be enclosed or covered with tarpaulin;
- All HGV's leaving the site will directed through a wheelwash in order to prevent mud and other wastes being tracked onto public roads;
- All stockpiles will be monitored and treated with water to minimise dust emissions;
- Hard surfaces on-site will be swept to remove any mud or aggregate build up to minimise dust emissions;
- During prolonged dry or windy periods, any areas with the potential to generate dust will be watered, in particular areas next to the site entrance; and,
- Public roads will be inspected regularly for cleanliness and cleaned as necessary.

More detailed mitigation measures specific to noise and vibration, air quality and traffic and transport are addressed in the relevant chapters of this EIAR.

Training on the requirements of the CEMP will be provided to all construction site staff by the appointed contractor as part of their site induction. Records of this training will be maintained on-site for future reference and auditing purposes.

5.7.2. Operational Phase

No specific mitigation measures are required for the operational phase of the proposed development with respect to population and human health, with any impacts of the development considered positive.

Regulatory safety standards will be developed and enforced at the completed business park as is required, including speed limits, appropriate road markings and signage to ensure the completed facility is operated and maintained to safeguard human health and the welfare of the facilities users.

Mitigation of potential impacts relating to air quality, noise and vibration and traffic and transport are detailed in the relevant chapters of this EIAR.

5.8. Residual Impacts

The implementation of the CEMP during the construction phase will allow for the implementation of appropriate environmental practises and it is considered that any residual impacts during the construction phase and when the site is active would be imperceptible.

The operation of the proposed development when completed, is considered to have a positive, long-term and significant impact for the local community and economy.

5.9. References

- All Island Research Observatory (AIRO), retrieved November 2023, https://www.maynoothuniversity.ie/airo;
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- Environmental Protection Agency, Draft 2015, Advice Notes for Preparing Environmental Impact Statements;
- Department of Business, Enterprise and Innovation, July 2017, County Employment Overview;
- Midlands Regional Authority, July 2010, Regional Planning Guidelines (RPG's) for the Midland Region 2010 to 2022;
- Dublin Regional Authority and Mid-East Regional Authority, June 2010, Regional Planning Guidelines (RPG's) for the Greater Dublin Area 2010 to 2022;
- Fingal County Council, April 2023, Fingal Development Plan (FDP) 2023-2029;
- Fingal County Council, Draft 2023, Local Economic and Community Plan (LECP) 2023 - 2028;

- Fingal County Council, 2016, Local Economic and Community Plan (LECP) 2016 - 2020.

6. Biodiversity

6.1. Introduction

This section of the Environmental Impact Assessment Report was carried out by Altemar Ltd. It assesses the biodiversity value of the proposed development area and the potential effects of the development on the biodiversity of the surrounding area and within the potential zone of influence (ZOI).

The programme of work in relation to biodiversity aspects of the EIAR have been designed to identify and describe the existing ecology of the area and detail sites, habitats or species of conservation interest. It also assesses the significance of the likely impacts of the scheme on the biodiversity elements and designs mitigation measures to alleviate identified impacts. Full details of all the mitigation measures and the phasing of the project are contained in the accompanying Construction Environmental Management Plan (CEMP), which has been prepared by Clifton Scannell Emerson Associates, Consulting Engineers.

A separate AA Screening and NIS, in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced to identify potential impacts of the development on Natura 2000 sites, Annex species or Annex habitats. It concludes that '*significant effects on the North-West Irish Sea SPA are likely from the proposed works in the absence of mitigation measures, primarily as a result of direct hydrological connection to the site via dust pollution and surface water runoff to the Balrickard Stream (also known as the Matt/ Bracken Stream) which drains the site. For this reason, an NIS was carried out to assess whether the proposed project, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European Site. All other Natura 2000 sites were screened out at initial screening.*

Construction works will create localised noise disturbance that will not impact on Natura 2000 sites. Mitigation measures will be in place to ensure that there are no significant impacts on the surface water that leads to the marine environment. Following the implementation of the mitigation measures outlined, the construction and operation of the proposed development would not be deemed to adversely affect the integrity of the North-West Irish Sea SPA, alone in combination with other plans and projects. No significant adverse effects are likely on all other Natura 2000 sites, in the absence of mitigation, alone in combination with other plans and projects.'

6.1.1. Expertise & Qualifications

This chapter of the EIAR has been prepared by Bryan Deegan of Altemar Ltd. Altemar Ltd. is an established environmental consultancy based in Greystones, Co. Wicklow that has been in operating in Ireland since 2001. Bryan Deegan MCIEEM is the Managing Director of Altemar Ltd. and holds a M.Sc. Environmental Science, BSc (Hons.) in Applied Marine Biology and a National Diploma in Applied Aquatic Science. He has over 28 years' experience as an environmental consultant in Ireland and was the ecologist for all aspects of this project. Previous projects where Altemar were the lead project ecologists include the Lidl Ireland GmbH regional distribution centres in Newbridge and Mullingar, Primark regional distribution centre Newbridge, 18 airside projects for daa at Dublin Airport and 7 marine fibre optic cable landfalls. This report has also been prepared by Frank Spellman (BSc Zoology, MSc Zoology) and Emma Peters (BSc (Hons.) Environmental Science). Frank has previous experience in carrying out a wide range of fauna surveys as both a sub-contractor and employee for consultancies and organisations in Ireland and the US. These include both roving and static acoustic bat surveys, terrestrial non-avian mammal surveys, breeding/wintering bird surveys, and freshwater ecology surveys. Emma is a skilled ecological assessor with aptitude for flora identification, invasive species and bat detection through static detector surveys, dusk emergence, and dawn re-entry surveys. Emma has been the lead ecologist in 30+ projects responsible for mammal tracking, camera trapping, wintering bird, breeding bird, bat surveys, flora and habitat mapping.

6.1.2. Proposed Development

The proposed development comprises of the provision of key civil infrastructure to facilitate the future development of the lands for a commercial logistics/warehousing development. This development will become an extension of the existing M1 Business Park development and this planning application entails the following:

- Demolition of a single-storey 200-square-metre (m^2) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- Demolition of 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;
- Provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and M1 motorway, referred to as Zone A and F.

- Zone A and F lands are located north and south of Bhailsigh Road (L1140), respectively, which connect to Junction 5 of the M1 Motorway and are located in the townlands of Rowan's Big and Rowan's Little.
- Preparation of indicative Masterplan for Zone A and F which contains layouts of the future planned commercial properties, consisting of mixed-use, warehousing and distribution units including associated loading bays for HGVs, service compounds, ESBN substations and parking areas to service each commercial unit site, which would be subject to individual planning permission applications.
- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k- to 105k-square-feet (ft^2) units with the potential to combine plots should larger units be required.
- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications.
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges.
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines.
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels.
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

A comprehensive description of the proposed development is presented in **Chapter 2** of this EIAR. See **Figure 6.1** below for proposed site outline and location.

6.1.3. Aspects Relevant to this Assessment

In summary, the proposed project will involve site clearance, reprofiling, the implementation of attenuation and drainage networks, in addition to building construction and landscaping. These elements will impact on biodiversity on site with potential impacts beyond the site outline within the Zone of Influence (ZOI).

6.2. Methodology

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

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013).
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2 (National Roads Authority, 2009)
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016)
- Bat Mitigation Guidelines for Ireland V2 (Marnell, *et al,* 2022)
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2006a)
- Bird Monitoring Methods - A Manual of Techniques for Key UK Species (Gilbert et al., 1998).
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).
- Guide to Habitats in Ireland (Fossitt, 2000).

A pre-survey biodiversity data search was carried out in August 2023 and revised in January 2024. This included examining records and data from the National Parks and Wildlife Service (NPWS), National Biological Data Centre (NBDC) and the Environmental Protection Agency (EPA), in addition to aerial, 6-inch maps and satellite imagery. A habitat survey of the site was undertaken within the appropriate seasonal timeframe for terrestrial fieldwork. Field surveys were carried out as outlined in **Table 6.1.**

Table 6.1. Assessment of key ecological areas in the Environmental Impact Assessment

Survey Type	Surveyors	Survey Dates
Terrestrial and avian ecology	Emma Peters (Altemar) and Frank Spellman (Altemar)	15th August 2023, 13th September 2023 and October 2023 - March 2024.
Bat and terrestrial ecology	Emma Peters (Altemar) and Frank Spellman (Altemar)	15th August 2023 and 13th September 2024.
Mammal ecology	Frank Spellman (Altemar)	16th November 2023 & 7th February 2024.

Desk studies were carried out to obtain relevant existing biodiversity information within the Zone of Influence (ZOI). As outlined in Office of the Planning Regulator (2021) "*The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km).*" The proposed development site is primarily a greenfield site consisting of hedgerow/treelines, arable land and grassland located within an agricultural environment at Rowans, Co. Dublin. After consultation with Clifton Scannell Emerson Engineers, it was outlined that, after attenuation on-site, surface water drainage will be directed to the Bracken River. The Bracken River ultimately outfalls to the marine environment and the North-west Irish sea SPA.

As a result, there is an direct hydrological pathway from the proposed development to designated conservation sites located within the marine environment. Additionally, given that excavation and construction works are proposed in close proximity to the Balrickard stream (which flows across the southern portion of the site) and the Bracken River (which flows along the east side of the site) there is the potential for dust and contaminated surface water to enter the proximate watercourse and impact on downstream aquatic biodiversity. In this case, the potential ZOI extends beyond the site, with the potential for downstream impacts to extend beyond the proposed development area via the proposed construction works and the surface water networks. Details of the proposed development are seen in **Chapter 2** of this EIAR. The proposed project construction methodology, layout, drainage strategy, CEMP, design and

landscape design were reviewed to inform this assessment. Further, the other chapters within the EIAR were assessed.

6.3. Baseline Conditions

6.3.1. Zone of Influence

As outlined in CIEEM (2018) 'The '*zone of influence' for a project is the area over which* ecological *features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries*.' In line with best practice guidance an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995).

The potential ZOI of the project in the absence of mitigation was deemed to be; within the site outline, and nearby sensitive receptors including the Balrickard Stream, Bracken River, and aquatic biodiversity downstream of the proposed works. Given the extent of the construction works, and the proximity of the Balrickard Stream and Bracken River to the subject site (traversing through a southern portion of the site), in the absence of mitigation there is the potential for dust and contaminated surface water runoff to enter the proximate watercourse and the marine environment downstream of the works.

After attenuation on-site, surface water drainage will be directed to the Bracken River. This watercourse outfalls to the North-west Irish sea SPA, which ultimately outfalls to the marine environment. As a result, there is an direct hydrological pathway from the proposed development to designated conservation sites located within the marine environment. In the case of the proposed development, the potential ZOI extends beyond the site, with the potential for downstream impacts to extend beyond the proposed development area to downstream biodiversity via the proposed construction works and the surface water/foul water networks during construction and operation.

6.3.2. Designated Sites

As can be seen from Figures 6.2 (SAC's within 15km), 6.3 (SPA's within 15km), 6.4 (NHA and pNHA within 15km), and 6.5 (Ramsar sites within 15km), there is one Natura 2000 site within 5km, and two proposed National conservation sites within five kilometres of the proposed development site. There are two Ramsar sites within 15km of the proposed development site. The distance and details of the conservation sites within 15km of the proposed development, and conservation sites beyond 15km with the potential for a hydrological connection, are seen in T**able 6.2** below.Given the extent of the proposed works, the proximity of the subject site to

the Bracken River (which is traverses along the east of the site), and the fact surface water drainage (after attenuation onsite) will discharge to this watercourse, it is considered that there is a direct hydrological pathway to designated sites located downstream within the marine environment. **Figures 6.6 –6.10** demonstrate watercourses proximate to the subject site and designated conservation sites with a hydrological pathway.

Table 6.2. Designated sites within 15km / with potential hydrological connection to the subject site

Designation	Name	Distance
SAC		
	Rogerstown Estuary SAC	6.2 km
	Rockabill to Dalkey Island SAC	9.5 km
	Malahide Estuary SAC	9.8 km
	Lambay Island SAC	14 km
SPA		
	North-West Irish Sea SPA	4.5 km
	Rogerstown Estuary SPA	6.4 km
	Skerries Islands SPA	7.7 km
	River Nanny Estuary and Shore SPA	9.2 km
	Malahide Estuary SPA	9.9 km
	Rockabill SPA	10 km
	Lambay Island SPA	13.9 km

Designation	Name	Distance
NHA		
	Skerries Islands NHA	7.6 km
pNHA		
	Bog Of The Ring	750 m
	Knock Lake	1.8 km
	Rogerstown Estuary	6.3 km
	Loughshinny Coast	8 km
	Cromwell's Bush Fen	9.6 km
	Malahide Estuary	9.8 km
	Portraine Shore	10.2 km
	Laytown Dunes/Nanny Estuary	10.7 km

	Feltrim Hill	13.2 km
	Rockabill Island	13.9 km
	Lambay Island	14.1 km
	Boyne Coast and Estuary	15 km
Ramsar		
	Rogerstown Estuary	7.1 km
	Broadmeadow Estuary	10 km

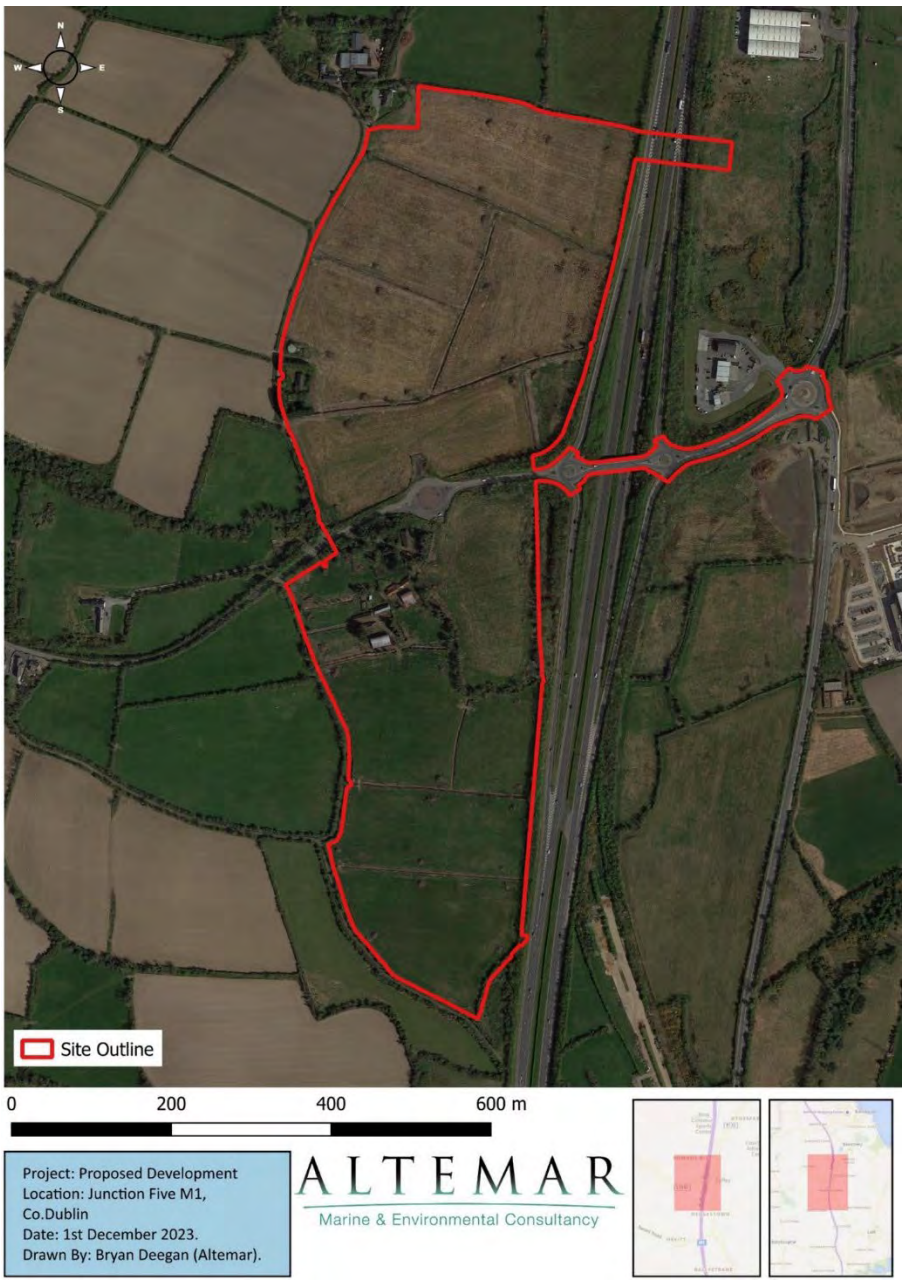

Figure 6. 1 Proposed Development Site Outline (red)

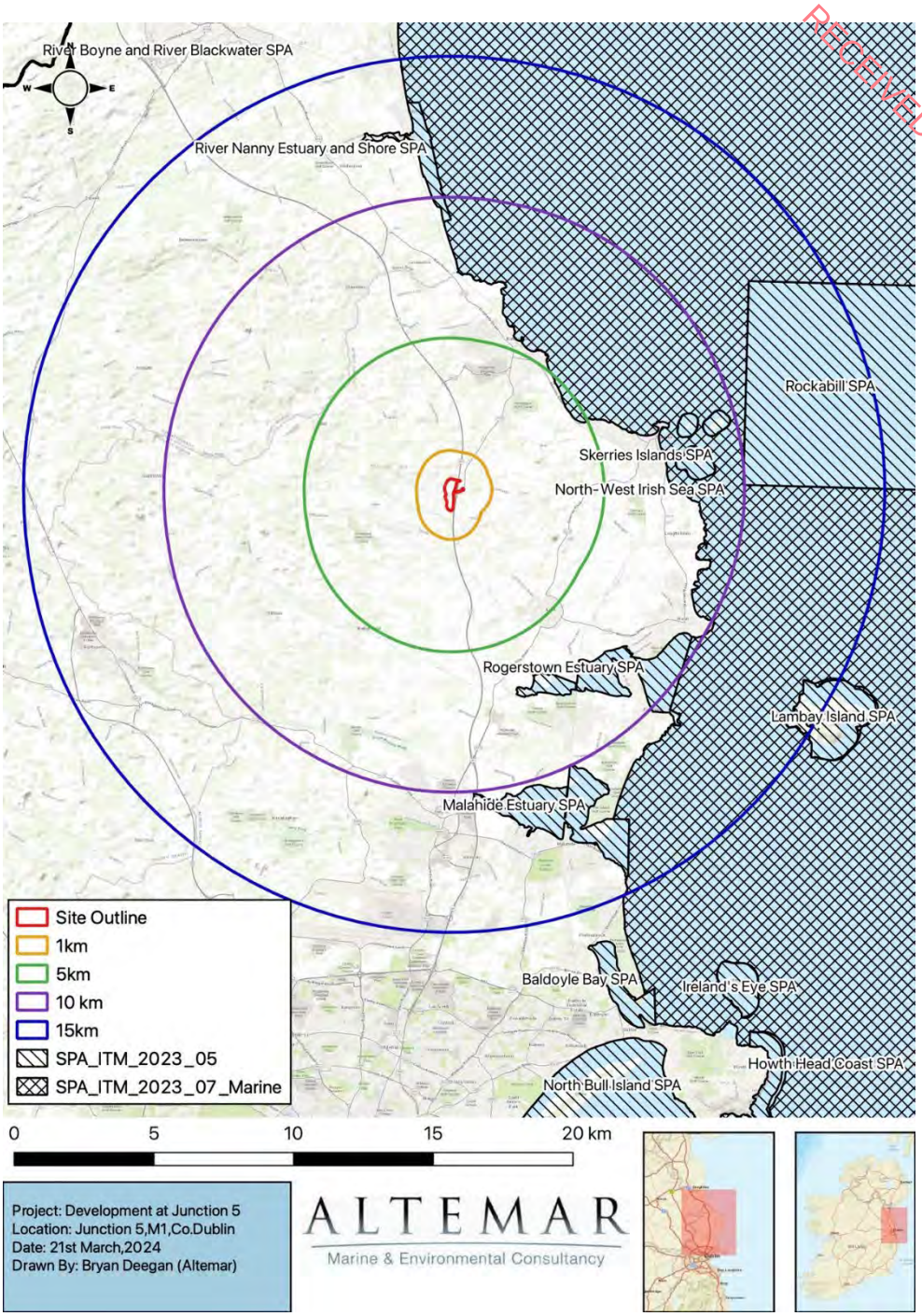

Figure 6. 2. Special Protection Areas within 15km of the proposed development site.

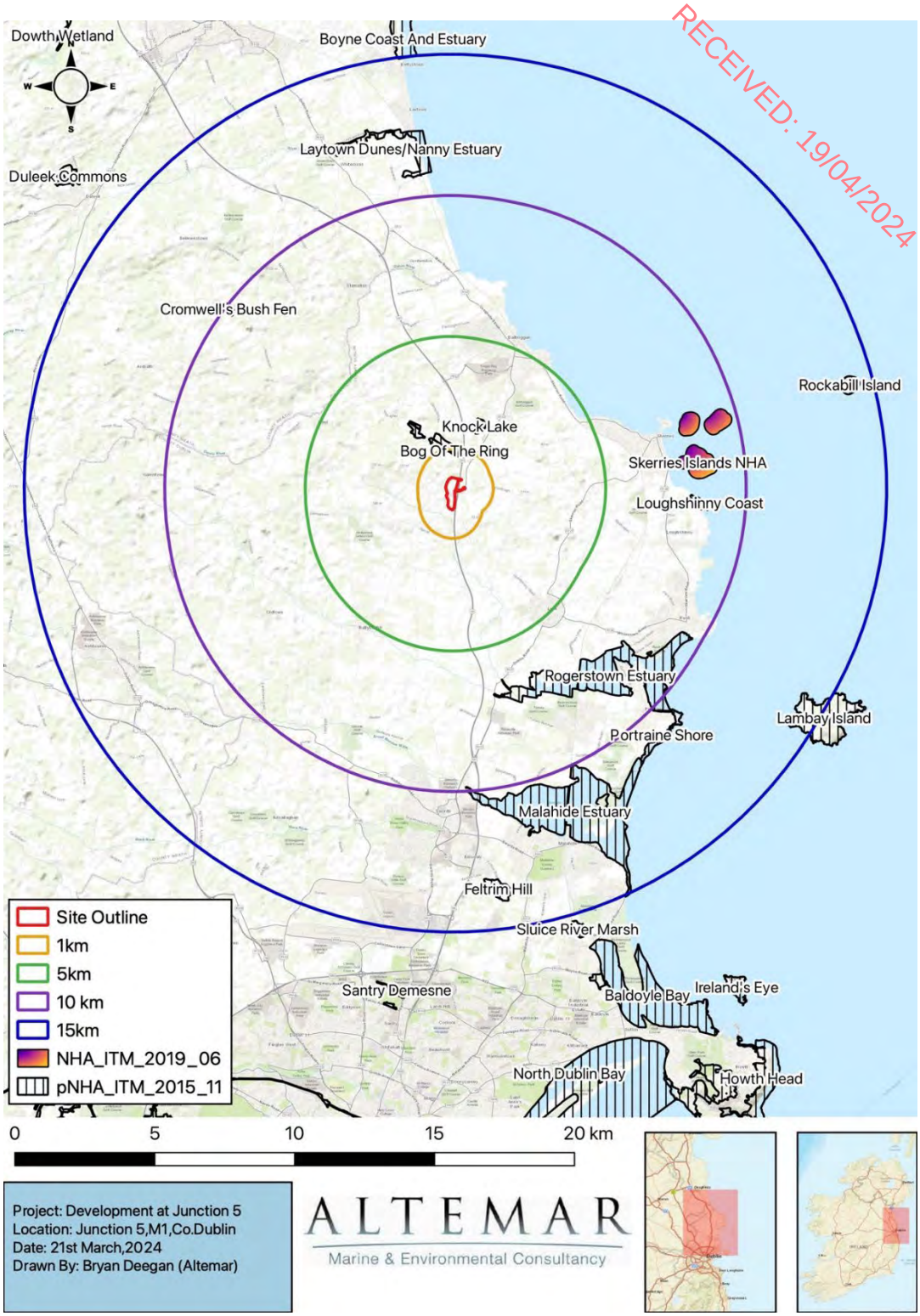

Figure 6. 3. NHAs and pNHAs within 15km of the proposed development site.

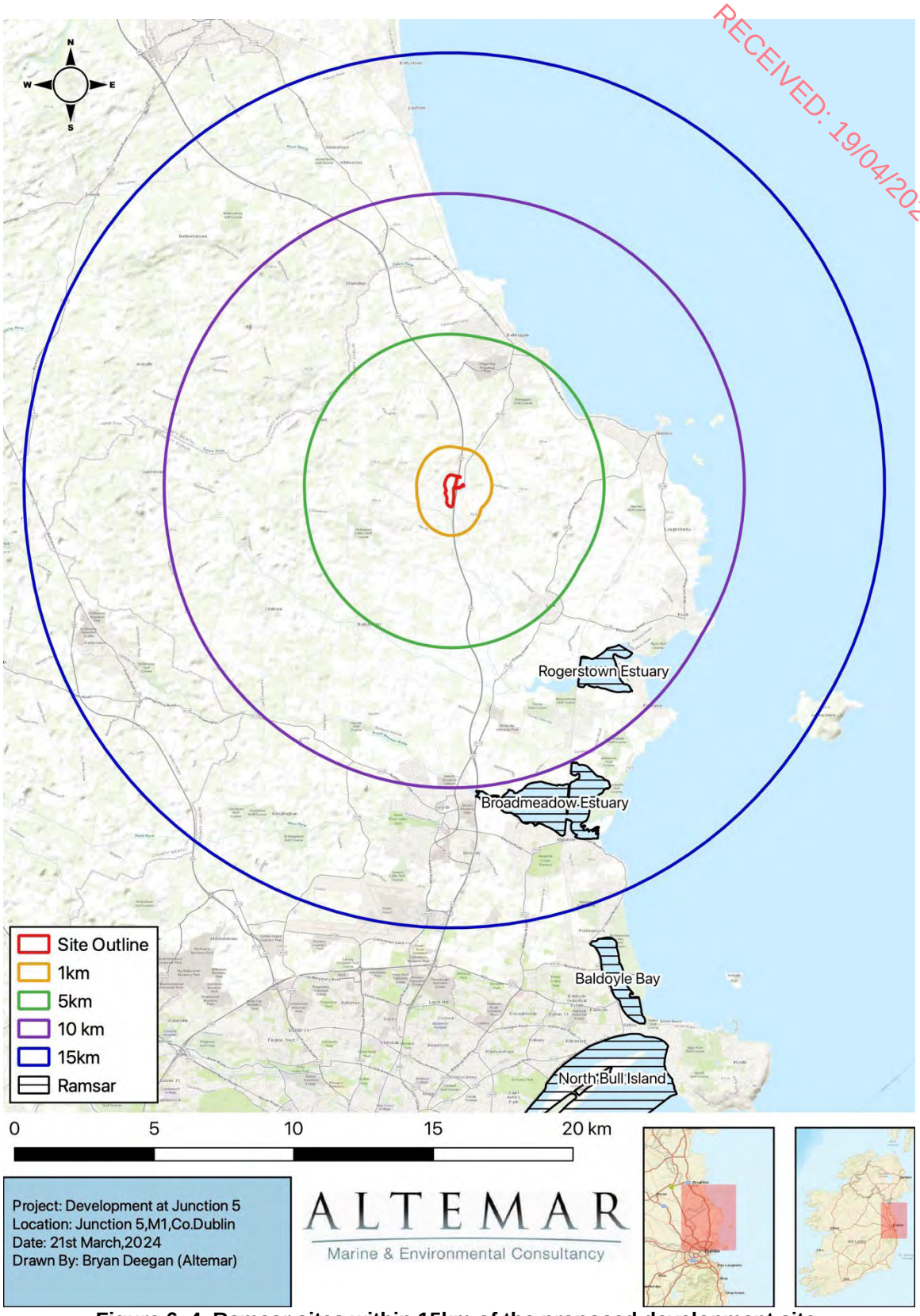

Figure 6. 4. Ramsar sites within 15km of the proposed development site.

Figure 6. 5. Waterbodies proximate to the proposed development site.

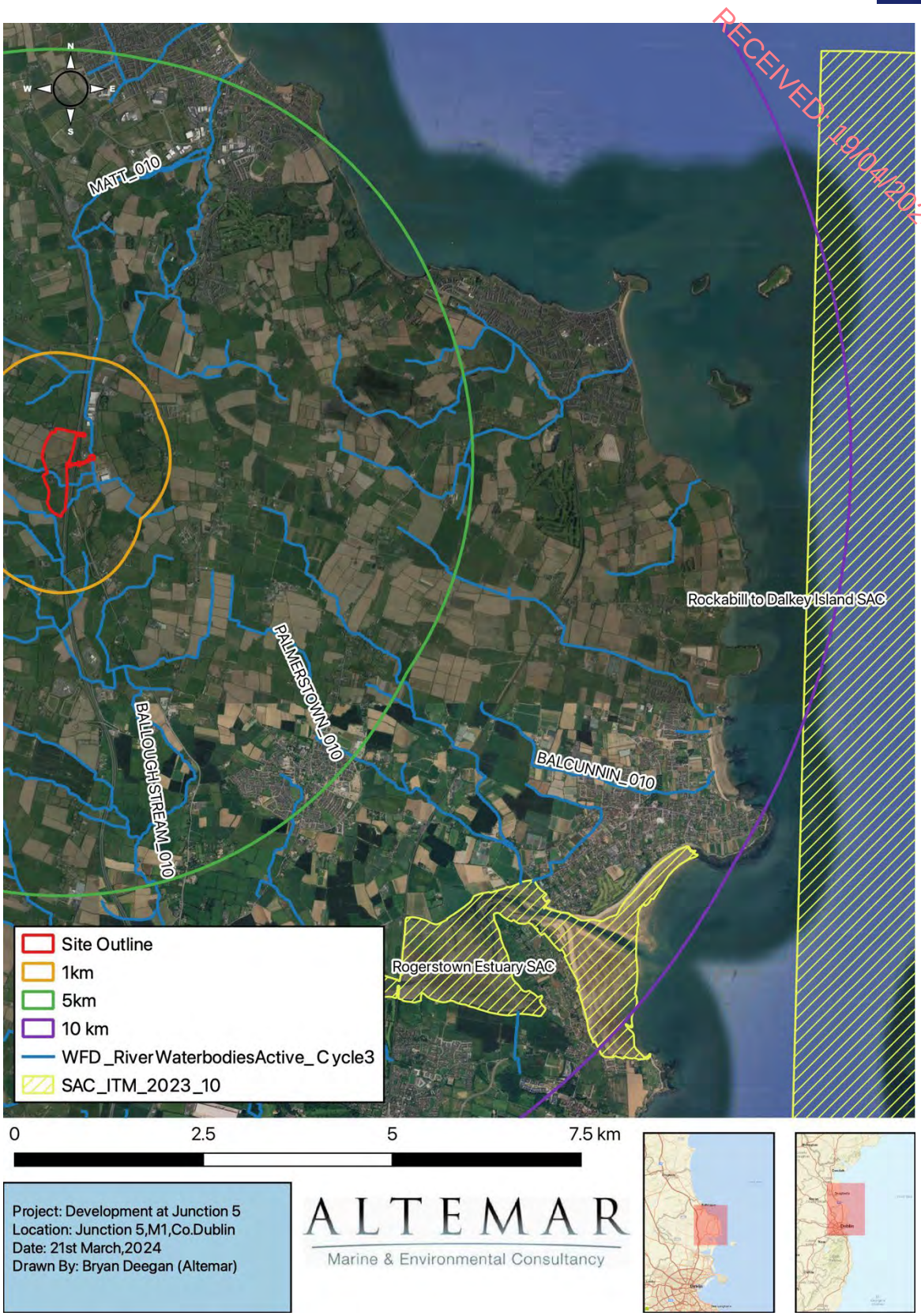

Figure 6. 6. Waterbodies and SACs proximate to the proposed development site.

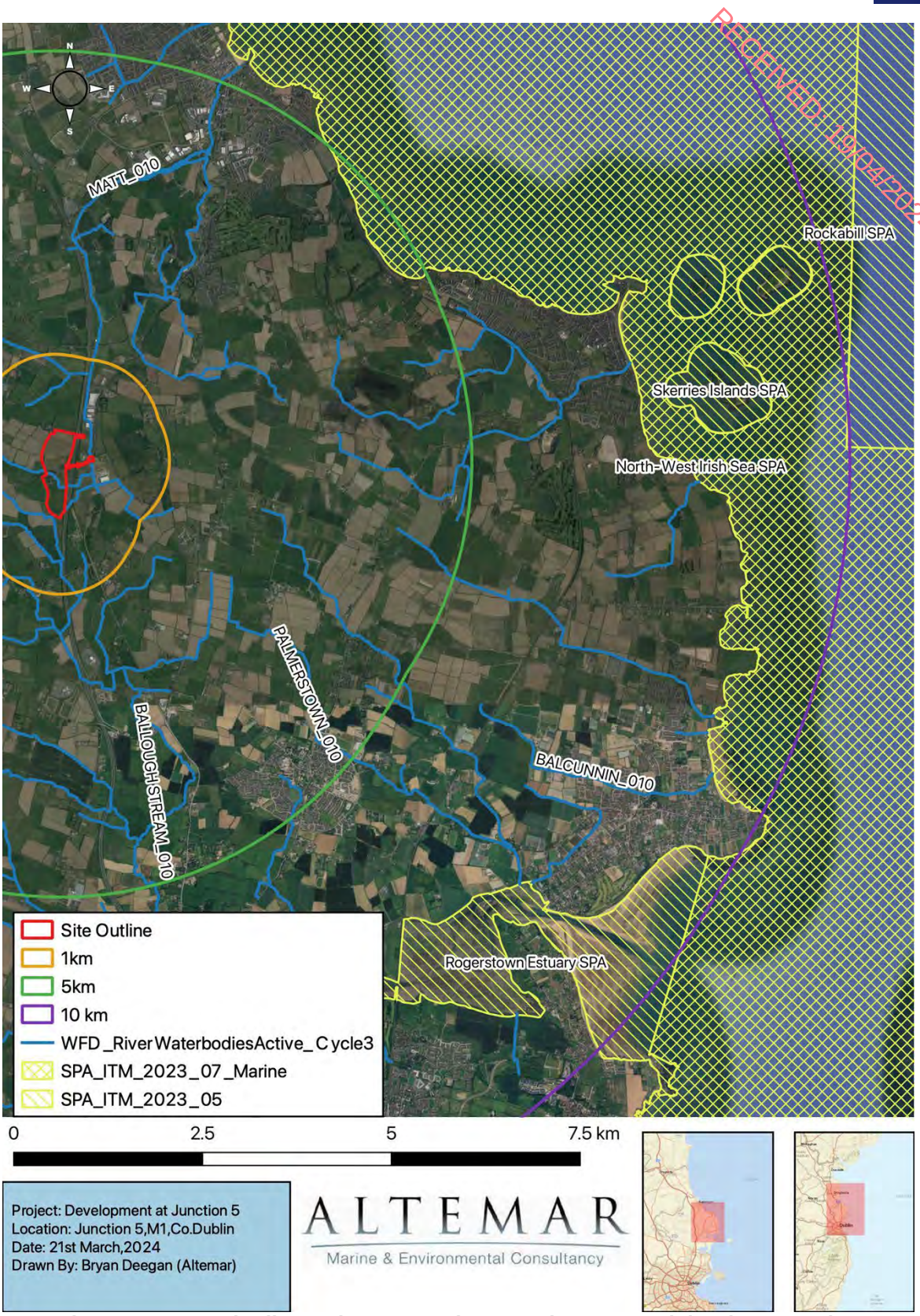

Figure 6. 7. Waterbodies and SPAs proximate to the proposed development site.

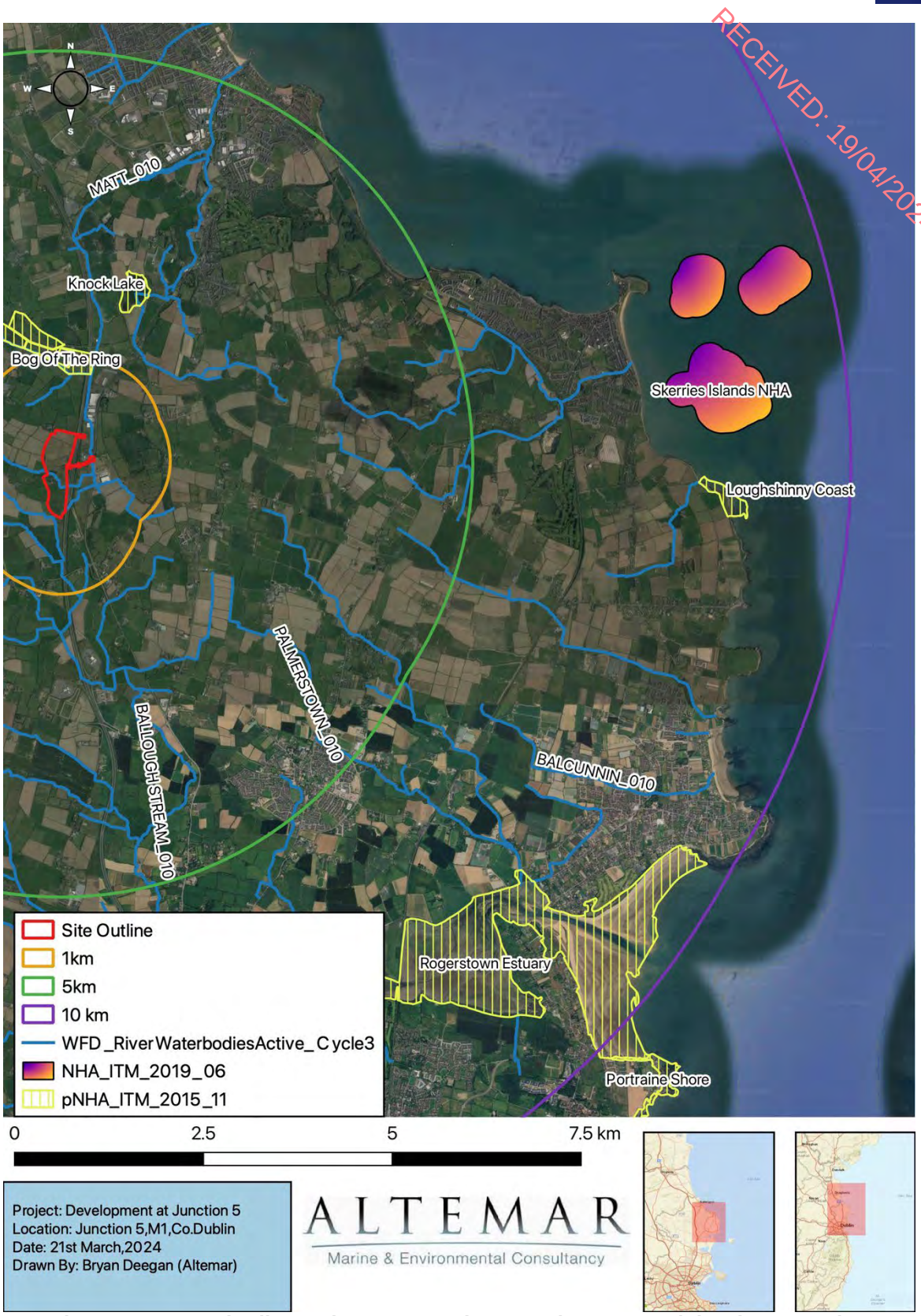

Figure 6. 8. Waterbodies and pNHAs proximate to the proposed development site.

Figure 6. 10. Waterbodies and Ramsar sites proximate to the proposed development site.

6.3.3. Desktop

6.3.3.1 Biodiversity Records

The National Biodiversity Data Centre's online viewer was consulted in order to determine the extent of biodiversity and/or species of interest in the area. First, an assessment of the site specific area was carried out and it recorded no species of interest in the site area. Following this, two 1km^2 grids (O1857 & O1858) that encompass the subject site were assessed. Table 6.3 provides a list of all species recorded in both grid areas that possess a specific designation, such as Invasive Species or Protected Species.

Table 6. 2. Table of species, NBDC (O1857 & O1558)

Date of Record	Species Name	Designation
04/08/2008	European Rabbit (Oryctolagus cuniculus)	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
12/10/2017	Common Kestrel (Falco tinnunculus)	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
29/07/2007	West European Hedgehog (Erinaceus europaeus)	Protected Species: Wildlife Acts

6.3.4. Fieldwork

6.3.4.1 Site Survey

Site assessments were carried out on the 15th August 2023 and the 13th September 2023. Habitats within the proposed development site were classified according to Fossitt (2000) based on the 13th September 2023 site visit (Figure 6.11) and the species noted within each habitat are described.

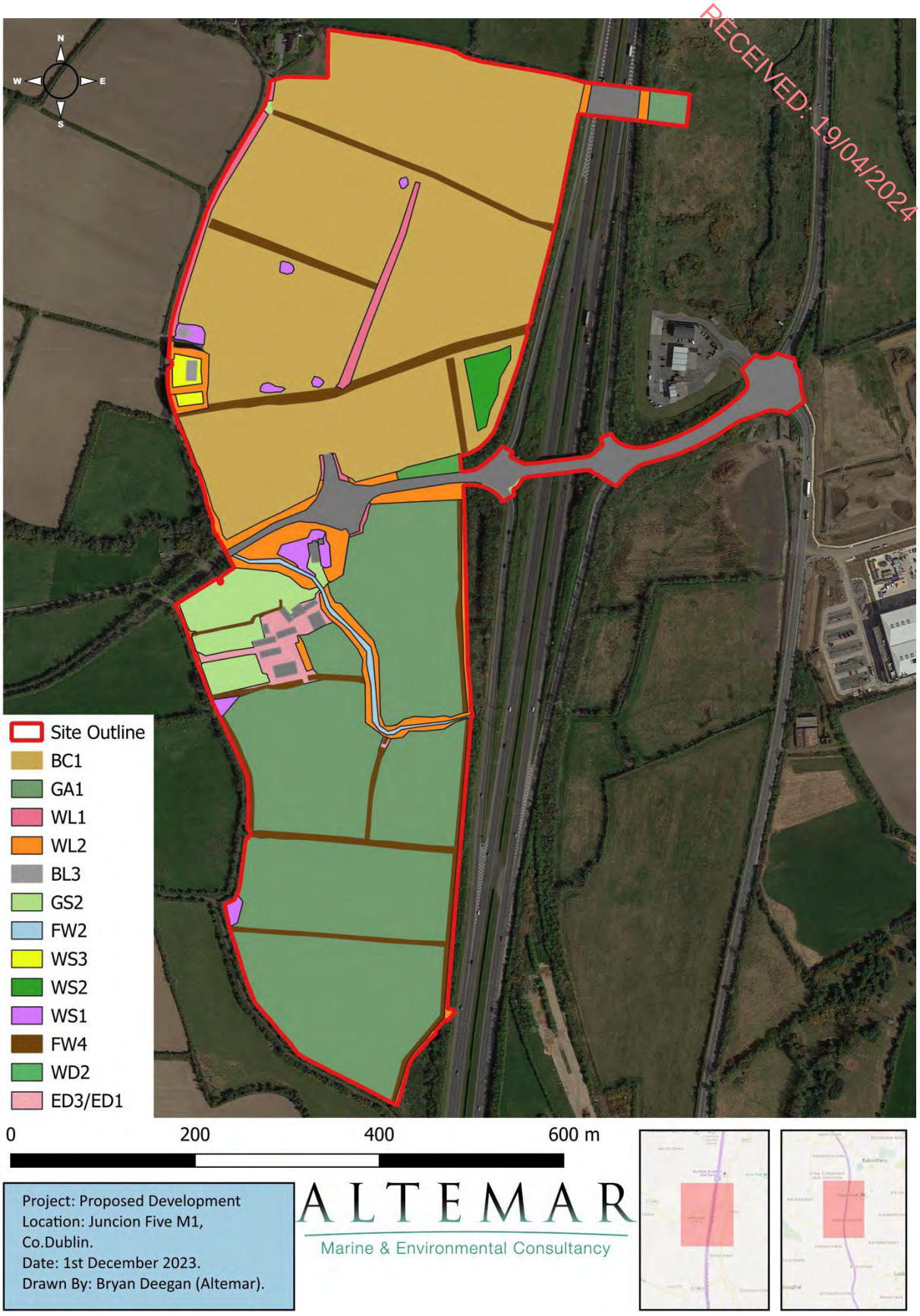

Figure 6. 11. Fossitt (2000) Habitats on site.

Table 6. 3. Terrestrial habitats and floral species composition.

Fossitt	Habitat and species description
BC1	 *Arable crops* - The Northern portion of the site primarily consisted of ground that had been cut for hay. Hay bales were noted onsite. The little wild vegetation included nipplewort (*Lapsana communis*), sun spurge (*Euphorbia helioscopia*), ramping fumitory (*Fumaria muralis*), purple loose strife (*Lythrum salicaria*), and redshank (*Persicaria maculosa*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…
GA1	 *Improved Agricultural land* – This habitat was located in the southern side of the subject site and was actively used to graze horses. The species within this site included creeping buttercup (*Ranunculus repens*), meadow buttercup (*Ranunculus acris*), white clover (*Trifolium repens*),

	red clover (*Trifolium pratense*), ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), broad-leafed doc (*Rumex obtusifolius*), water doc (*Rumex hydrolapathum*), meadow vetchling (*Lathyrus pratensis*), meadowsweet (*Filipendula ulmaria*), thistles (*Cirsium spp.*), birdsfoot trefoil (*Lotus corniculatus*), nettles (*Urtica dioica*), great willowherb (Epilobium hirsutum), dogwood (*Cornus sanguinea*), autumn hawksbit (*Scorzoneroides autumnalis*), silverweed *(Potentilla anserina*), bush vetch (*Vicia sepium*), marsh woundwort (*Stachys palustris*), horsetail (*Equisetum spp*), hogweed (*Heracleum sphondylium*), wood speedwell (*Veronica montana*), hedge bindweed (*Calystegia sepium*), compact rush (*Juncus conglomeratus*), dandilions (*Taraxacum officinale* agg.), herb Robert (Geranium *roberianum*), knotgrass (*Polygonum aviculare*), cow parsley (*Anthriscus sylvestris*), yarrow (*Achillea millefolium*) and groundsel (*Senecio vulgaris*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…

WL1	 ***WL1 Hedgerow* - Hedgerow habitat bordered the fields in the northern portion of the site and along the north west and north boundary. Species with in this habitat included brambles (*Rubus fruticosus agg*), blackthorn (*Prunus spinosa*), willow (*Salix spp.*), musk storks-bill (*Erodium moschatum*), ramping fumitory (*Fumaria muralis*), common ragwort (*Jacobaea vulgaris*), coltsfoot (*Tussilago farfara*), birdsfoot trefoil (*Lotus corniculatus*), ivy (*Hedera hibernica*) nettles (*Urtica dioica*), thistles (*Cirsium spp.*), cotoneaster (*Cotoneaster sp.*), broad-leafed doc (*Rumex obtusifolius*), great willowherb**

	(Epilobium hirsutum), hoary willowherb (*Epilobium parviflorum*), prickly sow-thistle (*Sonchus asper*), rapeseed (*Brassica napus*), meadowsweet (*Filipendula ulmaria*), gorse (*Ulex europaeus*), dogwood (*Cornus sanguinea*), common knapweed (*Centaurea nigra*), hogweed (*Heracleum sphondylium*), hedge bindweed (*Calystegia sepium*), hazel (*Corylus avellana*), honeysuckle (*Lonicera periclymenum*), cherry laural (*Laurocerasus officinalis*) and buddleja (*Buddleja davidii*).Some standalone trees of ash (*Fraxinus excelsior*), cherry (*runus avium*) and elder (*Sambucus nigra*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…
WL2	 *WL2 Treeline* – Treelines were a varied and common feature within the site comprising of ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), willow (*Salix spp*.), hazel (*Corylus avellana*), alder (*Alnus glutinosa*), oak (*Quercus spp.)*, birch (*Betula pendula*), gorse (*Ulex europaeus*), aspen (*Populus tremula*), field maple (*Acer campestre*), blackthorn (*Prunus spinosa*), cleavers (*Galium aparine*), cherry laural (*Laurocerasus officinalis*) and common lime (*Tilia x europaea (T. cordata x platyphyllos*. Within the houses were trees of apple (*Malus domestica*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…

BL3

Built Land - Much of the built land was comprised of existing roadway and roundabout. A farmyard with multiple farm buildings and two derelict houses were noted along with a second derelict house to the west of the site.

Table 6.5 Terrestrial habitats and floral species composition, continued…

GS2	 *Dry Meadows and Grassy Verges* – This habitat was noted with in the southern portion of the site, to the west, dry meadows had been left ungrazed and along the edges of field and pathways with species including white clover (*Trifolium repens*), red clover (*Trifolium pratense*), ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), daisy (*Bellis perennis*), broad-leafed doc (*Rumex obtusifolius*), thistles (*Cirsium spp.*), common ragwort (*Jacobaea vulgaris*), feverfew (*Tanacetum parthenium*), lesser stitchwort (*Stellaria graminea*), slender speedwell (*Veronica filiformis*) and redshank (*Persicaria maculosa*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…

FW2	 *Lowland Depositing River* - The Balrickard Stream/Watercourse west to east on the northern portion of the site. It has been connected to a series of drainage ditches which have impacted its flow. No frog were noted here.
	Table 6.5 Terrestrial habitats and floral species composition, continued…

WS3	 *Ornamental/ non-native shrubs* - Unmanaged shrubs of hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), cotoneaster (*Cotoneaster sp.*), honeysuckle (*Lonicera periclymenum*), brambles (*Rubus fruticosus agg*), gorse (*Ulex europaeus*) and tutsan (*Hypericum androsaemum*) grew in the garden of this delict house in the southern portion of the subject site. The ground cover species included ivy (*Hedera hibernica*), rough-stalked feather moss (*Brachythecium rutabulum*), great mullein (*Verbascum Thapsus*), red clover (*Trifolium pratense*), coltsfoot (*Tussilago farfara*), common knapweed (*Centaurea nigra*), thistles (*Cirsium spp.*), common ragwort (*Jacobaea vulgaris*) and self-heal (*Prunella vulgaris*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…

WS2	 *Immature Woodland* - To the east of the centre of the site was a young plantation of willow (*Salix spp*.) with ground cover species including encroaching brambles (*Rubus fruticosus agg*), purple loose-strife (*Lythrum salicaria*), great willowherb (*Epilobium hirsutum*), hoary willowherb (*Epilobium parviflorum*), creeping buttercup (*Ranunculus repens*), meadow vetchling (*Lathyrus pratensis*), groundsel (*Senecio vulgaris*) and nettles (*Urtica dioica*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…

WS1	 *Scrub* – Small patches of scrub were mosaiced around the subject site but this habitat primaly exsited along the banks of the drainage ditches. mainly consisting of brambles (*Rubus fruticosus agg*) and gorse (*Ulex europaeus*). Other species noted included nettles (*Urtica dioica*), tufted vetch (*Vicia cracca*), dogwood (*Cornus sanguinea*), rose-bay willowherb (*Chamaenerion angustifolium*), cats-ear (*Hypochaeris radicata*), common ragwort (*Jacobaea vulgaris*) and bittersweet (*Solanum dulcamara*).
	Table 6.5 Terrestrial habitats and floral species composition, continued…
FW4	*Drainage Ditch* **-**Drainage ditches were marking field boundaries throughout the sit. They were quite deep throughout and wide in places. The banks support a scrub/grassy verges habitat and thus floral species.
	Table 6.5 Terrestrial habitats and floral species composition, continued…

WD2	 *Mixed broad-leaf conifer Woodland* - In the centre of the subject site, along the series of roundabouts, a small woodland habitat expanded from the treeline. Ivy (*Hedera hibernica*) dominated the ground cover with some Lords and ladies (*Arum maculatum*), brambles (*Rubus fruticosus agg*), hart's-tongue fer (*Asplenium scolopendrium*), male fern (*Dryopteris filix-mas*) and bracken (*Pteridium aquilinum*). Trees noted were cherry laural (*Laurocerasus officinalis*), ash (*Fraxinus excelsior*), birch (*Betula pendula*), willow (*Salix spp*.), beech, sycamore, hawthorn, blackthorn, field maple and pine.
	Table 6.5 Terrestrial habitats and floral species composition, continued…
ED3/ **ED1**	*Recolonising bare ground/ Exposed sand, gravel or till* - The farmyard grounds consisted of gravel paths, recolonising bare ground and some parts with broken concrete.

Invasive Species

No invasive plant or animal species listed under the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) Section 49, the Third Schedule: Part 1 Plants, Third Schedule: Part 2A Animals were noted on site. No terrestrial or aquatic invasive species such as Japanese knotweed, giant rhubarb, Himalayan balsam, giant hogweed etc. that could hinder removal of soil from the site during groundworks were noted.

Terrestrial Mammals

No signs of badger activity or an active sett were noted on site. Tracks of brown rat (*Rattus norvegicus*) and an individual fox (*Vulpes vulpes*) and fox stool were noted on site. No mammal species of conservation importance have been noted on site during surveys. Protected species on record by NBDC data originated from the National Roadkill Survey (last record 2011), with no live sightings on record.

Amphibians and Reptiles

No amphibians or reptiles were noted on site. However, given the fact that there is a watercourse and drainage ditches it is highly likely that frogs are present on site. These habitats would be considered locally important primarily due to the likelihood of the habitats to support frogs.

Birds

Birds noted on site were recorded during site assessments. Specific wintering bird walkover and vantage point assessments were carried out 27th and 31st October 2023, 8th and 16th November 2023, 5th and 21st December 2023, 19th and 24th January 2024, 7th and 12th February 2024 and 1st and 15th March 2024 for the overall masterplan area. A breeding bird transect survey was also carried out on 15th March 2024. The following bird species were noted within the wider masterplan area. It is not considered that the proposed development site is an ex-situ site for designated sites. The site consists primarily of agricultural grassland and arable crop fields.

Table 6. 4. Bird species noted during wintering and breeding surveys.

Common Name	Scientific Name	Conservation Status
Black-headed Gull	*Larus ridibundus*	**Amber**
Goldcrest	*Regulus regulus*	**Amber**

Common Name	Scientific Name	Conservation Status
Greenfinch	*Chloris chloris*	Amber
Herring Gull	*Larus argentatus*	Amber
House Sparrow	*Passer domesticus*	Amber
Linnet	*Carduelis cannabina*	Amber
Skylark	*Alauda arvensis*	Amber
Starling	*Sturnus vulgaris*	Amber
Blackbird	*Turdus merula*	Green
Blue Tit	*Cyanistes caeruleus*	Green
Buzzard	*Buteo buteo*	Green
Chaffinch	*Fringilla coelebs*	Green
Coal Tit	*Periparus ater*	Green
Dunnock	*Prunella modularis*	Green
Goldfinch	*Carduelis carduelis*	Green
Great Tit	*Parus major*	Green
Hooded Crow	*Corvus cornix*	Green
Jackdaw	*Corvus monedula*	Green
Long-tailed Tit	*Aegithalus caudatus*	Green
Magpie	*Pica pica*	Green
Mistle Thrush	*Turdus viscivorus*	Green
Pheasant	*Phasianus colchicus*	Green
Pied Wagtail	*Motacilla alba yarrellii*	Green

Common Name	Scientific Name	Conservation Status
Robin	*Erithacus rubecula*	Green
Rook	*Corvus frugilegus*	Green
Siskin	*Spinus spinus*	Green
Stonechat	*Saxicola rubicola*	Green
Woodpigeon	*Columba palumbus*	Green
Wren	*Troglodytes troglodytes*	Green
Song Thrush	*Turdus philomelos*	Green
Meadow Pipit	*Anthus pratensis*	Red
Redwing	*Turdus iliacus*	Red
Snipe	*Gallinago gallinago*	Red

Bats

The bat assessment is seen in **Appendix 6.1.** There were no seasonal or climatic constraints as survey was undertaken within the active bat season in good weather conditions with daytime temperatures of greater than 10ºC after dark. Winds were very light and there was no rainfall. No evidence of a definitive bat roosts were found in any of the onsite trees or buildings. However, several trees of bat roosting potential were noted on site which were primarily hedgerow tree species. Please see Appendix 6.1 for further information.

Discussion Species and habitats

As can be seen from **Figure 6.10** the proposed development site consists primarily of Arable land (BC1), Dry Meadows and Grassy Verges (GS2), Agricultural Grassland (GA1), Scrub (WS1) and hedgerows (WL1), in addition to built land (BL3), Depositing Lowland River (FW2), Drainage ditches (FW4), Treelines (WL2) and a small amount of woodland. No flora or habitats of National or International conservation importance were noted on site during the surveys. No invasive flora species were noted on site. No flora species of conservation importance or invasive species were noted on site by the NPWS or NBDC or during site surveys. No amphibians or reptiles were noted on site. However, it is likely that the site is a favourable habitat for frogs. Native hedgerows were noted on site. These would also be seen to be locally

important to biodiversity. In relation to bird species no bird species on Annex I of the EU Birds Directive were noted on site by NPWS or NBDC. During surveys, eight Amber and three Red listed birds of conservation concern (Ireland) were observed overwintering on site. Five Amber and one Red listed bird of conservation concern (Ireland) were observed displaying breeding behaviour on site. The watercourse (traverses through the southern portion of the site, acting as a biodiversity corridor), drainage ditches, hedgerows and scrub would be seen as the most important habitats on site. These elements form refuges and food sources for local biodiversity and provide biodiversity corridors to the surrounding areas.

6.4. Predicted Impacts

The proposed infrastructure development will involve the removal of a portion of the existing terrestrial habitats on site in addition to demolition of existing house and farm buildings, re-profiling, excavations and the construction of roads and associated services.

Construction Phase (in the absence of mitigation)

In the absence of mitigation, the construction of the proposed development, would impact on the existing ecology of the site and the surrounding area. These construction impacts would include impacts that may arise during the site clearance, re-profiling of the site and the building phases of the proposed development including the works proximate to the Balrickard Stream, and proximate to and within the drainage ditch.

Construction phase mitigation measures are required on site particularly as significant reprofiling of the site is proposed which will remove a portion of the existing terrestrial habitats which can lead to silt laden and contaminated runoff. In addition, demolition works can cause dust to enter the air and surface water. It is also proposed to undertake works proximate to the Balrickard Stream. There is potential for silt laden runoff and contamination to enter both the onsite drainage ditch and Balrickard Stream with potential for downstream impacts.

Designated Conservation sites within 15km

The proposed development is not located within a designated conservation site. Runoff during site works, re-profiling, instream works and the construction of project elements could impact on the local biodiversity network and Balrickards Stream, with potential for negative water quality impacts extending beyond the site outline into the adjacent watercourses and the marine environment. However, the nearest conservation site along this pathway is a minimum of 4.5 km from the proposed development site. The project must comply with Water Pollution Acts and prevent silt laden runoff leaving the site but these measures are not necessary for the protection of European sites.

The accompanying NIS concludes "*that significant effects on the North-West Irish Sea SPA are likely from the proposed works in the absence of mitigation measures, primarily as a result of direct hydrological connection to the site via dust pollution and surface water runoff to the Balrickard Stream which drains the site. For this reason, an NIS was carried out to assess whether the proposed project, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European Site. All other Natura 2000 sites were screened out at initial screening.*"

Impacts: Minor adverse / International / Not significant / short-term. Mitigation measures are required to prevent downstream effects on the North West Irish Sea SPA.

Biodiversity

The impact of the development during construction phase will be a loss of existing habitats and species on site in addition to localised noise generated from construction. It would be expected that the flora and fauna associated cleared habitats would also be displaced.

Terrestrial mammalian species

During the site visits no terrestrial mammal species of conservation importance were recorded on site or in NPWS or NBDC records.

Impacts: Low adverse / site / Negative Impact / Not significant / short term. Mitigation is needed in the form of a pre-construction inspection for terrestrial mammals of conservation importance.

Flora

No protected flora was noted on site. Site clearance will remove the flora species on site.

Impacts: Low adverse / site / Negative Impact / Not Significant / Short term

Bat Fauna

There is no evidence of a current or past bat roost in the trees on site, therefore no significant negative impacts on the roosting of these animals are expected to result from the proposed development. There are few sites of roosting potential on site. Foraging was noted on site in 2023. Enhancement of the site with bat boxes is recommended due to the lack of roosting features in the area.

Impacts: Low adverse / site / Negative Impact / Not significant / short term. Mitigation is needed in the form of a pre-construction inspection and the control of light spill during construction. A post construction assessment of lighting will be required.

Aquatic Biodiversity

The Balrickard Stream traverses across the southern portion of the site and the Bracken River runs along the east side of the subject site. There are a number of drainage ditches within the site. Frogs and frog spawn were not observed on site, but would be expected. Silt and pollution could potentially impact on instream biodiversity and works could potentially result in the death of frogs in the absence of ecological supervision.

Impacts in the absence of mitigation: Moderate adverse / local / Negative Impact /not significant effects/ short term. Mitigation is needed in the form of control of silt and petrochemical and dust during construction. A pre-construction survey should be carried out for frogs.

Bird Fauna

In total 11 bird species of conservation importance have been noted overwintering on site. Additionally, 6 bird species of conservation importance were noted breeding within the site, most of which also overwinter. Site clearance could impact on bird nesting if carried out during bird nesting season. Noise during construction could potentially impact on roosting wintering birds within and proximate to the site.

Impacts: Low adverse / Local / Negative Impact / Not significant / short term. Mitigation is needed in the form of site clearance outside bird nesting season and control of noise during construction.

6.4.1. Operational Phase

Once constructed all onsite drainage will be connected to separate foul and surface water systems. Surface water runoff will comply with SUDS. The biodiversity value of the site would be expected to improve as the landscaping matures, particularly in the drainage ditch buffer zone. It would be expected that the ecological impacts in the long term would be positive once landscaping has established.

Designated Conservation sites within 15km

No significant impacts on designated sites are likely during operation.

Impacts: Negligible / International / Neutral Impact / Not significant / Long-term

Biodiversity

Terrestrial mammalian species

No protected terrestrial mammals were noted on site.

Impacts: Low adverse / site / Negative Impact / Not significant / long term.

Flora

No protected flora was noted on site.

Impacts: Negligible beneficial / site / Negative Impact / Not significant / long-term

Bat Fauna

The proposed development will change the local environment as infrastructure will be constructed and some of the existing vegetation will be removed. No bat roosts or potential bat roosts will be lost due to this development. A minor loss in foraging by common species of bats will be noted as a result of the proposed development and lighting. The proposed development would not be seen to have a significant collision risk for bat strikes.

Impacts: Low adverse / International / Negative Impact / Not significant / long term.

Aquatic Biodiversity

Due to the proximity to onsite drainage ditches and the Balrickard Stream and Bracken River, there is potential for downstream impacts on biodiversity from silt. Frogs were not observed on site but would be expected.

Effects: Slight effects / site / reversible effects/ Negative effect / Not significant / long term/likely. Standard mitigation is required in relation to discharges off site and a pre construction inspection.

Bird Fauna

The proposed development will change the local environment as new roadworks and services are to be constructed to facilitate future developments. Bird nesting and foraging resources will be lost. However, the provision of an attenuation pond will increase the availability of habitat for waterfowl. Landscaping will reduce the long-term impact of habitat loss by providing replacement habitat for foraging and roosting birds.

Impacts: Low adverse / local / Negative Impact / Not significant / long term.

6.4.2. Cumulative Effects

There are several development proposals located in the areas surrounding the subject site that have been granted permission. The following is a list of planning application(s) as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Database' portal:

Table 6. 5. Approved planning applications proximate to the subject site

Ref. No.	Address	Proposal
F18A/0565	M1 Business Park, Courtlough, Balbriggan, Co. Dublin	The development will consist of the demolition of an existing single storey derelict building and clearance of existing site vegetation to allow for the construction of an access road, junction treatments works with the R132, pedestrian facilities, surface water drainage, foul water drainage, water main infrastructure, flood attenuation basin, landscaping and all other associated site services and utilities necessary to facilitate the site development.
F18A/0593	M1 Business Park, Courtlough, Balbriggan, Co. Dublin	For the construction of a production and distribution warehouse building of 7939 sq.m with loading bays and yard for articulated lorries; and attached 2-storey office building of 1385 sq.m with first floor terrace and setback roof plant enclosure of 68 sq.m; external single storey plant enclosure at ground level of 622 sq.m separate single storey ESB substation, electrical switch room and transformer room at ground level of 49 sq.m; landscaped surface staff and visitor car parking; covered bike parking, smoking shelter, 2 no. vehicular entrances from access road, one of which is also a pedestrian entrance; signage on building and at entrances; boundary fencing and extensive boundary landscaping and all other associated site services and utilities necessary to facilitate the site development.
F22A/0258	Unit 1 & 2, Courtlough, M1 Business Park, County Dublin	The installation of 700 Sqm of roof mounted solar panels and all associated site works.
F22A/0255	M1 Business Park, Courtlough,	The decommissioning of an existing wastewater treatment plant (888 sq.m) located at the northern end

	Balbriggan, Co. Dublin.	of the M1 Business Park and replacing it with a proposed foul pumping station (317 sq.m), construction of an access road and footpath, berm embankment and landscaping with all ancillary works necessary to facilitate the site development. The proposed development also includes for the pumping of wastewater for a distance of 2.8 km approx, via a proposed 125mm diameter DN ductile iron rising main with all ancillary works along the R132 as far as the northern end of Balrothery village.
F18A/0733	Ace Express, M1 Business Park, Balbriggan, Co Dublin	For new 67.5 x 18 x 11.7 m high (1184m²) single storey storage extension to south elevation and 52 x 12.8 x 5.8m high (643m²) single storey storage extension to west elevation.
F23A/0361	Courtlough, Balbriggan, Co. Dublin	Permission Consequent on a Grant of Outline Permission, reference No. F21A/0591 for (i) construction of 1no. two storey four bedroom dwelling; (ii) new vehicular access from existing lane off L1155 Balrothery Road; and (iii) all associated ancillary works necessary to facilitate the development including wastewater treatment system and percolation area, SUDS water drainage, site works, Boundary treatments and Landscaping.
F21A/0211	Courtlough Shooting Grounds, Courtlough, Balbriggan, Co Dublin, K32 KD	(1) Construction of single storey changing facility (356m²) comprising reception area, WC, changing rooms (male and female), wet suit room, shower room, mechanical room and covered outdoor patio. (2) Construction of a 2-storey indoor activity centre (979m²) comprising open plan activity area, reception, cafe, seating area, WC, stairwell, and covered outdoor patio at ground floor level. First floor will comprise an office, 3 no. classrooms, and WC.

		(3) Provision of new 1-way vehicular entrance into the site from the Balrothery Road (LP01155). Vehicles will exit via the existing entrance onto the same road. (4) Provision of car parking comprising 42 no. car parking spaces and 3 no. mobility parking spaces and (5) SUDS drainage, foul treatment system, landscaping, boundary treatments and all associated works necessary to facilitate the development.
F23A/0361	Courtlough, Balbriggan, Co. Dublin	Permission Consequent on a Grant of Outline Permission, reference No. F21A/0591 for (i) construction of 1no. two storey four bedroom dwelling; (ii) new vehicular access from existing lane off L1155 Balrothery Road; and (iii) all associated ancillary works necessary to facilitate the development including wastewater treatment system and percolation area, SUDS water drainage, site works, Boundary treatments and Landscaping.
F22A/0066	Hazardstown Road (Matt Lane), Ring, Balbriggan, Dublin	Planning permission is requested for extension to front of existing garage and change of use to a Montessori-pre-school use, along with all associated siteworks (proposed operating hours from 09.15am - 12.30 pm).

Based on a review of the planning application viewer there are no committed developments in proximity to the subject site which are likely to give rise to cumulative impacts with it. Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant and localised. No significant cumulative effects are foreseen on biodiversity from cumulative impacts.

The proposed development is also located within a wider masterplan area, the habitats of which have been outlined in the Fossit (2000) habitat map (**Figure 6.11**). The future development of the masterplan area will be subject to additional design, biodiversity impact assessment, mitigation and consent. This will include landscape design and biodiversity enhancement to mitigate effects if encountered. As with the current design for the proposed development ecological input will be incorporated into the design and mitigation measures will be in place.

Based on a review of the planning application viewer there are no committed developments in proximity to the subject site which are likely to give rise to cumulative impacts with it. Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant and localised. No significant cumulative effects are foreseen on biodiversity from cumulative impacts.

6.5. Mitigation Measures

6.5.1. Incorporated Design Mitigation

Standard SUDS drainage and measures such as swales and detention basins are included on site with petrochemical interception and hydrobrake flow control included in the design and will be managed in accordance with the requirements of the Water Pollution Acts. A comprehensive landscaping strategy has been developed which introduces vegetation and management of the landscape and enhancement of biodiversity in addition to sustainable management of water and enhancement of biodiversity.

6.5.2. Demolition Phase Mitigation

Demolition of single story house and farming buildings is likely to create dust and noise effects. Measures will need to be taken to ensure dust and runoff do not enter the onsite drainage ditches, Balrickard stream in turn, Bracken river.

6.5.3. Construction Phase Mitigation

Construction and operational Mitigation Measures will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (ZoI) including the onsite drainage ditch, Balrickard Stream and Bracken River.

Designated Conservation Sites

There is a direct pathway to the North West Irish Sea SPA. There is a direct hydrological pathway to the Bracken River which leads to the North West Irish Sea SPA. During construction standard construction phase controls will be in place to remove silt and petrochemicals prior to discharge of surface water to the Balrickard, which in turn outfalls to the Bracken River. The measures have been designed to ensure that the project will comply with the Water Pollution Acts in relation to construction and drainage. All measures outlined below will be followed.

Contamination of watercourses leading to European Sites

- Prior to construction the appointment of an ecologist to oversee enabling works and the implementation of mitigation measures will be carried out. No works will

commence on site until the ecologist submits a letter to the local council authority to state that he/she has been appointed and has developed a Construction Environmental Management Plan which includes a) Phasing of the project, b) Full details of the works programme including methodologies for all works, surface water management and watercourse and pond works c) maps containing details of mitigation measures and any invasive species on site within 30m of site works including haul routes, site compounds etc. d) approval of the instream methodologies outlined by Inland Fisheries Ireland.

- Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing.
- Any discharges to the watercourse during construction must be discussed with the ecologist, undergo desilting and petrochemical interception and have twice daily turbidity monitoring.
- Local watercourses must be protected from dust, silt and contaminated surface water throughout the works.
- Local silt traps established throughout site as discussed with the ecologist.
- Mitigation measures on site include dust control, stockpiling away from watercourse and drains.
- Stockpiling of loose materials will be kept to a minimum of 20m from watercourses and drains.
- Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.
- Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, ditches or the watercourse, excavations and other locations where it may cause pollution.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the stream. Prior to discharge of water from excavations adequate filtration will be provided to ensure no deterioration of water quality.

- Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination.
- During the construction works silt traps will be put in place in the vicinity of all runoff channels the stream to prevent sediment entering the watercourse.
- Planting in the vicinity of the stream crossings should be put in place as soon as possible to allow biodiversity corridors to establish.
- On-site inspections will be carried out by project ecologist during enabling works and until drainage connection is complete.
- Maintenance of any drainage structures (e.g. de-silting operations) must not result in the release of contaminated water to the surface water network.
- No entry of solids or concrete to the associated stream or drainage network during the connection of pipework

Air & Dust

- The pro-active control of fugitive dust will ensure prevention of significant emissions arising, rather than a less effective attempt to control them once they have been released.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and / or windy conditions.
- Vehicles exiting the Site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20kph, and on hard surfaced roads as site management dictates.
- Public roads outside the Site will be regularly inspected for cleanliness and cleaned as necessary.

- Material handling systems and Site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Dust may enter the onsite watercourse via air or surface water with potential downstream impacts. Mitigation measures will be carried out reduce dust emissions to a level that avoids the possibility of adverse effects on the onsite watercourse. The main activities that may give rise to dust emissions during construction include the following:
    - Excavation of material;
    - Materials handling and storage;
    - Movement of vehicles (particularly HGV's) and mobile plant.
    - Contaminated surface runoff
- Trucks leaving the site with excavated material will be covered so as to avoid dust emissions along the haulage routes.
- Speed limits on site (15kmh) to reduce dust generation and mobilisation.
- The stream is to be protected from dust on site. This may require additional measures in the vicinity of the bridge (east of the site) if this road is used for machinery e.g. placing of terram/protective material over the stream.
- Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

Monitoring

- Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces within 100 m of site boundary, integrity of the silt control measures, with cleaning and / or repair to be provided if necessary.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- 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.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Maintain a vegetated strip and vehicle exclusion zone between the works and the Balrickard Stream (where possible) in consultation with the project ecologist.
- Regular inspection of surface water run-off and any sediment control measures e.g. silt traps will be carried out during the Construction Phase. Regular auditing of construction / mitigation measures will be undertaken e.g. concrete pouring, refuelling in designated areas etc.
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the Site and the suitable distance of topsoil piles from surface water drains will be maintained.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- 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.
- Due to the proximity of the onsite watercourse an ecologist will oversee works in particular the excavation of material from the perimeter of the site.
- The Contractor will be required to consult with an ecologist prior to the beginning of works to identify any additional measures that may be appropriate and/or required.

Storage/Use of Materials, Plant & Equipment

- Materials, plant and equipment shall be stored in the proposed site compound location;
- Plant and equipment will not be parked within 50m of the onsite watercourse at the end of the working day;
- Hazardous liquid materials or materials with potential to generate run-off shall not be stored within 50m of the onsite watercourse.
- All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater;
- Fuel may be stored in the designated bunded area or in fuel bowsers located in the proposed compound location. Fuel bowsers shall be double skinned and equipped with certificates of conformity or integrity tested, in good condition and have no signs of leaks or spillages;
- Waters collected in drip trays must be assessed prior to discharge. If classified as contaminated, they shall be disposed by a permitted waste contractor in accordance with current waste management legal and regulatory requirements;
- All persons working will receive work specific induction in relation to material storage arrangements and actions to be taken in the event of an accidental

spillage. Daily environmental toolbox talks / briefing sessions will be conducted for all persons working to outline the relevant environmental control measures and to identify any environment risk areas/works.

Watercourses

- In stream works to be carried out in full consultation with and to the advice of Inland Fisheries Ireland and the project ecologist.
- Staging of project to initially stabilise, isolate, fence off watercourse on site
- Mitigation measures on site include dust control, stockpiling away from watercourses and drains
- Pollution control and mitigation on site
- Stockpiling of loose materials will be kept away from watercourses and drains. A risk based approach will be taken.
- Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.
- During the construction works silt traps will be put in place in the vicinity of all runoff channels the stream to prevent sediment entering the watercourse.
- Petrochemical interception and bunds in refuelling area
- Planting in the vicinity of the stream crossings should be put in place as soon as possible to allow biodiversity corridors to establish.
- On-site inspections to be carried out by project ecologist. Twice daily monitoring of turbidity (from 11am) will be carried out on site.
- During the works silt traps will be put in place
- No discharges will be to the watercourse during works
- Silt traps established throughout site including a double silt fence between the site and the watercourse.
- Sufficient onsite cleaning of vehicles prior to leaving the site and on nearby roads, will be carried out, particularly during groundworks.
- The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained.

- The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area.
- A project ecologist must be appointed and be consulted in relation to all onsite drainage during construction works. Consultation with the project ecologist will not involve the formulation of new mitigation measures for the purposes of protecting any European Site, and relate only to the implementation of those mitigation measures already stated in the submission or the formulation of mitigation for other purposes.
- Dewatering of excavations may be necessary. Appropriate monitoring of groundwater levels during site works will be undertaken. Standard construction phase filtering of surface water for suspended solids will be carried out. Unfiltered surface water discharges or runoff are not permitted from the site into the Balrickard Stream during the works. Trenched double silt fencing shall be put in place along boundary of the proposed development site with 10m buffer from the Stream. This fencing must be in place as one of the first stages on site and prior to the full site clearance. The silt fencing will act as a temporary sediment control device to protect the watercourse from sediment and potential site water runoff but also act as a tree protection zone for the riparian buffer. The fencing will be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits.
- Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches.
- Abstraction of water from watercourses is not to be permitted.
- Spill containment equipment shall be available for use in the event of an emergency. The spill containment equipment shall be replenished if used and shall be checked on a scheduled basis.
- All site personnel will be trained in the importance of good environmental practices including reporting to the site manager when pollution, or the potential for pollution, is suspected. All persons working on-site will receive work specific induction in relation to surface water management and run off controls. Daily environmental toolbox talks / briefing sessions will be conducted to outline the

relevant environmental control measures and to identify any environment risk areas/works.

- Environmental risks due to construction and operation of the proposed development do potentially exist, particularly in relation runoff from sloping site, drains that could lead to the Balrickard Stream. Ecological supervision will be required during diversion, excavation and enabling works stages. Silt interception measures will need to be in place to ensure that the watercourses are not impacted during works and in particular during the site clearance, in-stream works and reprofiling stages. Landscaping of the grassed areas of the site proximate to the Stream will take place immediately following re-profiling, to act as a buffer to protect the watercourse.

Fauna

- A pre-construction inspection for mammals of conservation importance will be carried out.
- A pre-construction inspection for roosting bats importance will be carried out.
- A post construction light spill assessment will be carried out.

Wintering birds

- An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds will not be impacted.
- All mitigation measures outlined in the EIAR Chapters, Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) (if applicable) that pertain to the construction stage of the proposed development will be implemented by the Contractor.
- The effectiveness of the proposed mitigation will be monitored throughout the construction period.
- The construction corridor will be marked out prior to the commencement of construction.
- All construction work will be confined strictly to the construction corridor. Any construction works required outside the construction corridor will require prior approval from the ER.
- Lighting during construction should not spill outside the proposed development.

6.5.4. Human Health and Accidents & Disasters

Impacts on Human Health and Disasters are not deemed likely. However, all works should be carried out under compliance with relevant Health and Safety Legislation.

6.5.5. Operational Phase Mitigation

No significant effects are predicted for the operational phase. However, mitigation in terms of ensuring compliance with the Water Pollution Acts will involve a post construction assessment of the drainage infrastructure by the project ecologist to ensure it is constructed as outlined.

6.6. Residual Impacts

It is considered that the proposed development has satisfactorily addressed the current ecology on site into its design so that application of the standard construction and operational phase controls in this EIAR and the accompanying CMP will help reduce its impact on the local ecology to an adequate level.

It is considered that, where possible, biodiversity enhancement measures have been implemented into design to enhance the overall biodiversity value of the site. The overall impact on the ecology of the proposed development will result in a long term minor adverse, not significant, residual impact on the ecology of the site and locality overall. This is primarily as a result of the loss of foraging and nesting areas for birds that were noted on site. However, it should be noted that the site is within a development zone and is surrounded by significant area of similar agricultural land. It would be expected that the birds noted on site would be displaced from within the site but not displaced locally due to the availability of similar foraging areas in close proximity to the site.

Residual Impacts: Negative/ low adverse/ not significant /long-term/ localised/likely/slight effects.

6.7. Monitoring

No specific monitoring is required beyond the measures outlined above.

6.7.1. Summary of Mitigation & Monitoring

The Table below summarises the Construction Phase mitigation and monitoring measures.

Table 6.6. Construction phase mitigation and monitoring.

Likely Significant Effect	Mitigation	Monitoring
Silt and petrochemicals in the Balrickard Stream and Bracken River.	Filtering of surface water prior to discharge to Balrickard Stream and	During construction phase only.

	Bracken River. Compliance with Water Pollution Acts.	
Impacts on protected mammals	Pre construction survey. Compliance with Wildlife Acts.	Prior to works commencing
Impacts on nesting birds	Clearance outside bird nesting season	Site Clearance
Impacts on wintering birds	Construction operations outside of daylight hours kept to a minimum	During construction phase only.
Impacts on bats	Control of light spill	Post construction light spill assessment.
Significant Impacts on biodiversity	Appointment of project ecologist.	Throughout construction phase

The Table below summarises the Operational Phase mitigation and monitoring measures.

Table 6. 7. Summary of Operational Phase Mitigation and Monitoring.

Likely Significant Effect	Mitigation	Monitoring
Silt and petrochemicals in the Balrickard Stream and Bracken River.	Inspection of drainage infrastructure by project ecologist.	Post construction phase only.

6.8. References

- Environmental Protection Agency (August 2017): Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. EPA, Wexford
- Environmental Protection Agency (September 2015): Draft - Advice Notes on Current
- Practice (in the preparation on Environmental Impact Statements). EPA, Wexford
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- CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater and Coastal. Chartered Institute of Ecology and Environmental Management.
- DoEHLG (2013) Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment. Department of the Environment, Community and Local Government.
- Environmental Protection Agency 2002 Guidelines on the information to be contained in Environmental Impact Statements. EPA, Wexford, Ireland.
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- Lysaght, L. & Marnell, F (eds.) 2016 Atlas of Mammals in Ireland 2010-2015. National Biodiversity Centre, Waterford.
- NPWS 2013 The status of protected EU habitats and species in Ireland. DoEHLG, Dublin, Ireland.
- Assessment of Plans and Projects Significantly Affecting NATURA 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;http://ec.europa.eu/environment/nature/Natura2000management/docs/art6/Natura_2000_assess_en.pdf
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/guidance_art6_4_en.pdf
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging; http://ec.europa.eu/environment/nature/Natura2000/management/docs/guidance_doc.pdf
- The Status of EU Protected Habitats and Species in Ireland. http://www.npws.ie/publications/euconservationstatus/NPWS_2007_Conservation_Status_Report.pdf
- Fossitt. (2000) A Guide to Habitats in Ireland. The Heritage Council
- IFI (2016) Guidelines on the Protection of Fisheries During Construction Works in and Adjacent to Waters. Inland Fisheries Ireland
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7. Land, Soils & Geology

7.1. Introduction

This chapter of the EIAR was prepared by Stephen Coakley, BA (Mod Geol), PhD, PGeo. Stephen is a Chartered Geologist and Professional Hydrogeologist with Geosyntec Consultants Limited. Stephen has over six years' experience in the field of environmental impact assessment, hydrogeology and contaminated land and has worked on a range of large-scale developments requiring impact assessment in Ireland. He has experience in the assessment of impacts on the water environment for quarries, landfills and residential and commercial developments. The chapter was reviewed by Thomas Vainio-Mattila, MSc, PGeo, Principal Consultant with Geosyntec Consultants Limited. Thomas has over 25 years' experience working in geological engineering consultancies and has managed multiple large scale environmental site assessments in Ireland and the UK.

This chapter of the EIAR provides a description and assessment of the potential likely and significant impacts of the Proposed Development on land, soils and geology in the study area. It includes a baseline assessment of the land, soils and geology environmental setting and considers the potential impacts of the construction and operational phases of the Proposed Development. Where required, appropriate mitigation measures are recommended in order to limit any identified significant impacts, with an assessment of residual impacts and significance of effects.

7.2. Methodology

The assessment was carried out in accordance with the following guidance and tailored based on professional judgement:

- Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements (Institute of Geologists Ireland (IGI), 2013);
- IGI, Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Guidelines on the information to be contained in Environmental Impact Reports (Environmental Protection Agency (EPA), 2022);
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA), 2017);
- Draft - Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2015);
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2003);

- Guidelines on the Information to be Contained in Environmental Impact Statements, (EPA, 2002)
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (the NRA Guidance) (National Roads Authority, 2008)
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532 (CIRIA, 2006); and
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018).

Upon completion of the desk study and baseline assessment, the importance and sensitivity of the identified land, soils and geology receptors within the study area was assessed. Using the NRA Guidance, an estimation of the importance / sensitivity of the lands, soil geological environments within the study area is set out in **Table 7-1** and **Table 7-2** below.

Table 7-1: Estimation of Importance of Land, Soils and Geology Attributes

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	• Geological feature rare on a regional or national scale (NHA). • Large existing quarry or pit. • Proven economically extractable mineral resource.
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and / or soft organic soil underlying site	• Contaminated soil on site with previous heavy industrial usage. • Large recent landfill site for mixed wastes. • Geologically feature of high value on a local scale (County Geological Site). • Well drained and / or high fertility soils.

Importance	Criteria	Typical Example
	is significant on a local scale.	• Moderately sized existing quarry or pit. • Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and / or soft organic soil underlying site is moderate on a local scale	• Contaminated soil on site with previous light industrial usage. • Small recent landfill site for mixed wastes. • Moderately drained and / or moderate fertility soils. • Small existing quarry or pit. • Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and / or soft organic soil underlying site is small on a local scale.	• Large historical and / or recent site for construction and demolition wastes. • Small historical and / or recent site for construction and demolition wastes. • Poorly drained and / or low fertility soils. • Uneconomically extractable mineral resource.

Once the importance and sensitivity of the geological attribute is established, the conventional source-pathway-receptor model was applied to assess impacts on geology.

Where potential impacts are identified, the classification of impacts in the assessment follows the descriptors provided in the Glossary of Impacts contained in the following guidance documents produced by the EPA:

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003);
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002);
- Guidelines on the information to be contained in Environmental Impact Reports (EPA, 2022);

- Environmental Protection Agency (September 2015): Draft - Advice Notes on Current Practice (in the preparation of Environmental Impact Statements);
- Environmental Protection Agency (August 2017): Draft – Guidelines on the Information to be contained in Environmental Impact Assessment Reports; and,.
- Office of Public Works and Department of the Environment, Heritage and Local Government (November 2009): The Planning System and Flood Risk Management – Guidelines for Planning Authorities, Technical Appendix A (the OPW Guidelines).

The description process clearly and consistently identifies the key aspects of any potential impact source, namely its character, magnitude, duration, likelihood and whether it is of a direct or indirect nature. To provide an understanding of the stepwise impact assessment process applied below, we have firstly presented below a summary guide that defines the steps 1 to 7 (**Table 7-2**) taken in each element of the impact assessment process. The guide also provides definitions and descriptions of the assessment process and shows how the source-pathway-target model, and the EPA impact descriptors are combined.

Table 7-2: Assessment Methodology

Attribute	Status/occurrence	Importance
Step 1	Identification and Description of Potential Impact Source	This section presents and describes the activity that brings about the potential impact or the potential source of pollution. The significance of effects is briefly described.
Step 2	Pathway/Mechanism	The route by which a potential source of impact can transfer or migrate to an identified receptor. In terms of sand and gravel extraction, surface water and ground water flows are the primary pathways.
Step 3	Receptor	A receptor is a part of the natural environment which could potentially be impacted upon e.g. human health, plant/animal species, aquatic habitats, soils/geology, water resources, water sources. The potential impact can only arise as a result of a source and pathway being present.

Attribute	Status/occurrence	Importance
Step 4	Pre-mitigation Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impact before mitigation is put in place.
Step 5	Proposed Mitigation Measures	Control measures or monitoring that will be put in place to prevent or reduce all identified significant adverse impacts. These measures are provided in two types: Mitigation by avoidance Mitigation by practise and engineering design
Step 6	Post Mitigation Residual Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of potential impacts after mitigation is put in place.
Step 7	Significance of Effects:	Describes the likely significant post mitigation effects of the identified potential impact source on the receiving environment.

Using this defined approach, this impact assessment process is then applied to activities which have the potential to generate a source of significant adverse impact on the land, soils and geological environment.

7.3. Baseline Conditions

7.3.1. Desktop

A desk study of the Site and surrounding area was carried out to collate all available and relevant lands, soil and geological data for the study area. The following relevant resources were consulted for the Proposed Development and the study area:

- GSI online mapping and database (www.gsi.ie);
- GSI Bedrock Geology 1:100,000 Scale Map (www.gsi.ie);
- GSI Groundwater Body Characterisation Reports (www.gsi.ie);
- GSI Groundwater Source Protection Zone Reports (www.gsi.ie);

- GSI National Draft Bedrock Aquifer map (www.gsi.ie);
- GSI -Groundwater Database (www.gsi.ie);
- GSI 1:25,000 Field Mapping Sheets (www.gsi.ie);
- GSI database External Geotechnical Report 3082, Northern Motorway – Airport to Balbriggan, JC/JV, 1998 (www.gsi.ie)
- EPA Maps database (www.epa.ie);
- Soils Map of Ireland, National Soil Survey of Ireland, An Foras Talúntais (Teagasc Soil Map) (consulted at www.epa.ie);
- Met Eireann Meteorological Databases (www.meteireann.ie);
- National Parks and Wildlife Service (NPWS) on-line database (www.npws.ie);
- Water Framework Directive "Catchments" Map Viewer (www.floodinfo.ie);
- OPW Indicative Flood Maps (www.floodinfo.ie);
- OPW hydro-data (www.opw.ie/hydro-data);
- Ordnance Survey of Ireland (OSI), Discovery Series (www.osi.ie);
- Ordnance Survey of Ireland online historical maps and aerial photographs (www.osi.ie);

7.3.2. Site Description and Topography

The Site, comprising the area within the boundary shown in Figure 7.1, is located in the townlands of Rowans Big and Rowans Little, approximately 6.9 km south of Balbriggan, Co Dublin to the west side of the existing M1 Motorway (the M1) and existing M1 Business Park. The Bhailsigh road (the L1140) currently runs across the Site from northeast-southwest, with Zone A of the M1 Business Park to the north of the road and Zone F to the south.

The Site comprises an area of ca. 33.81 ha and has an elevation across the majority of the Site of between c. 37 and 51 meters above ordnance datum (m AOD). The overall local topography generally slopes downward gently from west to east. The Balrickard Stream (08B23), runs initially from northwest to southeast across Zone F, turning to flow eastward before passing beneath the M1 and joining the Bracken River as a minor tributary.

Land-use on the Site and in the surrounding area is predominately agricultural with subsidiary residential usage. There is a disused residential property within the western boundary of Zone A and three derelict residential buildings with farm buildings within the northwest of Zone F. Beyond the M1 to the east and northeast there are commercial properties that collectively form the existing M1 Business Park.

7.3.3. Soils, subsoils and geology

The Teagasc Soils Map indicates that there are three soil types at the Site. The majority of the Site is overlain by poorly drained mineral (mainly acidic) soils (AminPD) derived from non-calcareous parent materials (sandstone and shale till). A portion of the western half of Zone A and an area close to the buildings in Zone F is overlain by deep well drained mineral (mainly acidic) soils (AminDW) derived from mainly non-calcareous parent materials (sandstone and shale till). The south-eastern corner of the Site is overlain by alluvial mineral soil derived from an undifferentiated alluvium parent material.

The GSI quaternary sediments map indicates that the Site and study area is divided approximately along a north-south axis, with subsoil on the western side of the Site composed of till derived from Namurian sandstones and shales (TNSSs) and the eastern side of the Site composed of Irish Sea Till derived from Lower Palaeozoic sandstones and shales (IrSTLPSsS). A local subsoil geology map is shown in **Figure 7-1** below.

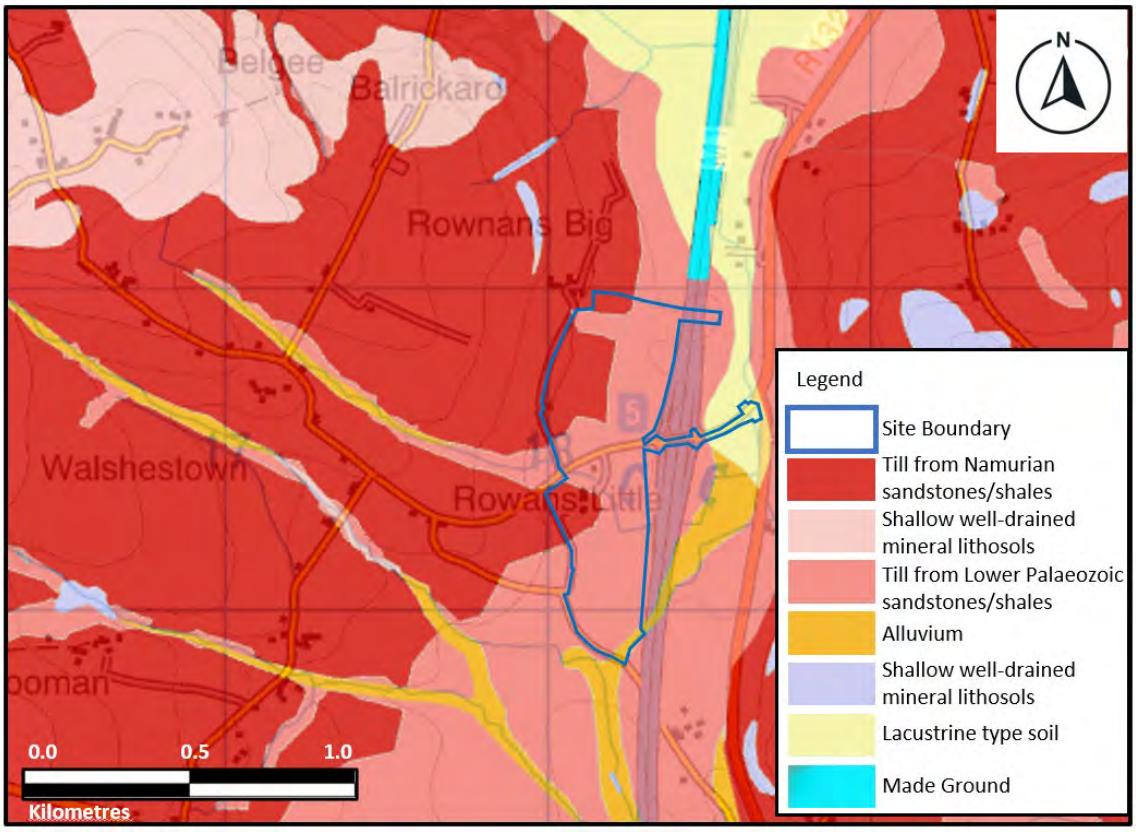

Figure 7-1 Local Subsoil Geology

Based on the GSI bedrock map of the study area (1:100,000), the majority of the Site (almost the entire area of Zone F and the eastern side of Zone A) is underlain by micrite, calcarenite and shale of the Loughshinny Formation (LO). A central strip of the Site is

underlain by the approximately north-south trending coarse sandstone and shale of the Balrickard Formation (BC). Within the northwest of Zone A, the Site is underlain by shale, sandstone and limestone of the Walshestown Formation (WL). A single north-south trending fault crosses the Site near the most easterly of the on-site roundabouts. The fault runs approximately parallel to the eastern side of the motorway. There is a northeast-southwest trending fault mapped c. 170 m from the northwestern corner of the Site. The closest bedrock outcrops are mapped c. 230 m northwest of the Site and 250 m east of the northern arm of the Site (east of the R132).

A local bedrock geology map is shown as **Figure 7-2** below.

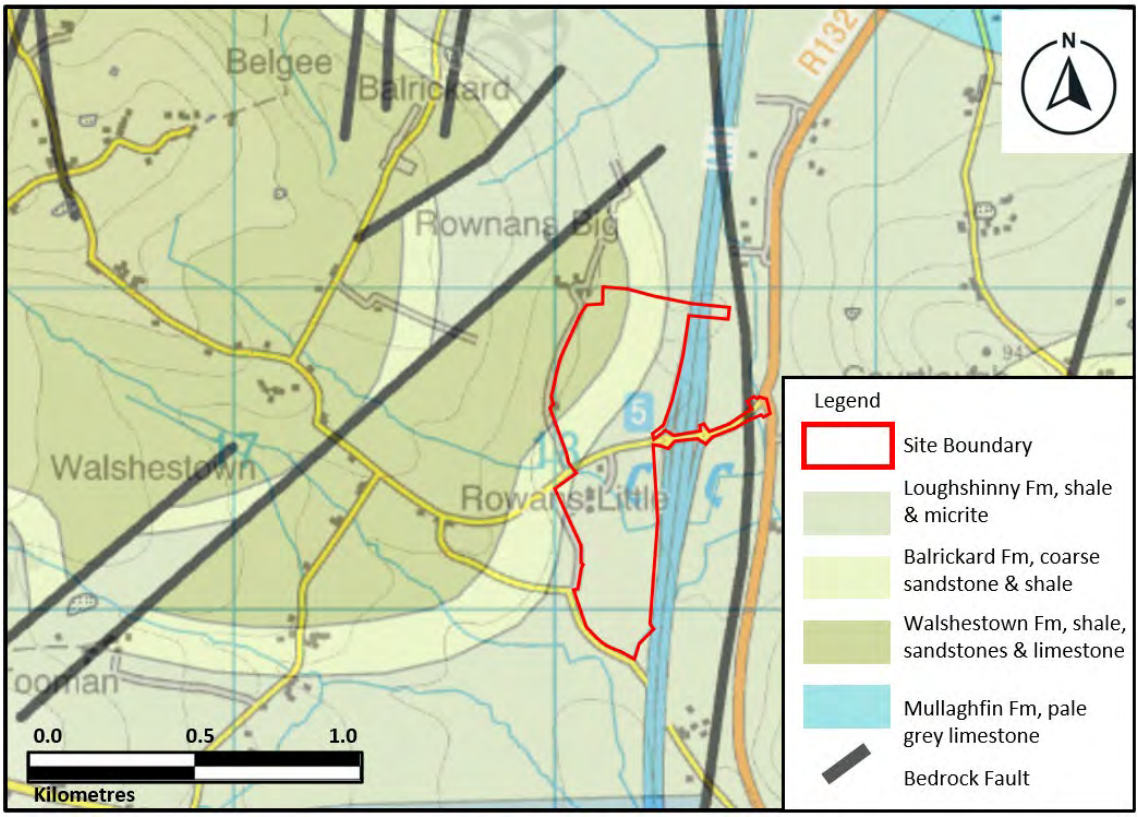

Figure 7-2: Local Bedrock Geology Map

There are multiple historical borehole records available within c. 50 m of the Site boundary associated with site investigations for the construction of the M1. Borehole logs are available in External Geotechnical Report 3082, Northern Motorway – Airport to Balbriggan (JC/JV, 1998)[1]. The deepest of the historical boreholes identified near the close to the Site was drilled c. 40 m to the east of the motorway and 100 m east of the Site, approximately in line with the north-south centre of Zone F. The borehole record is available as an external geotechnical record from the GSI Public Viewer (Borehole 356

in External Geotechnical Report 3082)[1]. The borehole was advanced to 10 meters below ground level (m bgl) without reaching bedrock. Overburden was recorded as:

- Firm brown sandy gravelly CLAY from 0 to 2.3 m bgl;
- Very stiff black sandy CLAY from 2.30 m bgl to 4.00 m bgl;
- Hard black gravelly CLAY with cobbles and boulders from 4.0 m bgl to 6.5 m bgl; and
- Hard brown gravelly CLAY with cobbles and boulders from 6.6 m bgl to 10 m bgl. Water strikes were recorded in the clay at 1.8 m bgl and 4 m bgl.

Based on a review of the log and the other logs within the cited report it is considered likely that depth to bedrock is in the area is > 10 m bgl.

Geological Heritage and Designated Sites

There are no Geological Heritage Sites within the Site. There are three audited Geological Heritage Sites within 5 km of the Site. The Walshestown Stream Section (ref: DF018) is located c. 300 m west and upstream of the Site, comprising rock exposures along the banks of a 1.5 km section of the Walshestown stream. The Nag's Head Quarry (DF016), a large quarry currently operating as a licensed landfill, with exposed limestone, shale and sandstone faces displaying structural deformation (chevron folds), is located c. 2.6 km west of the Site. The Balrickard Quarry (DF017), a disused quarry with exposed faces of Upper Carboniferous sandstone and shale is located 0.8 km northwest of the Site.

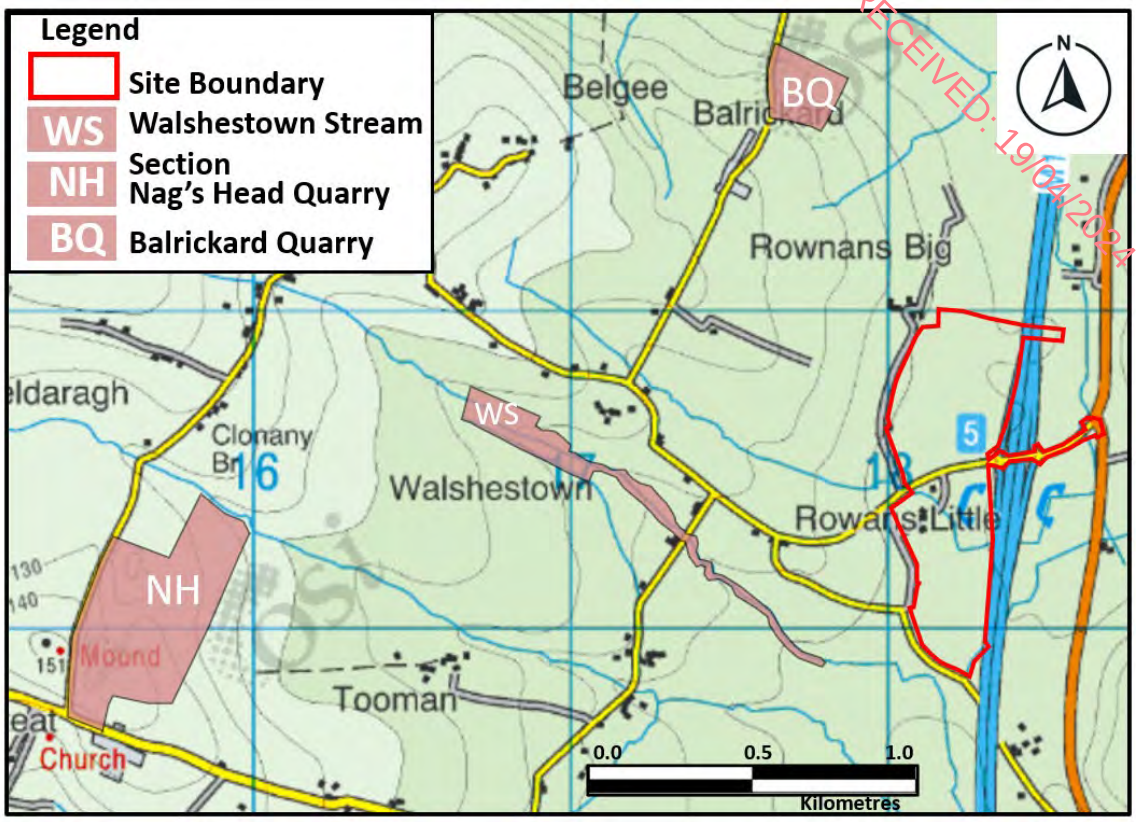

Figure 7-3: Designated sites within 5 km of the Site

There are two protected areas mapped by the EPA within 5 km of the Site. The Bog of the Ring (IE_001204) proposed Natural Heritage Area (pNHA) is located c. 0.8 km north of the Site and the Knock Lake (IE_001203) pNHA is 1.7 km northeast of the Site. There are no other protected areas within 5 km of the Site.

Licensed facilities and soil contamination

There are no known areas of soil contamination on the Site. According to the EPA online mapping (https://gis.epa.ie/EPAMaps), there are no licensed waste facilities at or adjacent to the Site. The boundaries of two licensed waste site are mapped within 3 km of the Site. Clashford Recovery Facility, license number W0265-01, was mapped at its closest point c. 370 m west of the Site and operates as a Soil Recovery Facility. A licensed landfill, Murphy Environmental Hollywood Limited, is located at its closest point c. 2.6 km west of the Site (W0129-02) at the Nag's Head quarry.

Economic Geology

There are no historic mines at or in the immediate vicinity of the Site. There is a recorded mineral locality (GSI Minerals Database) within 3 km of the Site. Mineral Location Ref 2902 for shale as a key mineral is mapped 1.9 km west of the Site at the Nags Head Quarry. A clay, brick mineral locality (ID 3264) is recorded at Bettyville townland, 2.8 km

southwest of the Site. The GSI data viewer shows no quarries within the proposed development area and no active quarries within the immediate environs of the Site. The Site is not mapped as having aggregate potential on the GSI online Aggregate Potential Mapping Database.

7.3.4. Fieldwork

Fieldwork carried out by Site Investigations Limited (SIL) is detailed in the SIL Ground Investigation Report[2] of October 2023 and included:

- A site walkover survey undertaken in conjunction with the desktop study that informed the design of the ground investigations described below.
- Ground investigations carried out by SIL to characterise the baseline land, soils, geological, hydrogeological, and hydrological environment between July and August 2023, which comprised:
    - Twelve (12 No.) cable percussive boreholes (BH01 to BH12) were advanced to a maximum depth of 7.0 m bgl;
    - Two (2 No.) air rotary boreholes adjacent to locations B06 and B12 to investigate depth to bedrock. At both locations drilling was terminated at 15 m bgl without encountering bedrock;
    - Twelve (12 No.) trial pits to a maximum depth of 3.0 m bgl;
    - Fourteen soil samples were taken for laboratory analysis during trial pitting;
    - Nine (9 No.) soakaway tests; and
    - Ten (10 No.) California Bearing Ratio tests.
- Groundwater monitoring was undertaken at the Site by Geosyntec on 5th October 2023 and is reported in Chapter 8.

Subsoil

The stratigraphic sequence encountered at the Site is generally consistent at all locations. An uppermost layer of topsoil is underlain by a brown sandy gravelly silty CLAY, over a black gravelly silty CLAY, in turn underlain by a brown sandy gravelly silty CLAY. Within the black CLAY layer there are occasional dense black gravels with high cobble content, which likely represent discontinuous lenses within the black CLAY. The thickness of the strata vary between locations and a summary of the geological logs from the trial pits and boreholes is included at **Table 7-3** below. The original site investigation logs are included in the SIL Ground Investigations Report[2] which has been submitted under separate cover as part of this application.

Table 7-3: Summary of subsurface profile at the Site. Uppermost to lowermost occurrence of strata.

Range of occurrence (m bgl)	Stratigraphic layer	Description
0.00 to 0.30	Topsoil	Brown clayey topsoil
0.10 to 2.70	Brown sandy gravelly silty CLAY	Soft to firm brown grey slightly sandy slightly gravelly silty CLAY with variable (low to high) cobble content
1.50 to 14.00	Black gravelly silty CLAY with occasional dense black gravel lenses occurring between 3.8 amd 8.3 m bgl	Firm to very stiff, black, slightly sandy gravelly silty CLAY with variable (low to high) cobble content. The occasional gravel lenses are composed of dense dark grey or black silty sandy GRAVEL with high cobble content.
13.50 to 15.00	Brown sandy gravelly silty CLAY	Brown slightly sandy slightly gravelly silty CLAY with cobbles

Groundwater was encountered in three trial pits in Zone A, at 1.60 m bgl (TP04) to 2.20 m bgl (TP02 and TP03) and in Zone F at 1.40 m bgl with the ingresses logged as either slow or as seepages. In the boreholes within Zone A groundwater was encountered between 1.7 m bgl and 6.6 m bgl and in Zone F between 4.20 and 4.40 m bgl.

No evidence of contamination was identified during site investigations. Six soil samples were taken for laboratory assessment by in Zone A by Site Investigations Limited and two samples were taken by Geosyntec. All samples were analysed for a suite of analysis chosen to enable detection of contaminants if present and for waste classification purposes. The results indicate that all samples fall within the inert Waste Acceptance Criteria and were classified as Non-Hazardous using the HazWasteOnLine™ tool (Refer to the Ground Investigation Report, 2023). A further six soil samples were taken for laboratory assessment in Zone F by Site

Investigations Limited and assessed for waste classification purposes. The laboratory results indicate that all samples fall within the Inert Waste Acceptance Criteria and may be classified as Non-Hazardous using the HazWasteOnLine™ tool (Refer to the Ground Investigation Report, 2023). It is noted that a single low-level detection of Chromium VI occurred in sample TP09 and that the HazWasteOnLine™ result is recorded as potentially hazardous, however on review of the data and report by Geosyntec the concentration of Chromium VI present is considered to be insufficient to be classified as hazardous.

Both samples taken by Geosyntec in Zone A at TP02 and TP06 were assessed using HazWasteOnLine™. Laboratory results for both samples are presented at **Appendix 7** with associated HazWasteOnLine™ reports and are classified as both non-hazardous and inert waste.

7.4. Characteristics of the Proposed Development

The Proposed Development will consist of the provision of civil infrastructure to facilitate the future development of the lands for a commercial logistics/warehousing development and will include a Construction Phase and an Operational Phase.

The Construction Phase will include the removal of topsoil, subsoil and shallow made ground along the routes of the proposed civil infrastructure.

In Zone A and Zone F the proposed civil infrastructure, which potentially requires soil, topsoil or made ground removal will consist of:

- Primary access roads including pedestrian/cycle paths; watermains, surface water and foul drainage networks; utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties;
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of SUDS, including an attenuation pond,

raingardens and bioretention ponds, Nature-based Solutions (NBS) and conveyance networks;

- The utilities ducts and foul drainage pipelines will be connected to the existing network located on the eastern side of the M1 Motorway via a crossing point in the northeast of Zone A. The existing foul drainage drains to the existing M1 Business Park Wastewater Treatment Plant. The foul drainage network will be connected to the existing network located on the eastern side of the M1 Motorway.
- Demolition of all existing buildings on Site, including:
    - Agricultural sheds, stables, warehouses and three residential homes located in Zone F;
    - A single-storey 200-square-metre (m^2) house, an abandoned water storage reservoir and associated pump station, on the western boundary of Zone A;
- Hard and soft landscaping, boundary treatments incorporated with NBS and SUDS;
- Ancillary works and earthworks.

In total it is expected that 13,467 m^3 of soil, subsoil or made ground will be excavated at the Site. In addition, the works will require the importation of 12,888 m^3 materials including general fill, asphalt, subbase, stone and topsoil. The proposed maximum depth of topsoil and subsoil to be excavated will be approximately 0.6 m to 1.2 m for road constructions, 2.2 m for SUDs and surface water features, including attenuation and bioretention ponds and 3.5 m for pipelines and manholes, 4.5 m for foul drainage pipelines and manholes and 1.4 m for public lighting ducting, telecom and power ducting.

7.5. Predicted Impacts

The following section details the potential impacts of the construction and operational phases of the Proposed Development on lands, soils and geology.

Significance of Attributes: Land at Topsoil and subsoil are a non-renewable resources. The topsoil at the Site is predominantly in use for arable and pasture agriculture and are of medium significance at a local scale. The subsoils are composed of tills and lithosols that occur widely across north Dublin and are considered of low local importance. The land use at the Site is typical agricultural use within the north Leinster area and of medium local importance. The bedrock beneath the Site is not considered to be of other than low importance at a local scale.

Geological heritage sites are of national importance and are considered of very high significance as receptors.

7.5.1. Construction Phase

Geologically significant sites, including Geological Heritage Sites, may be at risk of loss or damage from construction phase works. Contamination, spillages or excavation of topsoil or subsoil during works have the potential to impact and diminish the value of heritage sites. In the current instance there is no potential on-site receptor and there is considered to be no pathway from construction phase works to the three identified Geological Heritage Sites located within 5 km of the Site. Whilst the Walshestown Stream Section is only c. 300 m west of the Site, it is both upstream and up topographic gradient from the Site and it is concluded that there is no viable pathway between the two locations. Accordingly, these sites are not considered further as receptors in this document.

During the construction phase excavation is planned along the routes of the proposed roads, crossing, pathways, cycle routes and civil infrastructure. It is also required for the proposed construction of SUDs features, landscaping and boundary treatments, demolition and ancillary works/earthworks. Excavations have the potential to impact the lands, soil and geological environment in the study area. At the Site, topsoil and subsoils will be extracted using mechanical excavators and by directional pipe jacking or directional drilling technology at the M1 crossover point. The proposed maximum depth of topsoil and subsoil to be excavated will be approximately 4.5 m bgl for foul drainage pipelines and manholes and 1.4 m for public lighting ducting, telecom and power ducting. As bedrock depth is greater than 15 m bgl at the Site bedrock is not considered a potential receptor of impacts from excavation works. Impacts from excavation works to soil and topsoil receptors are assessed via potential pathways/mechanisms set out in **Table 7-4** below.

Table 7-4: Potential Impacts of excavations on topsoil and subsoil, Construction Phase

Pathway/Mechanism	Description of effect	Pre-mitigation potential impact
Removal from Site. A small proportion of the excavated topsoil and subsoil within the study area will be excavated and removed from Site.	A likely, minor, direct, adverse, permanent effect.	Slight to moderate

Pathway/Mechanism	Description of effect	Pre-mitigation potential impact
Erosion and compaction: Compaction, waterlogging, sealing, washout of fines and erosion are all potential effects of topsoil and associated vegetation removal. These mechanisms may occur due to the trafficking of plant, regrading of slopes, laying of hardstanding surfaces and storage of materials in areas not intended to be paved.	A likely, minor, direct, adverse temporary effect.	Slight to moderate
On site storage: Materials that are stockpiled incorrectly can be exposed to erosion and weathering, which potentially reduces the quality of the resource.	A likely, minor, direct, adverse temporary effect.	Slight to moderate
Excavation of unknown contaminated ground. No evidence of contaminated ground was identified during site investigations. Nonetheless there is potential for unknown contamination to be encountered during excavations that might require handling, on-site transport and off-site disposal or recovery. These activities have potential to contaminate in situ topsoil or subsoil if carried out incorrectly.	An unlikely minor, indirect, adverse temporary effect.	Slight to moderate

In situ or excavated topsoil and subsoil are also potentially vulnerable to contamination during construction works from activities such as accidental fuel spillage.

Table 7-5:Potential impact on lands soils and geology of accidental spillage of polluting materials on soils or subsoils, Construction Phase

Pathway/Mechanism	Description of effect	Pre-mitigation potential impact
Accidental spillage with vertical or lateral migration ground. There is potential for materials on Site to be spilled resulting in the contamination of in situ or excavated topsoil or subsoil. For example, these materials may include raw or uncured concrete and grouts, wash down water from exposed aggregate surfaces, concrete and mortars from ready mix trucks, fuels, lubricants, oils, and hydraulic fluids for equipment used on the development site or bitumen and sealants used for waterproofing concrete surfaces.	An unlikely, minor, direct, adverse, temporary effect.	Slight to moderate

7.5.2. Operational Phase

Since the land-use at the Site is currently predominantly agricultural, the Proposed Development of civil infrastructure in the identified locations will represent a permanent loss of soils as an agricultural resource locally on the Site along civil infrastructure pathways and SUDs locations only. The likely impact is described in **Table 7-6** below.

Table 7-6:Potential loss of soil for agricultural use within the Site due to new usage as civil infrastructure.

Pathway/Mechanism	Description of effect	Pre-mitigation potential impact
Change of land use to non-agricultural. It is assumed that the areas of soil or subsoil where civil infrastructure has been constructed at the Site will remain in non-agricultural use permanently. This will occur across a small proportion of the overall Site.	A likely, minor, direct, adverse, permanent effect.	Slight to moderate

There is potential for accidental spillage or leakage of contaminating material during the life of the development during use or maintenance of civil infrastructure. The potential impact is described in **Table 7-7** below.

Table 7-7:Potential Impacts of accidental spillage of polluting materials on soil and subsoil, Operational Phase

Pathway/Mechanism	Description of effect	Pre-mitigation potential impact
Accidental spillage with vertical or lateral migration ground. There is potential for small spillages or leakages during the ordinary use of the civil infrastructure on site, for example these fuels, lubricants or oils.	An unlikely, very low magnitude, direct, adverse, temporary effect.	Imperceptible

7.5.3. Potential Cumulative Impacts

Cumulative impacts as defined by the EU Guidelines include *impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.* The EPA (EPA, 2002) defines cumulative impacts as "The addition of many small impacts to create one larger, more significant, impact".

The assessment of cumulative impacts considers the total impact associated with the Proposed Development when combined with other past, present, and reasonably foreseeable future developments.

Based on a review of the planning application viewer on 15 April 2024 there are no committed developments in proximity to the Proposed Development that are likely to give rise to cumulative impacts with it.

An indicative masterplan for the M1 Business Park has been provided under separate cover. The masterplan is not currently permitted and does not form part of the Proposed Development. Should there be applications for planning permissions in the future that are consistent with the provided masterplan, an assessment will be completed as part of those future proposed developments of their cumulative impacts with then existing or approved developments. Currently, the total potential cumulative impact that it is practically possible to consider is set out below.

The masterplan envisages the development of individual commercial/industrial plots within the Business Park, the specification or other details of which do not exist at this time. Broadly, should commercial/industrial plots be developed within the masterplan area consecutively, using best practice industry mitigation measures, the cumulative impacts in the construction phase are likely to be unchanged (slight to moderate) for geology, lands or soils for the reasons outlined in Section 7.6. Should the developments occur concurrently the erosion and compaction impacts are potentially moderate, direct, adverse, temporary impacts, however these impacts would be reduced imperceptible with the implementation of best practise measures as outlined in mitigation measures at Section 7.6.

Operational stage impacts are likely to represent a permanent loss of soils as an agricultural resource. Should all the plots within the masterplan are be developed for industrial or commercial use, this would represent a likely, medium, direct, adverse, permanent effect with a moderate impact ranking. Other assessed impacts in section 7.5 are likely to be unchanged.

7.5.4. Do Nothing Impacts

If the Proposed Development did not proceed the Site would remain in agricultural use, there would be no impact on lands, soil or geology. It is envisaged that the land cover would remain unchanged as a greenfield site.

7.6. Mitigation Measures

During the Operational Phase, with the implementation of the proposed design, impacts will be imperceptible to moderate on land, soils and geological receptors.

During the Construction Phase every effort will be made to ensure that any detrimental environmental effects will be avoided, prevented or reduced. Potential impacts on land, soils and geology are assessed as slight to moderate pre-mitigation. To further mitigate the slight to moderate potential impacts, the measures set out below will be implemented:

- A construction environmental management plan (CEMP) will be prepared prior to construction commencing. The CEMP will include the mitigation measures set out in this EIAR and any additional measures required by the local authority. The CEMP will have regard to the guidance contained in the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015). The construction management team will supervise the construction of the project, including monitoring the performance of the contractors to ensure that the proposed construction phase mitigation measures are implemented.
- In relation to the specific risks assessed in this Chapter, mitigation measures include:
    - **Removal of excavated soil and topsoil from the Site.**
        - All topsoil or subsoil will be assessed for re-use within the Proposed Development by the appointed contractor, ensuring the appropriate handling, processing and segregation of the material. Where practical the removal of topsoil from the Proposed Development will be avoided. All earthworks will be undertaken in accordance with TII Specification for Road Works (SPW) Series 600 Earthworks (TII 2013) and project-specific earthworks specifications, ensuring that all excavated material and imported material is classified using the same methodology to allow maximum opportunity for the reuse of materials on site.
    - **Soil erosion and compaction**

- Management of surface water runoff will be undertaken during overburden stripping and landscaping works to ensure that silt does not enter the on-site agricultural drains or the Balrickard Stream.
- Where possible overburden stripping and landscaping works will be scheduled for periods of low rainfall to reduce potential erosion; and
- Landscaped areas will be planted with trees and grasses as soon as possible after formation to reduce the potential for erosion.

o **Storage of excavated topsoil and subsoil.**

- All excavated soil materials will be stockpiled using appropriate methods to minimise the impacts of weathering. Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff.

o **Excavation of unknown contaminated soil**

- The appointed contractor will ensure that excavations shall be kept to the minimum required, using shoring or trench boxes where appropriate. For more extensive excavations, a temporary works designer shall be appointed by the appointed contractor to design excavation support measures in accordance with all relevant guidelines that minimises the excavation of contaminated ground.
- The appointed contractor will be responsible for regular testing of excavated soils to monitor the suitability of the soil for reuse. Samples of ground suspected of contamination will be tested for contamination and will be disposed of at a suitably licensed or permitted site in accordance with the current Irish Waste Management legislation.
- Should dewatering be required in areas of contaminated ground, it shall be designed by the appointed contractor to minimise the mobilisation of contaminants into the surrounding environment.

o **Risk of contamination of existing soils by the construction activities such as accidental fuel spills**

- Good construction management practices, as outlined in the CIRIA guidance Control of Water Pollution from Construction Sites – Guidance for consultants and contractors (Masters-Williams et al., 2001) will be employed by the appointed contractor to minimise the risk of transmission of hazardous materials as well as pollution of adjacent watercourses and groundwater. The construction management of the

Site will take account of these recommendations to minimise as far as possible the risk of soil, groundwater and surface water contamination.

- Employing only competent and experience workforce, and site-specific training of site managers, foremen and workforce, including all subcontractors, in pollution risks and preventative measures;
- Ensure that all areas where liquids (including fuel) are stored, or cleaning is carried out, are in designated impermeable areas that are isolated from the surrounding area and within a secondary containment system, e.g. by a roll-over bund, raised kerb, ramps or stepped access;
- The location of any fuel storage facilities shall be considered in the design of all construction compounds. These are to be designed in accordance with relevant guidelines and codes of best practice and will be fully bunded;
- Good housekeeping at the Site (daily site clean-ups, use of disposal bins, etc.) during the entire Construction Phase;
- Potential pollutants to be adequately secured against vandalism;
- Provision of proper containment of potential pollutants according to codes of best practice;
- Thorough control during the entire Construction Phase to ensure that any spillage is identified at early stage and subsequently effectively contained and managed; and
- Spill kit to be provided and to be kept close to the storage area. Staff to be trained on how to use spill kits correctly.
- An Environmental Incident Response Plan will be implemented by the appointed contractor, which will identify the actions to be taken in the event of a pollution incident. It will address containment measures, emergency discharge routes, a list of appropriate equipment and clean-up materials and notification procedures to inform the relevant environmental protection authority. Sediment control methods will be implemented by the appointed contractor. The CEMP also addresses good construction management practices that will be employed to prevent the risk of pollution of the existing land, soils, geology and hydrogeology during construction (Refer also to Chapter 8 of this EIAR).

7.7. Monitoring

During the Construction Phase it is proposed soil and geological environment monitoring will include:

- The monitoring of works with supervision of contractor adherence to the CEMP.
- Monitoring of stockpile management at the Site (including protection of reusable excavated material and protection of soils from contamination).
- Monitoring of fuel storage areas and integrity inspections.
- Inspection of soil and its stability during excavations.
- Monitoring cleanliness of the road networks and ensuring implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of sediment control measures (for example any sediment retention ponds or surface water protection).

It is not proposed to undertake monitoring during the Operational Phase.

7.8. Residual Impacts

Effective implementation of the mitigation measures specified above will result in there being no significant residual impacts on land, soils and geology as a result of the construction and operation of the Proposed Development. The assessment of the predicted residual impacts for the Construction Phase are set out in **Table 7-8** below and the predicted residual impacts for the Operational Phase are set out in **Table 7-9.**

Table 7-8: Construction Phase Predicted Residual Impacts Following the Implementation of Mitigation Measures

Pathway/Mechanism	Description of Pre mitigation effect	Pre-mitigation potential impact	Post-mitigation potential impact
Removal from Site. A small proportion of the excavated topsoil and subsoil within the study area will be excavated and removed from Site.	A likely, minor, direct, adverse, permanent effect.	Slight to moderate	Imperceptible

Pathway/Mechanism	Description of Pre mitigation effect	Pre-mitigation potential impact	Post-mitigation potential impact
Erosion and compaction: Compaction, waterlogging, sealing, washout of fines and erosion are all potential effects of topsoil and associated vegetation removal. These mechanisms may occur due to the trafficking of plant, regrading of slopes, laying of hardstanding surfaces and storage of materials in areas not intended to be paved.	A likely, minor, direct, adverse temporary effect.	Slight to moderate	Imperceptible
On site storage: Materials that are stockpiled incorrectly can be exposed to erosion and weathering, which potentially reduces the quality of the resource.	A likely, minor, direct, adverse temporary effect.	Slight to moderate	Imperceptible
Excavation of unknown contaminated ground. No evidence of contaminated ground was identified during site investigations. Nonetheless there is potential for unknown contamination to be encountered during excavations that might require handling, on-site transport and off-site disposal or recovery. These activities have potential to	An unlikely low magnitude, indirect, adverse temporary effect.	Slight to moderate	Imperceptible

Pathway/Mechanism	Description of Pre mitigation effect	Pre-mitigation potential impact	Post-mitigation potential impact
contaminate in situ topsoil or subsoil if carried out incorrectly.			
Accidental spillage with vertical or lateral migration ground. There is potential for materials on Site to be spilled resulting in the contamination of in situ or excavated topsoil or subsoil. For example, these materials may include raw or uncured concrete and grouts, wash down water from exposed aggregate surfaces, concrete and mortars from ready mix trucks, fuels, lubricants, oils, and hydraulic fluids for equipment used on the development site or bitumen and sealants used for waterproofing concrete surfaces.	An unlikely, minor, direct, adverse, temporary effect.	Slight to moderate	Imperceptible

Table 7-9: Operational Phase Predicted Residual Impacts Following the Implementation of Mitigation Measures

Pathway/Mechanism	Description of Pre-mitigation effect Character-Magnitude-Duration-Probability-Consequences	Pre-mitigation potential impact	Post-mitigation potential impact
Change of land use to non-agricultural. It is assumed that the areas of soil or subsoil where civil infrastructure has been constructed at the Site will remain in non-agricultural use permanently. This will occur across a small proportion of the overall Site.	A likely minor, direct, adverse, permanent effect.	Slight to moderate	Slight to moderate
Accidental spillage with vertical or lateral migration ground. There is potential for small spillages or leakages during the ordinary use of the civil infrastructure on site, for example these fuels, lubricants or oils.	An unlikely, negligible direct, adverse, temporary effect.	Imperceptible	Imperceptible

7.9. References

1. External Geotechnical Report 3082, Northern Motorway – Airport to Balbriggan (JC/JV, 1998).
2. M1 Business Park Zone A and M1 Business Park Zone F, referred to together as the Ground Investigation Report, Site Investigations Limited, 2023 (Site Investigations Limited, 2023)

8. Water, Hydrology & Hydrogeology

8.1. Introduction

This chapter of the EIAR was prepared by Stephen Coakley, BA (Mod Geol), PhD, PGeo. Stephen is a Chartered Geologist and Professional Hydrogeologist with Geosyntec Consultants Limited. Stephen has over six years' experience in the field of environmental impact assessment, hydrogeology and contaminated land and has worked on a range of large-scale developments requiring impact assessment in Ireland. He has experience in the assessment of impacts on the water environment for quarries, landfills and residential and commercial developments. The chapter was reviewed by Thomas Vainio-Mattila MSc, PGeo Principal Consultant with Geosyntec Consultants Limited. Thomas has over 25 years' experience working in geological engineering consultancies and has managed multiple large scale environmental site assessments in Ireland and the UK.

This chapter provides a description and assessment of the potential likely and significant impacts of the Proposed Development on receiving surface waters (hydrology) and groundwater (hydrogeology) at the Site. It includes a baseline assessment of the water, hydrology and hydrogeology environmental setting and considers the potential impacts of the construction and operational phases of the Proposed Development within the study area. Where required, appropriate mitigation measures are recommended in order to limit any identified significant impacts, with an assessment of residual impacts and significance of effects.

8.2. Methodology

The assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgement:

- Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements (Institute of Geologists Ireland (IGI), 2013);
- IGI, Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency (EPA), 2017);
- Draft - Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2015);
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA, 2003);

- Guidelines on the Information to be Contained in Environmental Impact Statements, (EPA, 2002)
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (the NRA Guidance) (National Roads Authority, 2008)
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532 (CIRIA, 2006);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018).
- Office of Public Works and Department of the Environment, Heritage and Local Government (November 2009): The Planning System and Flood Risk Management – Guidelines for Planning Authorities, Technical Appendix A (the OPW Guidelines).

Upon completion of the desk study and baseline assessment, the importance and sensitivity of the identified water, hydrological or hydrogeological receptors within the study areas was assessed. Using the NRA Guidance, an estimation of the importance / sensitivity of the hydrogeological and hydrological environments within the study area is set out in **Table 8-1** and **Table 8-2** below.

Table 8-1: Estimation of Importance of Hydrology Attributes

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation, e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes.

Importance	Criteria	Typical Example
		Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities.
High	Attribute has a high quality or value on a local scale	Salmon fishery locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery. Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes. Quality Class D (Biotic Index Q2, Q1) Flood plain protecting residential or commercial property from flooding.

Importance	Criteria	Typical Example
		Amenity site used by small numbers of local people.

Table 8-2:Estimation of Importance of Hydrogeology Attributes

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g. SAC or SPA status.
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation - NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source.

Importance	Criteria	Typical Example
		Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer. Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes.

Examples of the categories of impact significance are outlined below in accordance with Guidelines on Environmental Impact Assessment issued by the European Commission in 2017.

- Imperceptible - An effect capable of measurement but without significant consequences.
- Slight Effects - An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate Effects - An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
- Significant Effects - An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
- Profound Effects An effect which obliterates sensitive characteristics.

Once the importance and sensitivity of the hydrological and hydrogeological attribute is established, the conventional source-pathway-receptor model for groundwater / surface water protection was applied to assess impacts groundwater and surface water specifically on downstream sensitive ecological receptors and local groundwater supplies.

Where potential impacts are identified, the classification of impacts in the assessment follows the descriptors provided in the Glossary of Impacts contained in the above referenced EPA guidance documents.

The description process clearly and consistently identifies the key aspects of any potential impact source, namely its character, magnitude, duration, likelihood and whether it is of a direct or indirect nature. **Table 8-3** demonstrates the criteria for estimating the magnitude of the impact on an attribute and **Table 9-4** presents the resulting estimation of the significance of potential impacts.

To summarise the stepwise impact assessment process applied below, we have firstly presented below a summary guide that defines the steps 1 to 7 (**Table 8-3**) taken in each element of the impact assessment process in below. The guide also provides definitions and descriptions of the assessment process and shows how the source-pathway-target model and the EPA impact descriptors are combined.

Table 8-3: Assessment Methodology

Attribute	Status/occurrence	Importance
Step 1	Identification and Description of Potential Impact Source	This section presents and describes the activity that brings about the potential impact or the potential source of pollution. The significance of effects is briefly described.
Step 2	Pathway/Mechanism	The route by which a potential source of impact can transfer or migrate to an identified receptor. In terms of sand and gravel extraction, surface water and ground water flows are the primary pathways.
Step 3	Receptor	A receptor is a part of the natural environment which could potentially be impacted upon e.g. human health, plant/animal species, aquatic habitats, soils/geology, water resources, water sources. The potential impact can only

Attribute	Status/occurrence	Importance
		arise as a result of a source and pathway being present.
Step 4	Pre-mitigation Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impact before mitigation is put in place.
Step 5	Proposed Mitigation Measures:	Control measures that will be put in place to prevent or reduce all identified significant adverse impacts. These measures are provided in two types: Mitigation by avoidance Mitigation by practise and engineering design
Step 6	Post Mitigation Residual Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of potential impacts after mitigation is put in place.
Step 7	Significance of Effects:	Describes the likely significant post mitigation effects of the identified potential impact source on the receiving environment.

Using this defined approach, this impact assessment process is then applied to activities which have the potential to generate a source of significant adverse impact on the hydrological and hydrogeological environment. **Table 8-4** illustrates a methodology for estimating the magnitude of potential impacts on attributes of different importance.

Table 8-4: Estimation of the Magnitude of a Potential Impact on an Attribute

Importance of Attribute	Magnitude of potential impact			
	Negligible	Minor Adverse	Moderate Adverse	Major Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very high	Imperceptible	Significant / Moderate	Profound/ Significant	Very Large
High	Imperceptible	Moderate / Slight	Significant/ Moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight / Moderate

8.3. Baseline Conditions

8.3.1. Desktop

A desk study of the Site and surrounding area was carried out to collate all available and relevant geological, hydrogeological, hydrological and meteorological data for the study area. The following relevant resources were consulted for the Proposed Development and the study area:

- GSI online mapping and database (www.gsi.ie);
- GSI Bedrock Geology 1:100,000 Scale Map (www.gsi.ie);
- GSI Groundwater Body Characterisation Reports (www.gsi.ie);
- GSI Groundwater Source Protection Zone Reports (www.gsi.ie);
- GSI National Draft Bedrock Aquifer map (www.gsi.ie);
- GSI -Groundwater Database (www.gsi.ie);
- GSI 1:25,000 Field Mapping Sheets (www.gsi.ie);
- EPA Maps database (www.epa.ie);

- General Soil Map of Ireland 2nd edition (www.epa.ie);
- Met Eireann Meteorological Databases (www.meteireann.ie);
- National Parks & Wildlife Services (NPWS) Public Map Viewer www.npws.ie;
- Soil Map of Ireland, National Soil Survey of Ireland, An Foras Talúntais (Teagasc Soils Map) (consulted at www.epa.ie);
- National Parks and Wildlife Service (NPWS) on-line database (www.npws.ie);
- Water Framework Directive "Catchments" Map Viewer (www.catchments.ie);
- OPW Indicative Flood Maps (www.floodinfo.ie);
- OPW hydro-data (http://www.opw.ie/hydro-data);
- Ordnance Survey of Ireland (OSI), Discovery Series (www.osi.ie);
- Ordnance Survey of Ireland online historical maps and aerial photographs (www.osi.ie);
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps (www.floodinfo.ie);

8.3.2. Site Description and Topography

The Site is located in the townlands of Rowans Big and Rowans Little, approximately 6.9 km south of Balbriggan, Co Dublin to the west side of the existing M1 Motorway (the M1) and existing M1 Business Park. The Bhailsigh road (the L1140) currently runs across the Site from northeast to southwest. Zone A lies to the north of the road and Zone F to the south. The site comprises an area of ca. 33.81 ha and has an elevation across the majority of the Site of between c. 37 and 50 meters above ordnance datum (m AOD). The overall local topography generally slopes downward gently from west to east. The Balrickard Stream (08B23), runs initially from northwest to southeast across Zone F, turning to flow eastward before passing beneath the M1 and joining the Bracken River as a minor tributary.

Land-use on the Site and in the surrounding area is predominately agricultural with subsidiary residential usage. There is a disused residential property within the western boundary of Zone A and three derelict residential buildings with farm buildings within the northwest of Zone F. Beyond the M1 to the east and northeast there are commercial properties that collectively form the existing M1 Business Park. Review of the available online OSI historical maps indicate that the Site has been in agricultural use with subsidiary residential use since the 19th Century.

Subsoils and Soils

Detail of the desk study of the land, subsoils and geological environment is provided in Chapter 7 and has been referred to in preparation of this Chapter. Subsoils at the Site are mapped by the GSI of low permeability and with a low recharge capacity. There are no records of soil contamination identified within the Site with the exception of a single minimal detection of

Chromium VI in a sample taken from TP09 during Site Investigation Limited's ground investigation at 0.5 m bgl (Ground Investigation Report, 2023[1]), which concentration is not considered hazardous on review by Geosyntec.

Regional Hydrogeology

The western side of Zone A and northwestern tip of Zone F is located above a poor bedrock aquifer (Pl), classified by the GSI as bedrock that is generally unproductive except for in local zones. Refer to **Figure 8-1** below.

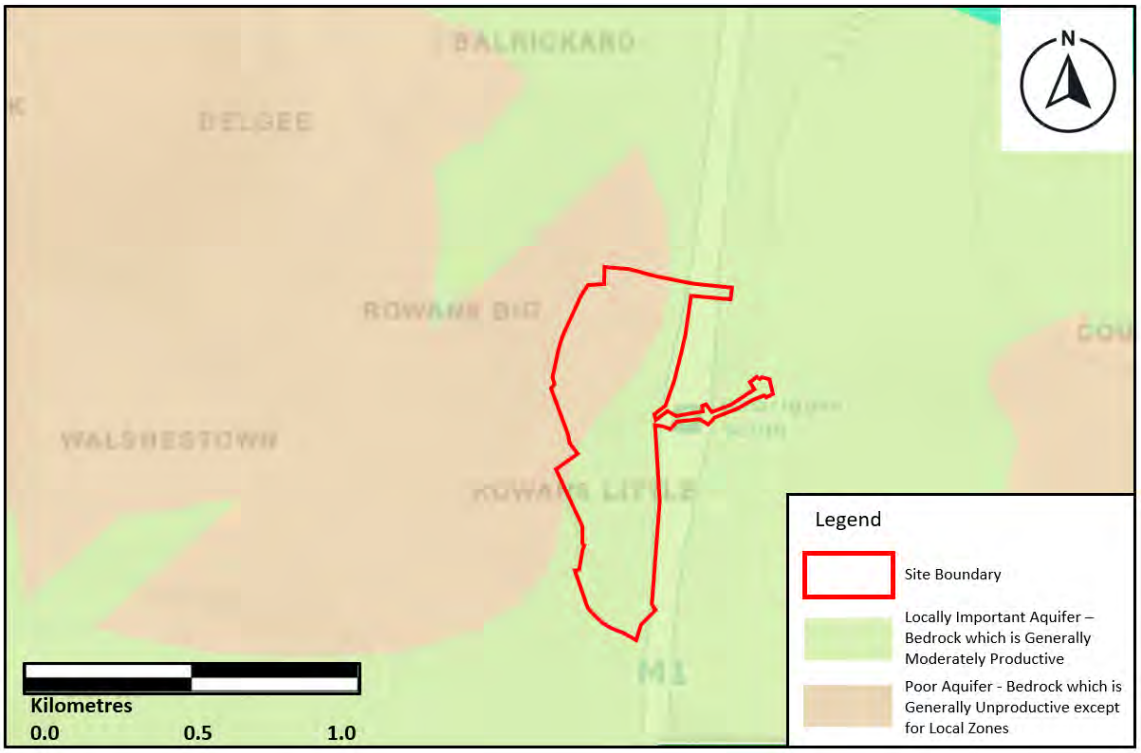

Figure 8-1: GSI Aquifer Classification

The bedrock aquifer is within the Hynestown Groundwaterbody (GWB) (IE_EA_G_033), associated with a hill composed of Namurian siliceous rocks that rises to 170 m AOD to the northwest of the Site. Refer to **Figure 8-1** above. The thickness of overburden decreases moving northwestward and uphill away from the Site. Elevations fall from 170 m AOD at the peak of the hill to around 50 m AOD at the eastern perimeter of the GWB on the Site.

The GSI GWB report for the Hynestown GWB indicates that groundwater flow is typically rapid and shallow. The rock is generally low permeability and flow is dependent on faults and joints, which may be impeded by shales. Flow is generally localized with little interconnectivity between systems. Water levels are usually less than 10 m below the surface. Local groundwater flow directions are determined by topography driven hydraulic, gradients, which converge to discharge a baseflow into rivers. At the Site, in Zone A to the north of the

Balrickard Stream, flow is expected to be southeastward with decreasing elevation and toward the Balrickard Stream.

The eastern portion of Zone A and nearly the entirety of Zone F is above a locally important bedrock aquifer, which is generally moderately productive. This aquifer is located within the Lusk-Bog of the Ring GWB (IE_EA_G_014). Refer to Fig. 8-1 above. The Lusk GWB extends east from Dunshaughlin, County Meath to the Irish Sea in north Dublin. Groundwater flow in the Lusk-Bog of mee Ring GWB is determined by the degree of local karstification, fracturing and limestone purity. In highly karstified areas flow is conduit dominated. In other areas flow systems are shallower and more diffuse and mostly unconfined.

Groundwater vulnerability beneath the Site is mapped as predominantly low with the exception of the most northwesterly corner of the Site, which contains areas mapped as moderate vulnerability and high vulnerability within the Hynestown aquifer. Refer to (**Figure 8-2** below). There are no mapped karst features within or near the Site.

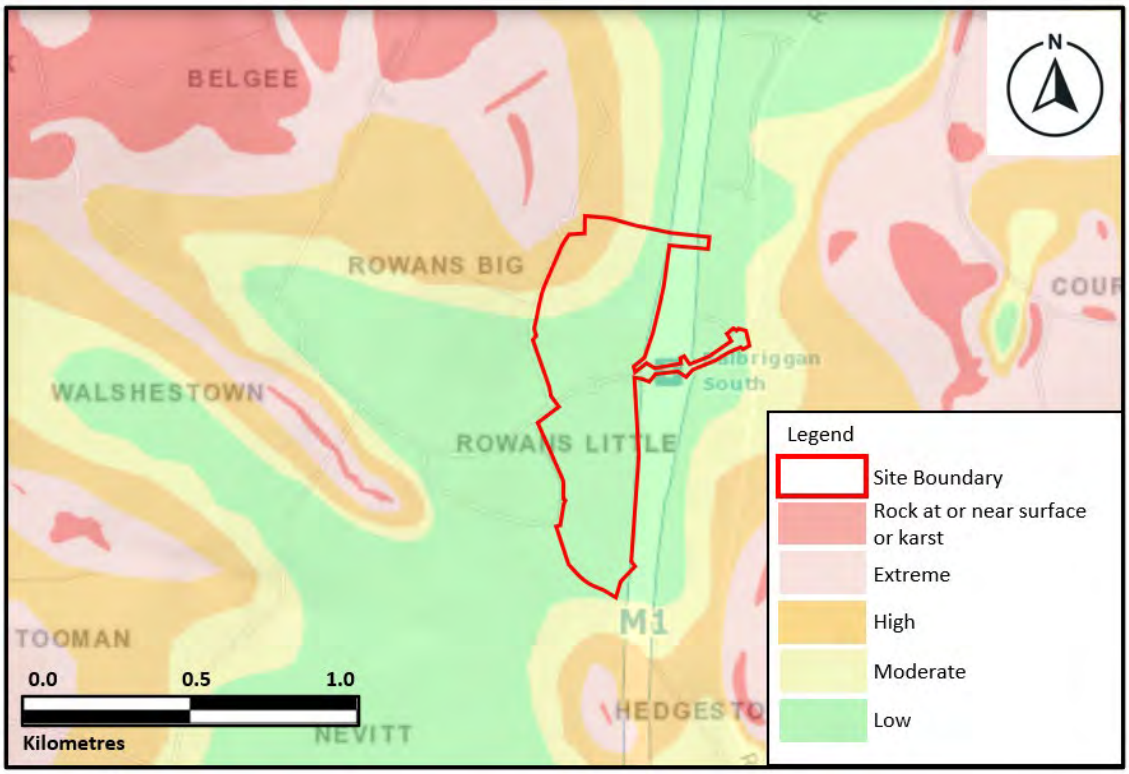

Figure 8-2: Groundwater vulnerability

Both GWBs achieved “good” status under the WFD 2016-2021 monitoring cycle. The Hynestown GWB has been designated as not at risk and the Lusk-Bog of the Ring GWB has been designated as at risk.

The GSI groundwater recharge map provides an estimate of the average amount of rainwater that percolates down through the subsoils to the water table over a year at the Site. Effective rainfall at the Site is mapped at 430 mm/yr. The highest average recharge rates are in the northwest of Zone A and the very southeast of Zone F where rates are between 64 and 108 mm/year, with a recharge coefficient of 16 to 25%. Across the remainder of the Site the rate of recharge is 32 mm/year with a recharge coefficient of 7.5%.

The entire Site falls within the Outer Protection Zone (SO) of the Bog of the Ring Public Supply Source Protection Area (**Figure 8-3**)**.** The two inner protection zones of the source protection area are c. 0.90 km and 3.4 km northwest of the Site at their closest points.

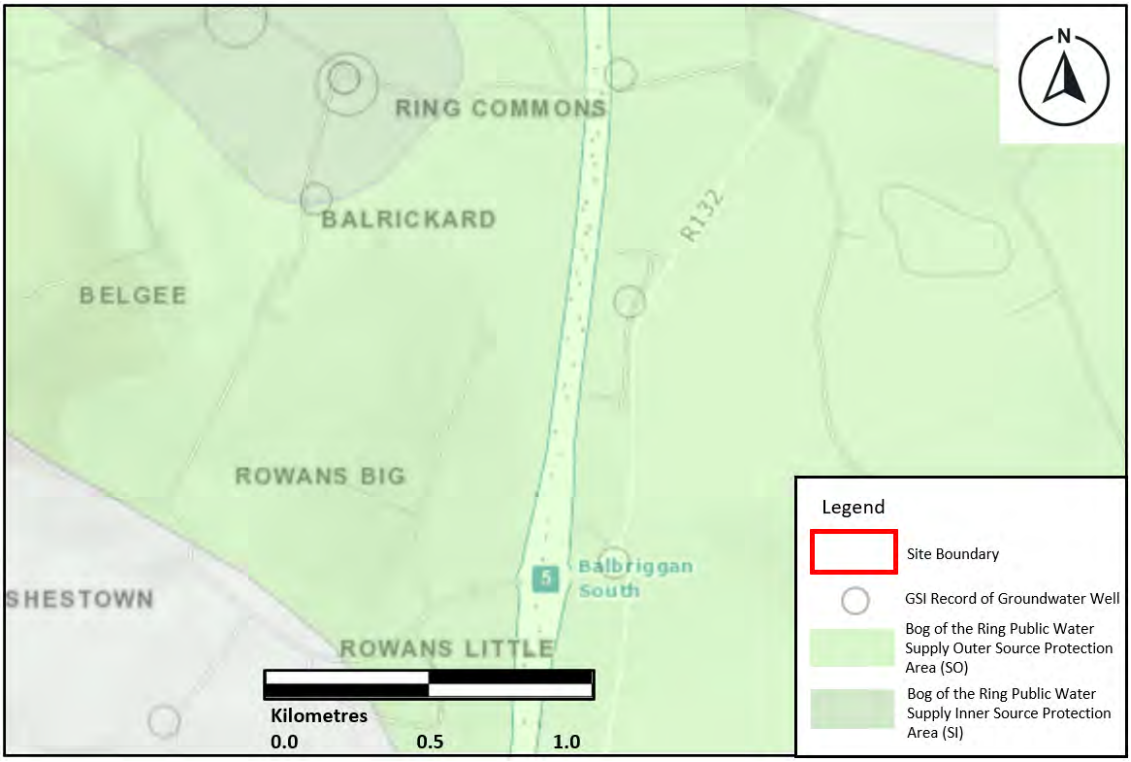

Figure 8-3: Groundwater Wells and Source Protection Area

Based on the topographical gradient and distribution of waterbodies in the area, the desk study suggests that hydraulic gradient in the aquifer is likely to be toward the on-site Balrickard Stream and the Bracken River to the east of the Site. This corresponds to a northwest to southeast gradient in Zone A and a southwest to northeast gradient in Zone F.

The GSI database records the possible presence of nine (9 No) groundwater wells within 1 km of the Site based on a mapping accuracy that varies between 100 and 500 m. The wells are summarized in **Table 9-5** below and illustrated in **Figure 8-4**. There are also a series of wells associated with the M1 motorway construction that run in a north-south orientation in line with the M1 motorway.

Table 8-5: Groundwater Wells within 1 km of the Site

Well ID	Depth to Bedrock	Well Depth	Type and use	Approx. Location Relative to Site	Yield Class
2925NEW081	13	65	Borehole - use Other	1km northwest	Excellent
2925NEW083	17	61	Borehole - use Other	As above	Excellent
2925NEW090	13.4	79	Borehole – use Public Supply (Co. Co.)	As above	Excellent
2925SEW020	2	122	Borehole - use Other	0.7km northwest of the Site	Excellent
2925SEW018	23	91	Borehole – use Co. Co,	0.9 km west of the Site	Excellent
2925SEW014	-	27.5	Industrial	Unknown	Good
2925SEW013	-	34.4	Agri & domestic	1 km southeast of the Site	Excellent
2925SEW017	15	91	Other	On Site or within 50 m of the Site (100 m accuracy).	Good
2925SEW019	-	38	Other		Excellent
2925NEW082	20	38	Industrial	0.9 km northeast	Excellent

It is noted that only three of these wells are downgradient of the Site with none of the downgradient wells recorded as for domestic use. The Balrickard Stream and River Bracken are likely to constitute hydraulic boundaries to flow of groundwater. There are no dwellings mapped between the Site and the River Bracken downgradient of the Site that are likely to have a private groundwater well.

It is proposed that the development will be connected to the public water mains to the east of the M1 and that no abstraction from groundwater for water supply purposes is anticipated during the Construction or Operational Phase of the development.

Regional and Local Hydrology

The Balrickard Stream, a minor tributary to the River Bracken (Matt_SC_010) flows from northwest to southeast across the Site, turning eastward within the Site to pass beneath the M1 motorway via a culvert. To the east of the motorway, the river joins the River Bracken (See Fig. 8-5), which flows northward and eastward toward Balbriggan harbour, where it enters the Irish Sea c. 5.35 km northeast of the Site. Existing agricultural open drainage ditches at the Site are mapped as predominantly west to east in orientation consistent with the topographical gradient at the Site. Zone A contains multiple agricultural open drainage ditches, two primary channels draining west-to-east, which cross underneath the M1 Motorway via existing culverts and secondary channels connecting the primary channels in a north-south direction. The southern half of Zone F is drained via existing agricultural drainage ditches, either draining to the Balrickard Stream or to the Rowans Little Stream, which flows from northwest to southeast close to the southern Site boundary. Further south, the Ballough Stream flows northwest to south-eastward, with both streams passing within 50 m of the Site's southernmost boundary (See Figure 8.5).

The majority of the Site is located within the Palmerstown_SC_10 (08) sub-catchment, which is a sub-catchment of the Nanny-Delvin catchment, Hydrometric Area 08, the Eastern River Basin District. A minor portion at the southwestern corner of the Site is located within the Ballough Stream_SC_10 (08_6) sub-catchment, within the same catchment and Hydrometric Area. There are no significant sand or gravel aquifers within the catchment (www.catchments.ie). There is no available Q-value for the River Bracken downstream of the Site.

Based on the effective rainfall and recharge rates at the Site it is assumed that there is a component of shallow and surface drainage at the Site above the low permeability clays to the agricultural drainage system and to the Balrickard Stream.

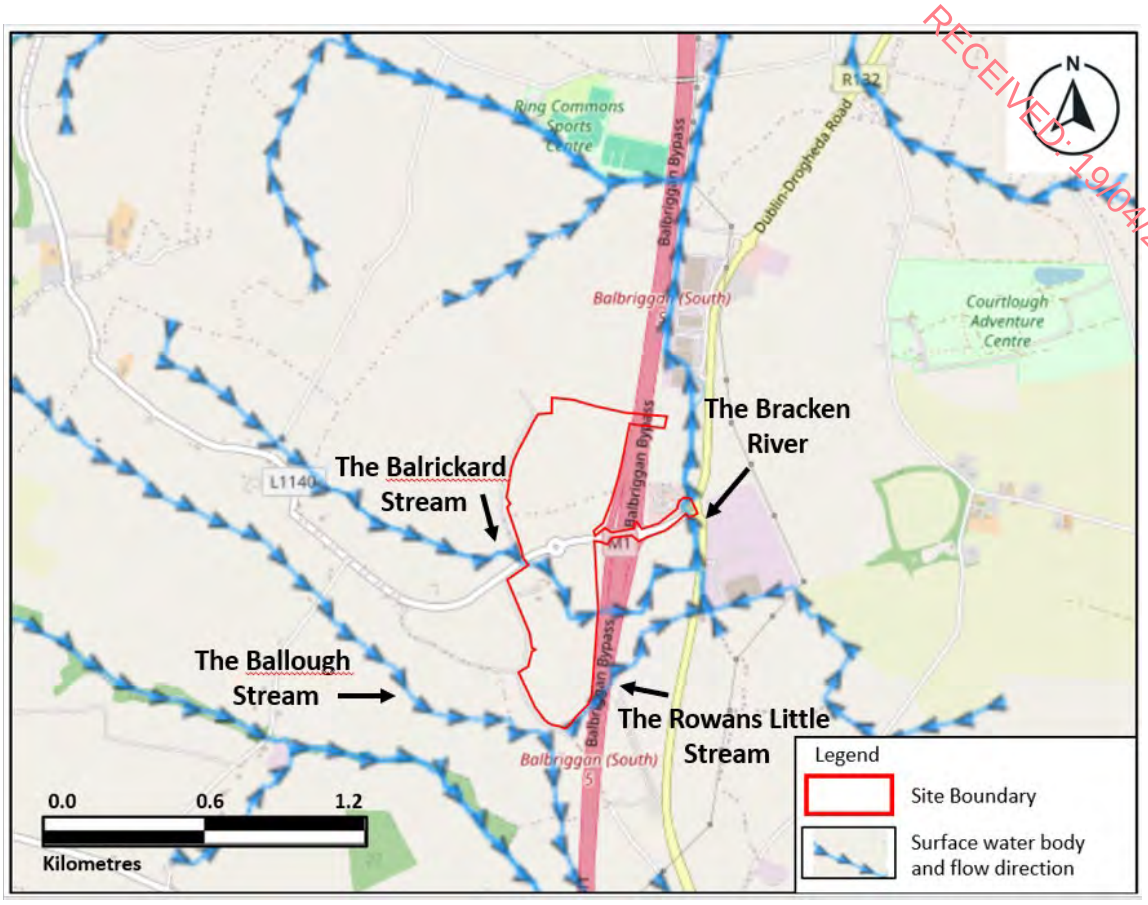

Figure 8-4: Local Hydrology

Protected Areas

There are two protected areas mapped by the EPA within 5 km of the Site. The Bog of the Ring (IE_001204) proposed Natural Heritage Area (pNHA) is located c. 0.8 km north of the Site and the Knock Lake (IE_001203) pNHA is 1.7 km northeast of the Site. There are no other protected areas within 5 km of the Site. The Site is considered unlikely to be connected hydrogeologically to a protected site due to the low permeability subsoils and the likely discharge of ground water to the Balrickard Stream, however there is a potential for hydrological connection to the downstream Bog of the Ring pNHA via the Bracken River.

The Balrickard Stream and the Rowans Little stream directly to the south of Zone F are designated ecological corridors in the Fingal County Development Plan 2023-2029. In line with Fingal Development Management Standards an ecological buffer of 48m from top of bank has been applied to the Balrickard stream and 10m to the Rowans Little Stream.

Flood Risk Assessment (FRA)

A detailed site specific flood risk assessment (SSRA)/Stage 3 flood risk assessment has been prepared for the Proposed Development by McCloy Consulting (March 2024) and

accompanies this application, to ensure that all major issues related to flooding are addressed. The SSRA was prepared in line with the Office of Public Works (OPW) Guidelines. It details existing flood risk within and in the vicinity of the Site and the flood risk management measures incorporated into the development design.

The SSRA assesses the adequacy of existing information and presents analysis undertaken to supplement existing data. It determines potential sources of flooding at the Site, the flood zones relevant to planning policy guidelines specific to flood risk management planning and provides a basis for appropriate design and mitigation measures to be considered as part of the Proposed Development.

The sources and extent of fluvial flooding at the Site were considered, as well as flooding to the Site from pluvial sources, overland flow and ponding of localised rainfall within the Site. The method of assessment complies with the Source-Pathway-Receptor model, allowing spatial assessment of flood risk to people, properties and the environment at the Site. The SSRA investigated the existing runoff characteristics and the potential impact the Proposed Development will have on pluvial (surface water) runoff from the Site. The OPW Catchment Flood Risk Assessment and Management (CFRAM) maps (refer to Figure 8-7 and Section 3.2 of the SSRA) as well as the OPW Flood hazard maps (refer to Figure 8-8) were reviewed to identify areas potentially at risk of flooding. OSI historical mapping (i.e. 6” and 25” base maps) was also used to identify any areas at risk. Generally, the Site is at an elevation between 37 and 51 m AOD, with a gentle slope toward the south and east of the Site and lowermost areas to the east of the motorway. There are no locations mapped on any historic maps which reference areas prone to flooding within the Site.

A minor area at the extreme south of the Site is mapped as at risk of pluvial (surface water) flooding in the CFRAM Preliminary Flood Risk Assessment (PRA) flood map (See the SSRA Figure 3.2). In addition, the CFRAMS Fingal East Meath Flood Risk Assessment and Management Study (FEM FRAMS) for the Bracken River (including the Balrickard Stream on-site) were reviewed and indicate that the Site is not affected by out of bank flooding except for a minor section at the south of the Site (refer to SSRA section 3.2).

The areas of the Site mapped as low probability of flooding (Annual Exceedance Probability (AEP) of 0.1%) are confined to the Balrickard Stream itself on the Site and a low-lying area in the southernmost site. No areas beyond the banks of the Balrickard Stream on the Site are mapped as medium probability (AEP of 1%) or as high probability (AEP of 10%) of flooding.

There is an arterial drainage scheme for the Bracken River and its tributaries mapped east of the motorway from Junction 5 on the M1 to Balbriggan.

To the east of the motorway there are areas 250 m east of the Site on the River Bracken mapped at low probability of flooding (including the current Fyffes Site and fields to its west on the opposite side of the R132). Approximately 350 m to the north of the Site and west of the motorway there is a zone mapped as at low probability of flooding, with areas 450 m and 600 m to the north mapped at medium and high probability respectively (both to the east and to the west of the motorway) (refer to **Figure 8-5**).

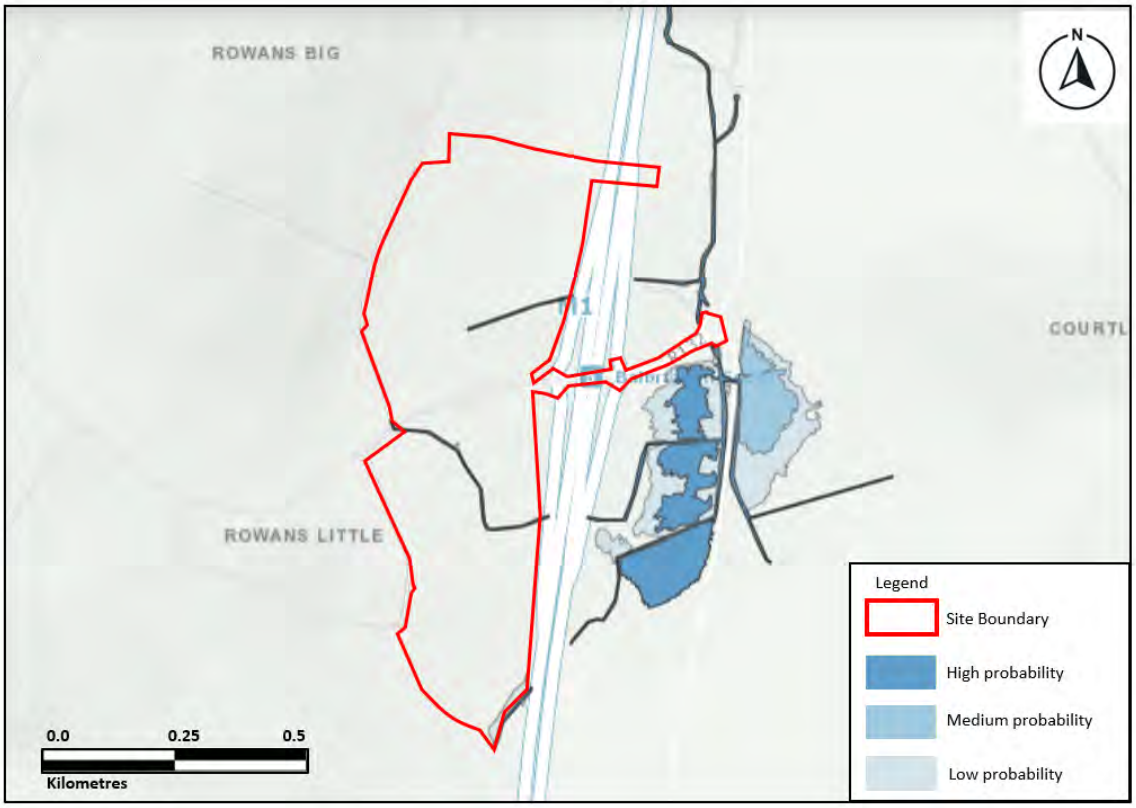

Figure 8-5: Catchment Flood Risk Assessment and Management (CFRAM) Map

The OPW flood hazard mapping highlights one flood event recorded in March 2008 and mapped c. 350 m north of the Site and to the east of the Motorway along the River Bracken, refer to **Figure 8-6**. This flood event was linked to an extreme rainfall event in March 2008.

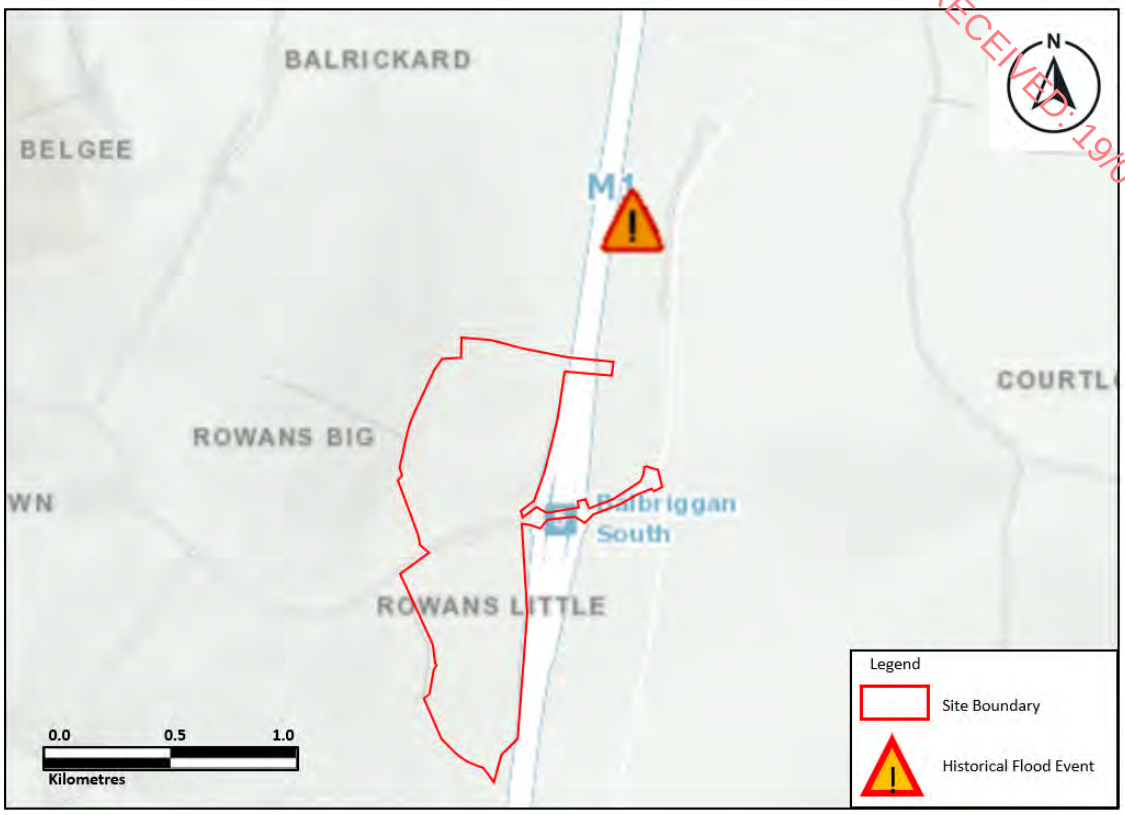

Figure 8-6: OPW Flood hazard map

Upon review of the publicly available data, the McCloy Consulting site-specific Flood Study was prepared to provide a more accurate and recent representation of flooding in the area (refer to Flood Study M02103-02_DG01 submitted under separate cover - for further information on flood modelling and hydrology methodologies). The Flood Study's results were similar to the existing CFRAMS mapping. The only area of surface ponding of fluvial floodwater was adjacent to the M1 in the northeast of the Site at the downstream end of a local field drain. It was determined that, whilst watercourses and open channel drains flows through and adjacent to the Site, there was little out-of-bank flooding within the Proposed Development boundary. In relation to Flood Zones as defined by the OPW guidelines, the majority of the Site lies in Flood Zone C with parts shown to lie in Flood Zone A and Zone B. No other significant flood mechanisms exist at the Site.

8.3.3. Fieldworks

Site investigations carried out to characterise the baseline geological, hydrogeological, and hydrological environment are listed in Chapter 7, with detail of the geological environment encountered and are referred to in this chapter. A detailed Site walkover survey, waterbodies survey, including inspection of all relevant hydrological features, such as existing drainage ditches, streams and springs was undertaken.

Subsoils

The SIL Ground Investigation Report[1] indicates that there is c. 15 m of predominantly low permeability clayey subsoils beneath the Site (with occasional gravel lenses occurring between 3.8 and 8.3 m bgl) overlain by up to 0.3 m of topsoil. Made ground was encountered at limited locations associated with slit trenches to identify existing service locations. Bedrock was not encountered during the SIL Ground Investigation which advanced two boreholes to maximum depth of 15 m bgl.

Groundwater was encountered in three trial pits in Zone A, at 1.60 m bgl (TP04) to 2.20 m bgl (TP02 and TP03) and in Zone F at 1.40 m bgl with the ingresses logged as either slow or as seepages. In the boreholes within Zone A groundwater was encountered between 1.7 m bgl and 6.6 m bgl and in Zone F between 4.20 and 4.40 m bgl.

Soil infiltration rates were assessed as part of the site investigation. At all locations the infiltration rate could not be calculated due to the low rate of infiltration caused by the low permeability of the clay subsoils.

Two groundwater wells were installed screened in the overburden at BH11 and the BH03. The locations of the boreholes are included in **Figure 8-7.** Borehole details are presented in the Ground Investigation Report, 2023 by Site Investigations Limited.

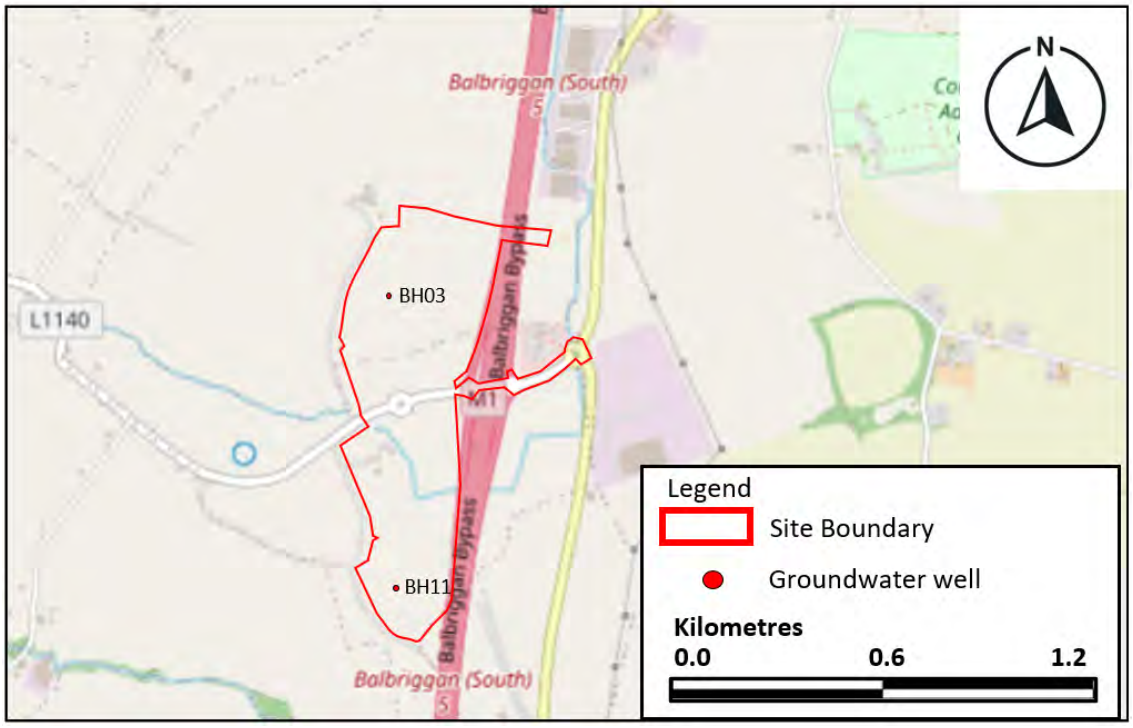

Figure 8-7: Groundwater Monitoring well locations.

Baseline groundwater samples were taken by Geosyntec on 5th October 2023 from the two groundwater monitoring wells and analysed for a broad suite including metals, PAHs, VOCs, SVOCs, pesticides, TPH CWG, nitrate, ammoniacal nitrogen, hexavalent and trivalent chromium and total nitrogen. Field hydrochemistry measurements (electrical conductivity, pH and temperature) were taken during monitoring and were within an acceptable range. The full laboratory results for samples are included as **Appendix 8.** Groundwater quality was acceptable from all samples taken.

Manual dip water levels were taken with shallow groundwater measured at 0.28 m bgl in BH03 and 0.3 m bgl in BH11.

Hydrological Conceptual Model and Receptor Sensitivity

The following conceptual understanding of groundwater and surface water flow was based on the desk study and field works.

The primary groundwater flow paths in the Hynestown and Lusk-Bog of the Ring GWBs are likely to be shallow toward the Balrickard Stream to the southeast. Baseflow is predicted to discharge to the Balrickard Stream and potentially the Bracken River to the east of the M1.

Site investigations confirmed that depth to bedrock at the Site is likely to be over 15 mbgl through low permeability clays (with occasional gravel lenses between 3.8 and 8.3 mbgl). Shallow groundwater was encountered between c. 1.7 and 6.6 mbgl during site investigations and measured at c. 0.3 mbgl in monitoring wells and is likely to represent water perched above the thick clay subsoils beneath the Site or within the shallow gravel lenses. As there is a c. 15 m thickness of low permeability clay at the Site, the great majority of effective rainfall at the Site is likely to flow at or close to the surface within the lenses in the shallow clays to the Balrickard Stream or on-Site drainage ditches and ultimately to the Bracken River. Recharge at the Site is expected to be minimal.

Due to the thickness of the clays there is considered to be no viable vertical migration pathway for contamination at or near the surface to the bedrock aquifer over 15m bgl. The bedrock aquifer and groundwater bodies beneath and downgradient of the Site, or groundwater wells at or downgradient of the Site, are therefore not regarded as sensitive receptors due to the thickness of the low permeability clays encountered during site investigations.

8.4. Characteristics of the Proposed Development

The Proposed Development will consist of the provision of civil infrastructure to facilitate the future development of the lands for a commercial logistics/warehousing development and will include a Construction Phase and an Operational Phase.

The Construction Phase will include the removal of topsoil, subsoil and shallow made ground along the routes of the proposed civil infrastructure.

In Zone A and Zone F the proposed civil infrastructure, which potentially requires soil, topsoil or made ground removal will consist of:

- Primary access roads including pedestrian/cycle paths; watermains, surface water and foul drainage networks; utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties;
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems (SUDS) including an attenuation pond, raingardens and bioretention ponds, Nature-based Solutions (NBS) and conveyance networks;
- The utilities ducts and foul drainage pipelines will be connected to the existing network located on the eastern side of the M1 Motorway via a crossing point in the northeast of Zone A. The existing foul drainage drains to the existing M1 Business Park Wastewater Treatment Plant. The foul drainage network will be connected to the existing network located on the eastern side of the M1 Motorway.
- Demolition of all existing buildings on Site, including:
    - Agricultural sheds, stables, warehouses and three residential homes located in Zone F;
    - A single-storey 200-square-metre (m^2) house, an abandoned water storage reservoir and associated pump station, on the western boundary of Zone A;
- Hard and soft landscaping, boundary treatments incorporated with Nature-based NBS and SUDS;

- Ancillary works and earthworks.

In total it is expected that 13,467 m^3 of soil, subsoil or made ground will be excavated at the Site. In addition, the works will require the importation of 12,888 m^3 materials including general fill, asphalt, subbase, stone and topsoil. The proposed maximum depth of topsoil and subsoil to be excavated will be approximately 0.6 m to 1.2 m for road constructions, 2.2 m for SUDs and surface water features, including attenuation and bioretention ponds and 3.5 m for pipelines and manholes, 4.5 m for foul drainage pipelines and manholes and 1.4 m for public lighting ducting, telecom and power ducting. It is noted that as shallow ground water flow is expected based on Site investigation results at the Site there is potential for excavations to encounter the perched water table.

All Proposed Development has been designed to be located within Flood Zone C with the exception of the crossing point of the Balrickard Stream, which will provide freeboard to the design flood level in line with OPW Guidelines Section 50 requirements.

8.5. Predicted Impacts

The following section details the potential impacts of the construction and operational phases of the Proposed Development on hydrology and hydrogeology.

Significance of Attributes: Based on the desk study the bedrock aquifer beneath the Site was considered to be of medium significance due to the Site falling within the SO of the Bog of the Ring Public Supply Source Protection Area. Shallow groundwater is not in use at the Site and is considered to be of medium significance due to its discharge within the Site to the Balrickard Stream. The Balrickard stream was considered to be an attribute of medium hydrological significance (of medium quality or value on a local scale). Based on the desk study and SSRA in regard to flood risk, the Site and surrounding area are considered of low to medium significance.

Flood Risk SSRA: A flood risk SSRA was completed for the Proposed Development includes an identification of potential flood hazards to life and property at the Site to enable assessment of the Site and the Proposed Development based on the Flood Risk Framework outlined in the OPW Guidelines. The SSRA concluded that:

- Due to the Site's location, topography and underlying geology, there was not considered to be a risk of coastal flooding, urban drainage flooding, reservoir/canal or artificial source flooding or of groundwater flooding (due to the till over shale geology not being susceptible to superficial deposit flooding and site topography and bedrock geology not being of a nature that would be

prone to clearwater groundwater flooding or impoundment of emergent groundwater.

- The SSRA concluded that the design of the Proposed Development would lead to no change from baseline conditions and have no impact on flood risk within the Site or elsewhere in keeping with the requirements of the OPW Guidelines. The SSRA also considered the risk under climate change scenarios (modelling of 20% increase in flood flows and / or 0.5 m increase in mean sea level, where applicable) and concluded that there was a potential a maximum increase in flood level of 0.66 m directly upstream of the M1 culvert at the south east of the Site (due to capacity issues with the larger flow) and a maximum of 0.14 m at all other points. concluded that the design of the Proposed Development would lead to little change in flood extents as a result of climate change and no new areas of out-of-bank flooding. The conclusions of the SSRA in relation to potential impacts have been incorporated where relevant to this chapter.

- **Flood Risk during Construction Phase:** During the construction phase excavation including trenching is planned along the routes of the proposed roads, bridge, pathways, cycle routes and other civil infrastructure. It is also required for the proposed construction of SUDs features, landscaping and boundary treatments, demolition and ancillary works/earthworks. Excavations have the potential to impact the hydrological and geological environment in the study area. At the Site, topsoils and subsoils will be extracted using mechanical excavators and by directional pipe jacking or directional drilling technology at the M1 crossover point. Potential impacts from excavation works to hydrological and hydrogeological receptors are assessed via potential pathways/mechanisms set out in **Table 8-6** below.
- **Flood Risk during Operational Phase:** Since the land-use at the Site is currently predominantly agricultural, the proposed development of road, pathway and cycle lane surfaces in the identified locations will represent a permanent change drainage and surface flow patterns at the Site. The likely impact is described in **Table 8-7** below.

8.5.1. Construction Phase

During the construction phase excavation including trenching is planned along the routes of the proposed roads, bridge, pathways, cycle routes and other civil infrastructure. It is also required for the proposed construction of SUDs features, landscaping and boundary treatments, demolition and ancillary works/earthworks.

Excavations have the potential to impact the hydrological and geological environment in the study area. At the Site, topsoils and subsoils will be extracted using mechanical excavators and by directional pipe jacking or directional drilling technology at the M1 crossover point.

Potential impacts from excavation works to hydrological and hydrogeological receptors are assessed via potential pathways/mechanisms set out in **Table 8-6** below.

8.5.2. Operational Phase

Since the land-use at the Site is currently predominantly agricultural, the proposed development of road, pathway and cycle lane surfaces in the identified locations will represent a permanent change drainage and surface flow patterns at the Site. The likely impact is described in **Table 9-7** below.

8.6. Potential Cumulative Impacts

Cumulative impacts as defined by the EU Guidelines include *impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.* The EPA (EPA, 2002) defines cumulative impacts as "The addition of many small impacts to create one larger, more significant, impact".

The assessment of cumulative impacts considers the total impact associated with the Proposed Development when combined with other past, present, and reasonably foreseeable future developments.

Based on a review of the planning application viewer on 15 April 2024 there are no committed developments in proximity to the Proposed Development that are likely to give rise to cumulative impacts with it.

An indicative masterplan for the M1 Business Park has been provided under separate cover. The masterplan is not currently permitted and does not form part of the Proposed Development. Should there be applications for planning permissions in the future that are consistent with the provided masterplan, an assessment will be completed as part of those future proposed developments of their cumulative impacts with then existing or approved developments. Currently, the total potential cumulative impact that it is practically possible to consider is set out below.

The masterplan envisages the development of individual commercial/industrial plots within the Business Park, the specification or other details of which do not exist at this time. Broadly, should commercial/industrial plots be developed within the masterplan area consecutively, using best practice industry mitigation measures, the cumulative impacts in the construction phase are likely to be identical for hydrology and hydrogeology (slight to moderate) to those assessed below for the Proposed Development.

Broadly, during the operational stage should hard standing be increased across the plots it will reduce natural infiltration and required management of surface drainage with potential

slight to moderate impacts on hydrology and hydrogeology. However, recharge to the bedrock aquifer is minimal at the Site and appropriately designed construction work mitigation measures and operational phase sustainable urban drainage systems are likely to reduce the cumulative impact to imperceptible on hydrogeology and hydrology.

8.7. Do Nothing Impacts

If the Proposed Development did not proceed the Site would remain in agricultural use, there would be no impact on the underlying hydrogeology or hydrology or on any downstream receptors. It is envisaged that the land cover would remain unchanged as a greenfield site.

8.8. Potential Impacts

8.8.1. Construction Phase

The potential impacts associated with the Construction Phase in the absence of pre - mitigation measures are set out at **Table 8-6** below.

Table 8-6: The potential pre mitigation impacts associated with the Construction Phase.

Pathway/Mechanism	Potential receptor	Description of effect	Significance of potential impact
Groundwater vulnerability due to excavations. The works will involve excavations of topsoil and subsoil. The Site is mapped as of predominantly low vulnerability with minor areas in the northwest with a moderate and high vulnerability. The depth of excavations will be limited to the uppermost few metres of overburden. There is at least c. 15 m of clayey subsoil with occasional shallow gravel lenses beneath the Site above the bedrock aquifer. The reduced thickness of overburden will not significantly effect the vulnerability of the groundwater in the event of a	Shallow groundwater	A likely, minor, adverse, direct, permanent effect.	Slight

Pathway/Mechanism	Potential receptor	Description of effect	Significance of potential impact
pollution event such as a fuel spillage during the construction works.			
Excavations during construction. The removal of vegetative cover during topsoil and subsoil removal could lead to loss of soil particles through uncontrolled sediment erosion, creating silty runoff to drainage ditches, the Bhailsigh Stream or River Bracken, particularly during periods of high rainfall. This runoff could cause pollution to surface waters through the generation of suspended solids.	Surface water	A likely, moderate, adverse, direct, temporary effect.	Moderate
Run-off from hardstanding and compaction. Creation of hard standing and soil compaction may increase levels of surface water run-off, resulting in localised flooding and subsequent soil erosion.	Surface water	A likely, minor, adverse, direct, permanent effect	Slight
Spill of fuel (stored or used on Site) or other potential contaminants. Accidental spill during construction works may cause short to long term, moderate to significant impacts to shallow groundwater and to surface water if not stored and used in an environmentally safe manner.	Shallow groundwater and surface water	A likely, minor to moderate, adverse, direct, temporary effect	Minor-Moderate

Pathway/Mechanism	Potential receptor	Description of effect	Significance of potential impact
Temporary storage of potentially contaminated material: The Site is a greenfield site and based on review of the site investigation data by Geosyntec, no evidence of contamination was identified during site investigations. Nonetheless there is potential to encounter contaminated material and waste material generated from construction activities may require disposal off-site if not suitable for reuse on site. Temporary storage on-site may be required. Impacts to shallow groundwater and surface water from possible contaminated direct runoff during rainfall events could potentially occur.	Shallow groundwater and surface water	A likely, moderate, adverse, direct, temporary effect for shallow groundwater and surface water.	Moderate
Excavation of contaminated material. No contamination was identified during the Site Investigation. Nonetheless there is potential to encounter contaminated material. In the event of encountering unexpected ground contamination or buried waste material, it is most likely to be highly localised with an associated low level of risk to the environment.	Shallow groundwater or surface water	An unlikely, minor to moderate, adverse, indirect, temporary effect.	Slight to Moderate
Importation of contaminated fill material. The importation of unsuitable or contaminated fill material may pose a	Shallow groundwater or surface water	An unlikely, potentially minor adverse, direct,	Slight

Pathway/Mechanism	Potential receptor	Description of effect	Significance of potential impact
risk to the shallow groundwater aquifer and surface waters.		temporary effect	
Sediment mobilization due to dewatering. Localised dewatering operations from trenches or excavations may be required during the construction works primarily relating to the build-up of rainwater within excavations. Dewatering of the underlying bedrock aquifer is not anticipated. The discharge of silty water to surface water has the potential to impact on surface water quality	Surface water	An unlikely, potentially moderate adverse, direct, temporary effect	Moderate
Potential mobilization of pollutants from Construction site in flood events during the construction phase.	Surface water	An unlikely, minor direct, temporary effect	Slight-

8.8.2. Operational Phase

The potential impacts associated with the Operational Phase in the absence of mitigation pre - measures are set out at **Table 9-7** below.

Table 8-7: The potential pre mitigation impacts associated with the Operational Phase.

Pathway/Mechanism	Description of effect	Significance of potential impact
Spills or leaks causing contaminated surface water runoff from roads and other hardstanding to shallow groundwater	Likely, minor, adverse, direct, temporary, effect.	Slight
Reduced infiltration of rainwater to shallow groundwater or the underlying aquifer. The increased presence of hard standing could potentially reduce the amount of infiltration of rainwater to the bedrock aquifer with potential impact on the hydrogeological and hydrological regime	Likely, moderate, adverse, direct, temporary effect.	Moderate
Increased risk to persons and property due to increased hard standing leading to pluvial/surface water flooding. The Site is situated at a higher or similar elevation than lands to the north, south and east and runoff from these areas will not pose a risk of pluvial flooding at the Site. For the lands at a higher elevation to the west of the Site, surface water from these areas may flow towards the Site. These were accounted for in modelling of the SSRA with flows directed towards the preferential flow paths of watercourses and open drainage channels. There was no	Likely, minor, adverse, direct, permanent effect	Slight

Pathway/Mechanism	Description of effect	Significance of potential impact
potential for pluvial runoff towards neighbouring lands / properties.		
Potential impact of the Proposed Development on fluvial flooding on persons or property or adjacent lands and development. The proposed surface water drainage outfalls (from attenuation pond in Zone A, and 4 No. outfalls from bioretention ponds in Zone F) would not increase flood risk either downstream or upstream of the Proposed Development in the Balrickard Stream due to the outfalls being restricted to predevelopment **r**unoff **r**ates.	Unlikely, minor, adverse, direct, permanent effect	Imperceptible

8.9. Mitigation Measures

During the Construction and Operational Phases every effort will be made to ensure that any detrimental environmental effects will be avoided, prevented or reduced. Potential impacts on hydrology and hydrogeology have been assessed in Section 8.8 pre-mitigation. To mitigate the assessed potential impacts, the measures set out below will be implemented:

8.9.1. Construction Phase

In response to the ecological corridor designation of the Balrickard Stream at the Site, a riparian corridor is proposed in the Proposed Development in line with the Inland Fisheries Ireland guidance to avoid any negative impacts on the watercourse.

During the Construction and Operational Phases every effort will be made to ensure that any detrimental environmental effects will be avoided, prevented or reduced. To further mitigate the potential impacts, the measures set out below will be implemented:

- The control measures outlined in the attached CEMP will be implemented along with the control measures outlined in this EIAR and any additional measures required by the local authority. The CEMP will have regard to the guidance contained in the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015). The construction management team will supervise the construction of the project, including monitoring the performance of the contractors to ensure that the proposed construction phase mitigation measures are implemented.

- In relation to the specific risks assessed in this Chapter, mitigation measures include:

  Construction Phase:

  - **Groundwater vulnerability due to excavations.** The limited depth of excavation activities will minimise the risk of increasing groundwater vulnerability at the Site. Appropriate groundwater protection/mitigation measures in relation to fuel storage and construction traffic are detailed in the following sections and will ensure the risk posed is low, temporary and neutral.

  - **Excavations during construction.** Surface water runoff from areas stripped of topsoil and associated vegetation and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment in runoff prior to controlled discharge to the surface water network. Stockpiles will be stored in an appropriate manner on site for the duration of the construction works and protected for re-use on completion of the main site works. Storage methods that minimise the impacts of weathering will be used. Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff.

  - **Run-off from hardstanding and compaction.** An appropriately designed site drainage system during the construction stage will ensure that surface water runoff is appropriately controlled and treated before discharge. Settlement ponds will be established. Trenched double silt fencing shall be put in place along the boundary with a ten-meter buffer from the onsite drainage ditches and the Balrickard Stream. This fencing shall be in place as one of the first stages on site and prior to commencement of soil removal works. The silt fencing shall act as a temporary sediment control device to protect the drains and watercourses from sediment and potential site water runoff. The fencing

shall be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits. Concrete trucks, cement mixers or drums/bins will only be permitted to wash out in a designated wash out area greater than 50 m from sensitive receptors including drainage ditches, drains or waterbodies. Abstraction of water from watercourses will not be permitted.

Water quality monitoring within the drainage ditches and Balrickard Stream will be undertaken by the contractor during the period of the construction phase of works. The monitoring will be undertaken on a daily, bimonthly, and monthly basis to ensure compliance with the 2009 Surface Water Regulations and with any conditions set by the planning authority. Daily monitoring will comprise visual and on-site monitoring (e.g. pH, Electrical Conductivity, Temperature and Total Dissolved Solids). Bimonthly monitoring will involve samples collected for laboratory testing including Total Suspend Solids (TSS), Total Dissolved Solids (TDS), pH, Electrical Conductivity, Chloride and Ammoniacal Nitrogen. Monthly monitoring will include heavy metals, nitrate, nitrite, ORP and total hydrocarbons. Baseline monitoring of the Balrickard Stream will be undertaken to determine the condition prior to commencement of the construction works. Any exceedances of baseline conditions attributed to the construction operations will be immediately assessed by the contractor and identification of the source of the impact identified to facilitate appropriate measures to prevent any further potential impacts.

- **Spill of fuel (stored or used on Site) or other potential contaminants.** Good construction management practices, as outlined in the CIRIA guidance Control of Water Pollution from Construction Sites – Guidance for consultants and contractors (Masters-Williams et al., 2001) will be employed by the appointed contractor to minimise the risk of transmission of hazardous materials as well as pollution of adjacent watercourses and groundwater. The construction management of the Site will take account of these recommendations to minimise as far as possible the risk of soil, groundwater and surface water contamination. This will include employing only competent and experience workforce, and site-specific training of site managers, foremen and workforce, including all subcontractors, in pollution risks and preventative measures. The appointed contractor must ensure that

- Ensure that all areas where liquids (including fuel and waste fuel) are stored, or cleaning is carried out, are in designated impermeable areas that are isolated from the surrounding area, including surface water drains and open waters (incl. excavations) and within a secondary containment system, e.g. by a roll-over bund, raised kerb, ramps or stepped access; The location of any fuel storage facilities shall be considered in the design of all construction compounds. Fueling, lubrication and storage areas and site offices will not be located within 25m of drainage ditches, surface waters or open excavations. These are to be designed in accordance with relevant guidelines and codes of best practice and will be fully bunded;
- Good housekeeping at the Site (daily site clean-ups, use of disposal bins, etc.) during the entire Construction Phase;
- Skips will be closed or covered to prevent materials being blown or washed away and to reduce the likelihood of contaminated water leakage;
- Hazardous wastes such as waste oil, chemicals and preservatives, will be stored in sealed containers and kept separate from other waste materials while awaiting collection by a registered waste carrier; Potential pollutants to be adequately secured against vandalism; Provision of proper containment of potential pollutants according to codes of best practice;Thorough control during the entire Construction Phase to ensure that any spillage is identified at early stage and subsequently effectively contained and managed; andSpill kit to be provided and to be kept close to the storage area. Staff to be trained on how to use spill kits correctly.

An Environmental Incident Response Plan, as presented within the attached CEMP,will be implemented by the appointed contractor, which will identify the actions to be taken in the event of a pollution incident. It will address containment measures, emergency discharge routes, a list of appropriate equipment and clean-up materials and notification procedures to inform the relevant environmental protection authority. Sediment control methods will be implemented by the appointed contractor..

All waste containers (including all ancillary equipment such as vent pipes and

refueling hoses) will be stored within a secondary containment system (*e.g.* a bund for static tanks or a drip tray for mobile stores and drums). The bunds will be capable of storing 110% of the tank capacity. Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% of the aggregate capacity (whichever is greater). Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity. Where more than one drum is stored the drip tray must be capable of holding 25% of the aggregate capacity of the drums stored.

Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times.

Refueling may only occur within a designated bunded area. Surface water runoff from a refueling area will discharge to a drain via a full retention petrol interceptor. Prior to the interceptor, a silt trap will be remove the majority of suspended solids. The provision of wheel wash facilities close to the site entrance shall reduce the deposition of mud, soils and other substances on the surrounding road network. Oil which accumulates within the interceptor shall be regularly removed by an appropriately licensed contractor. In addition, the interceptor shall be appropriately maintained in accordance with the manufacturer's specification.

Monitoring prior to, during and post construction works of surface water quality shall be undertaken to ensure minimum disturbance of water quality in the boundary ditch. During the construction phase, the monitoring programme will include daily checks, weekly inspections and monthly audits to ensure compliance with the Construction Environmental Management Plan. Hazardous waste shall be dealt with in accordance with the Waste Management (Hazardous Waste) Regulations. An Emergency Operating Plan (EOP) to deal with the possibility of contamination or fuel spills, *e.g.,* pumping of wells or sumps to collect contaminated groundwater or surface water for treatment will be developed and incorporated into an overall Construction & Waste Management Plan (CWMP) for the development. The CIRIA document (2001) recommendations for developing a contingency plan for pollution emergencies will be implemented and include the following:

- Containment measures.
- Emergency discharge routes.

- List of appropriate equipment and clean-up materials.
- Maintenance schedule of equipment.
- Details of trained staff.
- Details of staff responsibilities.
- Notification procedures to inform the relevant environmental protection authority.
- Audit and review schedule; and,
- List of specialist pollution clean-up companies and their telephone numbers.

Any vehicles utilised during the operational phase shall be maintained on a weekly basis and checked daily to ensure any damage or leakages are corrected. The potential impacts are limited by the size of the fuel tank of the largest plant / vehicles used on the Site. Precautions shall be taken to avoid spillages. These include:

- Use of secondary containment e.g. bunds around oil storage tanks;
- Use of drip trays around mobile plant;
- Supervising all deliveries and refueling activities; and,
- Designating and using specific impermeable refueling areas isolated from surface water drains.

- **Temporary storage of potentially contaminated material:** Appropriate safe storage of all and waste materials shall be implemented during the construction works in accordance with the Construction Waste Management Plan (CWMP) for the works. Measures include:
  - Covering of stockpiles to minimise surface water runoff,
  - Creation of berms around stockpiles to contain runoff during heavy rainfall events.
  - Waste segregation and storage in dedicated sealed skips

- **Excavation of contaminated materials.** Special environmental and human

health contingency plans and procedures, following best-practice guidance, will be developed for the unexpected discovery of contaminated or illegally deposited waste materials. In the event of encountering contaminated ground or buried waste, an appropriately scoped contaminated land site investigation will be undertaken by a contaminated land consultant comprising soil monitoring, water monitoring, gas and vapour monitoring and groundwater level monitoring as appropriate. All works will be undertaken in accordance with best practice and EPA Guidance on the Management Of Contaminated Land and Groundwater at EPA Licensed Sites, 2013.On completion of the above, a suitably detailed remediation program of works will be undertaken under the direction and supervision of a contaminated land consultant. The outcome of the investigation will dictate the most appropriate remedial solution for the development. Samples of ground suspected of contamination will be tested for contamination. Should dewatering be required in areas of contaminated ground, it shall be designed by the appointed contractor to minimise the mobilisation of contaminants into the surrounding environment.

- **Importation of contaminated fill material.** All imported fill material shall be sourced from approved sources and appropriately certified and fit for purpose. All fill material will be confirmed to be inert prior to importation to the Site including confirmation of the chemical testing and a visual assessment. Fill sourced from non-licenced/non-permitted facilities will require prior authorisation under Article 27 legislation.

- **Sediment mobilization due to dewatering.** The temporary disposal and treatment of any water pumped from any excavations will be carefully managed. All waters from excavations will be passed through an on-site construction stage drainage system before being discharged and filtering of surface water for suspended solids will be carried out. Untreated water discharges or runoff shall not be permitted from the Site.

- All waters abstracted from excavations will be monitored, as a minimum, on a daily, bimonthly, and monthly basis to ensure compliance with the 2009 Surface Water Regulations and with any conditions set by the planning authority. Daily monitoring will comprise visual and on-site monitoring (e.g. pH, Electrical Conductivity, Temperature and Total Dissolved Solids). Bimonthly monitoring will involve samples collected for laboratory testing including Total Suspend Solids (TSS), Total Dissolved Solids (TDS), pH, Electrical Conductivity, Chloride and

Ammoniacal Nitrogen. Monthly monitoring will include heavy metals, nitrate, nitrite, ORP and total hydrocarbons. Any exceedances of baseline conditions in that is attributed to the construction operations will be immediately assessed by the contractor and identification of the source of the impact identified to facilitate appropriate measures to prevent any further potential impacts. The contractor will consult with the local authority to facilitate the application and granting of a temporary discharge licence if required. **Potential mobilisation of pollutants from construction site in flood events during the construction phase.** The implementation of the mitigation measures above, in particular the bulleted measures under*: Run-off from hardstanding and compaction*; S*pill of fuel (stored or used on Site) or other potential contaminants; and temporary storage of potentially contaminated material,* will be applied to mitigate this this risk.

8.9.2. Operational Phase

- Spills or leaks causing contaminated surface water runoff from roads and other hardstanding to shallow groundwater. An appropriately designed drainage system has been designed for the subject site. The system was designed in accordance with SUDS guidance. The SuDS features include an attenuation pond, raingardens and bioretention ponds, Nature-based Solutions (NBS) and conveyance networks
- Reduced infiltration of rainwater to shallow groundwater or the underlying aquifer An appropriately designed drainage system has been designed for the subject site. The system was designed in accordance with the CIRIA SUDS Manual 2015 It incorporates partial infiltration design on SUDS features.
- Increased risk to persons, property due to increased hardstanding leading to pluvial/surface water flooding or fluvial flooding. To mitigate on-site potential flood risk to land and property, an appropriately designed drainage system has been prepared for the subject site in accordance with local authority drainage standards. **Drainage system maintenance by the ultimate owner/occupier shall be required to include cyclical (min. annual) check of any flow control device – in particular clearing of debris; Cyclical (min. annual) visual inspection of any surface or underground attenuation features – blockages and obstructions to be removed by jetting as required.**

  Off-site surface water effects will be mitigated by provision of SUDS components and no increase in rate and volume of run-off of surface water from the Site as a result of the Proposed Development. The proposed

development crosses an existing open drainage channel in the northern part of the Site. While not classed as a watercourse on EPA / OPW datasets, so not subject to Section 50 or forming a Flood Zone, the existing drainage function of the channel should be maintained. Details / sizing of required culvert and / or diversion to be confirmed at detailed design stage as part of surface water management design for the Site. **Watercourse maintenance by the ultimate owner/occupiers of the Site shall be required to include general watercourse / culvert maintenance which will reduce the risk of blockage at downstream culverts and screens and maintain the capacity of the channels. The following measures are intended to inform any future maintenance programme for watercourses and culverts: Removal of any items within the channel that can impede flow; adequate attention to river banks, with removal of brambles, bushes and stiff vegetation that reduce flow capacity/increase debris collection; removal of weed growth from the centre of the channel; removal of build up of silt in channels and at culvert inlets with appropriate disposal; Cyclical (min. annual) visual inspection of culvert inlets and screens and removal of debris as required, ensuring debris removed is not deposited in an area likely to fall back into the channel.**

8.10. Residual Impacts

Table 8-8: Summary of Construction and Operational Phase Predicted Residual Impacts following the Implementation of Mitigation Measures

Construction Phase				
Pathway/Mechanism	**Receptor**	**Pre-mitigation effect**	**Pre-mitigation significance of impact**	**Post-mitigation significance of impact**
Groundwater vulnerability due to excavations. The works will involve excavations of topsoil and subsoil. The Site is mapped as of low vulnerability with a small area	Shallow groundwater	A likely, minor, adverse, direct, permanent effect.	Slight	Imperceptible

in the northwest of the Site of moderate and high vulnerability. The depth of excavations will be limited to the uppermost metres in the overburden. There is c. 15 m of clayey subsoil beneath the Site above the bedrock aquifer. The reduced thickness of overburden will not significantly effect the vulnerability of the groundwater in the event of a pollution event such as a fuel spillage during the construction works.				
Excavations during construction. The removal of vegetative cover during topsoil and subsoil removal could lead to loss of soil particles through uncontrolled sediment erosion, creating silty runoff to drainage ditches, the Bhailsigh Stream or River Bracken, particularly during periods of high rainfall. This runoff could cause pollution to surface waters through the generation of suspended solids.	Surface water	A likely, moderate, adverse, direct, temporary effect.	Moderate	Imperceptible
Run-off from hardstanding and compaction. Creation of hard standing and soil compaction may	Surface water	A likely, minor, adverse, direct,	Slight	Imperceptible

increase levels of surface water run-off resulting in localised flooding and subsequent soil erosion.		permanent effect		
Spill of fuel (stored or used on Site) or other potential contaminants. Accidental spill during construction works may cause short to long term, moderate to significant impacts to shallow groundwater and to surface water if not stored and used in an environmentally safe manner.	Shallow groundwater and surface water	A likely, minor to moderate, adverse, direct, temporary effect	Minor-moderate	Imperceptible
Temporary storage of potentially contaminated material: The Site is a greenfield site and no evidence of contamination was identified during site investigations. Nonetheless there is potential to encounter contaminated material. In addition waste material generated from construction activities may require disposal off-site if not suitable for reuse or recovery off site. Temporary storage on-site may be required. Impacts to shallow groundwater and surface water from possible contaminated direct runoff	Shallow groundwater and surface water	A likely, moderate, adverse, direct, temporary effect for shallow groundwater and surface water.	Moderate	Imperceptible

during rainfall events could potentially occur.				
Excavation of contaminated material. No contamination was identified during the Site Investigation. Nonetheless there is potential to encounter contaminated material. In the event of encountering unexpected ground contamination or buried waste material, it is most likely to be highly localised with an associated low level of risk to the environment.	Shallow groundwater or surface water	An unlikely, potential minor to moderate, adverse, indirect, temporary effect.	Slight to Moderate	Imperceptible
Importation of contaminated fill material. The importation of unsuitable or contaminated fill material may pose a risk to the shallow groundwater aquifer and surface waters.	Shallow groundwater or surface water	An unlikely, potentially minor to major adverse, direct, temporary effect	Slight	Imperceptible
Sediment mobilization due to dewatering. Localised dewatering operations from trenches or excavations may be required during the construction works primarily relating to the build up of rainwater within excavations. Dewatering of the underlying bedrock aquifer is not anticipated. The discharge of	Surface water	An unlikely, potentially moderate adverse, direct, temporary effect	Moderate	Imperceptible

silty water to surface water has the potential to impact on surface water quality				
Potential mobilisation of pollutants from Construction site in flood events during the construction phase.	Persons and Property, Surface water	An unlikely potentially slight adverse, direct, temporary effect	Slight	Imperceptible
Operational Phase				
Pathway/Mechanism	**Receptor**	**Pre-mitigation effect**	**Pre-mitigation significance of impact**	**Post-mitigation significance of impact**
Spills or leaks causing contaminated surface water runoff from roads and other hardstanding to shallow groundwater	Shallow groundwater and surface water	Likely, minor, adverse, direct, temporary, effect.	Slight	Imperceptible
Reduced infiltration of rainwater to shallow groundwater or the underlying aquifer. The increased presence of hard standing could potentially reduce the amount of infiltration of rainwater to the bedrock aquifer with potential impact on the hydrogeological and hydrological regime	Shallow groundwater and surface water	Likely, moderate, adverse, direct, temporary effect.	Moderate	Imperceptible

Increased risk to persons and property due to increased hardstanding leading to pluvial/surface water flooding.	Flood risk to persons and property	Likely, minor, adverse, direct, permanent	Slight	Imperceptible
Potential impact of the Proposed Development on fluvial flooding on persons or property or adjacent lands and development.	Flood risk to persons and property	Unlikely, minor, adverse, direct, permanent effect	Imperceptible	Imperceptible

8.11. References

4. External Geotechnical Report 3082, Northern Motorway – Airport to Balbriggan (JC/JV, 1998)
5. M1 Business Park Zone A and M1 Business Park Zone F, referred to together as the Ground Investigation Report, Site Investigations Limited, 2023 (Site Investigations Limited, 2023);
6. Flood Risk Assessment. M1 Business Park – Zones A and F. McCloy Consulting, March 2024.

9. Air Quality and Climate

9.1. Introduction

This chapter evaluates the impact which the Proposed Development may have on Air Quality and Climate as defined in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

This chapter has bene prepared by Brian Sheridan of Odour Ireland who has a Hons Degree in Analytical Science from Dublin City University, Masters in Engineering Technology from UCD and a Ph . D in Engineering Science specialising in Chemical and Biological Engineering. Brian also completed a Post-Doctoral Research in the Department of Chemical Engineering in UCLA, California and has over 25 yrs. experience in Air Quality assessments and completed in excess of 200 EIA's / EIARS / Air Quality assessments.

The chapter describes the potential impacts to ambient air quality from the proposed development of M1 Business Park to be located in Rowans Little, Co. Dublin. Particular attention is given to the potential exposure of receptors to airborne pollutants resulting from the development and operation of the subject site. Sensitive receptors, including local business units and Sensitive receptors within circa 0.75 kilometre (km) of the subject site have been included within the assessment.

The proposed development comprises the provision of the key infrastructure to facilitate the future development of the lands for a logistics/warehousing development. This development will become an extension of the existing M1 Business Park at Courtlough. The proposals involve the demolition of all existing buildings on site. Provision of internal roads and services infrastructure (surface water, foul and water supply) to facilitate the future development of the lands including public lighting, utility connections (power, telecommunications and gas) and SuDS drainage. Provision of new access roads from 'Bhailsigh Road' (L1140) to Zone A and Zone F and a new cycle and pedestrian route over the M1 motorway via the (L1140) towards the R132. Upgrades and modifications to the existing roundabout along the L1140. All ancillary landscaping, road works, boundary treatments and site development works to support the development.

The location of the site is c. 45 m OD. A detailed description of the proposal is presented in Chapter 2 of the EIAR.

The scope of the study consists of the following components:

- assessment of effects on climate;

- review of background ambient air quality in the vicinity of the application area using available collected baseline and reference data generated by the EPA and other referenced sources;
- identification of the significant substances likely to be released from the proposed facility during construction and when operational;
- identification of predicted ground level concentrations (GLC's) of released substances at the site boundary and at identified sensitive receptors in the local environment;
- evaluation of the significance of these predicted concentrations, including consideration of whether these GLC's are likely to exceed the ambient air quality standards and guidelines;
- assessment of other potential air quality impacts such as construction dust and emissions from construction, operational phase traffic and operational process emissions associated with the proposed plant.

9.2. Methodology

This report has been prepared in accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022). Potential impacts have been described with regard to Table 3.3 of the guidelines.

9.2.1. Criteria for Rating of Impacts

Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values for "Air Quality Standards" are health or environmental based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 9-1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards, guideline and or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporates European Commission Directive 2008/50/EC which has set limit values for the pollutants such as Oxides of nitrogen, Particulate matter (PM10), Carbon monoxide, Benzene and Sulphur dioxide relevant to the assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and also includes ambient limit values relative to $PM_{2.5}$.

Table 9-1: Ambient Air Quality Standards and Guideline Limit Values for Air Pollutants Considered in Assessment

Parameter	**Directive / Regulation**	**Limit Type**	***Value***
Nitrogen Dioxide (NO_2)	2008/50/EC and SI 739 of 2022	Hourly limit for protection of human health – not to be exceeded more than 18 times/year-1 hour average	200 $\mu g/m^3$ NO_2
		Annual limit for protection of human health-Annual	40 $\mu g/m^3$ NO_2
		Annual limit for protection of vegetation-Annual	30 $\mu g/m^3$ $NO + NO_2$
Carbon monoxide (CO)	2008/50/EC and SI 739 of 2022	8-hour limit (on a rolling basis) for protection of human health	10,000
Sulphur Dioxide (SO_2)	2008/50/EC and SI 739 of 2022	Hourly limit for protection of human health – not to be exceeded more than 24 times/year-1 hour average	350 $\mu g/m^3$
		Daily limit for protection of human health – not to be exceeded more than 3 times/year-24hr average	125 $\mu g/m^3$
		Annual & Winter limit for the protection of ecosystems-Annual	20 $\mu g/m^3$
Particulate Matter as PM_{10}	2008/50/EC and SI 739 of 2022	24-hour limit for protection of human health – not to be exceeded more than 35 times/year-24 hour average	50 $\mu g/m^3$ PM_{10}
		Annual limit for protection of human health-Annual	40 $\mu g/m^3$ PM_{10}

Parameter	**Directive / Regulation**	**Limit Type**	***Value***
Particulate matter as $PM_{2.5}$	2008/50/EC and SI 739 of 2022	Annual limit for protection of human health-Annual	25µg/m^3 $PM_{2.5}$
Benzene	2008/50/EC and SI 739 of 2022	Annual limit for protection of human health	5 µg/m^3
Total depositional dust (TDD)	TaLuft / EPA Guidelines	Daily limit averaged over 1 month to minimise nuisance dust at receptor	350 mg/m^2/day

Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust which are less than 10µm in size and the EU ambient air quality standards outlined in Section 9.2.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction and operation phase of a development in Ireland.

However, guideline for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission levels for dust deposition of 350 mg/m^2/day) averaged over a one month monitoring period at any receptor outside the site boundary. Recommendations from the Department of the Environment, Health and Local Government (DOEHLG, 2004) apply the Bergerhoff limit of 350 mg/m^2/day to the site boundary for quarries. This limit value can be implemented with regard to dust impacts from construction and operation phase of the Proposed Development.

This limit value of 350 mg/m2/day has also been incorporated into Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006) and the Irish Concrete Federation Environment Code (ICF, 2005).

Gothenburg Protocol

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. In 2010, the Gothenburg Protocol was revised to include national

emissions reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emissions reduction commitments for $PM_{2.5}$.

European Commission Directive 2001/81/EC and the National Emissions Ceiling Directive (NECD), prescribes the same emissions limits as the 1999 Gothenburg Protocols. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005. The data available from the EPA in 2019 (EPA, 2019) indicated that Ireland complied with the emissions ceilings for SO_2 and NH_3 but failed to comply with the ceiling for NO_x and NMVOCs. Directive (EU) 2016/2284 "On the reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/EC/EC" was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_x, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020 emissions targets are 25.5 kt for SO_2 (65% on 2005 levels), 66.9kt for NO_x (49% reduction on 2005 levels), 56.9 kt for NMVOCs (25% reduction on 2005 levels), 112 kt for NH_3 (1% reduction on 2005 levels) and 15.6 kt for $PM_{2.5}$ (18% reduction on 2005 levels). In relation to 2030, Ireland's emission targets are 10.9 kt (85% below 2005 levels) for SO_2, 40.7 kt (69% reduction) for NO_x, 51.6 kt (32% reduction) for NMVOC, 107.5 kt (5% reduction) for NH_3 and 11.2 kt (41% reduction) for $PM_{2.5}$.

Climate Agreements

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002 (UNFCCC, 1997). For the purposes of the UN burden sharing agreement under Article 4 of the Doha Amendment to the Kyoto Protocol, in December 2012, Ireland agreed to limit the net growth of the six Greenhouse Gases (GHGs) under the Kyoto protocol to 20% below the 2005 level over the period 2013 to 2020 (UNFCCC, 2012). The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as Emissions Trading and burden sharing. The most recent Conference of the Parties to the Convention (COP24) took place in Katowice, Poland from the 4th to the 14th December 2018 and focused on advancing the implementation of the Paris Agreement. The Paris Agreement was established at COP21 in Paris in 2015 and in an important milestone in terms of international climate change agreements. The Paris agreement was agreed by over 200 nations and has a stated aim of limiting global temperature increase of no more than 2°C above pre-industrial levels with efforts to limit the rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions of greenhouse gas

emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made on elevating adaption onto the same level as action to cut and curb emissions.

The EU in 2014 agreed the "2030 Climate and Energy Policy Framework" (EU, 2014). The European Council endorsed a binding EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The target will be delivered collectively by the EU in the most cost-effective manner possible, with the reductions in the ETS and non-ETS sector amounting to 43% and 30% by 2030 compared to 2005, respectively. Secondly, it was agreed that all Member States will participate in this effort, balancing considerations of fairness and solidarity. The policy also outlines, under "Renewables and Energy Efficiency", an EU binding target of at least 27% for the share of renewable energy consumed in the EU in 2030.

In relation to the EU 20-20-20 targets for CO_2, Ireland has a target of 20% reduction in non-Emission Trading Scheme (non-ETS) greenhouse gas emissions by 2020 relative to the 2005 levels. The EPA confirmed that the 2016 levels are 0.3 Mt CO_2eq over the target and projections to the 2020 indicate that the target is unlikely to be met in future years.

9.2.2. Construction phase

Air Quality

There is the potential for a number of emissions to the atmosphere during the construction phase of the proposed development. In particular, the construction and excavation activities may generate quantities of dust in the immediate region of the construction activities and along the route of the haulage trucks.

Climate

The impact of the construction phase of the development on climate was determined by a qualitative and quantitative assessment of the nature and scale of greenhouse gas generating activities associated with the Proposed Development.

9.2.3. Operational Phase

Air Quality

The assessment methodology as a result of impacts associated with traffic involves air dispersion modelling using the UK Design Manual for Roads and Bridges Screening Model (UK Highways Agency, DEFRA, 2007) (Version 1.03c, July 2007), the NO_X to NO_2 Conversion Spreadsheet (UK DEFRA, 2016) (Version 6.1), and following guidance issued by Transport

Infrastructure Ireland (TII, 2011), UK Highways Agency (2007), UK Department for Environment, Food and Rural Affairs (2018) and the EPA (2017 Draft; 2015 Draft).

Transport Infrastructure Ireland guidance states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or,
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills, etc.).

In order to determine which road links need inclusion in the local air quality assessment, they must meet one or more of the following criteria. This criterion is stipulated in the UK Design Manual for Roads and Bridges guidance (UK Highways Agency, 2007), on which Transport Infrastructure Ireland guidance (2011) was based on Proposed Development.

- Road alignment change of 5 m or more,
- Daily traffic flow changes by 1,000 AADT or more,
- HGV flows change by 200 vehicles per day or more,
- Daily average speed changes by 10 km/h or more, or
- Peak hour speed changes by 20 km/h or more.

The DMRB model was completed and included in the overall impact assessment on Air quality.

With regards to process-based emissions there are no defined scheduled emission points for the development. Individual development units will be required to satisfy such an assessment during their planning consent application.

With regards to the Greenhouse Gases associated with the proposed development, each individual development unit will be required to take account of greenhouse gases during planning consent application.

9.3. Characteristics of the development

A detailed description of the proposal is presented in Chapter 2 of the EIAR.

The proposed development facilities will include the following:

- Demolition of existing single dwelling located along the western boundary of the site;

- Provision of roads and services infrastructure (surface water, foul and water supply) to facilitate the future development of the lands including public lighting, utility connections (power, telecommunications and gas) and SuDS drainage;
- Provision of a new access road from 'Bhailsigh Road' (L1140) and a new cycle and pedestrian route over the M1 motorway via the (L1140);
- Upgrades and modifications to the existing roundabout along the L1140;
- All ancillary landscaping, road works, boundary treatments and site development works to support the development.

9.3.1. Construction phase

The existing greenfield site will be developed with the following facilities to include the construction of:

- Demolition of a single-storey 200-square-metre (m^2) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- Demolition of 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;
- Provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and M1 motorway, referred to as Zone A and F;
- Zone A and F lands are located north and south of Bhailsigh Road (L1140), respectively, which connect to Junction 5 of the M1 Motorway and are located in the townlands of Rowan's Big and Rowan's Little;
- Preparation of indicative Masterplan for Zone A and F which contains layouts of the future planned commercial properties, consisting of mixed-use, warehousing and distribution units including associated loading bays for HGVs, service compounds, ESBN substations and parking areas to service each commercial unit site, which would be subject to individual planning permission applications;
- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k- to 105k-square-feet (ft^2) units with the potential to combine plots should larger units be required;
- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications;

- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties; and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

9.3.2. Operational Phase

The proposed facility will be prepared through the implementation of ground, civils and services. Each individual plot within the proposed M1 Business Park will be individually developed and subject to future planning consent. There are currently no emissions associated with air quality from the proposed development.

9.4. Baseline Conditions

9.4.1. Sensitive receptors

The proposed development comprises the provision of the key infrastructure to facilitate the future development of the lands for a logistics/warehousing development. This development will become an extension of the existing M1 Business Park at Courtlough. The proposals involve the demolition of all existing buildings on site. Provision of internal roads and services infrastructure (surface water, foul and water supply) to facilitate the future development of the lands including public lighting, utility connections (power, telecommunications and gas) and SuDS drainage. Provision of new access roads from ‘Bhailsigh Road’ (L1140) to Zone A and Zone F and a new cycle and pedestrian route over the M1 motorway via the (L1140) towards the R132. Upgrades and modifications to the existing roundabout along the L1140. All ancillary landscaping, road works, boundary treatments and site development works to support the development.

The site is located in the townland of Rowans Big and Rowans Little, approximately 6km south of Balbriggan, Co Dublin and just west of the existing M1 Motorway and M1 Business Park.

Zone A and F lands are located north and south of Bhailsigh Road (L1140), respectively, which connect to Junction 5 of the M1 Motorway. The proposed site is 33.81ha.

The site is currently used predominately for agriculture with an abandoned water storage reservoir and associated pump station located on the western boundary of Zone A. 10 No. existing agricultural sheds, stables, warehouses and residential homes are also located in the north western portion of Zone F. The existing land uses within the redline boundary are shown in Figure 2 below. An existing substantial roundabout, public footpath and signage are located to the south of Zone A and north of Zone F and provides access points for the proposed development. A section of the LL140/R132 is included within the site boundary to provide upgrades to the road to improve accessibility for pedestrians and cyclists. The upper reach of the Bracken River flows through Zone F, originating from aculvert crossing underneath Bhailsigh Road (LL140) and draining in a southeasterly direction before crossing the M1 Motorway via another culvert. An existing crossing over the Bracken River is located near the Bhailsigh Road roundabout to access the existing agricultural buildings and dwellings.

Any houses and commercial developments within a 0.75 km of the site are considered in the assessment for air quality pollutants outlined in Section 9.2.1 of the EIAR. Receptors in proximity to the development can potentially be affected by outlined pollutants.

Other Chapter studies or elements of the other chapters (e.g. climate) can consider a wider study area as appropriate and sensitive receptors as outlined within.

Twenty three specific sensitive receptor properties in the vicinity of the subject site were detailed within the assessment (see Table 9-2).

Table 9-2: Sensitive receptors in the vicinity of subject site.

Receptor Identity	Receptor Description	Distance
A	Dwelling House and Farm – House with adjoining Agricultural sheds	c. 20m from North-West corner of site boundary
B	Dwelling house and farm – House with adjoining Agricultural sheds	c. 680m North-West of site boundary
C	Dwelling House	c. 570m West of site boundary
D	Dwelling House	c. 750m West of site boundary
E	Dwelling House	c. 670m West of site boundary
F	Dwelling House	c. 645m West of site boundary
G	Dwelling house	c. 675m West of site boundary
H	Dwelling house	c. 605m West of site boundary
I	Farm - Agricultural sheds	c. 485m West of site boundary
J	Dwelling House	c. 415m West of site boundary
K	Dwelling House	c. 370m West of site boundary
L	Dwelling House	c. 345m West of site boundary
M	Dwelling House	c. 230m West of site boundary
N	Farm - Agricultural sheds	c. 640m South of site boundary
O	Dwelling House and Farm – House with adjoining Agricultural sheds	c. 750m South-East of site boundary

Receptor Identity	Receptor Description	Distance
P	Cluster of Dwellings – Group of houses	c. 745m South-East of site boundary
Q	Dwelling House	c. 750m South-East of site boundary
R	Cluster of Dwellings – Group of houses	c.750m South-East of site boundary
S	Dwelling house and farm – House with adjoining Agricultural sheds	c.300m South-East of site boundary
T	Farm - Agricultural sheds	c. 350m East of site boundary
U	Industrial Building – Fyffes Factory	c. 500m East of site boundary
V	Industrial Building – Applegreen Filling Station	c. 155m East of site boundary
W	Industrial Buildings – Dole, Cube Kitchens, LMS, Murdock Builders Merchants, Danann, Ace Express Freight	c. 160m North-East of site boundary

9.4.2. Meteorological Data / Climate

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions and stationary sources, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic and stationary based sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ to PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative synoptic weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 18 km south of the proposed site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speed over a five year period (see Figure 9-1). For data collated during the five representative years (2016 to 2020) (Met Eireann, 2021), the predominant wind direction is westerly, south easterly and southerly, with general moderate wind speeds averaging 4 to 6 m/s for the period 2016 to 2020 (source, www.met.ie).

Poor dispersion can occur under certain weather characteristics known as inversions that form in very light or calm wind and stable atmospheric conditions. The wind roses presented in Figure 9-1 identifies that such wind conditions are very infrequent (0.05% of hours in the years 2016 to 2020 inclusive).

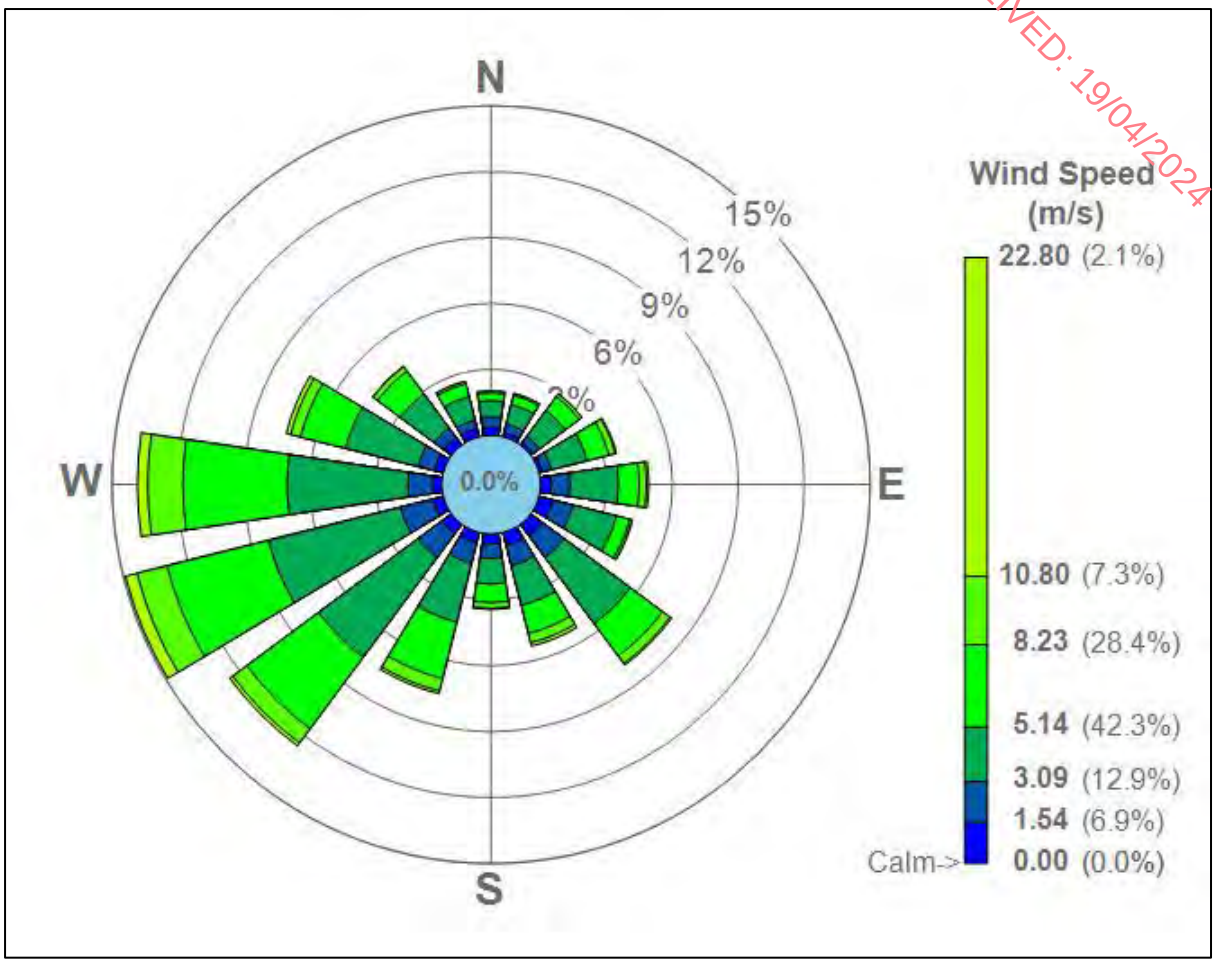

Figure 9-1: Graphical representation of hourly meteorological data Dublin Airport 2016 to 2020 (www.met.ie)

9.4.3. Effects of Climate Change in Ireland

The potential effects of climate change on a global scale have been investigated by the Intergovernmental Panel on Climate Change (IPCC). The potential resulting impacts in Ireland are outlined below and include the following:

- Significant increases in winter rainfall, in the order of 10% in the southeast, with a corresponding increase in the water levels in rivers, lakes and soils. Flooding will be more frequent than experienced at present.
- Lower summer rainfall, in the order of 10% in the southern half of the country. Less recharge of reservoirs in the summer leading to more regular and prolonged water shortages than at present.

- An overall annual decrease in rainfall in the east of the country and a resultant decrease in baseline river flows.
- Increased agricultural production, with new crops becoming more viable and potentially reduced agricultural costs. Grass growth could enjoy beneficial effects with an increase of 20% possible with higher temperatures and changes in rainfall patterns.

A paper entitled *Establishing Reference Climate Change Scenarios for Ireland* (Sweeney & Fealy, 2003) identified future climate change scenarios for Ireland. This paper predicts that the average annual temperature in Ireland will increase by 1.5°C by the 2050's with an average increase in summer temperature of 2°C. These temperature increases are predicted to be accompanied by alterations in precipitation levels. The authors estimate an 11% increase in precipitation levels during the winter periods, whilst a more significant increase in precipitation levels during the summer periods were predicted i.e. 25% by the 2070's.

It is important to note that considerable uncertainty is encountered when attempting to predict future climate scenarios. This uncertainty arises due to the difficulties associated with determining future demographic changes, economic development, technological advancement and future emissions of greenhouse gases to the atmosphere. Further difficulty is associated with the complexity of the climatic system and uncertainty surrounding these processes.

It is recognised that Ireland cannot, on its own, prevent or ameliorate the impacts of climate change. However, the 2020 climate and energy package for Europe states a number of greenhouse reduction target to be achieved to include:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- Raising the share of EU energy consumption produced from renewable resources to 20%;
- A 20% improvement in the EU's energy efficiency.

9.4.4. Baseline Air Quality

The EU Air Framework Directive deals with each EU Member State in terms of 'Zones' and 'Agglomerations' for air quality. For Ireland, four zones, A, B, C and D have been defined and are included in the *Air Quality Standards (AQS) Regulations* (SI No 739 of 2022).

- Zone A – Dublin conurbation
- Zone B – Cork conurbation

- Zone C – 21 towns in Ireland with population > 15,000
- Zone D – remaining area of Ireland

Rowans Little and its environs are classified for the purposes of this assessment as falling within Zone D. While there is some availability of recent and historic data for air quality in major urban and rural areas, there is no specific data available from the national air quality monitoring database for air quality specific to the subject site. As such, available data from the EPA Monitoring Site located in a Zone D area has been referenced for Nitrogen Oxides, Sulphur Dioxide, Benzene and PM_{10} and $PM_{2.5}$ levels (see Table 9-3) and is considered representative of background air quality in the study area. In addition, specific baseline monitoring data for specified compounds were monitored within the subject site location for reference purposes (see Table 9-3). This survey was undertaken in order to assess the baseline air quality concentrations of specific key pollutants contained within Table 9-3. The results of data collation are presented in Table 9-3.

Table 9-3: EPA and reference site specific air quality data.

Parameter - Zone D unless otherwise stated for NO_2, SO_2, PM_{10} & $PM_{2.5}$, Benzene & CO	**Annual average 2021 ($\mu g/m^3$)**	**Annual average Year 2022 ($\mu g/m^3$)**	**Site specific Baseline data ($\mu g/m^3$) (collected b/n 11/08/2023 & 08/09/2023 @ 6 locations (L1 - L6) within boundary of site)**	**Notes**
Oxides of nitrogen (NO_2) - Zone C	7.5	7.3	6.65 to 20.02	EPA Baseline reports - Air quality in Ireland 2021 & 2022
Sulphur dioxide (SO_2) - Zone C	4.2	5.0	<1.58	EPA Baseline reports - Air quality in Ireland 2021 & 2022
Particulate matter PM_{10} - Zone C	11.9	12.7	-	EPA Baseline reports - Air quality in Ireland 2021 & 2022
Particulate matter $PM_{2.5}$ - Zone C	8.7	8.4	-	EPA Baseline reports - Air quality in Ireland 2021 & 2022
Benzene - Zone C	0.4	0.5	0.34 to 0.68	EPA Baseline reports - Air quality in Ireland 2021 & 2022
Carbon monoxide (CO) - Zone C	0.3	0.8	-	EPA Baseline reports - Air quality in Ireland 2021 & 2022
Total depositional dust ($mg/m^2/day$)	-	-	133-156	Collected on site between 11/08/2022 & 08/09/2022 - Range from Locations L1 - A6 within boundary of site - see Figure 9-2

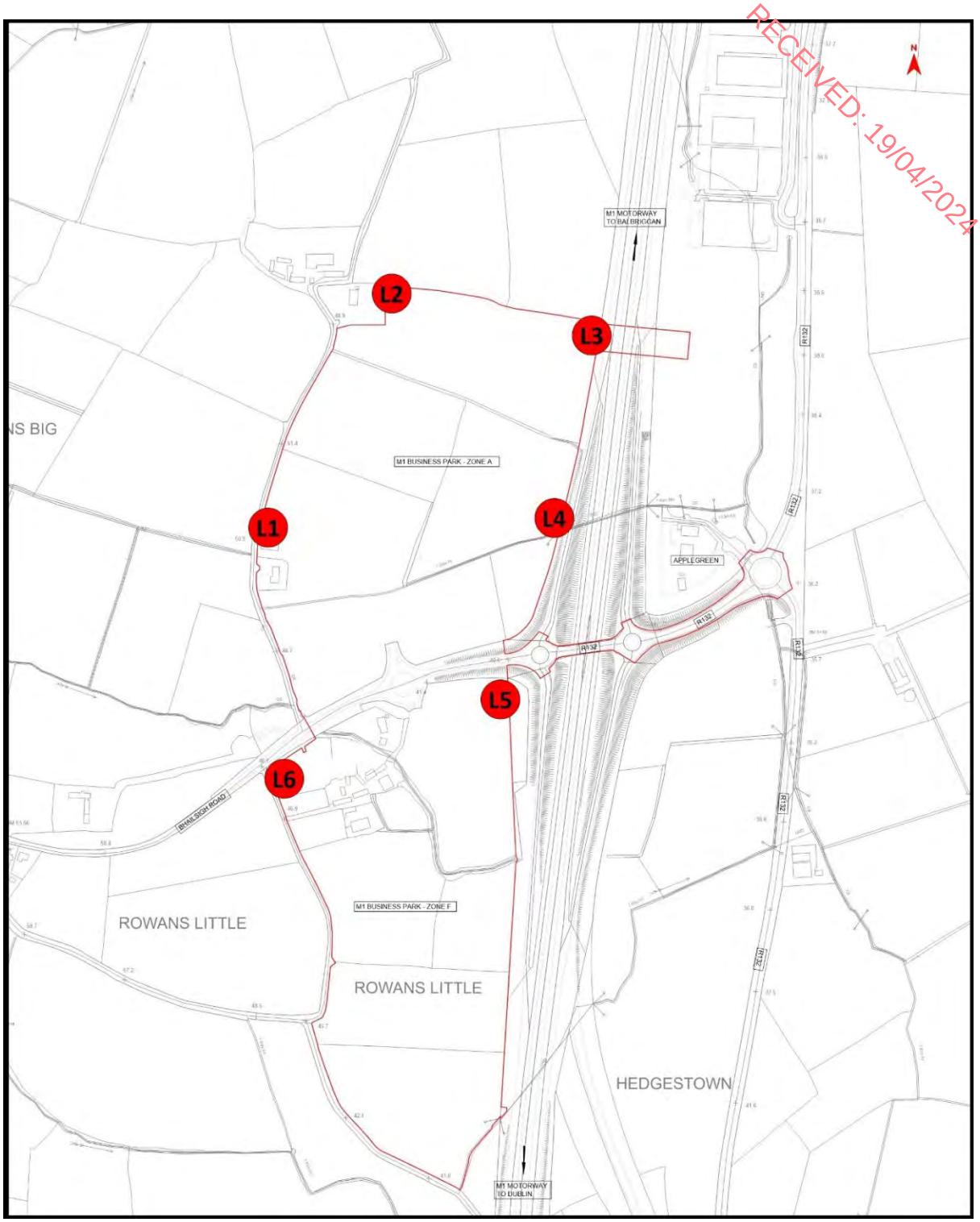

Figure 9-2 . Location map of ambient air quality monitoring locations within the proposed site boundary.

Oxides of Nitrogen

Nitrogen is a constituent of both the natural atmosphere and of the biosphere. When industrial metabolism releases nitrogen to the environment it is considered a "pollutant" because of its

chemical form: NO, NO_2, and N_2O. In the transportation sector, NOx emissions result from internal combustion engines. In power plants and industrial sources, NOx is produced in boilers. The overwhelming fraction of nitrogen oxide emissions arises from the high temperature combustion of fossil fuels; emissions from metal-processing plants and open-air burning of biomass. Nitrogen dioxide is classed as both a primary pollutant and a secondary pollutant. As a primary pollutant NO_2 is emitted from all combustion processes (such as a gas/oil fired boiler or a car engine). Potentially, the main source of primary NO_2 for the proposed development will be from construction traffic and machinery.

Continuous monitoring carried out across Zone D sites indicates an average annual mean concentration ranging from 7.3 to 7.5 µg/m^3 in 2021 and 2022 (see Table 9-3) (EPA, 2021, 2022). Site specific data collected between August and September 2023 indicated an annual average level of between 6.65 to 20.02 µg/m^3. Sufficient data is available for all stations to observe tends over the periods 2021 to 2023. An analysis of the data suggests upper max average concentrations of no more than 20.02 µg/m^3. Based on these results, a conservative estimate of the background annual average NO_2 concentration in the region of the Proposed Development is 20.02 µg/m^3.

Sulphur dioxide

Sulphur dioxide is a colourless gas, about 2.5 times as heavy as air, with a suffocating faint sweet odour. It occurs in volcanic gases and thus traces of sulphur dioxide are present in the atmosphere. Other sources of SO_2 include smelters and utilities, electricity generation, iron and steel mills, petroleum refineries, pulp and paper mills, metallurgical processes, chemical processes and the combustion of iron pyrites, which is often present in coal. Small sources include residential, commercial and industrial space heating.

Continuous monitoring carried out across Zone D sites indicates an average annual mean concentrations ranging from 4.20 and 5.0 µg/m^3 in 2021 and 2022 (see Table 9-3) (EPA, 2021, 2022). Site specific data collected between August and September 2023 indicated an annual average level of <1.58 µg/m^3. Sufficient data is available for all stations to observe tends over the periods 2021 to 2023. An analysis of the data suggests upper max average concentrations of no more than 5.0 µg/m^3. Based on these results, a conservative estimate of the background annual average SO_2 concentration in the region of the Proposed Development is 5.0 µg/m^3.

PM_{10} & $PM_{2.5}$

Major sources of particulates include industrial/residential combustion and processing, energy generation, vehicular emissions and construction projects. The particulate matter created by these processes is responsible for many adverse environmental conditions including reduced visibility, contamination and soiling, but also recognised as a contributory factor to many respiratory medical conditions such as asthma, bronchitis and lung cancer. PM_{10} and $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter of 10 and 2.50 μm, respectively. Generally, such particulate matter remains in the air due to low deposition rates. Particulate matter is of concern in Europe and air quality limits have been set for both PM_{10} and $PM_{2.5}$.

Continuous PM_{10} monitoring carried out across Zone D sites indicates an average annual mean concentrations ranging from 11.9 to 12.7 μg/m^3 in 2021 and 2022 (see Table 9-3) (EPA, 2021, 2022). Sufficient data is available for all stations to observe tends over the periods 2021 to 2022. An analysis of the data suggests upper max average concentrations of no more than 12.7 μg/m^3. Based on these results, a conservative estimate of the background annual average PM_{10} concentration in the region of the Proposed Development is 12.70 μg/m^3.

Continuous $PM_{2.5}$ monitoring carried out across Zone D sites indicates an average annual mean concentrations ranging from 8.4 to 8.7 μg/m^3 in 2021 and 2022 (see Table 9-3) (EPA, 2021, 2022). Sufficient data is available for all stations to observe tends over the periods 2021 to 2022. An analysis of the data suggests upper max average concentrations of no more than 8.70 μg/m^3. Based on these results, a conservative estimate of the background annual average $PM_{2.5}$ concentration in the region of the Proposed Development is 8.70 μg/m^3.

Carbon monoxide

Carbon monoxide is produced as a result of incomplete burning of carbon-containing fuels including coal, wood, charcoal, natural gas, and fuel oil. It can be emitted by combustion sources such as un-vented kerosene and gas heaters, furnaces, woodstoves, gas stoves, fireplaces and water heaters, automobile exhausts, etc.

Carbon monoxide interferes with the distribution of oxygen in the blood to the rest of the body. If large amounts are inhaled, this gas can impede coordination, worsen cardiovascular conditions, and produce fatigue, headache, weakness, confusion, disorientation, nausea, and dizziness. Very high levels can cause death. The symptoms are sometimes confused with the flu or food poisoning. Foetuses, infants, elderly, and people with heart and respiratory illnesses are particularly at high risk for the adverse health effects of carbon monoxide.

Continuous Carbon monoxide monitoring carried out across Zone D sites indicates an average annual mean concentrations ranging from 300 to 800 μg/m^3 in 2021 and 2022 (see Table 9-3)

(EPA, 2021, 2022). Sufficient data is available for all stations to observe tends over the periods 2021 and 2022. An analysis of the data suggests upper max average concentrations of no more than 800 µg/m^3. Based on these results, a conservative estimate of the background annual average Carbon monoxide concentration in the region of the Proposed Development is 800 µg/m^3.

Benzene

The sources associated with individual volatile organic compounds (VOCs) tend to be dependent on the nature of industries in a region. Methane is a naturally occurring VOC derived from plants and animals; it is also generated as a by-product of certain industries. Benzene and other aromatic/alkanes are most often derived from petrol driven vehicle exhausts. Heavier semi-volatile organic compounds are frequently derived from diesel-powered engines.

Continuous Benzene monitoring carried out across Zone D sites indicates an average annual mean concentrations ranging from 0.40 to 0.50 µg/m^3 in 2021 and 2022 (see Table 9-3) (EPA, 2021, 2022). Site specific data collected between August and September 2023 indicated an annual average level of 0.290.34 to 0.68 µg/m^3. Sufficient data is available for all stations to observe tends over the periods 2021 to 2023. An analysis of the data suggests upper max average concentrations of no more than 0.68 µg/m^3. Based on these results, a conservative estimate of the background annual average Benzene concentration in the region of the Proposed Development is 0.68 µg/m^3.

Total Depositional Dust

Total dust deposition was measured at the site using Bergerhoff gauges specified in the German Engineering Institute VDI 2119 entitled “Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method).” Samples were collected at six locations (i.e. L1 to L6) over a 30-day period, as shown in Figure 9-2. The purpose of these monitors is to assess the baseline total depositional dust impact within the proposed site boundary. The results are presented in Table 9-3.

Currently in Ireland there are no statutory limits for dust deposition, however, EPA guidance suggest, "a soiling of 10mg/m^2/hour is generally considered to pose a soiling nuisance" (TA Luft 2002). This equates to 240mg/m^2/day of Total Depositional Dust. The EPA recommend a maximum level of 350mg/m^{2}day of dust deposition when measured according to TA Luft standard, which includes both soluble and insoluble matter (i.e. EPA compliance monitoring is based on the TA Luft Method). This value was not exceeded at any of the sample locations with all measured values at least 55% lower than the maximum recommended limit value.

Farming activities were on going in the area which contributed to the levels of depositional dust monitored on the proposed subject site.

9.4.5. Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance documents "Significance in air quality Nov 2009 and Guidance on the Assessment of Mineral Dust Impact for Planning" (2016) prior to assessing the impacts of air pollutants from a Proposed Development, the sensitivity of the area must first be assessed as outlined below.

With regards to dust nuisance both receptors sensitivity and proximity to proposed works area are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time.

In terms of receptor sensitivity to dust spoiling, there are a number of sensitive receptors located less than 100 m from the proposed facility (see Figure 9-2). Based on the IAQM criteria outlined in Table 9-4, the worst case sensitivity of the area to dust spoiling is considered to be **Medium**.

Table 9-4: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor sensitivity	**Number of receptors**	**Distance from source (m)**			
		<20	**<50**	**<100**	**<350**
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	**Medium**	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust spoiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptors sensitivity based on type (residential receptor are classified as sensitive) and the number of receptors affected within various distance bands from the works. A conservative estimate of the current annual

mean PM_{10} concentration in the vicinity of the Proposed Development is estimated to be 12.70 µg/m^3 and there are between 1-10 sensitive receptors located less than 200 m from the proposed development works. Based on the IAQM criteria outlined in Table 9-5, the worst-case sensitivity of the area to human health is considered **Low**.

Table 9-5: Sensitivity of the Area to Human Health Impacts

Receptor sensitivity	**Annual Mean PM_{10} Concentration**	**Number of receptors**	**Distance from source (m)**			
			<20	**<50**	**<100**	**<200**
High	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	**Low**	Low	Low	**Low**
Medium	<24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	<24 µg/m^3	>1	Low	Low	Low	Low

With regards to describing the impact magnitude for change in ambient air pollutant concentrations as a percentage of Objective / Limit value / Environmental Assessment Level, this can be described depending on the magnitude of change. **Table 9-6** presents the different categories associated with this description (IAQM, 2009).

Table 9-6: Generic Basis of Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations as Percentage of Objective/Limit Value/Environmental Assessment Level

Magnitude of change	**Annual Mean**
Large	Increase / Decrease >10%
Medium	Increase / Decrease 5 - 10%
Small	Increase / Decrease 1 - 5%
Imperceptible	Increase / Decrease <1%

9.5. Potential Impacts

9.5.1. 'Do Nothing'

The baseline survey undertaken as part of this assessment suggests that air quality in the vicinity of the application area is expected to be good with typical levels of pollutants for a suburban area. All pollutant levels are within the relevant Irish and EU limits. In the event that the development does not proceed it is likely that air quality will remain the same and/or slightly improve in years to come with improvements in technology.

9.5.2. Construction Phase

Direct

The following sections describe the potential impacts to air quality resulting from the construction phase of the proposed plant. The impacts have been assessed on a local scale to determine impacts on human health and ecological receptors. The aspects considered include:

- Excavation from the excavation during ground works,
- Construction dust and its potential to impact on sensitive receptors and to cause an environmental nuisance,
- Construction traffic emissions and their potential for impacts on sensitive receptors.

The impacts are assessed in the following sections with respect to the relevant assessment criteria where appropriate.

Construction / Demolition Dust

There is limited potential impact on air quality during the short construction phase of the Proposed Development from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts, etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction and the relative location of receptor to the site activities.

It is important to note that the potential impacts associated with the construction phase of the Proposed Development are short-term in nature (associated with excavation and construction within the development). When the dust minimisation measures detailed in the mitigation

section (see Section 9.6) of this chapter are implemented, fugitive emissions of dust from the site will not be significant and will pose no nuisance at nearby receptors.

Table 9-7 presents the distances within which dust could be expected to result in a nuisance from construction sites for impacts such as soiling (dust nuisance), PM_{10} deposition and vegetation effects. This data has been taken from the National Roads Authority (NRA) *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* and is considered a worst case assessment. These distances present the potential for dust impact with standard mitigation in place.

Detail of proposed mitigation measures to be implemented as part of the construction phase of the project are presented under the attached CEMP for the proposed development presented in **Appendix 4** of this Report.

Table 9-7: Assessment criteria for the impact of dust from construction, with standard mitigation in place

Source		**Potential distance for significant effects (distance from source)**		
Scale	**Description**	**Soiling**	**PM_{10}**	**Vegetation effects**
Major	Large construction sites with high use of haul roads	100m	25m	25m
Moderate	Moderate sized construction sites with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites with minor use of haul roads	**25m**	**10m**	**10m**

Source: National Roads Authority, 2006.

The construction phase of this proposal is deemed for the purposes of this assessment to be of a minor scale. Using this screening assessment tool, at a minor construction site there is a risk that dust may cause an impact at sensitive receptors within 25m of the source of the dust generated. The nearest residential sensitive receptors to the centre of the subject site is

located at a distance of greater than 25m from the activity area, therefore, the impact from construction activities can be considered to be imperceptible.

A Construction Environmental Management Plan (CEMP) incorporating dust mitigation measures will further reduce any impacts significantly and this will be implemented as part of the proposed development.

9.5.3. Construction Traffic Emissions

Emissions associated with construction traffic can impact on local air quality. In particular, the proposed routes used for deliveries and any sensitive receptors that line these routes may experience impacts to local air quality.

The potential impact of construction traffic associated with this proposal was estimated as a worst case Annual Average Daily Traffic (AADT) scenario of less than or equal to 100 with a HVG content of less than or equal to 73% with a mean traffic speed of 20km/hr. The detailed results of the modelling exercise are presented in **Table 9-8.** Impacts associated with construction traffic will be negligible as can be observed in **Table 9-8.**

Table 9-8: Predicted contribution of air pollutants to baseline air quality as a result of construction traffic

Link location	**Benzene Annual mean ($\mu g/m^3$)**	**Carbon monoxide Annual mean ($\mu g/m^3$)**	**Oxides of nitrogen Annual mean ($\mu g/m^3$)**	**Particulate matter 10um Annual mean ($\mu g/m^3$)**	**Days > 50 ($\mu g/m^3$)**
Worst case receptor 5m from road centreline on any roadway	<0.01	<0.01	0.70	0.04	0

Indirect

There are no indirect emissions to air associated with construction.

9.5.4. Operation Phase

Air quality impacts may arise from process-based emissions and traffic movements associated with the operational phase of the proposed Business Park. Traffic based air quality emissions

will result from traffic making deliveries and collections to and from the proposed Business Park and employee traffic movements.

9.5.5. Direct Impacts

Traffic

The detailed information provided in the Traffic and Transport assessment (see Chapter 12 of the EIAR) has been used to identify whether any significant impact on sensitive receptors will occur. The traffic information has been inputted into the Design Manual for Roads and Bridges (DMRB), Volume 11 (ver. 1.03c) model. This model was prepared by the United Kingdom Department of Transport, the Scottish Office of Industrial Development, the Welsh Office and the Department of Environment for Northern Ireland as a screening tool to assess worst-case air quality impact associated with traffic movements.

The screening model uses a worst-case scenario in calculating emissions. The emission factors used for each pollutant are intentionally set to biased and to overestimate the actual emission rate. In addition, wind speeds are assumed to be 2 ms^{-1} (approximately 3.90 knots compared to a mean wind speed of between 4 to 6 ms^{-1} at the nearest Met station (Dublin Airport Met Station)). Emission rates predicted as a result of traffic are added to the cumulative emissions generated by the proposed plant's scheduled emission points and baseline data. This is considered a worst case assessment of likely impact. It can therefore be assumed with confidence that traffic related air pollution will not arise if the model does not identify any issues.

Traffic figures have been assessed using Annual Average Daily Traffic (AADT) figures. The Heavy Goods Vehicle (HGV) percentage was taken from the traffic assessment. As the average speed of vehicles has a significant effect on the generation of pollutants, calculations are carried out at a worst case traffic speed scenarios. The speed used is 20 km hr^{-1}, to represent gridlock conditions so as to assess the worst case scenario. In addition, it was assumed within the model that the sensitive receptor was located within 5m of the road centreline, again to represent worst case conditions.

Traffic: Output Data from Traffic Air Quality Model

Table 9-9 presents the results of the worst case conservative traffic air quality modelling data, performed in order to ascertain the likely air quality impact as a result of a change to traffic patterns generated during the operational phase of the subject site.

Based on the IAQM (2009) guidance document, impacts of air quality can be considered **Negligible** and **Imperceptible**. With regards to human health impacts, all parameters remain

well within the Air Quality Limit values contained in **Table 9-1** for the protection of human health (see Table 9-3) and thus impacts can be considered **Negligible** to both the environment and human health.

Table 9-9 Predicted contribution of air pollutants as a result of operation traffic, do-nothing (2026) and do-something scenario (2026)

Year	**Worst case Assessment location**	
	Worst case junction	
Baseline emissions as a result of traffic 2026 – Do nothing	Carbon monoxide Annual mean (µg/m^3)	0.05
	Benzene Annual mean (µg/m^3)	0.05
	Oxides of nitrogen Annual mean (µg/m^3)	4.40
	Particulate matter 10um – Annual mean (µg/m^3)	0.59
	Particulate matter 10um – Days > 50 (µg/m^3)	0
Emissions as a result of traffic 2026 – Do something	Carbon monoxide Annual mean (µg/m^3)	0.04
	Benzene Annual mean (µg/m^3)	0.04
	Oxides of nitrogen Annual mean (µg/m^3)	7.70
	Particulate matter 10um – Annual mean (µg/m^3)	0.70
	Particulate matter 10um – Days > 50 (µg/m^3)	0

As can be observed, there is a small increase in the air quality impact of named pollutants as a result of increased baseline traffic numbers when the development occurs with only a slight increase occurring in pollutant concentration predicted 5m from the road centreline.

In terms of the 'do nothing' versus 'do something' there is a slight increase in some pollutant concentration in the order of 8.25% of the impact criterion (see Table 9-6) which is considered to be Medium. When this increase is added to baseline data presented in Table 9-3 for each named pollutant, emissions will remain well within the air quality limits presented in Table 9-1 for the protection of human health.

Climate

Electrical and Diesel usage would be expected to be the dominant sources of greenhouse gas emissions as a result of the operation of the proposed development. Diesel and Electrical used to operate the plant will give rise to CO_2 and N_2O emissions as a result of the proposed development.

This proposed development will only provide ground works and services with no buildings will be provided as part of the development. Individual planning applications will determine the greenhouse gases contribution levels with the particular application.

9.5.6. Unplanned events (Accidents or major disasters)

With regards to unplanned events (Accidental / Major disasters) such as a fire, the risk would be considered low. The impacts to Air Quality would be considered **Negligible**.

9.5.7. Cumulative impacts

With regards to cumulative impacts, the baseline air quality analysis carried out as part of the assessment identified that all levels of classical air pollutants were less than the allowable guideline and statutory limit values. This baseline assessment would have considered the existing environment while the air quality impact assessment has considered the proposed facility. Given that all baseline and process contribution air quality pollutants were below statutory and guideline limit values for such pollutants, cumulative impact can be consider compliant with any regulatory limit value.

With regard to the proposed indicative masterplan, traffic data has been considered in line with the traffic data presented within Chapter 12. Impacts to air quality from the proposed traffic numbers associated with the future indicative masterplan were deemed to negligible and imperceptible. Other impacts associated with the indicative masterplan at this stage of the project are unknown and should be assessed as part of the subsequent planning applications to be submitted for the individual warehouses when more detailed designs are available.

9.5.8. "Worst Case" Scenario

A worst case of assessment was utilised throughout the air quality impact study in order to assess any risk associated with the proposed operation of the Business Park.

9.5.9. Table of Impacts

Table 9-10: Table of Impacts

Scenarios where Impacts may arise	Potential Impact				Quality of Effect	Significance of Effect	Extent/Context of Effect	Probability	Duration	Type of Effect (as per Table 3.4, EPA, 2021)
	Activity	Attribute/receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)						
Construction phase	Construction of proposed development (construction traffic, excavation, track out)	Number of sensitive within 0.75km	Medium Sensitivity	Direct: Air emissions arising from construction traffic, excavation and track out.	Negative	Imperceptible	Number of sensitive within 0.75km	Likely	Temporary	Imperceptible
Operational phase	Traffic	Number of Sensitive receptors within 0.75km	Low Sensitivity	Direct: Air emissions and dust as a result of traffic	Negative	Imperceptible	Number of Sensitive receptors within 0.75km	Likely	Temporary	Imperceptible
	Climate	Number of Sensitive receptors within 0.75km	Medium Sensitivity	Direct: Greenhouse gasses as a result of operations	Negative	Imperceptible	Number of Sensitive receptors within 0.75km	Likely	Temporary	Imperceptible
	Dust	Number of Sensitive receptors within 0.75km	Low Sensitivity	Direct: Dust emissions as a result of Site preparation, Excavation, Construction, Track out, Off site transportation	Negative	Insignificant	Number of Sensitive receptors within 0.75km	Likely	Temporary	Imperceptible
	Multiple pollutants from process	Number of Sensitive receptors within 0.75km and Natura receptors up to 15 km from site	Low sensitivity	Direct: Emission of various pollutants from process operations	Negative	Negligible	Number of Sensitive receptors within 0.75km and Natura receptors up to 15 km from site	Likely	Continuous	Imperceptible
Unplanned Events	Fire / Explosion / Dust blow	Sensitive receptors within 0.75km	Low	Direct/Indirect	Negative	Major	Within 0.75km of the site, low number of receptors	Unlikely	Temporary	Imperceptible

9.6. Mitigation measures

9.6.1. Construction phase

The objective of dust control at site is to ensure that no significant nuisance occurs at nearby sensitive receptors. The construction / demolition phase is limited and short in duration;

In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (IAQM (2014), The Scottish Office (1996), UK Office of Deputy Prime Minster (2002) and BRE (2003)) and the USA (USEPA (1997)).

A full traffic management plan and dust management plan will be incorporated into the Construction Environmental Management Plan (CEMP) in order to minimise such emissions as a result of the construction phase of the development. This will be generated specifically for the proposed development when detailed design is completed.

Site management

The aim is to ensure good site management by avoiding dust becoming airborne at sources. This will be done through good design and effective control strategies. A Dust Management Plan (DMP) should be prepared and agreed with the stakeholders for implementation on-site. A DMP is a documented site-specific operational plan to prevent or minimise the release of dust from the site. It should describe the management and operational actions the site will use to deal with both anticipated (e.g. forecast) and actual high risk conditions (e.g. dry days with measured winds above moderate breeze). The DMP should describe the conditions under which dust is most likely to pose a risk of disamenity at sensitive receptors close to the site and set trigger levels which, when exceeded, would require further dust control measures to be implemented (i.e. over and above the routine measures).

At the construction planning stage, the siting of activities and storage of materials will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 9-1 for the wind rose for Dublin Airport met station). As the prevailing wind is predominately south westerly, locating materials downwind (to the north east/north west) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.20 mm/day, dust generation is generally suppressed (UK Office of Deputy Prime Minister (2002), BRE (2003)). The

potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 Knots) (at 7m above ground) to release loose material from storage materials and other exposed surfaces (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The operator must monitor performance to ensure that the proposed mitigation measures are implemented and that dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- 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;
- All dust control conditions contained within shall be achieved.
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practices and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Site Roads and Routes

Movement of transportation trucks and plant trucks along haul roads (in particular unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of supressing dust emissions from unpaved roads to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK Office of Deputy Prime Minister, 2002).

- Bowsers or suitable watering equipment will be available during periods of dry weather through the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained

periods to ensure that unpaved areas are kept moist. The required application rate frequency will vary according to soil type, weather conditions and vehicular use;

- Any hard surface roads will be swept to remove mud and aggregate materials from their surface.

Site traffic on Public roads

Spillage and blow off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed, covered or wetted at all times to restrict the escape of dust;
- Public roads directly outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The proactive control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the operator.

A full traffic management plan and dust management plan will be incorporated into the Environmental Management System in order to minimise such emissions as a result of the operational phase of the development. This will be generated specifically for the proposed development when detailed design is completed.

In order to ensure that no dust nuisance occurs at sensitive receptors, a series of measures will be implemented through the CEMP:

- On site roads shall be regularly cleaned and maintained as appropriate.
- Hard surface roads shall be swept to remove mud and aggregate materials from their surface as a result of the development.
- Any un-surfaced roads shall be restricted to essential site traffic only.
- Furthermore, any on site road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during extended dry and/or windy conditions.
- Vehicles using site roads shall have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced site road and on hard surfaced roads speed shall be restricted to 20 km per hour.

- Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the subject site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.
- In relation to the completion of the proposed development, the hard standing surface, and all roads will be tarmacadamed/concreted where applicable. In periods of dry weather when dust emission would be greatest, a road sweeper, which would also dampen the road, will be employed as required to prevent the generation of dust.
- In terms of good practice construction vehicles and equipment will receive regular maintenance. Technical inspection will be performed of vehicles to ensure they will perform most efficiently. A Traffic Management Plan will be implemented to minimise congestion.

9.6.2. Operational Phase

Scheduled emission points

There are no scheduled emission points associated with the proposed development.

9.6.3. Table of Mitigation

Table 9-11: Table of Mitigation Measures

Scenarios where Impacts may arise	Potential Impact			Mitigation measure	Residual Effect (following mitigation)	
	Activity	Attribute/receiving environment	Nature of Effect (description)	Description	Significance or quality of Effect	Probability
Construction Phase	Construction of proposed development	Sensitive receptors within 0.75km	Dust arising from construction traffic	Construction traffic will be restricted to standard working hours and exclude Sundays. Construction works will be carried out in accordance with guidance set out in Section 9.6.2	Imperceptible	Unlikely
Operational Phase	Site management	Sensitive receptors within 0.75km	Poor site management will lead to increased emissions and poor control	The operator must monitor performance to ensure that the proposed mitigation measures are implemented and that dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions; 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; All dust control conditions contained within shall be achieved. At all times, the procedures put in place will be strictly monitored and assessed. See Section 9.6.2	Imperceptible	Unlikely
	Site roads and routes	Sensitive receptors within 0.75km	Dust arising from site roads and route location	Speed restrictions to 20 km/hr. Minimise unpaved sections and located away from sensitive receptors. Bowsers wetting to minimise dust formation during dry conditions See Section 9.6.2	Imperceptible	Unlikely
	Site traffic on public road	Sensitive receptors within 0.75km	Dust from transport vehicles and dirty roads	Controlled via covering, wetted or enclosed load transport Road sweeper to clean roads, Wheel wash to minimise tracking on to roads See Section 9.6.2	Imperceptible	Unlikely
	Equipment vehicles	Sensitive receptors within 0.75km	Air emissions as a result of poorly maintained site vehicles	Service and maintain site vehicles regularly to minimise air emissions associated with the equipment.	Imperceptible	Unlikely
	Scheduled emission points	Sensitive receptors within 0.75km	Air emissions as a result of abnormal plant operation	Service and maintain regularly to minimise air emissions associated with the equipment. Performed air monitoring of exhaust of emission points to ensure reliability of performance.	Imperceptible	Unlikely
Unplanned Events	None	Sensitive receptors within 0.75km	None	None	None	None

9.7. Residual Impacts of the Development

9.7.1. Construction Phase

There will be no residual impacts on air quality or climate as a result of the limited construction phase.

9.7.2. Operational Phase

Air Quality

When dust mitigation measures detailed in the mitigation section of this report are implemented, fugitive emissions of dust and particulate matter from the site will be **minor** and **not significant** in nature posing no nuisance at nearby receptors.

Climate

Based on the scale and nature of construction / operation works and the intermitted use of equipment, the potential impact on climate change and transboundary pollution from the Proposed Development is deemed to be **Temporary** and **not significant** in relation to Ireland's obligations under the EU 2020 targets.

Human Health

Best practice mitigation measures are proposed for the operational phase of the Proposed Development which will focus on the pro-active control of dust and air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during the operation of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction and operation of the Proposed Development is likely to be **Temporary** and **imperceptible** with result to human health.

9.8. Interactions

Interactions with human health and population are likely to arise during the construction and operation phase, however the mitigation measures that will be put in place during the construction and operation phase of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction and operation of the Proposed Development is likely to be **Minor** and **imperceptible** with result to human health. This is further discussed within Chapter 5 - Population and Human Health.

9.9. Monitoring measures

With respect to monitoring measures temporary dust deposition monitoring will be carried out at the facility during construction phase of the project in order to ensure the boundary levels of deposition and nuisance dust are within recommended limit which are typically less than 350 mg/m^2/day.

With regards to the operation phase of the project, given the expected low emission concentrations of likely pollutants, no ongoing monitoring is anticipated.

9.10. Summary/Conclusions

The Air Quality and Climate assessment has been carried out in line with all relevant guidelines. The proposed subject site has been designed to ensure that there are no significant adverse effects on air quality. This is demonstrated through the air assessment and air modelling study, which establishes that no International or Irish air quality standards or guidelines are forecast to be exceeded.

The assessment concludes that operation of the subject site will have imperceptible effects on air quality and the health of local people.

Application of an Environmental Management System will incorporate best practice measures in order to minimise dust and air pollutants at the subject site. During the construction and operational phase, emissions to air from the construction, landscaping and operation of the process will be regulated in accordance with specific conditions set out within the EIAR.

9.11. References

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5. EEA (2014), NEC Directive Status Reports 2013

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14. ERM (1998), Limitation and Reduction of CO_2 and other Greenhouse Gas Emissions in Ireland
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26. UN Framework Convention on Climate Change (2012), Doha Amendment to the Kyoto Protocol

27. UN Framework Convention on Climate Change (FCCC) (1997), Kyoto Protocol to the United Nations Framework Convention on Climate Change

28. USEPA (1997), Fugitive Dust Technical Information Document for the Best Available Control Measures

10. Noise & Vibration

10.1. Introduction

This section of the EIAR has been prepared by Rowan Engineering to identify and assess the potential noise and vibration impacts associated with the proposed scheme consisting of a business park (*ca.* 33.81 HA) located in the townlands of Rowans Big and Rowans Little, Lusk, Co. Dublin. The site is primarily greenfield and is located to the west of the M1 motorway and to the north of the Bhailsigh Road (L1140).

This chapter has been prepared by Dr. Conor Tonra who is a Director with Patel Tonra Ltd. (PTL). Conor has been working in the field of Acoustics since 1994; he has completed the IOSH Diploma in Environmental Noise. He has extensive knowledge in aspects of environmental noise monitoring, analysis, impact assessment and reporting and has prepared environmental impact assessments reports for various major developments.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site, an assessment of the potential noise and vibration impact associated with the proposed development during both the short-term construction phase and the long-term operational phase on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

During the construction phase, the range of activities with potential to generate noise and vibration emissions to off-site sensitive receptors will include: site preparation works, demolition works, construction of the proposed development and erection of any temporary buildings/compounds that may be required.

During the operational phase, the potential sources of noise are those associated with additional vehicular traffic on public roads. Separate planning applications will be made for each of the new businesses operating on the lands developed – it is not intended to assess their impacts in this assessment.

The significance of impacts has been assessed in accordance with the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, May 2022.

With regard to the quality of the impact, ratings may have positive, neutral or negative applications. The significance of an impact on the receiving environment is described in the range between imperceptible and profound. The duration of impacts as described in the EPA Guidelines are presented on a scale between momentary and permanent.

Noise and vibration emissions from the development will vary in terms of quality, duration and magnitude. The following sections analyse the expected construction and operational phase noise and vibration impacts both in terms of the proposed assessment criteria and the expected impacts in terms of the significant effects.

10.1.1. Consultation

Rowan Engineering in partnership with Patel Tonra Ltd. (PTL) have been commissioned to assess the potential impacts of the proposed development in terms of noise and vibration during the construction and operational phases.

The principal members of the Rowan Engineering EIA team involved in this assessment include the following persons:

- Noise Modeller & Lead-Author:

Dr. Conor Tonra – BSc (Analytical Science), PhD (Physical Chemistry), MIEMA, CEnv, Certificate in Training and Continuing Education, IOSH Environmental Noise Competency Certificate Current Role: Principal Consultant/Company Director of Patel Tonra Ltd. Experience ca. 30 years

- Project Coordinator & Reviewer:

Elaine Gibson, Qualifications: –MSc Environmental Engineering. Current Role: Environmental Director. Experience ca. 13 years.

Consultation between Rowan Engineering and other members of the planning/design team was made in order to obtain information required to assess the potential construction and operational phase impacts on ambient noise levels in the site vicinity.

10.2. Methodology

A review of relevant standards and guidelines has been conducted to set noise and vibration criteria for the developments' construction and operational phases;

- Baseline noise monitoring has been undertaken to characterise the receiving noise environment;
- Predictive calculations have estimated the likely noise emissions during the construction phase at nearest noise sensitive (monitoring) locations (referred to as NMLs from hereon, outlined in Figure 10-1Figure 10-2. .
- Predictive calculations have assessed potential impacts associated with the developments' operation at NML's surrounding the development, and;

- A schedule of mitigation measures has been proposed to reduce potential impacts relating to noise and vibration to and from the proposed development.

10.2.1. Legislation, Policy and Guidance

In preparing this noise and vibration chapter, reference is made to the following documents and Standards:

- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022)
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out EIA – (Department of Housing, Planning and Local Government - August 2018
- Fingal County Council's (CCC) Noise Action Plan 2019 to 2023 (NAP)
- ISO 1996-2:2017 Acoustics -- Description, measurement and assessment of environmental noise -- Part 2: Determination of sound pressure levels
- ISO 9613 (1996): Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation
- BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise
- BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration
- British Standard BS 6472 (1992): Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).
- BS8233:2014 Guidance on sound insulation and noise reduction for buildings
- BS4142:2014+A1: 2019 Methods for Rating and Assessing Industrial and Commercial Sound'
- World Health Organisation (WHO) Guidelines for Community Noise
- World Health Organisation (WHO) Night Noise Guidelines for Europe (2009)
- Design Manual for Roads and Bridges (DMRB), Highways England Company Limited, Transport Scotland, The Welsh Government and The Department for Regional Development (Northern Ireland)
- Calculation of Road Traffic Noise (CRTN), 1998, Department of Transport, Welsh Office (UK)

- Guidelines for the Treatment of Noise and Vibration in National Road Schemes", Transport Infrastructure Ireland (TII), October 2004.
- Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, Transport Infrastructure Ireland (TII), March 2014)
- Safety, Health and Welfare at Work (General Application) Regulations 2007 (Statutory Instrument No. 299 of 2007)

Relevant noise & vibration criteria for the developments' construction and operational phases, along with the methodology for conducting baseline noise surveys, are outlined below.

10.2.2. Construction Phase

10.2.3. Noise

The closest neighbouring NMLs to the proposed development are the residential dwellings primarily to the west/north-west (individual residences in Rowans Big, i.e. MNL2) and south/south-east (individual residences in Hedgestown, i.e. NML4) of the site. The distance between the construction site and nearby NMLs varies, the closest distance between the site boundary and closest neighbouring dwelling will be approximately 10 metres, but generally construction works will occur between 100 and 500 metres from existing dwellings, depending on the location where specific works are occurring.

There are no statutory limits with respect to construction noise in Ireland, additionally, limits for construction noise are not outlined in Fingal County Council's (FCC) Noise Action Plan 2019 to 2023 (NAP). However, the FCC NAP, Section 3 "Legal and Policy Framework" provides an overview of existing noise management legislation, regulations and guidance in Ireland and regional scale. Section 3.4 states the following in relation to construction noise:

In the absence of a regulatory assessment method or limit values, the NRA issued the document 'Guidelines for the Treatment of Noise and Vibration in National Road Schemes' (2004), which sets out the procedure to be followed in respect of 'the planning and design of national road schemes'. These guidelines set out limits for noise related to both the construction and traffic flow on new road schemes".

The TII overall acceptable levels of construction noise, which should not be exceeded at noise sensitive locations during the construction phase of a development, are set out in Table 10-1, following.

Table 10-1: TII Maximum Permissible Noise Levels at the Facade of Dwellings during Construction

Days and Times	Noise Levels (dB re. $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites is considered to represent the industry standard methodology for the assessment of construction noise and describes two methods for deriving noise significance thresholds for construction sites.

BS 5228:2009+A1:2014 (Appendix E.1) describes a method for identifying 'Potential significance based upon noise change'. Following this methodology, BS 5228:2009+A1:2014 designates a noise sensitive monitoring location (NML) into a specific category based on pre-existing ambient noise levels and then sets a threshold noise value that, if exceeded, indicates a significant construction noise impact.

Table 10-2, following, presents the threshold values for significant noise impacts for weekday daytime and Saturday morning activity.

Table 10-2: BS 5228 Construction Noise Thresholds for Significant Effects

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A [A]	Category B [B]	Category C [C]
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

- Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

- Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
- Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.
- 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

Annex E.2 of BS 5228-1:2009+A1:2014 also provides the following comments in relation to 'Potential significance based on fixed noise limits':

"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut. The noise can be measured with a simple sound level meter, as we hear it, in A-weighted decibels (dB(A))– see note below. Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:

- 70 decibels (dBA) in rural, suburban and urban areas away from main road traffic and industrial noise;
- 75 decibels (dBA) in urban areas near main roads in heavy industrial areas.

These limits are for daytime working outside living rooms and offices. In noise-sensitive situations, for example, near hospitals and educational establishments – and when working outside the normal hours say between 19.00 and 22.00 hours – the allowable noise levels from building sites will be less: such as the reduced values given in the contract specification or as advised by the Environmental Health Officer (a reduction of 10 dB(A) may often be appropriate). Noisy work likely to cause annoyance locally should not be permitted between 22.00 hours and 07.00 hours."

Taking account of the measured ambient noise levels, FCC recommendations and BS 5228 significance thresholds, the recommended noise limits for construction activity are as follows:

Monday to Friday	07.00 – 19.00	70 dB $L_{Aeq,11hr}$
Saturday	08.00 – 17.00	70 dB $L_{Aeq,6hr}$

It is assumed that construction works will take place during normal working hours only. Permission will be requested from the Local Authority in the event that works are required to take place outside of the above hours.

10.2.4. Vibration

Following the same approach, BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Vibration recommends that, for soundly

constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above.

The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. The recommended construction vibration criteria are presented in Table 10-3, following.

Table 10-3: Vibration Criteria During Construction Phase

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:-		
Less than 15Hz	**15 to 40Hz**	**40Hz and above**
15 mm/s	20 mm/s	50 mm/s

10.2.5. Operational Phase

10.2.6. Noise

Additional Road Traffic on Public Roads

The potential noise impact associated with the proposed development introducing additional traffic onto the existing road networks has been considered. Table 10-4, following, states the likely impact associated with any particular change in traffic noise level (Source DMRB, 2012).

Table 10-4: DMRB impact associated with change in traffic noise level (long term)

Noise Change (dB $L_{A10,18hr}$)	Magnitude of Impact
0	No Change
0.1 - 2.9	Negligible
3 - 4.9	Minor
5 - 9.9	Moderate
10+	Major

Table 10-4 has presented the DMRB (2012) likely impacts associated with long-term change in traffic noise level, the corresponding significance of impact presented in the 'EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR), May 2022 is presented in Table 10-5 for consistency in wording and terminology for the assessment of impact significance.

Table 10-5: DMRB impact associated with change in traffic noise level (Updated)

Noise Change (dB $_{LA10,18hr}$)	Magnitude of Impact	Impact Guidelines on the Information to be contained in EIAR (EPA)
0	No Change	Imperceptible
0.1 - 2.9	Negligible	Not Significant
3 - 4.9	Minor	Slight
5 - 9.9	Moderate	Moderate
10+	Major	Significant, Very Significant, Profound

10.2.7. Other Noise Sources

For any other general noise sources, appropriate guidance on internal noise levels for dwellings is contained within World Health Organization Guidelines (for Community Noise), which states the following.

"World Health Organisation (WHO) Guidelines

WHO guidelines make numerous recommendations for noise levels in specific environments in order to minimise the health impact of environmental noise. In the context of the WHO definition of health as, "...a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity", these guideline values can be seen as aspirational targets based on the precautionary principle. The guidelines set out a number of external and internal values for daytime and night time noise levels which aim to minimise all identified adverse health effects, including annoyance, for residential properties and other noise sensitive premises. Examples of the WHO 'Guideline values for Community Noise' in specific environments' are:

LAeq, day ≤ 55dB outdoor living area, to avoid serious annoyance;

LAeq, day ≤ 50dB outdoor living area, to avoid moderate annoyance;

LAeq, day≤ 35dB dwelling indoors, to avoid moderate annoyance;

LAeq, night ≤ 30dB inside bedrooms, to avoid sleep disturbance;

LAeq, night ≤ 40dB outside bedrooms with open window, sleep disturbance;

LAFmax, night≤ 45dB noise maxima inside bedrooms, to avoid sleep disturbance.

The WHO Night Noise Guidelines for Europe (2009) were subsequently developed to provide expertise and scientific advice in developing future standards in the area of night noise exposure control. The document presents guidelines values with the intention of preventing the harmful effects of noise. These are grouped into biological effects, sleep quality, well-being and medical conditions. It is recommended that the population should not be exposed to night noise levels greater than 40 dB of Lnight, outside (a long-term eight-hour average between 23:00 and 07:00 hrs). The level can be considered a health-based limit value necessary to protect the public, including most of vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise. Adverse health effects are observed among the exposed population between".

Based upon the above guidelines, noise criteria from site operation to nearby dwellings are as follows:

Daytime (07:00 to 23:00hrs) 50 dB $L_{Aeq,1hr}$

Night-time (23:00 to 07:00hrs) 40 dB $L_{Aeq,15min}$

10.2.8. Vibration

Guidance as to an acceptable magnitude of vibration during the operational phase of the development is best taken from British Standard BS 6472 (1992): Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz). The Standard contains recommendations that continuous vibration in residential buildings should not exceed nominally 0.3mm/s by daytime and 0.2mm/s by night-time.

No significant sources of vibration are expected to arise during the operational phase of this development. Operational vibration has therefore not been addressed further in this chapter.

10.3. Baseline Conditions

10.3.1. Background

This section of the chapter provides the baseline information in relation to noise that exists in the vicinity of the proposed development. The subject site occupies a total area of approximately 33.81ha and is situated at Walshestown, close to Junction-5 of the M1 motorway in North County Dublin.

A baseline noise survey has been undertaken as part of the planning application prepared for the proposed development.

The survey was conducted in general accordance with ISO 1996-2:2017 Acoustics -- Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels. Specific details are set out in the following sections.

10.3.2. Choice of Measurement Locations

Four Noise Monitoring Locations (NML's) surrounding the site were selected for the noise survey; each of these locations are described in turn below.

NML1: at the (proposed) site entrance(s), on the L1140, at the southern boundary of the Zone-A site; also close to the northern boundary of the Zone-F site; some unoccupied/abandoned residences located to the SW of this location.

NML2: at the closest residence to the Zone-A site, located to the NW of the proposed development, and situated within ca. 10m of the subject site boundary.

NML3: at the closest (current) commercial business to the Zone-A and Zone-F site(s), and situated ca. 160m from the Zone-A (Eastern) boundary, and ca. 220m from the Zone-F (Eastern) boundary.

NML4: at the closest residence to the Zone-F site, located to the SE of the proposed development, and situated within ca. 280m of the subject site boundary.

The position of each noise measurement location in relation to the site boundary are identified in **Figure 10-1** and **Figure 10-2**, following.

Figure 10-1: Site Location Plan Indicating Baseline Noise Monitoring Locations – Part-1

Figure 10-2: Site Location Plan Indicating Baseline Noise Monitoring Locations – Part-2

10.3.3. Survey Periods

Daytime, evening and night-time attended noise measurements were conducted between: (a) 08:30hrs on 24th August 2023 to 01:00hrs on 25th August 2023, and (b) 10:00 hrs and 23:50 hrs on 30th November 2023.

The weather during the daytime August survey was dry and sunny with temperatures in the range 14 to 19 degrees, wind speeds of 3 m/s in a westerly direction.

The weather during the evening/night-time August surveys was dry and clear with temperatures in the range 13 to 15 degrees, wind speeds of 2-3 m/s in a westerly direction.

The weather during the daytime November survey was dry, cold and sunny with temperatures in the range 3 to 6 degrees, wind speeds of 3 m/s in easterly and north-easterly directions.

The weather during the evening/night-time November surveys was clear, cold and relatively still with temperatures in the range 0 to 1 degrees, wind speeds of 2 m/s in a westerly direction.

10.3.4. Instrumentation

Measurements were made using a Quest Technologies Sound Level Meter (Type 1) SE/DL and Real Time Frequency Analyser. Sample periods were 15-minute log periods. The instrumentation was calibrated using a Quest Technologies QC 20 Calibrator. Calibration certificates are available on request.

10.3.5. Measurement Parameters

The noise survey results are presented in decibels (dB), using the following parameters:

$L_{Aeq,T}$ is the equivalent continuous sound level and is used to describe a fluctuating sound as a single value over the sample period (T).

$L_{AFmax,T}$ The maximum A-weighted sound pressure level occurring within a specified time period (T). Measured using the “Fast” time weighting.

$L_{AF10,T}$ Refers to those A-weighted noise levels in the top 10 percentile of the sampling interval; it is the level which is exceeded for 10% of the measurement period (T). It is used to determine the intermittent high noise level features of locally generated noise and usually gives an indicator of the level of road traffic. Measured using the “Fast” time weighting.

$L_{AF90,T}$ Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval (T). It is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to describe a background level without contribution from intermittent sources. Measured using the “Fast” time weighting.

All sound levels in this report are expressed in terms of decibels (dB) relative to 2x10-5 Pa.

10.3.6. Baseline Noise Survey Results

Location NML1

Table 10-6, following, presents a summary of the daytime (i.e. 07:00 to 19:00hrs), evening (i.e. 19:00 to 23:00hrs) and night-time (i.e. 23:00 to 07:00hrs) noise levels measured at Location NML1.

Table 10-6: Summary of Measured Baseline Noise Levels at Location NML1

Date and Start Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)			
	$L_{Aeq,15min}$	$L_{Amax,15min}$	$L_{A10,15min}$	$L_{A90,15min}$
24 August 2023 at 08:52	52	65	56	45
24 August 2023 at 10:05	50	75	52	45
24 August 2023 at 11:06	54	79	53	45
24 August 2023 at 22:01	49	71	50	44
24 August 2023 at 23:17	52	62	54	48
25 August 2023 at 00:17	45	64	47	42

During the noise survey, the dominant noise sources were noted to be from motorway traffic, on nearby M1, occasional local road traffic, birdsong, and leaf rustle.

Daytime ambient noise levels were in the range 50 to 54 dB $L_{Aeq,}$15min. The daytime background noise was 45 dB $L_{A90,15min}$.

Evening and Night-time ambient noise levels were in the range 45 to 52 dB $L_{Aeq,15min}$. The night-time background noise was in the range 42 to 48 dB $L_{A90,15min}$.

Location NML2

Table 10-7, following, presents a summary of the daytime (i.e. 07:00 to 19:00hrs), evening (i.e. 19:00 to 23:00hrs) and night-time (i.e. 23:00 to 07:00hrs) noise levels measured at Location NML2.

Table 10-7: Summary of Measured Baseline Noise Levels at Location NML2

Date and Start Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)			
	$L_{Aeq,15min}$	$L_{Amax,15min}$	$L_{A10,15min}$	$L_{A90,15min}$
24 August 2023 at 09:18	44	62	46	41
24 August 2023 at 10:27	44	57	46	40
24 August 2023 at 11:27	48	73	46	41
24 August 2023 at 22:22	50	56	52	47
24 August 2023 at 23:37	51	63	53	46
25 August 2023 at 00:38	40	59	41	37

During the noise survey, the dominant noise sources were noted to be from motorway traffic, on nearby M1, occasional local road traffic, birdsong, and leaf rustle.

Daytime ambient noise levels were in the range 44 to 48 dB $L_{Aeq,15min}$. The daytime background noise was in the range 40 to 41 dB $L_{A90,15min}$.

Evening and Night-time ambient noise levels were in the range 40 to 51 dB $L_{Aeq,15min}$. The night-time background noise was in the range 37 to 46 dB $L_{A90,15min}$.

Location NML3

Table 10-8, following, presents a summary of the daytime (i.e. 07:00 to 19:00hrs), evening (i.e. 19:00 to 23:00hrs) and night-time (i.e. 23:00 to 07:00hrs) noise levels measured at Location NML3.

Table 10-8: Summary of Measured Baseline Noise Levels at Location NML3

Date and Start Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)			
	$L_{Aeq,15min}$	$L_{Amax,15min}$	$L_{A10,15min}$	$L_{A90,15min}$
24 August 2023 at 09:44	62	75	64	59

24 August 2023 at 10:46	60	83	62	57
24 August 2023 at 11:48	61	79	62	58
24 August 2023 at 22:43	60	87	58	56
24 August 2023 at 23:57	54	61	56	51
25 August 2023 at 00:59	56	71	63	48

During the noise survey, the dominant noise sources were noted to be from motorway traffic, on nearby M1, regular site noise (commercial forecourt) or local road traffic, birdsong, leaf rustle, and occasional pedestrian noise.

Daytime ambient noise levels were in the range 60 to 62 dB $L_{Aeq,15min}$. The daytime background noise was in the range 57 to 59 dB $L_{A90,15min}$.

Evening and Night-time ambient noise levels were in the range 54 to 60 dB $L_{Aeq,15min}$. The night-time background noise was in the range 48 to 56 dB $L_{A90,15min}$.

Location NML4

Table 10-9, following, presents a summary of the daytime (i.e. 07:00 to 19:00hrs), evening (i.e. 19:00 to 23:00hrs) and night-time (i.e. 23:00 to 07:00hrs) noise levels measured at Location NML4.

Table 10-9: Summary of Measured Baseline Noise Levels at Location NML4

Date and Start Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)			
	$L_{Aeq,15min}$	$L_{Amax,15min}$	$L_{A10,15min}$	$L_{A90,15min}$
30 November 2023 at 10:57	62	70	63	61
30 November 2023 at 11:41	64	81	65	61
30 November 2023 at 12:24	62	72	63	61

30 November 2023 at 22:36	61	65	62	57
30 November 2023 at 23:16	59	72	61	56
30 November 2023 at 23:32	60	68	62	57

During the noise survey, the dominant noise sources were noted to be from motorway traffic, on nearby M1, occasional local road traffic, birdsong, and leaf rustle.

Daytime ambient noise levels were in the range 62 to 64 dB $L_{Aeq,15min}$. The daytime background noise was 61 dB $L_{A90,15min}$.

Evening and Night-time ambient noise levels were in the range 59 to 61 dB $L_{Aeq,15min}$. The night-time background noise was in the range 56 to 57 dB $L_{A90,15min}$.

Traffic Flows during Baseline Noise Survey

Where appropriate, EPA noise mapping will be used, in combination with a review of available and historic TII traffic count data for nearby traffic counters, in order to estimate the effect of potential reduced traffic flows. The estimated reduction will be calculated and the baseline data will be corrected in order to correct for any potential impacts where appropriate.

10.4. Predicted Impacts

10.4.1. Characteristics of the Proposed Development

The proposed business park development will consist of:

- Demolition of a single-storey 200-square-metre (m²) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- Demolition of 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;
- Provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and M1 motorway, referred to as Zone A and F;

- Zone A and F lands are located north and south of Bhailsigh Road (L1140), respectively, which connect to Junction 5 of the M1 Motorway and are located in the townlands of Rowan's Big and Rowan's Little;
- Preparation of indicative Masterplan for Zone A and F which contains layouts of the future planned commercial properties, consisting of mixed-use, warehousing and distribution units including associated loading bays for HGVs, service compounds, ESBN substations and parking areas to service each commercial unit site, which would be subject to individual planning permission applications;
- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k- to 105k-square-feet (ft^2) units with the potential to combine plots should larger units be required;
- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;
- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties; and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

Please refer to Chapter 2 for the full description of the proposed development.

When considering a development of this nature, the potential noise and vibration impact on the surroundings must be considered for each of two distinct stages:

- construction phase, and;
- operational phase.

Construction Phase

During the construction phase the main site activities will include site clearance, ground excavation works and provision of infrastructure, construction of the buildings, road construction and landscaping. Potential impacts during the construction phase will be short-term.

Operational Phase

Operational phase outward noise impacts will be long-term and will typically consist of:

- increased noise due to additional vehicular traffic on public roads,

Potential impacts during the operational phase will be long-term.

10.4.2. Do-Nothing Scenario

If the proposed development does not proceed there would be no additional impact on the local ambient noise and vibration conditions.

Under the 'Do Nothing' scenario there would be no change to the current land use of the site. There will be no impact on noise/vibration to surrounding receptors.

10.4.3. Potential Effects – Construction Phase

Noise

During the construction phase the main site activities will include site clearance, demolition works, ground excavation works and provision of infrastructure, road construction and landscaping. Potential impacts during the construction phase will be short term.

BS 5228-1:2009+A1:2014 provides catalogue of source noise levels for various construction plant, machinery and activity, along with a clear methodology and procedure for the prediction of noise from construction to sensitive receptors. This allows for an indicative assessment of the likely impacts of construction activity to nearby dwellings.

Table 10-10, following, presents construction plant items that are considered to be typical for a site of this nature, along with the BS5228-1 reference noise emission values at the nominal distance of 10 metres.

Table 10-10: Typical Construction Plant Items and BS5228-1 Reference Noise Emission Values

Phase	Item of Plant (BS 5228-1 Ref.)	Construction Noise Level at Reference Distance (10m) dB $L_{Aeq,1hr}$
Demolition	Pulveriser on excavator (C1.3)	80
	Tracked Excavator, loading Dump Truck (C1.10)	85
	Dump Truck, tipping fill (C2.30)	79
	Dump Truck, empty (C2.31)	87
Site Preparation	Wheeled Loader Lorry (C2 28)	74
	Diesel Generator (C4.76)	78
	Track Excavator (C2 22)	75
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
Road Construction	Breaker (C1.1)	76
	Dumper (C6.26)	77
	Paver (C5.33)	81
	Roller (D7.79)	75
Landscaping	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
	Surfacing (D8.25)	68

The nearest third-party noise sensitive locations to the proposed construction works are the properties to the west/north-west (NML1 at ca. 10m) and south-east (NML4 at ca. 280m) of the site boundary.

The closest works area is approximately 150m from the nearest properties with the remainder of works taking place across the site at varying distances. In order to assess a worst-case scenario, construction noise levels at distances of 100m, 200m and 500m have been used although a prediction to 10m distance is also provided as a reference in **Table 10-11**.

The calculations also assume that the equipment will operate for 66% of a typical 12-hour working day and that a standard site hoarding, typically 2.4m height will be provided around the perimeter of the construction site for the duration of works. Table 10-11 summarises the construction noise predictions.

Table 10-11: Typical Construction Noise Predictions at Various Distances

Phase	Predicted Construction Noise Level dB $L_{Aeq,11hr}$ at 100m	Predicted Construction Noise Level dB $L_{Aeq,11hr}$ at 200m	Predicted Construction Noise Level dB $L_{Aeq,11hr}$ at 500m
Demolition	65	59	53
Site Preparation	59	51	41
Road Construction	59	51	41
Landscaping	56	49	39

With consideration of the site location, the likely construction phase activities, the distances from these works to nearby dwellings and the proposed construction noise criteria (i.e. 70 dB $L_{Aeq,11hr}$ for weekday daytime periods) it is **not** expected that potentially significant noise impacts will be encountered when works are occurring, with approximately 180 metres as the closest point to neighbouring dwellings.

Though no significant noise generation is expected from the construction project, noise mitigation measures will be put in place during construction in order to reduce related impacts as far as is reasonably practicable. The use of best practicable means (BMP) to control emissions can constitute a ground of defence against charges that a nuisance is being caused.

Typical mitigation measures that should be considered are presented in the relevant sections of this document.

Vibration

With consideration of the distance from site boundaries to nearby sensitive receptors, and proposed general methods of construction, it is projected that vibration emissions to nearby receptors will be not significant. Vibration mitigation measures are, however, presented in the relevant sections of this document in order to ensure that construction vibration emissions are adequately controlled.

10.4.4. Operational Phase

Increased Noise due to Additional Vehicular Traffic on Public Roads

A traffic impact assessment has been prepared as part of this EIAR. Information provided by the traffic consultant (Clifton Scannell Emerson Associates Consulting Engineers) was provided to Rowan Consulting and this information has been used to determine the predicted change in noise levels in the vicinity of the adjacent road network along which traffic will travel to and from the site. Traffic data for the following scenarios has been reviewed in preparing this assessment:

- Base AADT for Years 2026 (Opening Year) and 2041 (Opening Year + 15 Years), and;
- Base + Development AADT for Years 2026 (Opening Year) and 2041 (Opening Year + 15 Years).

AADT flow data has been used to assess the potential change in noise levels along the adjacent roads between the base year and the scenarios incorporating future site traffic. Changes in road traffic noise on the local road network have been considered using prediction guidance contained within Calculation of Road Traffic Noise (CRTN) issued by the Department of Transport in 1988. The future traffic flow data takes account of the proposed development. Table 10-12 and

Table 10-13 summarise the calculated change in road traffic noise level for the assessment years.

Table 10-12: Assessment of Change in Traffic Noise Levels on Roads Surrounding the Site (AADT: Base 2026 vs Base + Development 2026); Noise Levels calculated for NML2 receptor

Road Link	AADT Traffic Flows		Predicted Change in Noise Level, dB (L_{A10})
	Do Nothing (2026)	Do Something (2026)	
M1 Northbound	29284	30757	+0.2
M1 Southbound	27699	29196	+0.2
Site Road Northbound	0	3000	+46.0
Site Road Southbound	0	1839	+43.8
L1140 East	1104	5339	+6.8
L1140 West	1082	1305	+0.8
Related Noise @ receptor, NML2, dB_{LA10}	62.5	62.9	+0.4

Table 10-13: Assessment of Change in Traffic Noise Levels on Roads Surrounding the Site (AADT: Base 2041 vs Base + Development 2041); Noise Levels calculated for NML2 receptor

Road Link	AADT Traffic Flows		Predicted Change in Noise Level, dB (L_{A10})
	Do Nothing (2041)	Do Something (2041)	
M1 Northbound	34135	35607	+0.2
M1 Southbound	32336	33833	+0.2
Site Road Northbound	0	3000	+46.0
Site Road Southbound	0	1839	+43.8

Road Link	AADT Traffic Flows		Predicted Change in Noise Level, dB (L_{A10})
	Do Nothing (2041)	Do Something (2041)	
L1140 East	1278	5512	+6.4
L1140 West	1251	1473	+0.7
Related Noise @ receptor, NML2, dB_{LA10}	63.2	63.5	+0.2

The calculated increase in noise level is less than 2.9 dB ('Negligible') along most of the existing roads assessed, with the exception of the local access road to the subject site from the M1 motorway (L1140 East), on which a Moderate Impact is expected. Major impacts, from a noise perspective are expected on the new access road(s) to the subject site. In terms of the noise impact on the closest residential receptor (NML2), the predicted impacts are likely to be Negligible in 2026 and 2041. Referring to Table 10-5 confirms that this calculated change in noise level is 'Negligible' and the associated impact is 'Not Significant'.

10.5. Mitigation Measures

10.5.1. Construction Phase

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2'. Whist construction noise and vibration impacts are calculated to be within the criteria set out in this document for the majority of the time, the contractor will ensure that all necessary noise and vibration control measures will be used, in order to ensure impacts to nearby residential noise sensitive locations are not significant.

The following mitigation measures are required during the construction of the proposed development:

- Use of a site hoarding, minimum 2.4m height to be erected around the perimeter of the construction site for the duration of works where the distance of works is 30m or less to nearby noise sensitive locations;
- Limiting the hours of construction to the following:

  Monday to Friday 07.00 – 19.00

  Saturday 07.00 – 13.00

  In exceptional circumstances, and subject to agreement with Fingal County Council, extended hours of operation may be applied for. In such instances an assessment of potential noise impacts shall be carried out in advance of works taking place, and submitted to Fingal County Council, as part of the extended hours request.
- Monitoring levels of noise and vibration during critical periods and at sensitive locations;
- Maintaining site access roads even so as to mitigate the potential for vibration from lorries;
- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of barriers as necessary around items such as generators or high duty compressors;
- Situate any noisy plant as far away from sensitive properties as is reasonably practicable and the use of vibration isolated support structures where necessary;
- Establishing channels of communication between the contractor/developer, Local Authority and residents, and;
- Appointing a site representative responsible for matters relating to noise and vibration.

During the construction phase all scaffolding, hoarding and cranes would only be in use for as long as necessary to facilitate the construction of the proposed development. The impact of these is considered negligible. No additional mitigation is required.

10.5.2. Operational Phase

Increased Noise due to Additional Vehicular Traffic on Public Roads

During the operational phase of the development, noise mitigation measures with respect to traffic coming to/from the development are not deemed necessary.

10.6. Interactions and Potential Cumulative Effects

10.6.1. Interactions

Local noise conditions will be influenced by the outcome of other environmental attributes assessed within this EIAR as follows:

- Traffic and Transportation (Chapter 12) - Noise and vibration interacts with Roads and Traffic and information provided in the Traffic Chapter has been used in preparing this EIAR Noise & Vibration Chapter.

10.6.2. Cumulative Impacts

Construction Phase

The phasing/commencement of any other permitted developments in the locality could potentially result in the scenario where a number of other construction sites are in operation at the same time as the proposed development. The location of any other nearby construction sites in relation to each other and to nearby noise sensitive locations, means that there is a general low risk of cumulative construction noise emissions resulting in an exceedance of the relevant criteria.

Operational Phase

The location of the proposed development site in relation to nearby noise sensitive locations and the distance from the proposed development site in relation to other nearby lands means that there is minimal risk of cumulative operational phase noise emissions resulting in an exceedance of the relevant criteria. No additional mitigation measures are therefore required.

With regard to the wider masterplan for the proposed development each unit will be subject to subsequent planning applications and may change from the indicative masterplan. Without very specific details on each unit, it is not possible to assess noise impact, other than it will be somewhat greater than what is currently present now. There will be cumulative impacts. However, the current noise climate is significant, due to the motorway presence, so it should be possible to include additional commercial operations within the development without significant impacts on the existing receptors.

10.7. Residual Impacts

According to Environmental Protection Agency guidelines, a residual Impact is described as 'the degree of environmental change that will occur after the proposed mitigation measures have taken place.' The mitigation strategy above recommends actions which can be taken to reduce or offset the scale, significance and duration of the effects on the surrounding receptors from effects posed by noise or vibration.

10.7.1. Construction Phase

During the construction phase of the project there will be some negative impact on nearby noise sensitive locations due to noise/vibration emissions from construction activity. The implementation of suitable control measures will ensure that the impact is minimized. The residual impact from construction is as follows.

Table 10-14: Construction Phase Residual Noise/Vibration Impacts

Quality	Significance	Duration
Negative	Moderate	Short-term

In terms of the noise exposure of construction workers, the Safety, Health and Welfare at Work (General Application) Regulations 2007 (Statutory Instrument No. 299 of 2007) provides guidance in terms of allowable workplace noise exposure levels for employees. The Regulations specify two noise Action Levels at which the employer is legally obliged to reduce the risk of exposure to noise. The appointed contractor will be required to comply with the Regulations and provide appropriate noise exposure mitigation measures where necessary.

The noise exposure level to off-site receptors during the construction phase will be below the lower Action Level and therefore the risk of noise exposure resulting in hearing damage to off-site receptors is not significant.

In terms of construction noise emissions to nearby off-site receptors, provided that noise emissions are controlled to comply with the recommended significance thresholds, as outlined in previous sections, and considering the short-term nature of the works, the potential health impacts associated with construction noise is not significant.

10.7.2. Operational Phase

The anticipated residual impact from the operational phase of the development is summarised as follows.

Table 10-15: Operational Phase Residual Noise/Vibration Impacts

Quality	Significance	Duration
Negative	Not Significant	Long-term

The operational phase outward noise emissions will be controlled to comply with the recommended World Health Organisation (WHO) Guidelines, the potential health impacts associated with operational phase site noise emissions are not significant.

10.8. Monitoring

The appointed contractor will be required to monitor levels of noise and vibration during critical construction periods at nearby sensitive locations and/or development site boundaries.

10.9. References

- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022)
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out EIA – (Department of Housing, Planning and Local Government - August 2018
- Fingal County Council's (CCC) Noise Action Plan 2019 to 2023 (NAP)
- ISO 1996-2:2017 Acoustics -- Description, measurement and assessment of environmental noise -- Part 2: Determination of sound pressure levels
- ISO 9613 (1996): Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation
- British Standard BS 6472 (1992): Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).
- BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise
- BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration
- BS8233:2014 Guidance on sound insulation and noise reduction for buildings

- BS4142:2014+A1: 2019 Methods for Rating and Assessing Industrial and Commercial Sound'
- World Health Organisation (WHO) Guidelines for Community Noise
- World Health Organisation (WHO) Night Noise Guidelines for Europe (2009)

11. Landscape and Visual

11.1. Introduction

This Landscape and Visual Assessment (LVIA) has been prepared to accompany a planning application for a development comprising the provision of the key infrastructure to facilitate the future development of the lands for a logistics/warehousing development just off Exit 5 of the M1.

The report was prepared by Richard Barker, Divisional Director at Macro Works. Richard holds a master's degree in Landscape Architecture, a post graduate diploma in Forestry and a Bachelor of Arts degree in Environmental Studies. He is a Corporate Member of the Irish Landscape Institute with 19 years' experience in assessing the landscape and visual impact of proposed industrial, commercial, infrastructural and renewable energy developments in Ireland

This LVIA describes the landscape context of the proposed development and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape / townscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape / townscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

11.1.1. Approach and Statement of Authority

This LVIA adopts an approach that is founded in the following best practice guidance documents:

- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3);

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Assessments (2022); and
- 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.

This LVIA was prepared by Macro Works Ltd. Macro Works' relevant experience includes a broad range of infrastructural, renewable energy, industrial and commercial projects since 1999, including numerous urban, residential, and mixed use development projects.

11.1.2. Description of Proposed Development

The proposed development comprises the following main components, further details of which can be found in Chapter 2: Project Description.

- Demolition of all existing buildings on site;
- Provision of internal roads and services infrastructure (surface water, foul and water supply) to facilitate the future development of the lands including public lighting, utility connections (power, telecommunications and gas) and SuDS drainage;
- Provision of new access roads from 'Bhailsigh Road' (L1140) to Zone A and Zone F and a new cycle and pedestrian route over the M1 motorway via the (L1140) towards the R132;
- Upgrades and modifications to the existing roundabout along the L1140; and
- All ancillary landscaping, road works, boundary treatments and site development works to support the development.

11.2. Methodology

This document uses methodology as prescribed in the previously mentioned GLVIA3, which follows the European Landscape Convention (ELC) definition of landscape:

> "*Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from "high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)" - whether protected or degraded."*

11.2.1. Scope of the Assessment

GLVIA3 establishes guidelines and not a specific methodology. The preface recognises that:

> *"This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand."*

The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose. The LVIA Methodology can be summarised as undertaking the following key tasks:

- Desk study and site visit in November 2023;
- Defining the Baseline Landscape setting and conditions;
- Identification and Evaluation of key components of the proposed development;
- Consideration of Mitigation Measures, where applicable;
- Assessment of Landscape Effects;
- Assessment of Visual Effects; and
- Summary Statement of Significance.

11.2.2. Study Area

A 2km study area has been adopted in order to understand the site's wider landscape and visual context. A development of the scale and type proposed is likely to be difficult to discern beyond this distance, and so 2km is considered conservative and comprehensive. The cautiously large LVIA study area used in this instance also reflects the fact that this enabling works project foreshadows more comprehensive development of the site and therefore establishes a study area for any future LVIA studies associated with that development.

Due to the combined influence of natural topography, and screening elements in the wider landscape, a proportionate degree of focus is placed on the landscape within approximately 500m, this containing locations from where the development may be visible, and likely to give rise to the most notable landscape or visual effects. The study area is illustrated in **Figure 11-1**.

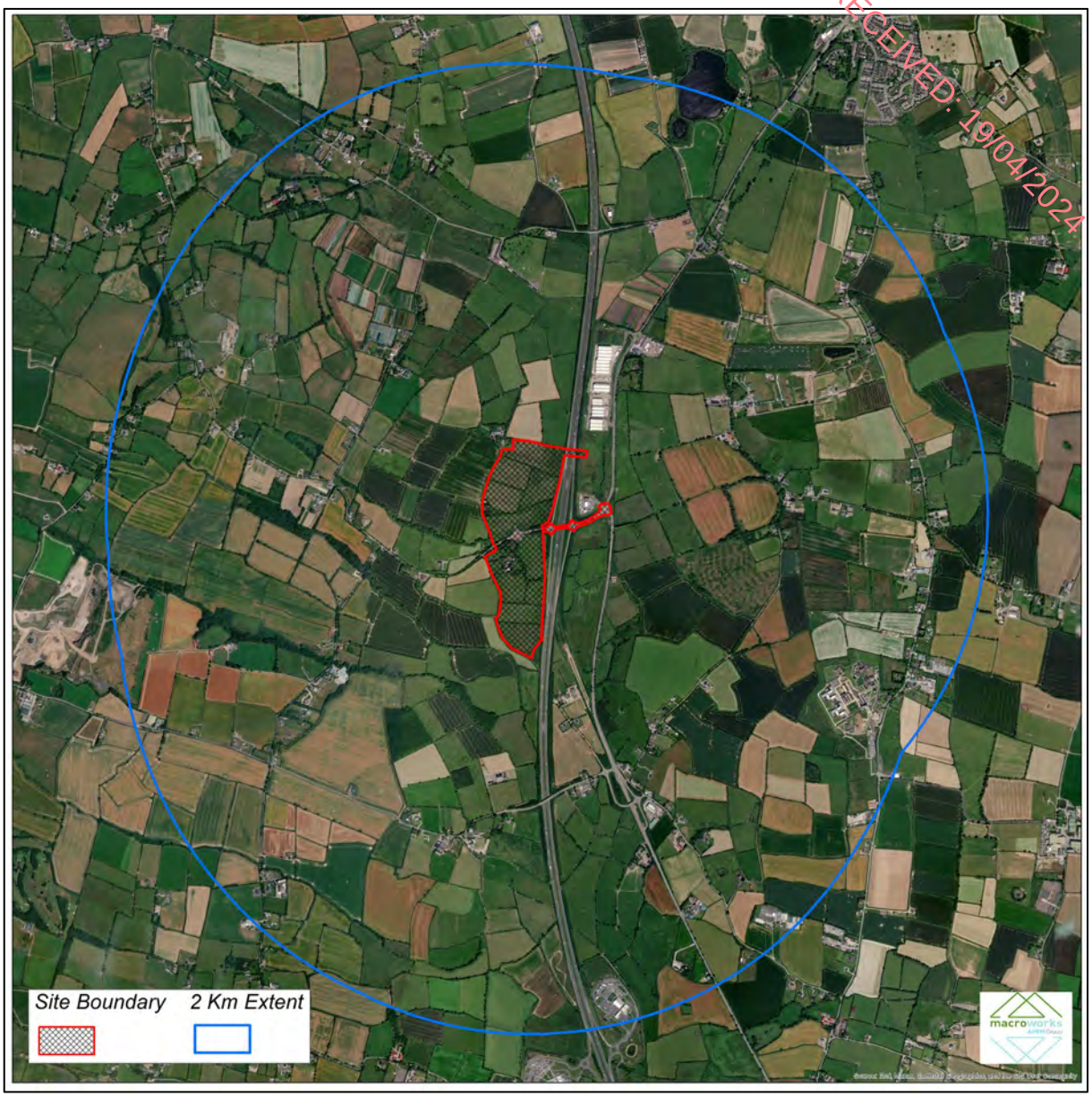


Figure 11-1: Site and 2km study area

11.2.3. Landscape Impact Assessment

This part of the LVIA provides an assessment of how the introduction of the proposed development will affect the physical features and fabric of the landscape, and then how the proposals influence landscape character with reference to published descriptions of character and an understanding of the contemporary character of the landscape as informed through desktop and site studies.

When assessing the potential landscape effects of the development, the value and sensitivity of the landscape receptor is weighed against the magnitude of impact to determine the

significance of the landscape effect. Criteria outlined below are used to guide these judgements.

Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the following criteria set out in **Table 11-1**.

Table 11-1: Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.

Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

Magnitude of change - Landscape

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. Table 11-2 outlines criteria used to inform this judgement.

Table 11-2: Magnitude of Change - Landscape

Criteria	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.

Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

11.3. Visual Impact Assessment

This part of the LVIA provides an assessment of how the introduction of the proposed development will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the proposed development upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and
- The overall impact on visual amenity.

It has been deemed appropriate to structure the assessment around representative viewpoint locations. Viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the proposed development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

Sensitivity of Visual Receptors

As with landscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike landscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

Susceptibility of Visual Receptors to change

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- "Residents at home;
- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- Communities where views contribute to the landscape setting enjoyed by residents in the area;
- Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".
- Visual receptors that are less susceptible to changes in views and visual amenity include;
- "People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;
- People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

Value attached to Views

The value attached to a view is determined by considering the following:

- Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
- Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development

Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;

- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Viewer connection with the landscape. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy roads versus tourists focussed on the character and detail of the landscape;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

Magnitude of Change - Visual

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the proposed development. This is directly influenced by its 'visual presence/prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature, and essentially relate to how noticeable or 'dominant' the proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant. Criteria used to inform judgements are provided in Table 11-3.

Table 11-3: Magnitude of Change - Visual

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings

	and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

11.3.1. Significance of Effects

The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at Table 11-4 as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity, but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape institute, 10th June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at **Table 11-5.**

Table 11-4: Significance Matrix

	Sensitivity of Receptor				
Magnitude	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible

Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

It is important that the likely effects of the proposals are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement, and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as 'Substantial' or greater (shaded cells) are considered to be the most notable in landscape and visual terms, and may be regarded as 'Significant', albeit it is important to note that this is not a reflection on their acceptability in planning terms.

Table 11-5: Indicative significance of effect criteria descriptions

	Landscape	**Visual**
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and	An effect that alters the character of the visual environment in a manner that is consistent with existing and

	emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

11.3.2. Quality of Effects

In addition to assessing the significance of landscape and visual effects, the quality of the effects is also determined. Within this LVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape;
- Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/landscape.

11.4. Landscape and Visual Baseline

This section of the LVIA presents the existing landscape and visual context against which any changes brought about by the proposed development are assessed.

The landscape context is described in relation to the proposed application site and the wider study area with reference to published descriptions of landscape character, as well as characteristics of the landscape such as landform and drainage, vegetation, land use, settlement pattern, transport routes and public amenities and facilities.

11.4.1. Landscape Baseline

The two portions of the site – Zone A and Zone F, are contained within several agricultural fields in the townlands of Rowan's Big and Rowan's Little, located just off the M1 motorway corridor, at northbound Exit 5 to Balbriggan (South). The lands at the location of the proposed works are currently used for agricultural purposes, and contain several derelict dwelling structures and farmsteads. Bhailsigh Road (L1140) separates the two zones, running through the center with Zone A is located north and Zone F located South of the local road. For the most part, both zones are bounded by hedgerow vegetation. Mature treelined hedgerows run along the north, east and south borders of Zone A, whilst mature vegetation surrounds Zone F on all sides with an additional portion of hedgerow running through the northern side of Zone F. Refer to **Figure 11-2.**

On a broader scale, the proposed development is located within a gently undulating landscape with elevations on site range from approximately 38mOD to 50mOD. The surrounding landscape generally slopes toward the M1 motorway corridor which runs through the centre of the study area, adjacent to the proposed development. Toward the east, elevations begin to gently increase at greater distances from the motorway corridor, whereas elevation increases more drastically to the west of the site, in the direction of the Naul Hill upland areas, the highest point of which reaches c. 176mOD at Knockbrack Hill.

Beyond the immediate context, the site is set in a semi-rural, semi-industrial landscape. The primary land use within the immediate surrounds and wider context is intensive agriculture, with field sizes ranging from small to medium scale. Field boundaries consist of a mixture of low clipped and dense mature hedgerows. Despite the typical rural hinterland nature of much of the surrounding study area, the landscape is also heavily influenced by a range of strongly anthropogenic land uses and landscape features. Within the eastern half of the study area there are a number of commercial/industrial land uses, including the M1 business park, a children's detention centre, two rest stops and the Fyffes warehouse. In addition, there are a number of smaller local businesses generally dispersed along the road corridors including industrial scale farmsteads, mechanics and construction companies. In the eastern half of the

study area, industry is generally scattered along the existing road network primarily along the R132 regional road and L1155 local road. Within the western half of the study area the land uses are noticeably more agriculturally focussed, with a number of industrial scale farm sheds scattered throughout. A small/medium scale quarry is also present toward the outer extents of the western half of study area.

Settlement patterns within the study area comprise relatively dispersed one-off houses and farmsteads, with the occasional linear cluster of residences typically found at crossroads. In general, the settlement pattern tends to follow the layout of the surrounding local road network, whilst maintaining good setbacks from the roads.

Heritage and recreation within the study area typically pertain to outdoor sporting facilities and local churches and graveyards. While there are a number of ‘preserve views’ designations along local roads within the study area, these typically relate to narrow open views over low lying agricultural lands.

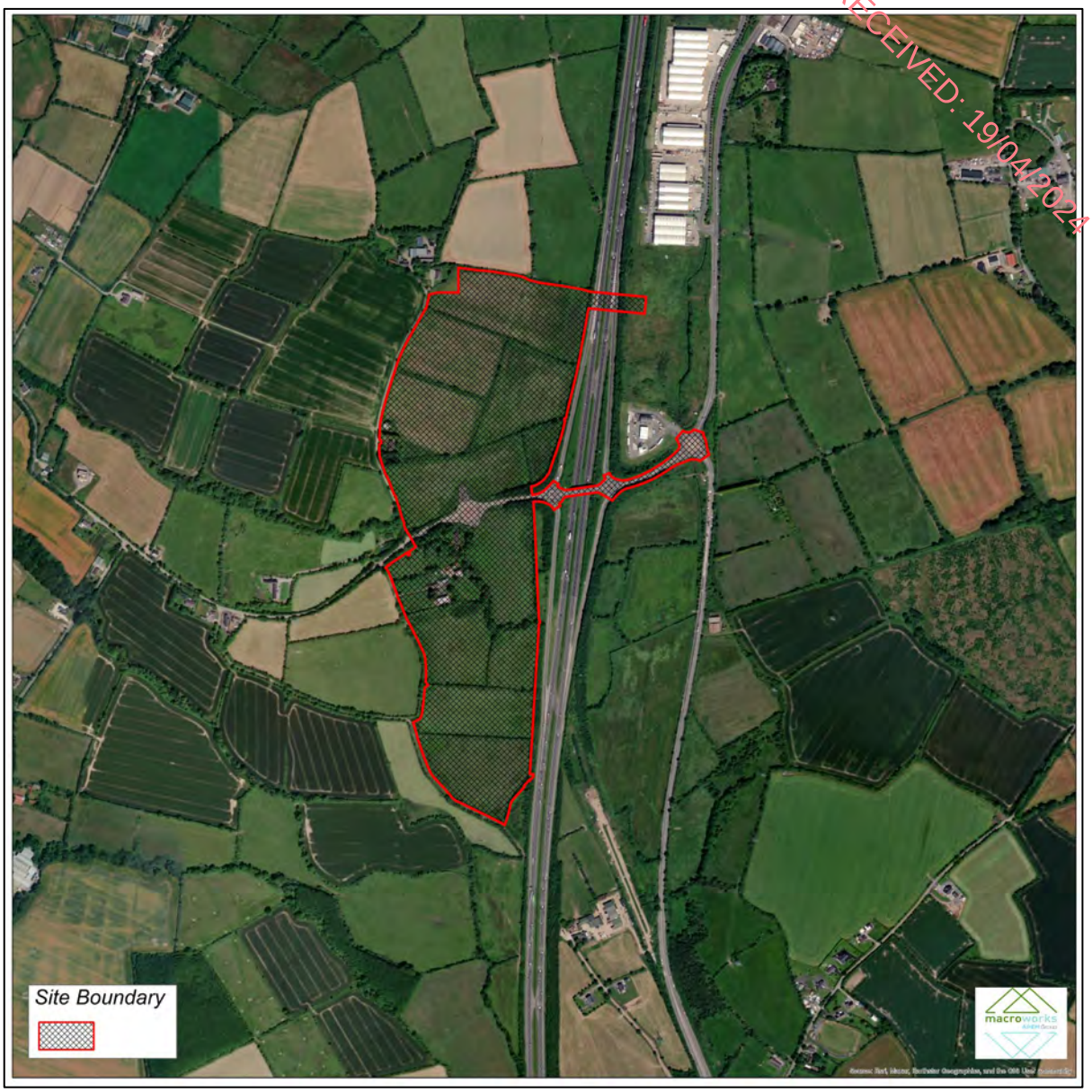


Figure 11-2: Site context

11.4.2. Landscape and Planning Designations

The site is located within the administrative area of Fingal County Council (FCC) and is therefore subject to the land zoning policies and objectives of the Fingal County Development Plan (FCDP) 2023-2029. The FCDP provides a framework to guide future development within the Fingal jurisdiction in North Dublin and accordingly contains many policy objectives that deal with the strategic planning issues.

Whilst it is acknowledged that the FCDP contains policy objectives that deal with many design and environmental considerations, those that are considered to be of particular relevance to landscape and visual issues are predominantly contained in Chapter 9 (Green Infrastructure

and Natural Heritage) of the FCDP. Those relevant policies and objectives within Chapter 9 are GINHP9, GINHP25-26 and GINHO55-62. Objective DMSO162, within chapter 14 is also relevant.

The Fingal Development Plan (2023-2029) incorporates a Landscape Character Assessment for Fingal, which identifies a range of six landscape character types. Each landscape type is assigned a 'value' through the consideration of such elements as aesthetics, ecology, historical, cultural, religious or mythological. The proposed development is located in the Landscape Character Type (LCT) 'High Lying Agricultural' which is classed as having 'High' landscape sensitivity and a 'High' landscape value. The 'High Lying' character type is described as;

> *"an area of upland, rising to a high point of 176 metres at Hillfort Mound, to the southeast of the Naul. These hills afford panoramic views of the Mourne Mountains to the north, the coastline to the east and the Wicklow Mountains to the south. There are a number of important visual ridges on these uplands, that can be seen from wide areas of Fingal and Meath. Almost the whole County can be viewed from the more elevated roads. It also has an important ecological value with strong hedgerows and the presence of the 'Bog of the Ring' proposed Natural Heritage Area here. There is little obtrusive or inappropriate development in the area and there is a pronounced absence of any substantial coniferous woodland."*

The Fingal Development Plan identifies highly sensitivity landscape (HSL) areas, described as areas that are *'likely to be vulnerable to change'*. As can be seen on FCDP Green Infrastructure Map Sheet No. 14, the proposed development falls within the Naul area of sensitivity, located along the outer eastern extent of the HSL area. The HSL designation encompasses a High Amenity zoning (HA), relating to the Naul Hills upland area to the south/southeast of Naul village.

Whilst the character assessment is considered relevant at the more strategic landscape level, given the scale of the site relative to the breadth of the identified areas of character described, its contained nature and its physical relationship with the surrounding residential land-uses, it is not considered to be of a scale that is helpful in understanding the potential influence of the proposed development. Furthermore, the site is peripheral within this LCT and physically separated from the distinct upland areas that contribute landscape sensitivity to the High Lying Agricultural LCT. The most notable of these is these are the Naul Hills, which, as previously mentioned, lie to the south/southeast of Naul village.

According to Chapter 13 (Land Use Zoning) of the FCDP, the site is located within a 'GE - General Employment' zoning classification. Figure 11-3refers. The principal zoning objective for this is to 'Provide opportunities for general enterprise and employment'. The land uses listed as 'permitted in principle' within GE zones are of a similar nature to that proposed as part of the development including; Industry (general and light), Utility Installations, Enterprise Centre and Logistics. The vision for GE zoned areas is to;

> *"facilitate opportunities for compatible industry and general employment uses including appropriate sustainable employment and enterprise uses, logistics and warehousing activity in a good quality physical environment. General Employment areas should be highly accessible, well designed, permeable and legible."*

FCDP Green Infrastructure Map Sheet No. 14 (see Figure 11-3below) identifies scenic routes within Fingal, with the objective to 'preserve views' from the identified routes. A total of 17 identified routes with some degree of visual amenity fall within the study area (see Figure 11-4 below), however the FCDP (2023-2029) does not provide a description of the identified views nor the aspect of the associated visual amenity. Notwithstanding, it appears that the scenic routes located on elevated lands toward the western half of the study area are afforded pleasant views looking out over the lower lying landscape to the east. The exception to this is the section of scenic route along the L1080 local road, which is afforded amenity views facing north, east and south. Similarly, many of the routes within the eastern half of the study area are afforded amenity views toward the east, away from the site. There are two exceptions to this, where two small sections of unnamed local road in the eastern half of the study area are oriented west/east, and are afforded pleasant landscape views toward the north and south. It should be noted however that many of these identified 'scenic routes' are bound on both sides by treelined hedgerow, affording only brief glimpses out over the surrounding low-lying landscape. Section 9.6.15 of the FCDP deals with Views and Prospects and states that there is a need;

> *"to protect and conserve views and prospects throughout the County for future generations. In assessing views and prospects it is not proposed that this should give rise to the prohibition of development along these routes, but development, where permitted, should not hinder or obstruct these views and prospects and should be designed and located to minimise their impact."*

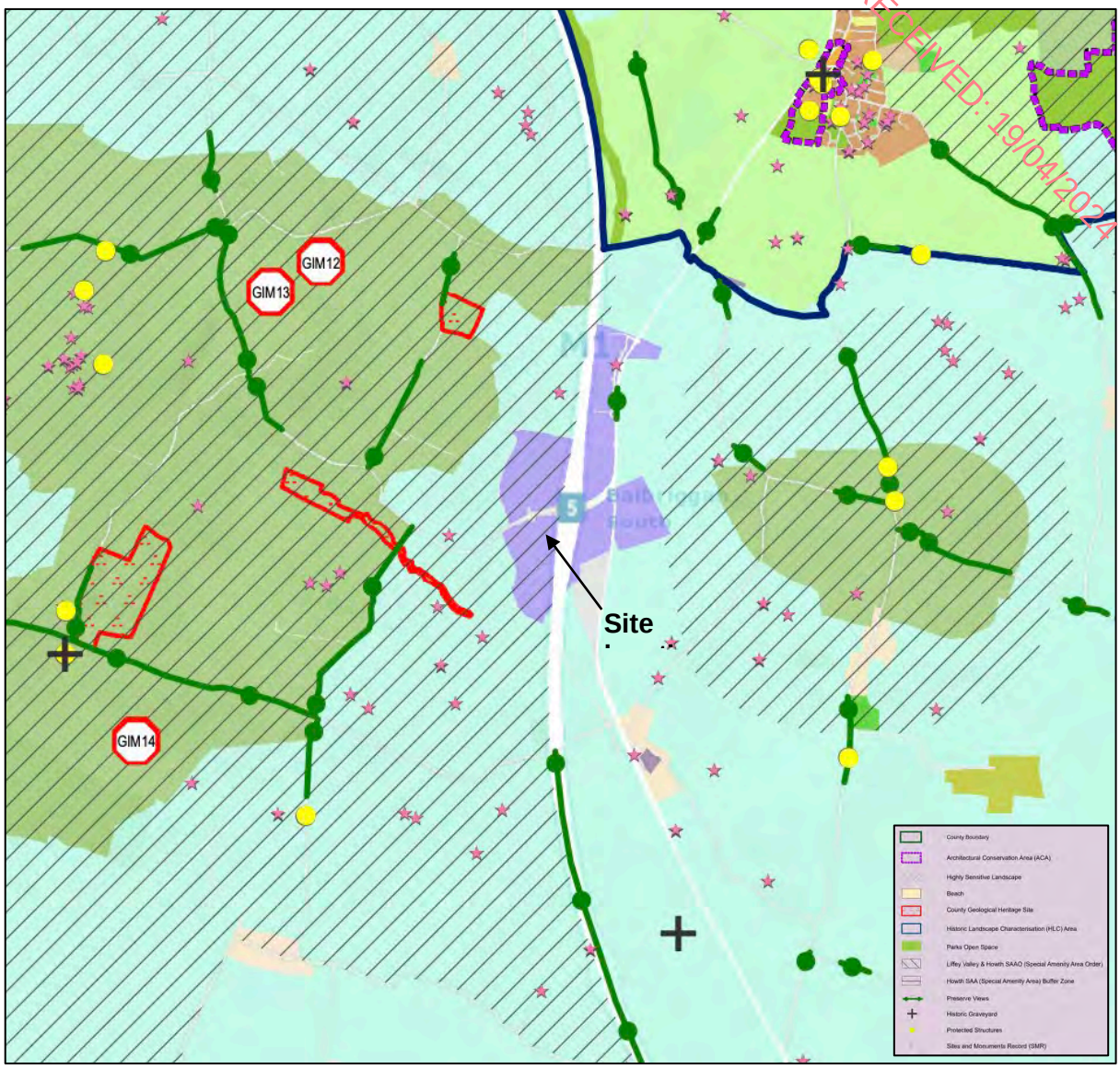


Figure 11-3: Extract from Fingal County Development Plan Green Infrastructure Map Sheet No. 14.

Figure 11-4: Extract from Fingal County Council data[1] indicating locations of 'preserve views' objective routes.

11.4.3. Visual Baseline

It is not warranted to include each and every location that provides a view towards the proposed development as this would make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the assessment of visual impacts is structured around a total of 7 no. representative viewpoint locations that are located within the surrounding landscape, with a particular focus on receptors within 500m of the site, considering the scale of the proposed development.

Representative assessment viewpoints seek to reflect a range of different receptor types, distances and orientations, to help to inform the conclusions being made. In the case of this

[1] *https://fingalcoco.maps.arcgis.com/home/item.html?id=860ade0b97cd4b22ba19a1b7e32bfed0*

development, where views are precluded by built form and vegetation, they seek to demonstrate the absence of visibility. Viewpoints are detailed in Table 11-6 and illustrated in Figure 11-5.

Table 11-6: Outline Description of Representative Viewpoints

VP No.	Location	Representative of	Direction of view
VP1	R132 at Courtlough	Road users, Scenic route	SW
VP2	Local road at Rowans Big	Local residents	SE
VP3	Local road at Walshestown	Local residents, Road users, Scenic route	E
VP4	R132 at M1 overpass	Road users	W and NE
VP5	L1140 at Rowans Little	Road users	N and S
VP6	R132 at Hedgestown	Road users	NW
VP7	Tooman local road at Walshestown	Local residents, Road users, Scenic route	NE

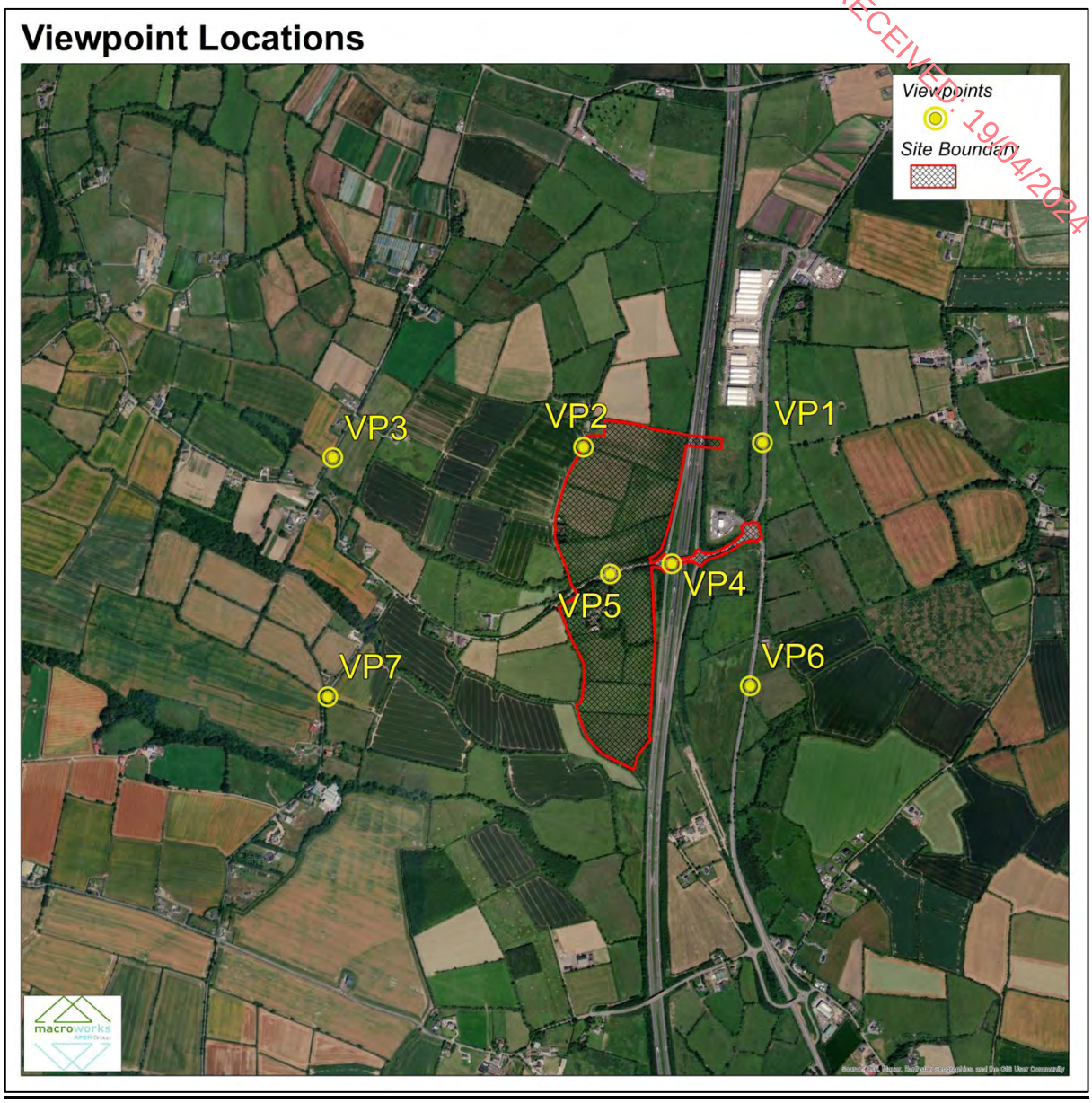


Figure 11-5: Viewpoint Location Map

11.5. Mitigation and Restoration

Consideration has been given to what measures can be taken to reduce, avoid, compensate and remedy any potential impacts. From a landscape and visual perspective, considering the scale of the proposed development and given the site's location adjacent to a busy motorway corridor, alongside the degree of vegetative screening provided by existing hedgerows, additional screen planting is not considered necessary at this stage.

11.6. Landscape Impact Assessment

11.6.1. Landscape Sensitivity

Whilst the immediate vicinity of the site has a generally rural landscape character, the wider study area is slightly more anthropogenic in nature. There is a clear presence of industry within the western half of the study area, along with the M1 motorway corridor through the centre of the study area, which heavily influence the overall character of the wider landscape. Nonetheless, while this is a modified landscape it is by no means degraded. This is a robust, productive landscape that encompasses numerous rural land uses.

There is a degree of recognised visual amenity in the area, as represented by the number of FCDP 2023-2029 designated scenic routes within the study area. A total of 17 scenic routes fall within the study area, however the FCDP (2023-2029) does not provide a description of the identified views nor the aspect of the associated visual amenity. Notwithstanding, it appears that the scenic routes located on elevated lands toward the western half of the study area are afforded pleasant views looking out over the lower lying landscape to the east. The exception to this is the section of scenic route along the L1080 local road, which is afforded pleasant views facing north, east and south. Similarly, many of the routes within the eastern half of the study area are afforded pleasant views toward the east, away from the site. Exceptions to this include two small sections of unnamed local road in the eastern half of the study area are oriented west/east, and are afforded pleasant landscape views toward the north and south. Notwithstanding, these scenic views are of local importance and generally relate to mid/long distance views from locally elevated sections of road, over the surrounding low-lying agricultural landscape.

The site in question is situated in the LCT - '*High Lying Agricultural'* which has been identified as having 'High' sensitivity, and 'High' landscape value. Furthermore, the site is located within a highly sensitivity landscape (HSL) area, described as areas that are *'likely to be vulnerable to change'*. While there are landscape features within the study area that have been identified as highly sensitive, such as the Naul upland areas and Knockbrack Hill, the landscape in the immediate surrounds of the site identifies more as a robust, working, rural landscape situated adjacent to a major road corridor. Furthermore, the land use zoning maps contained within the FCDP 2023-2029, illustrate that in spite of being located within a landscape area recognised as sensitive, the site is located within a 'GE - General Employment' zoning classification. The principal zoning objective for this is to 'Provide opportunities for general enterprise and employment'. The land uses listed as 'permitted in principle' within GE zones are of a similar nature to that proposed as part of the development including; Industry (general and light), Utility Installations, Enterprise Centre and Logistics, thus decreasing the sensitivity in the surrounding locale. Furthermore, the existing business and commercial land uses within the

surrounding landscape influence the overall character of the area, reinforcing that development in this area is suitable, and a characteristic feature of the landscape.

On the basis of the factors outlined above it is considered that this is a complex rural landscape with robust productive landscape values. Whilst the wider area has a pleasant semi-rural character, generated by its undulating, agrarian characteristics, landscape values are generally associated with industry, productivity and rural subsistence rather than any sense of rarity or the naturalistic. While much of the study area is designated as having 'special' sensitivity with a modest sense of visual amenity afforded from elevated locations across the surrounding low lying lands, the wider environs take the form of a typical rural landscape, bordering a major road corridor which anthropogenically influences the land use in the immediate vicinity.

Overall, it is considered that this is a diverse working and semi-industrial landscape that has, in places, samples of settled, commercial and rural land types. On balance, it is considered that this is a robust and productive landscape, with a landscape sensitivity that is deemed to be **Medium-low**.

11.6.2. Magnitude of Landscape Effects

Construction Phase effects

During the construction stage there will be construction-related activity within and around the site, and nearby approach roads. This may include, but is not limited to:

- Site preparation works and groundwork operations;
- Foundation work including the installation of foundations and services;
- HGVs transporting materials and infrastructure to and from the site;
- Movement of heavy machinery on-site;
- Temporary storage of site arisings / construction materials on-site;
- Security fencing/hoarding and site lighting.

Construction phase landscape effects are an inevitable consequence of the proposal being brought forward, with the most notable influence being as a result of the intensity of movement, and clutter of temporary structures associated with the construction works along the existing road network.

Construction stage landscape impacts will be localised to the immediate landscape setting, and 'short-term' in duration, relating primarily to the movement on the site and the local road network during the construction stage.

Significance of landscape effects (construction stage)

On the basis of the reasons outlined above, the magnitude of change is deemed to be **Low**. When combined with the **Medium-low** sensitivity of the receiving landscape, the overall significance of effect is considered to be **Slight / Negative**.

Operational Phase effects

In terms of physical landscape effects, the proposed development will not require any significant excavation that would permanently alter the landform of the site. The proposed new internal access/service tracks will be constructed to service the site which will be developed in the future and will be similar in nature to the existing road infrastructure that can be found throughout the nearby surrounding landscape.

In relation to landscape character, the key impacts will occur as a result of the introduction of additional built infrastructure such as roads into a landscape which is already heavily influenced by the nearby M1 motorway corridor and related road features at Exit 5.

The proposed new road features are inconsistent with the agricultural character of the receiving lands, and at a site level, the perception of this land as being solely farmland will inherently be changed. Notwithstanding, the site's location is relatively discrete, set in a sparsely populated area within a site which is surrounded on most sides by hedgerow vegetation, providing a degree of visual containment from local receptors and limiting its contribution to perceived landscape character outside of its immediate footprint. Furthermore, in instances where the proposed development is visible, the features proposed will merely present as an extension of the existing local road network. However, it is important to note that the application site lands have a very limited visual influence over the broader area.

When viewed in plan, the proposed development represents as a modest extension to the existing road network and thus marginal increase in single land use in the area. However, the proposal benefits from successive layers of vegetation in the landscape which restrict the outward influence of the development on landscape character.

It is also important to consider that the proposed enabling works are the discrete and small scale precursor to a more comprehensive scale of business park development in the future. A land use for which this site has been zoned as part of the strategic land use planning of this area. As such, the proposed development serves to facilitate the land use objective.

Significance of landscape effects (operational phase)

When considered in relation to the immediate landscape of the site and its adjacent landscape context within approximately 500m, the magnitude of change is deemed to be **Low**. When combined with the **Medium-low** sensitivity of the receiving landscape, the effects to landscape

character at this localised level are considered to be **Slight-imperceptible** / **Neutral**, in recognition of the negligible degree to which it would influence landscape character.

11.7. Visual Impact Assessment

11.7.1. Sensitivity of visual receptors

Views of the agricultural landscape within the study area from elevated areas are generally pleasant in terms of the low-lying, generally 'green', and settled working character of the surrounding lands. The network of hedgerows and vegetation that occur throughout the surrounding landscape contribute to some sense of naturalness, and in combination with its undulating topography generates a high degree of containment in many locations. However, whilst the agricultural context forms the primary landscape and visual experience in this area, in the local landscape of the site, this is interrupted by features and activity associated with the nearby road network, including the M1 motorway corridor and exit, and the L1140 local road. Indeed, all parts of this landscape, including those areas in agricultural use, demonstrate longstanding human intervention in the landscape.

There is some degree of visual amenity within the study area, as is indicated by the number of FCDP 'preserve views' designations present within 2km of the site. Notwithstanding, given the nature and scale of the development, only those within approximately 1km of the site were deemed to have potential for views of the development. On balance, three views were selected – VP1, VP3 and VP7, to represent views from FCDP (2023-2029) designated routes. VP3 and VP7 represent points along sections of elevated local roads which are afforded pleasant mid-distance views over the low-lying agricultural landscape to the east. On balance, both VP3 and VP7 are deemed Medium in terms of visual sensitivity. VP1 was captured in the vicinity of a 'preserve views' designation which occurs just north of this point. However, it is important to note that this designation occurs along a section of the R132 regional road, adjacent to the existing M1 business park, thus there is no particular sense of visual amenity at this location, which was confirmed during site investigations. On balance, VP1 is deemed to have Low visual sensitivity. VP2 is deemed as having a Medium-low visual sensitivity as it represents the views that are afforded from nearby residences, whereas the other remaining viewpoints – VP4, VP5 and VP6 are all deemed Low sensitivity, having been captured from within the surrounding road network to represent transient views that are afforded to road users.

In general, views toward the site and within the study area are not considered to be particularly unique, but rather tend to be typical and contained mid-distance agricultural views rather than expansive and/or exceptional views. Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape

are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on major transport routes where road infrastructure and traffic volume draw from visual amenity.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations contained in the methodology Section 11.2.3, the range of visual receptor sensitivity is only considered to fall between Medium and Low as determined on a case-by-case basis for each representative viewpoint in Table 11-7 below.

11.7.2. Magnitude of Visual Effects

The assessment of visual impacts at each of the selected representative viewpoints is aided by photomontages of the proposed development. Photomontages are a ‘photo-real’ depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced which are included within Appendix 11 of this EIAR:

- Existing view;
- Outline view (yellow outline showing the extent of the development overlaid on the photograph); and,
- Montage view.

Table 11-7: Visual Impact Assessment of Representative Viewpoints

VP No.	Existing View Context	Receptor Sensitivity	Description and Magnitude of Visual impact	Significance/ Duration / Quality
VP1	This is a roadside view captured from a point along the R132 regional road, just south of the existing M1 business park. It is a typical roadside view which faces southwest looking out over a greenfield site covered by a mixture of scrubby and bushy vegetation. Just north of this section of road there is a 'preserve views' designation, therefore this view was captured to represent this designation, as well as views afforded to road users.	Low	The proposed development will not be visible from this location due to screening by intervening vegetation. This view has been used to illustrate the absence of impact from this road, and the nearby scenic route designation. On balance, the magnitude of impact is deemed **Negligible / Neutral** by default.	**Imperceptible / Long-term/ Neutral**
VP2	This view was captured from an unnamed local road to the west of the proposed development, thus oriented east. This point is situated in the	Medium-low	Owing to the relatively open nature of this view and its proximity to the site, a large portion of the proposed site access road within Zone A has the potential to be visible from this location, but barely	**Slight / Long-term/ Neutral**

	vicinity of two dwellings, located at the end of this local road. Both dwellings are generally contained within their respective landholdings, surrounded on most sides by hedgerow vegetation. Views from this location are comparatively open, albeit somewhat truncated due to the density of the vegetation in the middle ground of the view. Notwithstanding, there are brief views of gently rolling terrain in the background, beyond the vegetation.		discernible. Whilst the proposed development does represent a change in tone, texture and the degree of built development within this otherwise pastoral scene, given the scale and contained nature of the development, these changes are considered minimal. Furthermore, the development is low-lying and follows the ground profile. Overall, the magnitude of visual impact is deemed **Low**.	
VP3	This view is afforded from an elevated section of local road near a cluster of dwellings at Rowans Big. This local road is also afforded a 'preserve views' scenic designation for its distant views across the landscape toward the east and southeast. This viewpoint was captured from an agricultural gateway,	Medium	The proposed development will not be visible from here due to screening by terrain and vegetation. This view has been used to illustrate the absence of impact from this scenic route and nearby dwellings. The magnitude of impact is therefore deemed **Negligible / Neutral**.	**Imperceptible / Long-term/ Neutral**

	and depicts a typical rural scene with no notable degree of scenic amenity. The view looks out over a gently sloping pastoral field, contained on all sides by mature hedgerow vegetation. Partial narrow views of the landscape in the distance are afforded by gaps in vegetation, however these are fleeting glimpses.			
VP4	This is a roadside view afforded from a Point along the R132 where is overpasses the M1 motorway corridor. The view faces west and east, and depicts features typical of an overpass, including a roundabout, signage and tall roadside vegetation.	Low	The proposed development will be visible from this location, where upgrades to the existing road network are subtle but visible. The existing roads will be widened slightly and the grassy roadside banks will be converted to paved cycleway/pathway. Overall the modifications to the existing road marginally increase the built tone within the view, adding hard surfacing in areas that were previously verdantly toned, however these changes are not conspicuous in this busy roadside context. Overall,	**Slight-imperceptible / Long-term/ Neutral**

			the magnitude of visual impact is deemed **Low-negligible**.	
VP5	This is a roadside view afforded from the centre of a roundabout along the L1140 local road, where the R132 regional road at Exit 5 meets the local road. The view faces north and south, and depicts what appears as unfinished roadways closed off by concrete blocks and dirt mounds, overgrown with grassy vegetation. Beyond the immediate roadside context, there are relatively narrow views of agricultural fields bound by hedgerow vegetation.	Low	Captured from the centre of the roundabout where the L1140 meets the R132 overpass road, this is the clearest view of the proposed development. From this location, the most noticeable change to the road layout is where the L1140 road enters the new sections of access road into Zone A and Zone F. At these points, the enabling works entail the removal of overgrown scrubby roadside vegetation, dirt mounds and concrete blocks, bordered by new paved roadways delineated by a pathway/cycleway. Whilst the removal of the scrubby roadside vegetation and parts of the grass verge increase the proportion of built tone within the view, these works present as improvements to this otherwise low amenity roadside scene. On balance, the magnitude of visual impact is deemed **Low / Positive-Neutral**.	**Slight / Long-term/ Positive-Neutral**

VP6	This is a roadside view captured from a point along the R132 regional road, just south of the Fyffes warehouse. It is a typical roadside view which faces northwest looking out over scrubby roadside vegetation into an agricultural field backed by tall dense vegetation, which serves to truncate the view.	Low	The proposed development will not be visible from this location due to screening by intervening vegetation. This view has been used to illustrate the absence of impact from this road, and the nearby scenic route designation. On balance, the magnitude of impact is deemed **Negligible / Neutral** by default.	**Imperceptible / Long-term/ Neutral**
VP7	This view is afforded from an elevated section of the Tooman road local road set between several dwellings that are dispersed along this road. This local road is also afforded a 'preserve views' scenic designation for its distant views across the landscape toward the east and southeast. This viewpoint was captures from an agricultural gateway, and depicts a pleasant but typical rural scene looking out over pastoral fields, a network of hedgerows and a gently	Medium	The proposed development will not be visible from here due to screening by terrain. This view has been used to illustrate the absence of impact from this scenic route and nearby residences. The magnitude of impact is therefore deemed **Negligible / Neutral**.	**Imperceptible / Long-term/ Neutral**

	sloping landscape containing the background.			

As can be seen from the results of Table 11-7, the proposed development is extremely well screened with very few instances where the proposed upgrade works along the existing road network and additional portions of development within the site are visible, outside of the immediate vicinity. Four of the seven representative viewpoints will have an Imperceptible / Neutral significance of impact, whilst all three remaining viewpoints will have a Slight or Slight-imperceptible significance of impact as a result of their proximity to the proposed development. These effects will also be of a Neutral or Positive quality.

11.8. Cumulative Impacts

Within a cumulative assessment, the baseline against which landscape and visual effects are assessed is extended to consider other relevant schemes that are not currently present in the landscape but that are subject to a valid planning application (or have been permitted) as being operational and present in baseline views. Cumulative effects therefore represent any increased effects that may be generated by the development in a scenario where other relevant schemes in the locality are operational.

In accordance with GLVIA3, schemes that are at feasibility and pre-planning are not generally considered to be appropriate in the context of a cumulative assessment due to a lack of certainty that they will come forward and because of an absence of detail that enable any meaningful judgements to be made.

No comparable developments were identified, but considering the site's visual containment, it is not considered that there is any potential for cumulative landscape or visual effects.

The only other consideration is the future development of the zoned business park that these enabling works will facilitate. In that future context, the enabling works represent a very minor and associated (required) component of the overall masterplan. The two elements should not be considered in isolation to each other or even cumulative to each other as they are integral parts of the same future development that is envisaged by the land-use zoning for this area. Neither would exist without the other in the planned future scenario.

Notwithstanding, the enabling works are generally internal to the site and as it is developed in accordance with the masterplan, they will become increasingly screened by the business park developments, which will incorporate their own screen planting measures. These developments will each be subject to their own planning applications and assessments.

11.9. Summary of Impacts

In terms of landscape impacts, there will be some modest physical impacts to landform and land cover at a site scale, but in the context of the wider setting, these will be minor and unlikely to be noticed beyond the immediate context of the site.

The proposed development is considered to have limited potential to materially impact the local landscape character given its nature as an amendment to the existing road network, with the addition of some upgrades and additional sections. Overall, it is considered that the landscape of the study area is principally that of a productive, yet partially industrious rural landscape. There is some degree of scenic amenity in the area, as highlighted by the number of sections of road with FCDP 'preserve views' designations, and the designation of the site within a High Amenity zoning (HA), relating to the Naul Hills upland area to the south/southeast of Naul village. The site is located within a 'GE - General Employment' zoning classification, whose principal zoning objective for this is to 'Provide opportunities for general enterprise and employment'. On balance, the significance of landscape impact is deemed to be Slight-imperceptible, within the immediate vicinity of the site and reducing to slight and imperceptible at greater distances, in recognition of the negligible degree to which it would influence landscape character.

Visual impacts were assessed at 7 No. viewpoints which represent different receptors, viewing distances and viewing angles within the study area. Visibility of the proposed development is limited to the immediate vicinity of the site given the nature and scale of the development, adjacent to and acting as an extension of the existing road network. The significance of visual impact ranges between 'Slight' and 'Imperceptible' and in the three cases where effects greater than imperceptible are assessed, the quality of the visual change is either Neutral or Positive.

VP2, VP4 and VP5 will experience Slight or Slight-imperceptible significance of visual impact, due to their proximity to the proposed enabling works and the proportion of the development visible from these locations. In most instances, the only visual changes are to the existing road network, apart from VP2 which sees an alteration of land use from purely pastoral, to a pasture with a road through its centre. In other instances, where the development is visible primarily as changes to the existing road network, these changes are subtle, and do not stand out in the context of the views, within an existing road corridor.

Given the site's scale and its nature as enabling works, in preparation for future development, the proposed development is considered to be of modest consequence in terms of effects to landscape character and views. In this regard it is considered that this is an appropriately sited

development, that can be readily assimilated into this landscape with little consequence to landscape character, or views.

11.10. Conclusion

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed development and associated site works are not considered to give rise to any significant landscape / visual or cumulative impacts.

12. Traffic and Transport

12.1. Introduction

This chapter has been prepared by Clifton Scannell Emerson Associates (CSEA) to assess the likely effects of the subject development in terms of vehicular, pedestrian and cycle access during construction and operational phases.

This chapter has been prepared specifically by Fernando Silva a Transportation Engineer with CSEA with 8 years experience. His qualifications and memberships are listed below:

- Engineering Degree in Environmental and Sanitarian Engineering awarded by Pontifical Catholic University of Campinas in 2017, Campinas, Sao Paulo, Brazil
- LinSig 3.0: Junction Modelling Computer Workshop, JCT, 2023
- TRANSYT 16 Foundation Course at TRL (UK's Transport Research Laboratory), 2019
- Member of the Chartered Institution of Highway and Transportation, Republic of Ireland branch (MCIHT), 2021 to Present
- Member of Engineers Ireland (MIEI), 2024 to Present
- Member of the Brazilian Regional Council of Engineering and Agronomy of Sao Paulo (CREA-SP), 2018 to Present

The development proposed as part of the subject application is solely related to the construction of the civil infrastructure to service future-planned commercial buildings. The commercial buildings themselves will be subject to future planning applications.

Even though the commercial buildings are not currently proposed, the potential transport impacts associated with them have been considered in this assessment. This Chapter provides a comprehensive review of all the potential transport impacts associated with the overall development. The Construction Phase assessment is specifically related to the construction impacts of the proposed civil infrastructure outlined in this application, while the Operational Phase relates to the potential future transportation impacts associated with the operation of the future-planned commercial buildings.

This Chapter describes: the methodology adopted, the receiving environment at the area surrounding the application site, the characteristics of the scheme in terms of physical infrastructure proposed and potential future-planned commercial buildings, the potential traffic impacts associated with the Construction and the Operational Phases, and the mitigation measures required to prevent, reduce, or offset any significant adverse effects.

12.2. Methodology

The following methodology has been adopted for this assessment:

Establishing the Receiving Environment (Baseline Conditions): the receiving environment has been described, including information on the existing site location and use, description of relevant local roads and junctions and baseline traffic volumes, description of local public transport services and facilities, and existing local pedestrian and cycle facilities and movements.

Describing the Development: the development has been described, including information of the civil infrastructure proposed as part of the subject application as well as an estimation for the potential land uses and sizes of the future-planned commercial buildings envisaged for the scheme. It also includes description of proposed access arrangements and required parking facilities, details of pedestrian/cycle facilities upgrades and proposals, and estimation of trip generation and trip distribution. Details on existing and target modal splits have also been included.

Assessing the Development's Impacts: the impacts of the scheme on the local road network have been assessed, including information on estimated traffic increase during construction of the proposed civil infrastructure and estimated traffic increase during the operation of the future-planned commercial buildings. The assessed years are Construction Year (2024), Operational Opening Year (2026), Operational Opening Year +5 Years (2031) and Operational Opening Year +15 Years (2041). Junctions 10 (ARCADY) software has been used to model the junctions for their critical morning and evening peaks hours.

Mitigation Measures: mitigation measures and Plans set to help minimise any potential traffic impact that may arise from both the construction of the proposed civil infrastructure and the operation of the future-planned commercial buildings have been outlined.

12.3. Receiving Environment

This section considers the baseline conditions of the surrounding area and provides background information to determine the significance of any traffic and transport implications. It also includes details of the existing and planned/future local road network infrastructure and the accessibility of the site by sustainable modes of transport.

Local Roads

The subject site is situated to the west of the R132 and immediately west (adjacent) to Junction 5 of the M1 motorway. Refer to **Figure 12-1**. The L1140 (Bhailsigh Road) intersects the site from east to west and provides the existing access to the site.

Figure 12-1 Location of Subject Site in the Local and Expanded Road Network.

M1 Motorway serves as a strategic vehicular link to Dublin City and provides connection to several towns and cities along its length such as Swords, Drogheda and Dundalk. To the south, the M1 provides direct access to Dublin Airport and terminates at the M1/M50 interchange, where the M50 extends southward providing direct access to Dublin Port via Dublin Port Tunnel.

Along the section adjacent to the subject site, the M1 motorway is configured as a double carriageway with two lanes in each direction, featuring On Slip and Off Slip lanes on both sides. The M1 is subject to a speed limit of 120kph.

The R132 serves as another strategic vehicular link to Dublin City and various key towns and cities along its route. In proximity of the subject site, the R132 is a single carriageway road with an 80kph speed limit (reducing to 60kph approaching the Applegreen roundabout), providing access to some employment developments.

Access to the subject development site is proposed via L1140, facilitated by an existing roundabout. In the section bisecting the site, the L1140 is a single carriageway road with an existing carriageway width of 7.52m, featuring 1.9m verge and Armco barriers on both sides. Refer to **Figure 12-2** for existing L1140 cross section.

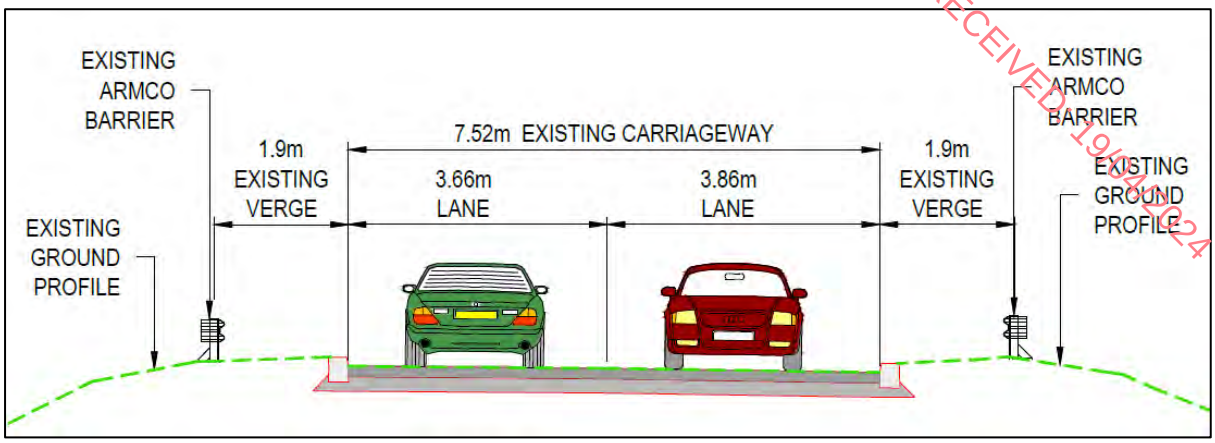


Figure 12-2 L1140 – Existing Cross Section.

Local Relevant Junctions

The primary local junctions considered relevant to the subject assessment are the following:

- Junction 1 (Existing Roundabout): L1140 (Bhailsigh Road)

Junction 1 is an existing two-armed priority-controlled roundabout with an Inscribed Circular Diameter (ICD) of 50 metres and provision for future third and fourth arms (north and south). The construction/extension of these north and south arms are proposed as part of the subject application to form the access to the proposed development. Details of the proposed site access arrangements are provided later in this Chapter.

- Junction 2 (Existing Roundabout): L1140 / M1 Northbound Off Slip / M1 Northbound On Slip

Junction 2 is an existing four-armed priority-controlled roundabout with an ICD of 34 metres. The southern and northern approaches of the roundabout are formed by the M1 Northbound Off Slip and On Slip, and therefore are entry only and exit only arms, respectively.

- Junction 3 (Existing Roundabout): L1140 / M1 Southbound Off Slip / M1 Southbound On Slip

Junction 3 is an existing four-armed priority-controlled roundabout with an ICD of 34 metres. The northern and southern approaches of the roundabout are formed by the M1 Southbound Off Slip and On Slip, and therefore are entry only and exit only arms, respectively.

- Junction 4 (Existing Roundabout): L1140 / R132 / Access Road to Applegreen Petrol Station

Junction 4 is an existing four-armed priority-controlled roundabout with an ICD of 50 metres. The northwestern approach is the existing access to an Applegreen Petrol Station.

The location of each of the above junctions in relation to the subject development site is illustrated in **Figure 12-3** below.

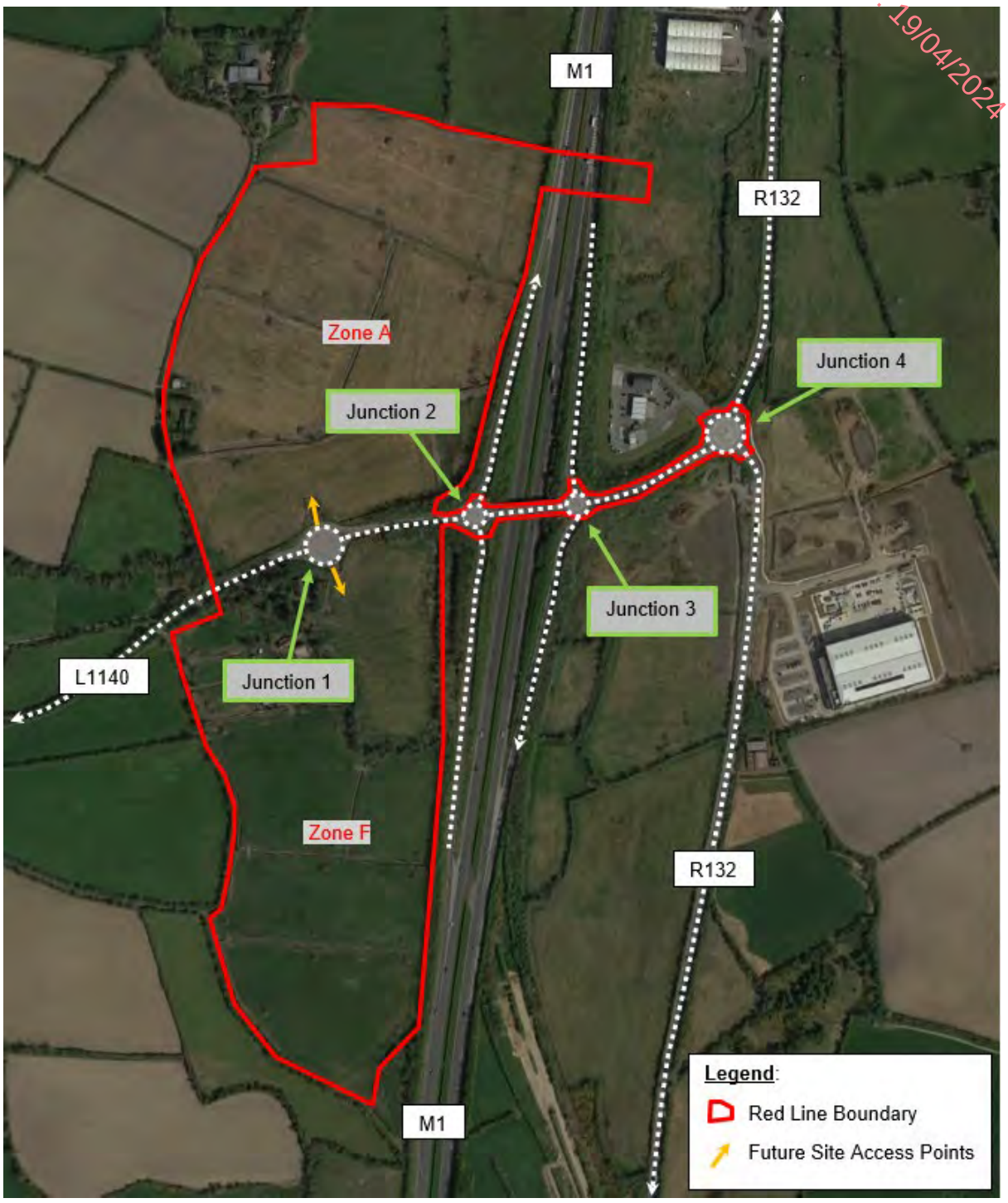


Figure 12-3 Location of Local Relevant Junctions.

Existing Traffic Flows

In order to determine the volume of traffic movements at the local relevant junctions and surrounding road network, a set of classified traffic surveys was commissioned.

Traffic surveys were carried out by 'IDASO' during the period of 48 hours from Tuesday 10th October 2023 (Day 1) to Wednesday 11th October 2023 (Day 2) at the 4 no. junctions illustrated in **Figure 12-3** above and on both directions of the M1 motorway (northbound and southbound).

The identified peak hours for each surveyed site are shown in **Table 12-1** below.

Surveyed Site	Surveyed Peak Day	Surveyed Peak Hours	
		AM	PM
Junction 1	Day 2	07:45 to 08:45	16:15 to 17:15
Junction 2	Day 1	07:45 to 08:45	16:30 to 17:30
Junction 3	Day 1	07:45 to 08:45	16:30 to 17:30
Junction 4	Day 1	07:45 to 08:45	16:30 to 17:30
M1 Northbound (Link 5)	Day 2	11:00 to 12:00	16:45 to 17:45
M 1 Southbound (Link 6)	Day 1	06:15 to 07:15	12:15 to 13:15

Table 12-1 Traffic Survey – Recorded Peak Hours by Site.

As can be seen from above, the network traffic peak hours vary by each surveyed site. Even though most identified peaks across the 4 no. surveyed junctions fall between 07:45 to 08:45 in the AM and 16:30 to 17:30 in the PM, to undertake a conservative analysis, for the purpose of this assessment, each site has been assessed based on their individual peak hours and associated peak hour volumes. Full IDASO traffic survey is provided in Appendix 12. A summary of the 2023 peak hour volumes through each surveyed site is shown below.

Surveyed Site	Surveyed Two-way Flows (PCU)	
	AM Peak Hour	PM Peak Hour
Junction 1	121	97
Junction 2	574	869
Junction 3	1,241	1,225
Junction 4	1,678	1,586
M1 Northbound (Link 5)	1,543	3,644
M 1 Southbound (Link 6)	3,319	1,756

Table 12-2 Traffic Survey – Recorded Two-way Flows by Site.

The two-way traffic figures presented above are in Passenger Car Units (PCU) with the following Vehicle to PCU conversion factors assumed: Motorcycle – 0.4, Passenger Car/LGV – 1.0, Medium Goods Vehicle (MGV/OGV1) – 1.5, Buses and Coaches – 2.0 and Heavy

Goods Vehicle (HGV/OGV2) – 2.3. (Source: TII, Project Appraisal Guidelines for National Roads Unit 5.2 – Data Collection, October 2016 – PE-PAG-02016).

Annual Average Daily Traffic (AADT)

As recommended in the Transport Infrastructure Ireland (TII) Publication 'Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts, October 2016 – PE-PAG-02039', the traffic count data has been converted to AADT data in order to provide a dataset representative of the annual traffic flow profile for the road network in the local area.

The Generic Expansion Factor Method, as outlined in the TII Publication, was used to convert the surveyed flows into AADT. The following factors for the Dublin Region were used:

- **0.94** (Day 1 – Tuesday) Weekly Flow Index applied to the 24-hour total to convert it to Weekly Average Daily Traffic (WADT).
- **0.92** (Day 2 – Wednesday) Weekly Flow Index applied to the 24-hour total to convert it to Weekly Average Daily Traffic (WADT).
- **1.01** (Month – November) Monthly Flow Index applied to WADT to convert it to AADT.

Hour Ending	Proportion of Daily Traffic	Surveyed Flows (2-way)					
		Junction 1 (Day 2)	Junction 2 (Day 1)	Junction 3 (Day 1)	Junction 4 (Day 1)	Link 5 (Day 2)	Link 6 (Day 1)
01:00	0.0008	2	48	63	73	269	123
02:00	0.004	1	30	50	63	216	83
03:00	0.003	0	30	37	40	160	90
04:00	0.004	1	29	52	56	109	241
05:00	0.007	6	38	121	142	174	450
06:00	0.013	11	51	234	260	313	1185
07:00	0.037	35	156	624	780	588	3092
08:00	0.077	87	354	928	1333	1251	2854
09:00	0.081	94	477	1059	1411	1327	2799
10:00	0.066	82	344	783	1065	1148	2155

11:00	0.055	66	315	609	841	1231	1643
12:00	0.055	62	309	590	807	1197	1501
13:00	0.059	83	377	677	927	1478	1468
14:00	0.062	66	461	728	972	1642	1446
15:00	0.063	74	488	754	992	1831	1320
16:00	0.069	92	599	868	1139	2635	1449
17:00	0.083	95	781	1105	1450	3235	1386
18:00	0.088	80	807	1118	1453	3279	1396
19:00	0.075	54	507	705	902	2595	1223
20:00	0.054	60	371	550	715	1622	880
21:00	0.039	45	274	391	522	1136	591
22:00	0.031	20	177	273	366	815	439
23:00	0.022	13	102	174	238	601	340
00:00	0.014	11	57	100	124	435	222
Total 24-Hour		1,140	7,182	12,593	16,671	29,287	28,376
WADT (Day 1 - Tue)	**0.94**	-	6,751	11,837	15,671	-	26,673
WADT (Day 2 - Wed)	**0.92**	1,049	-	-	-	26,944	-
AADT (Month- Nov)	**1.01**	**1,059**	**6,819**	**11,956**	**15,827**	**27,213**	**26,940**

Table 12-3 AADT Calculations.

Local Bus Servies

The subject site is currently not directly serviced by a public bus service, though the closest bus stops would be on R132 approximately 850m northeast of the proposed site access – to the east of M1 motorway, being Grooms Bus Stops No. 1000231 (northbound) and No. 100761 (southbound). These bus stops are serviced by the following bus routes:

Bus Eireann Route 101: Dublin (Busáras) – Dublin Airport – Drogheda Bus Station.

Balbriggan Express Route 191: Mountain View, Stamullen – Balbriggan – Eden Quay Dublin.

A summary of the frequency of which each bus route operates is provided in **Table 12-4**. The location of the subject bus stops and the walking route to/from the site access point are illustrated in **Figure 12-4**.

Bus Route	Direction	Frequency at Grooms Bus Stops		
		Monday to Friday	Saturday	Sunday
Bus Eireann 101	Dublin to Drogheda	***24 hours service*** 21h to 06h: ~ Hourly 06h to 21h: 15 - 35 min	***24 hours service*** 21h to 06h: ~ Hourly 06h to 21h: 30 - 35 min	***24 hours service*** All day: ~ Hourly
	Drogheda to Dublin	***24 hours service*** 20h to 05h: ~ Hourly 05h to 20h: 15 - 35 min	***24 hours service*** 20h to 05h: ~ Hourly 05h to 20h: 25 - 35 min	***24 hours service*** All day: ~ Hourly
Balbriggan Express 191	Stamullen to Dublin	***3 services*** *(set down)* 07h08; 07h58; 09h07	-	-
	Dublin to Stamullen	***2 services*** 17h45; 18h30	-	-

Table 12-4 Local Bus Routes – Existing Weekday and Weekend Frequencies.

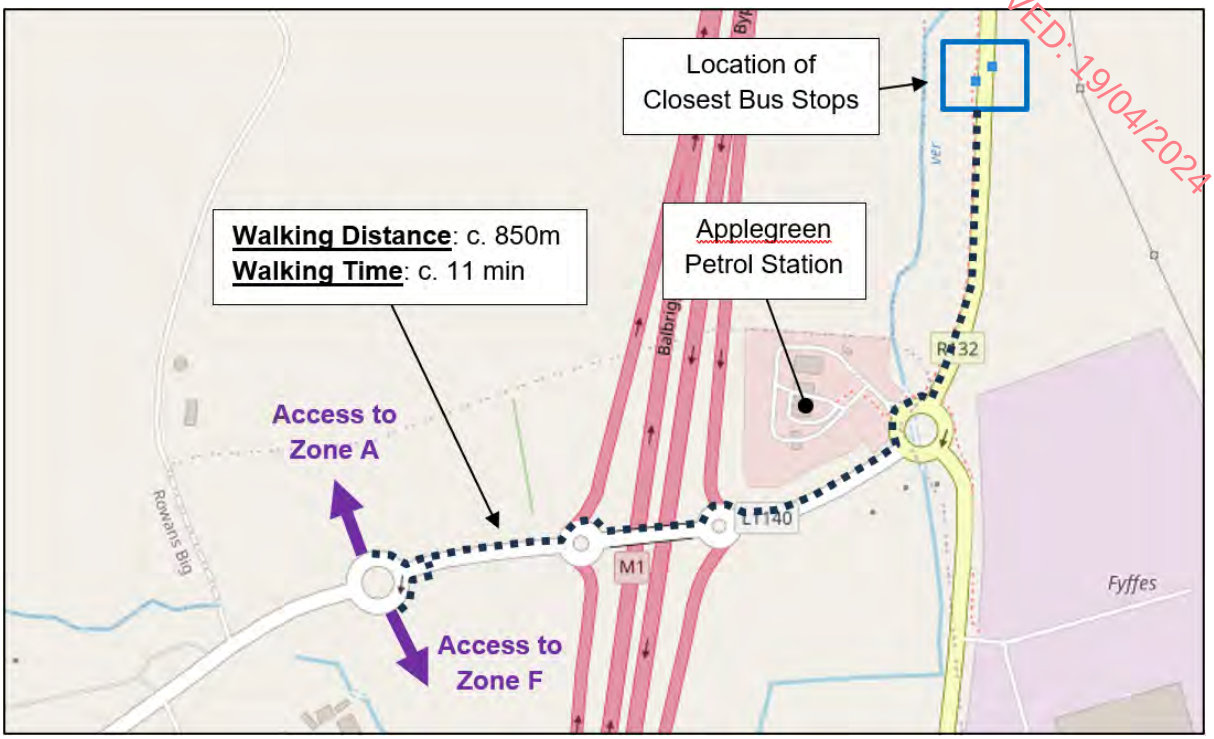


Figure 12-4 Location of Closest Bus Stops and Walking Routes from the Site Access Points.

Access from the proposed development's access point to the closest bus stops on R132 is via L1140 (eastwards across the M1 motorway) and R132 (northwards up until the bus stops). Footpaths are provided on L1140 near the development's access roundabout, along the M1 overbridge and along R132 from Applegreen petrol station as far as the bus stops. For existing local pedestrian facilities refer to **Figure 12-6**.

With the focus of enhancing the connectivity between the proposed development and the local public bus services, new active travel facilities are proposed as part of the subject application. Details of these proposed facilities are provided later in this Chapter.

Local Cycle Facilities

There are no existing cycle facilities in the local area.

Proposals for the Greater Dublin Area Cycle Network Plan were published by the National Transport Authority in 2022, which superseded the latest 2013 version. The Plan sets out a vision and a strategy for the construction and/or designation of a comprehensive network of cycling routes throughout the Greater Dublin Area. An extract of 'Cycle Network Plan – Balbriggan & Skerries' sheet is reproduced in **Figure 12-5** below.

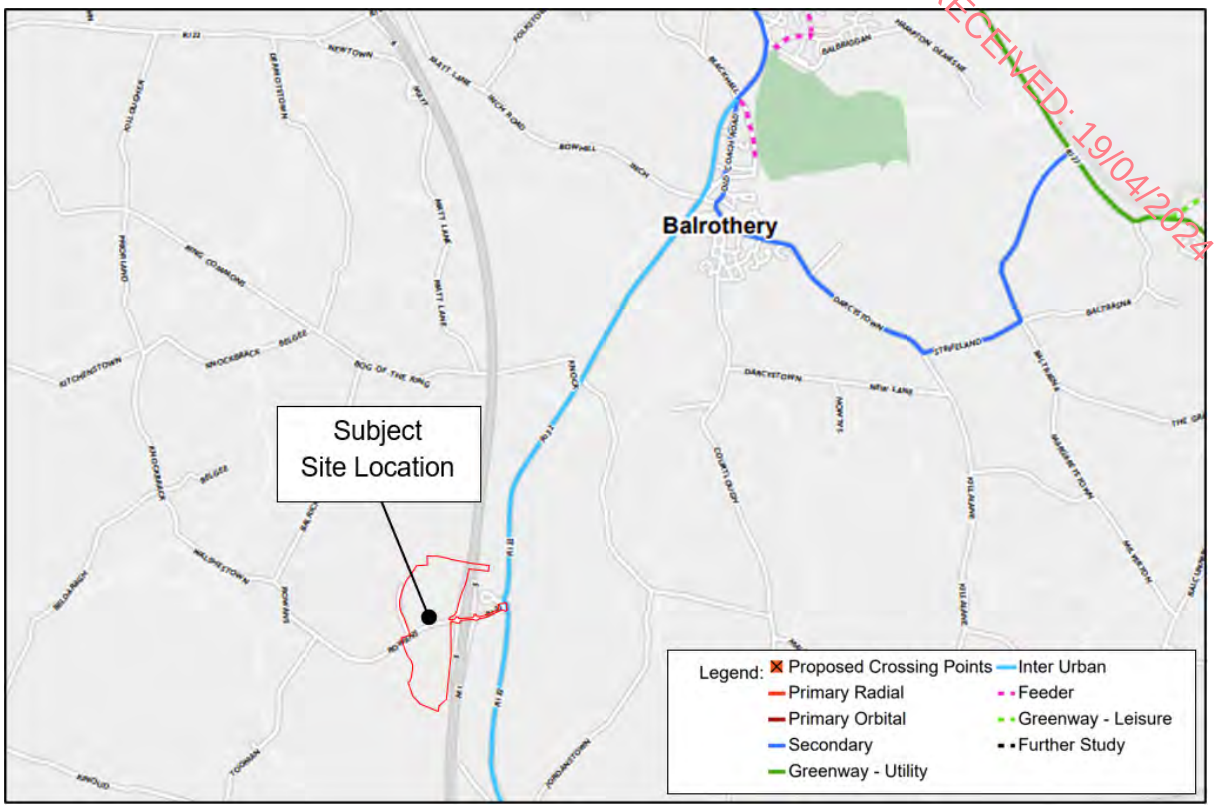


Figure 12-5 GDA Cycle Network Plan – extract from Balbriggan & Skerries sheet.

An Inter Urban Cycle Route along the R132 is proposed under the GDA Cycle Network Plan. This route will facilitate cyclist movements to/from Balbriggan to the north and to/from the several areas in and around Dublin to the south.

As part of the subject application, new active travel facilities are proposed to enhance the connectivity between the proposed development and the facilities along R132. Details of these proposed facilities are provided later in this Chapter.

Local Pedestrian Facilities

The pedestrian facilities currently available in the local area are illustrated in **Figure 12-6** below. It is comprised of c. 1.6m wide footpaths around the development's access roundabout, c. 2.0m wide footpaths along both sides of the M1 overbridge, c. 2.0m wide footpaths along the western side of the R132 and c. 2.0m wide footpaths along the eastern side of the R132 southwards from the Applegreen Petrol Station's Roundabout. Dropped kerbs and tactile paving facilities are provided on the existing pedestrian crossings at the roundabouts.

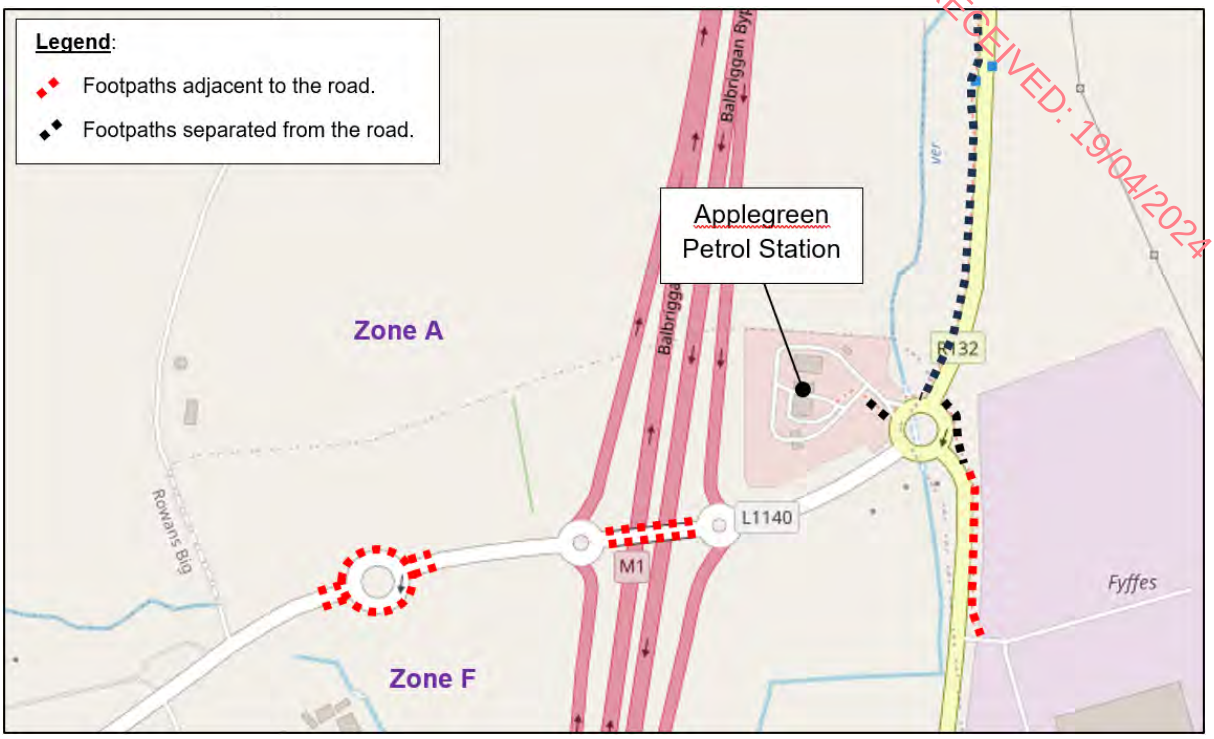


Figure 12-6 Existing Local Pedestrian Facilities.

As can be noted, the existing footpaths in the local area are disconnected from each other, which indicate that pedestrian's movement is currently constrained and not safe – especially for those crossing the M1.

As part of the subject application, new active travel facilities are proposed. These will enhance the connectivity between the proposed development and the existing pedestrian facilities along R132. Details of these facilities are provided later in this Chapter.

Surveyed Cycle and Pedestrian Flows

As part of the traffic survey commissioned for this application, IDASO have also carried out additional surveys to determine the existing pedestrian flows on Junction 1 (Site Access Roundabout) and Junction 4 (Applegreen Roundabout) and existing cycle flows on all junctions. These surveys were also undertaken during the period of 48 hours from Tuesday 10th October 2023 (Day 1) to Wednesday 11th October 2023 (Day 2). The results of the surveys are provided below.

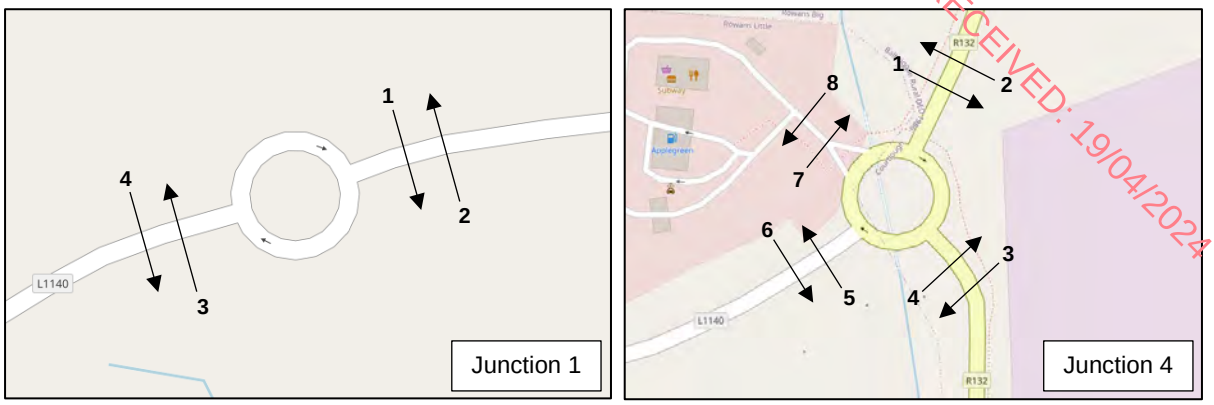


Figure 12-7 Surveyed Pedestrian Movements at Junction 1 and Junction 4.

Day 1 has been identified for both surveyed junctions as the day with the highest number of pedestrian movements recorded amongst the two surveyed days.

Surveyed Site	Movement	Surveyed Pedestrian Movements (Entire Day)
Junction 1	**1**	2
	2	0
	3	1
	4	0
Junction 4	**1**	13
	2	14
	3	0
	4	0
	5	1
	6	0
	7	8
	8	12

Table 12-5 Pedestrian Survey Results.

It is notable that pedestrian activity in the area is quite low, particularly on the site access roundabout, with just 3 recorded movements at Junction 1 and 48 recorded movements at Junction 4 over a 24-hour period. This reflects the non-urbanised location where the subject site is situated.

With regards to cyclist movements, Day 2 has been identified for all surveyed junctions as the day with the highest number of cyclist movements, except Junction 4. A summary of the two-way cyclist movements recorded on each junction is provided below.

Surveyed Site	Surveyed Day	Surveyed Cyclist Movements (Entire Day)
Junction 1	**2**	6
Junction 2	**2**	6
Junction 3	**2**	6
Junction 4	**1**	51

Table 12-6 Cyclist Survey Results.

Regarding cyclist movements, the activity in the area is also minimal, particularly at the site access roundabout (Junction 1) and the roundabouts facilitating access to the M1 motorway (Junction2 and 3). The majority of recorded cyclist movements at Junction 4 (Applegreen Roundabout) pertain to northbound and southbound travel along the R132, with 23 and 19 daily movements respectively.

12.4. Characteristics of the Proposed Development

Proposed Development

A full description of the proposed development can be found in Chapter 2 of this EIAR. The following is a general outline of the development:

- Demolition of a single-storey 200-square-metre (m²) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A
- Demolition of 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential homes located in Zone F.
- Provision of civil infrastructure to service future-planned commercial properties, including main access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks and utility services including power and telecommunications.
- Upgrading and modification of the existing Bhailsigh (L1140) roundabout in accordance with current Transport Infrastructure Ireland roundabout design standards.
- Provision of 3.0m wide shared paths from the proposed L1140 roundabout, over the M1 motorway via the L1140 to the existing roundabout intersection between the L1140 and R132, providing connectivity to existing infrastructure and public transport services.

- All associated road works including surfacing, line marking, landscaping, controlled and uncontrolled pedestrian crossings and appropriate signage.

Vehicular Access Roundabout

Vehicular access to the site is proposed through the L1140 roundabout which, as part of the subject application, is proposed to be upgraded/modified. Access to Zone A is intended through the extension of the northern approach of the roundabout, while access to Zone F is proposed through the extension of the southern approach.

The proposed roundabout modifications include:

- Maintenance of the 50m Inscribed Circular Diameter (ICD).
- Enlargement of main central island by introducing a 2.0m-wide central overrun area capable of being mounted by trailers and HGVs.
- Reduction of circulating lanes width from 9.5m to 7.5m.
- Introduction of a signalised toucan crossing on the eastern approach.
- Introduction of uncontrolled crossings on the northern and southern approaches.
- Maintenance of existing pedestrian crossings on the western approach.

The roundabout's proposed modified layout is illustrated in **Figure 12-8**.

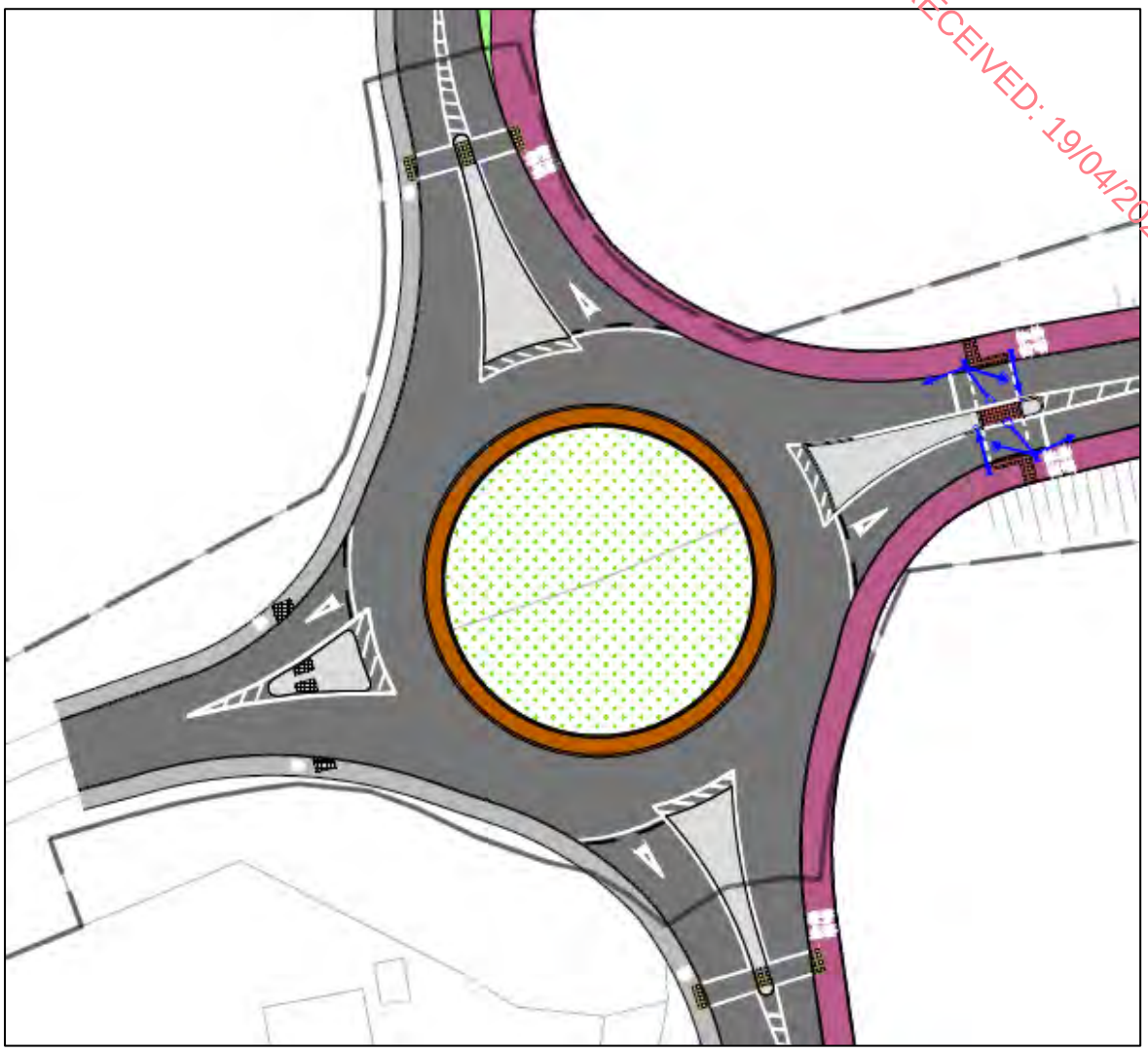


Figure 12-8 Bhailsigh Road (L1140) Access Roundabout – Proposed Modified Layout.

Access Roads

The various cross sections for the proposed Zone A and Zone F access roads are illustrated in **Figure 12-9** and **Figure 12-10** below, respectively.

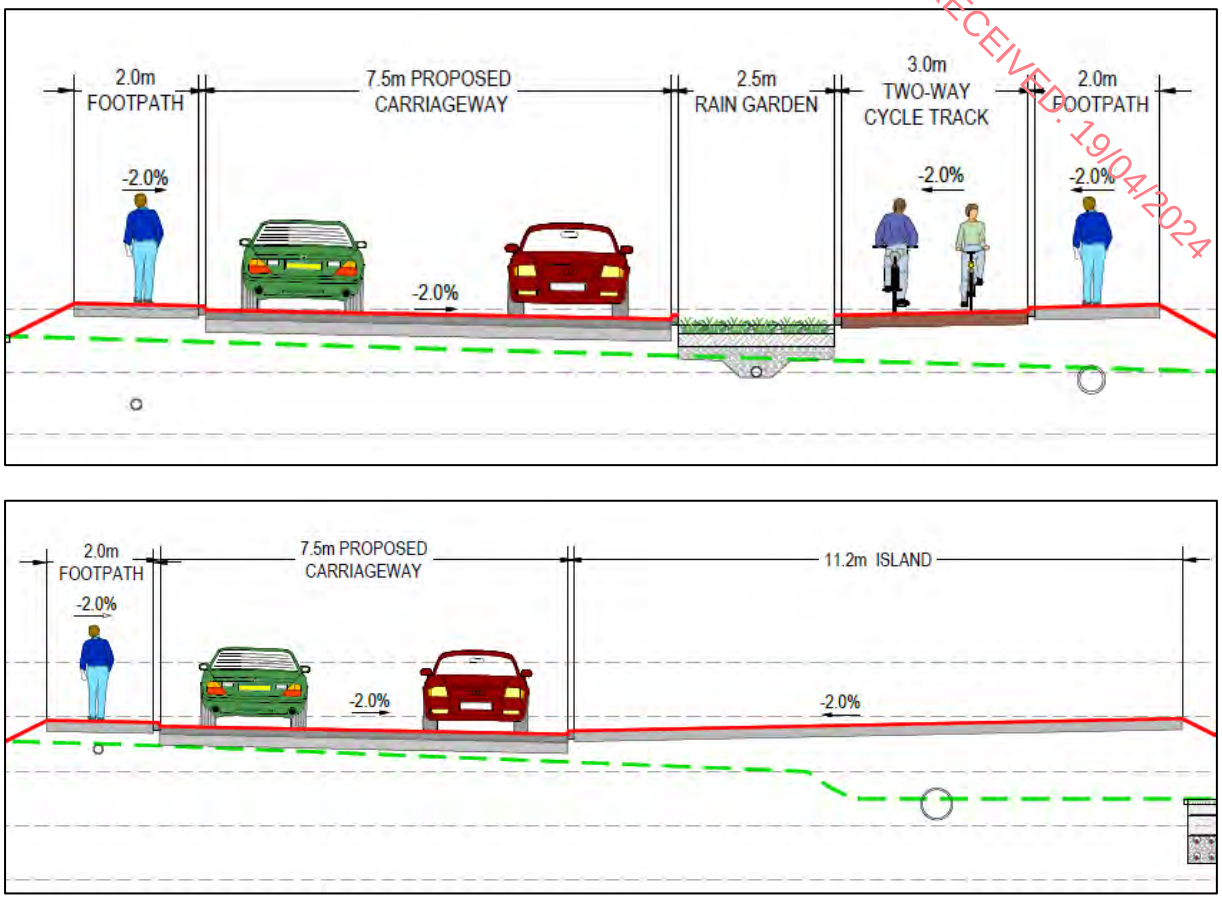
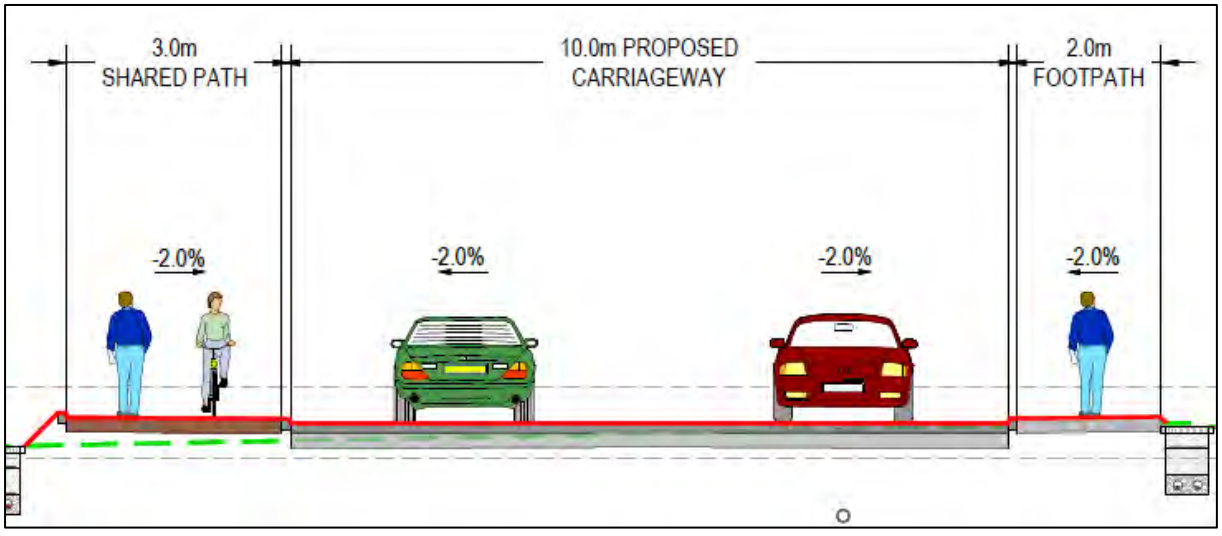


Figure 12-9 Zone A – Cross Sections of Proposed Access Road.



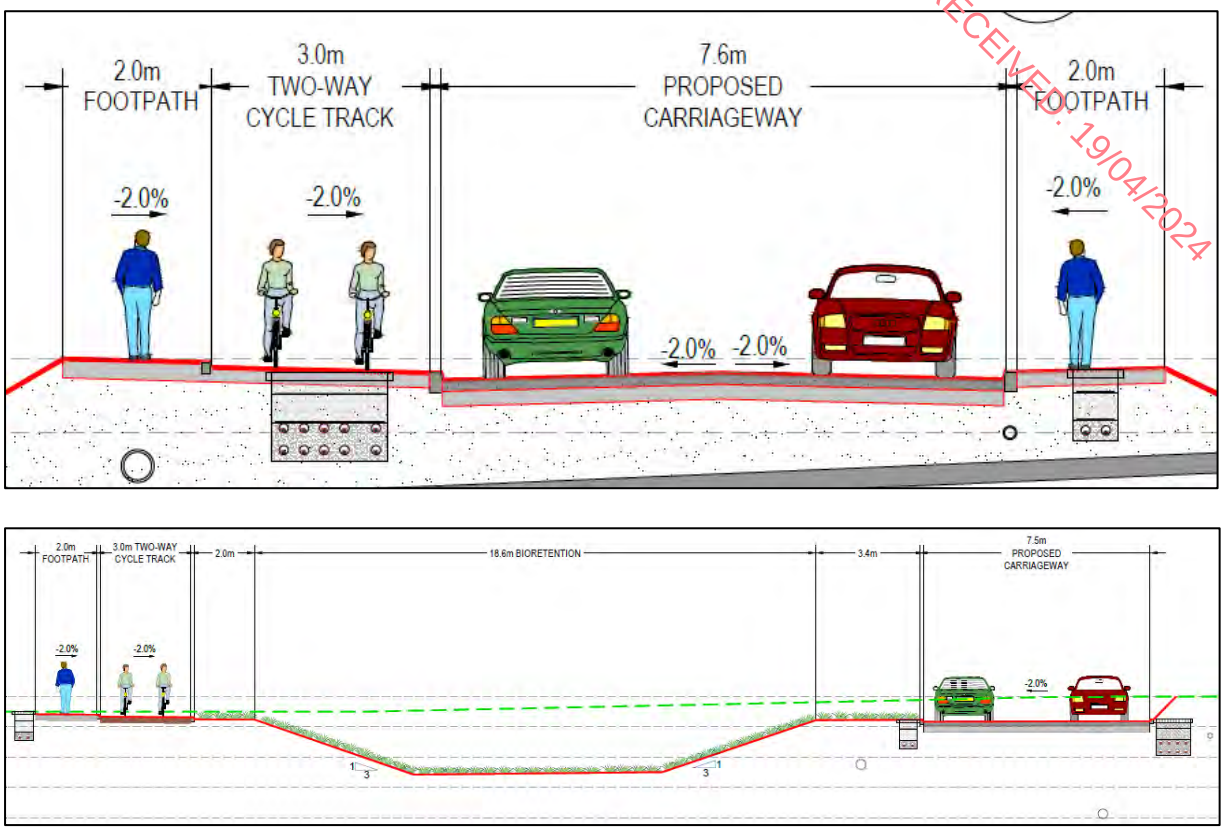


Figure 12-10 Zone F – Cross Sections of Proposed Access Road.

Proposed Active Travel Facility along L1140

Pedestrian and cyclist access to both Zone A and Zone F will also be facilitated by the modified Bhailsigh (L1140) roundabout.

To improve active travel connectivity between the site access and the public transport facilities along R132 – such as the existing bus stops and the inter-urban cycle route, it is proposed to construct 3.0m-wide shared paths along both sides of the L1140 / R132. This facility is set to commence at the L1140 site access roundabout, extend along the M1 overbridge, and connect to the existing pedestrian infrastructure at the Applegreen roundabout. Refer to

Figure 12-11.

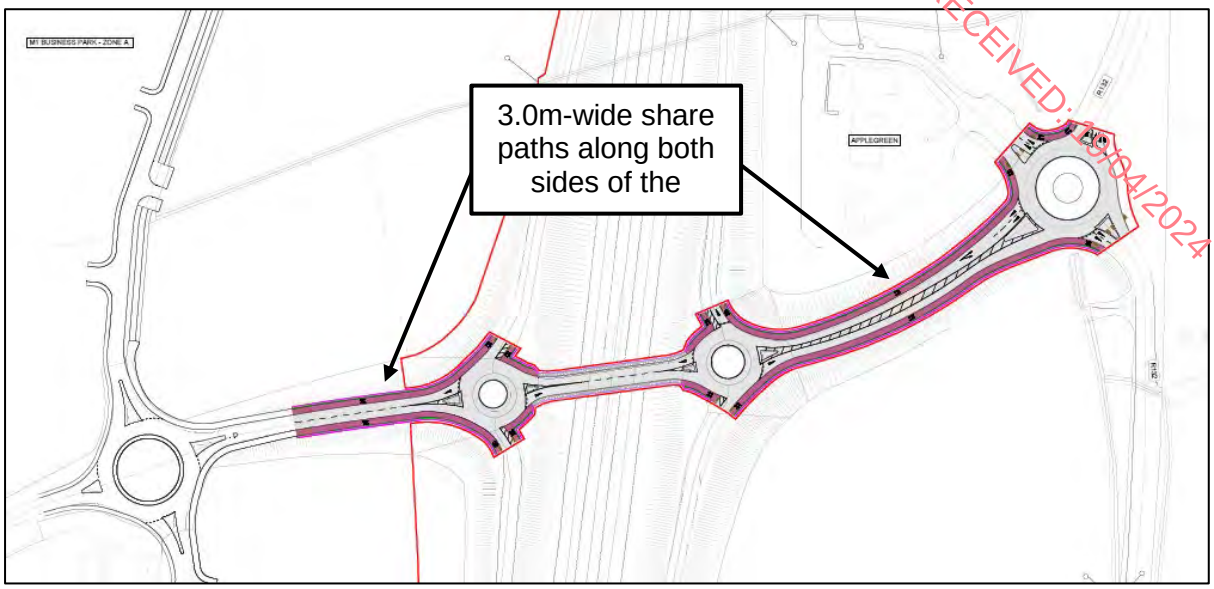


Figure 12-11 Proposed Shared Active Travel Facility along L1140.

Internal Active Travel Infrastructure

The proposed internal infrastructure includes the provision of two-way cycle tracks measuring 3.0m in width and footpaths measuring 2.0m in width running along the access roads within each Zone. These facilities will lead towards the proposed modified L1140 roundabout and will tie into the 3.0m-wide shared active travel facility proposed along L1140.

Various strategic-located crossing facilities are planned within the site (and also outside) to ensure the safe and convenient movement of all users, enhancing permeability. These facilities consist of features such as dropped kerbs with tactile pavement and raised tables with tactile pavement, aiming to provide comfort and independence for all users, including those with disabilities. Additionally, the raised tables will also serve as a traffic calming measure to reduce vehicle speeds within the site.

Car and Cycle Parking

Given the nature of the development proposed under the subject application (civil infrastructure to serve future-planned commercial buildings), no car or cycle parking spaces are required. However, each individual planning application for the future-planned commercial developments within the site shall include a parking compliance statement. This statement should address adherence to the Fingal Development Plan standards and guidelines, specifying the total number of parking spaces including allocation details of electric vehicle (EV), disabled, motorcycle and cycle spaces. Any deviation from the parking requirements must be substantiated and approved by the planning authority.

12.5. Predicted Impacts

12.5.1. Construction Phase

Trip Generation - Construction Phase

The construction of the proposed development (civil infrastructure only) is envisaged to take approximately 8 months to complete. During the construction phase, some construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff.

It is estimated that, on the busiest construction days, the subject site (both Zone A and Zone F) will attract/generate a total of 22 Light Vehicles (LV) trips per day (11 inbound in the morning and 11 outbound in the evening) on a carpooling basis, and a total of 60 Heavy Vehicles (HV) trips per day (30 inbound and 30 outbound, spread throughout the day).

It should be noted that the majority of the construction traffic (if not all) will occur outside the traditional network peak hours (as drivers will be instructed to do so), however, for the purpose of the subject assessment, it has been conservatively assumed that 10 HV trips will occur during the network morning peak hour (5 inbound and 5 outbound) and 10 HV trips will occur during the evening peak hour (5 inbound and 5 outbound). For robustness, all estimated LV trips were assumed to occur during the peak hours. Refer to **Table 12-7** below.

Zone	Peak Hours Trips - Construction Phase			
	Light Vehicles (LV)		Heavy Vehicles (HV)	
	Arrivals	Departures	Arrivals	Departures
Zone A (Morning Peak)	6	-	3	3
Zone A (Evening Peak)	-	6	3	3
Zone F (Morning Peak)	5	-	2	2
Zone F (Evening Peak)	-	5	2	2
Total (Morning Peak) - Vehicles	11	11	5	5
Total (Evening Peak) - Vehicles	11	11	5	5
Total (Morning Peak) - PCU	11	11	12	12
Total (Evening Peak) - PCU	11	11	12	12

Table 12-7 Trip Generation – Construction Phase.

HV traffic figures shown above were converted to Passenger Car Units (PCU) based on the 2.3 factor for Heavy Goods Vehicles (HGV/OGV2) as set out in the TII, Project Appraisal Guidelines for National Roads Unit 5.3 – Data Collection, October 2016 – PE-PAG-02016.

The construction trips in **Table 12-7** above will be ***brief*** in terms of duration – occurring during the peak periods of the road network, and ***slightly negative*** in terms of magnitude.

Construction carparks, in the construction compounds within each Zone, will be created at the start of the works by laying of a temporary surface for vehicles. All HGV deliveries and workforce trips to/from the site will be made from east and via the L1140 roundabout.

Trip Distribution – Construction Phase

Given the location of the site – adjacent to Junction 5 of the M1 motorway and the lands to the west of the site being rural in nature, it has been determined that the vast majority of the construction traffic will arrive/depart to/from the site via the M1 motorway with a minor proportion arriving/departing via the R132. The trip distribution characteristics assumed for the construction phase are as follows:

- 50% from/to south via M1 motorway.
- 40% from/to north via M1 motorway.
- 5% from/to north via R132.
- 5% from/to south via R132.

Traffic Increase on Assessed Junctions – Construction Phase

The AM and PM peak hours traffic increase expected to be generated by the proposed development during the construction phase is provided in **Table 12-8** below.

Junction No.	Surveyed Flows (pcu)		Construction Traffic (pcu)		Construction Traffic (% Increase)	
	AM P.H.	PM P.H	AM P.H.	PM P.H	AM P.H.	PM P.H
J1	121	97	46	46	38%	47%
J2	574	869	46	46	8%	5%
J3	1,241	1,225	25	25	2%	2%
J4	1,678	1,586	5	5	0.3%	0.3%

Table 12-8 Surveyed Two-way Traffic and Expected Traffic Increase – Construction Phase.

With the construction traffic trips on the local road network, Junction 1 is expected to receive a two-way traffic increase in the scale of 40%, while the estimated traffic increase for Junctions 2, 3 and 4 are expected to be significantly lower.

The effects of the construction trips on Junction 1 will therefore be ***brief moderate negative***, while the effects on Junctions 2, 3 and 4 will be ***brief slight negative***.

Assessed Scenarios – Base Year and Construction Phase

It has been estimated/assumed as part of the subject assessment that the proposed development (civil infrastructure to serve future-planned commercial buildings) will be completed by late 2024 / early 2025.

Therefore, the performance of the junctions during the construction phase has been analysed for the critical AM and PM peak hours (07:45hrs to 08:45hrs and 16:30hrs to 17:30hrs, except for Junction 1 which the PM peak hour is from 16:15hrs to 17:15hrs) for the following scenarios:

- 2023 Base Year (BY): with 2023 surveyed flows.
- 2024 Do Nothing (DN): with 2023 surveyed flows factored up.
- 2024 Do Something (DS) – Construction Phase: with 2023 surveyed flows factored up + construction trips.

For the 2024 Do Something - Construction Phase scenario Junction 1 has been modelled based on its modified layout as proposed under the subject application (Refer to **Figure 12-8**).

2023 surveyed flows were factored up into 2024 flows based on '*Table 6.2: Link-Based Growth Rates: Country Annual Growth Rates (excluding Metropolitan Areas)*' within the TII Publications – Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, October 2021 (PE-PAG-02017). The traffic growth rates are:

- Light Vehicles (LV) – 2023 to 2024: 1.0180
- Heavy Vehicles (HV) – 2023 to 2024: 1.0317

Traffic forecast figures for all assessed scenarios are provided in **Appendix 12.**

Analysis Results – Base Year and Construction Phase

The Traffic and Transport Assessment (TTA) prepared for the subject application (accompanying the documentation package under a separate cover) includes detailed traffic modelling to assess impact and determine whether the local assessed junctions would have sufficient capacity to accommodate the trips arising from the construction phase. A summary of the ARCADY analysis results for the Base Year and Construction Phase is provided below.

Junction 1

Junction 1 is an existing two-armed priority-controlled roundabout with an Inscribed Circular Diameter (ICD) of 50 metres and provision for future third and fourth arms (north and south). For the Base Year and the 2024 Do Nothing scenarios, Junction 1 has been modelled based on its existing layout where the northern and the southern layouts are not opened to traffic. The ARCADY analysis results are summarised in **Table 12-9** below. The arms of the existing Junction 1 were labelled as follows within the ARCADY model:

- **Arm 1**: L1140 (E)
- **Arm 2**: Southern Approach – not opened to traffic.
- **Arm 3**: L1140 (W)
- **Arm 4**: Northern Approach – not opened to traffic.

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:15 to 17:15)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2023 Base Year						
Arm 1	0.1	3.37	0.07 (A)	0.0	3.31	0.04 (A)
Arm 2	-	-	-	-	-	-
Arm 3	0.0	2.97	0.04 (A)	0.0	2.99	0.04 (A)
Arm 4	-	-	-	-	-	-
2024 Do Nothing						
Arm 1	0.1	3.41	0.07 (A)	0.0	3.35	0.04 (A)
Arm 2	-	-	-	-	-	-
Arm 3	0.0	2.97	0.04 (A)	0.0	3.00	0.04 (A)
Arm 4	-	-	-	-	-	-

Table 12-9 Junction 1 Existing Layout – ARCADY Results – BY and DN - Construction.

As summarised above, the modelling results indicate that Junction 1 is currently operating well within capacity during both peak hours and would continue to do so for the 2024 Do Nothing scenario should the proposed development not take place.

Table 12-10 below presents the ARCADY analysis results for the proposed modified Junction 1 in the 2024 Do Something – Construction Phase scenario. The arms of the proposed modified Junction 1 were labelled as follows within the ARCADY model:

- **Arm 1**: L1140 (E)

- **Arm 2**: Access Road to Zone F (S)
- **Arm 3**: L1140 (W)
- **Arm 4**: Access Road to Zone A (N)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:15 to 17:15)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2024 Do Something – Construction Phase						
Arm 1	0.1	3.19	0.09 (A)	0.1	3.18	0.06 (A)
Arm 2	0.0	2.34	0.01 (A)	0.0	2.08	0.01 (A)
Arm 3	0.0	2.81	0.04 (A)	0.0	2.83	0.04 (A)
Arm 4	0.0	2.83	0.01 (A)	0.0	2.52	0.01 (A)

Table 12-10 Junction 1 Proposed Layout - ARCADY Results – DS - Construction.

The modelling results for the proposed Junction 1 (modified layout) indicate that it would operate well within capacity for the 2024 Do Something – Construction Phase scenario during both peak hours with the highest RFC at 0.09 and a corresponding LOS of 'A' occurring on Arm 1 in the AM. No significant queues or delays were recorded.

Junction 2

Junction 2 is an existing four-armed priority-controlled roundabout with an ICD of 34 metres. The southern and northern approaches of the roundabout are formed by the M1 Northbound Off Slip and On Slip, and therefore are entry only and exit only arms, respectively.

As there are no modifications proposed to the geometric design of Junction 2, for all scenarios it has been modelled based on its existing layout. The ARCADY analysis results for all scenarios are summarised in **Table 12-11** below. The arms of Junction 2 were labelled as follows within the ARCADY model:

- **Arm 1**: M1 Northbound On Slip (N) – exit only
- **Arm 2**: L1140 (E)
- **Arm 3**: M1 Northbound Off Slip (S)
- **Arm 4**: L1140 (W)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:30 to 17:30)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2023 Base Year						
Arm 2	0.2	3.08	0.16 (A)	0.3	3.23	0.24 (A)
Arm 3	0.4	4.21	0.25 (A)	0.7	5.05	0.41 (A)
Arm 4	0.0	3.11	0.04 (A)	0.1	3.80	0.07 (A)
2024 Do Nothing						
Arm 2	0.2	3.10	0.16 (A)	0.3	3.26	0.25 (A)
Arm 3	0.4	4.29	0.26 (A)	0.7	5.19	0.42 (A)
Arm 4	0.0	3.13	0.04 (A)	0.1	3.85	0.07 (A)
2024 Do Something – Construction Phase						
Arm 2	0.2	3.14	0.17 (A)	0.4	3.32	0.25 (A)
Arm 3	0.4	4.39	0.27 (A)	0.8	5.38	0.43 (A)
Arm 4	0.1	3.76	0.06 (A)	0.1	4.22	0.09 (A)

Table 12-11 Junction 2 Existing Layout – ARCADY Results – BY, DN and DS - Construction.

The modelling results as summarised above indicate that Junction 2 is currently operating well within capacity during both peak hours and would continue to do so for the 2024 Do Nothing scenario should the development not take place.

For the 2024 Do Something - Construction Phase scenario, the results indicate that Junction 2 would also operate well within capacity during both peak hours. The highest RFC is recorded at 0.43 with a corresponding LOS of 'A' also occurring on Arm 3 in the PM. No significant queues or delays are recorded. This demonstrates that Junction 2 would have sufficient capacity to accommodate the estimated traffic arising from the construction of the proposed development (civil infrastructure only).

Junction 3

Junction 3 is an existing four-armed priority-controlled roundabout with an ICD of 34 metres. The northern and southern approaches of the roundabout are formed by the M1 Southbound Off Slip and On Slip, and therefore are entry only and exit only arms, respectively.

As there are no modifications proposed to the geometric design of Junction 3, for all scenarios it has been modelled based on its existing layout. The ARCADY analysis results for all scenarios are summarised in **Table 12-12** below. The arms of Junction 3 were labelled as follows within the ARCADY model:

- **Arm 1**: M1 Southbound Off Slip (N)
- **Arm 2**: L1140 (E)
- **Arm 3**: M1 Southbound On Slip (S) – exit only
- **Arm 4**: L1140 (W)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:30 to 17:30)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2023 Base Year						
Arm 1	0.4	4.22	0.26 (A)	0.2	4.09	0.16 (A)
Arm 2	0.6	3.46	0.37 (A)	0.6	3.21	0.35 (A)
Arm 4	0.3	3.33	0.23 (A)	0.5	3.50	0.33 (A)
2024 Do Nothing						
Arm 1	0.4	4.31	0.26 (A)	0.2	4.13	0.16 (A)
Arm 2	0.7	3.50	0.38 (A)	0.6	3.24	0.35 (A)
Arm 4	0.4	3.38	0.23 (A)	0.5	3.53	0.34 (A)
2024 Do Something – Construction Phase						
Arm 1	0.4	4.40	0.27 (A)	0.2	4.23	0.17 (A)
Arm 2	0.7	3.56	0.38 (A)	0.6	3.31	0.36 (A)
Arm 4	0.4	3.41	0.24 (A)	0.6	3.57	0.35 (A)

Table 12-12 Junction 3 Existing Layout – ARCADY Results – BY, DN and DS - Construction.

The modelling results as summarised above indicate that Junction 3 is currently operating well within capacity during both peak hours and would continue to do so for the for the 2024 Do Nothing scenario should the development not take place.

For the 2024 Do Something – Construction Phase, the results indicate that Junction 3 would also operate well within capacity during both peak hours. The highest RFC is recorded at 0.38 with a corresponding LOS of 'A' occurring on Arm 2 in the AM peak hour. No significant queues or delays are recorded. The results demonstrate that Junction 3 would have sufficient capacity to accommodate the estimated traffic arising from the construction of the proposed development (civil infrastructure only).

Junction 4

Junction 4 is an existing four-armed priority-controlled roundabout with an ICD of 50 metres. The northwestern approach is the existing access to an Applegreen Petrol Station. For all

scenarios, it has also been modelled based on its existing layout. The ARCADY analysis results for all scenarios are summarised in **Table 12-13** below. The arms of Junction 4 were labelled as follows within the ARCADY model:

- **Arm 1**: R132 (NE)
- **Arm 2**: R132 (SE)
- **Arm 3**: L1140 (SW)
- **Arm 4**: Access Road to Applegreen Petrol Station (W)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:30 to 17:30)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2023 Base Year						
Arm 1	0.9	4.78	0.47 (A)	0.4	3.11	0.26 (A)
Arm 2	0.3	3.24	0.22 (A)	0.4	3.03	0.28 (A)
Arm 3	0.8	4.62	0.42 (A)	0.8	4.60	0.45 (A)
Arm 4	0.1	2.45	0.07 (A)	0.1	2.42	0.08 (A)
2024 Do Nothing						
Arm 1	1.0	4.89	0.48	0.4	3.14	0.27 (A)
Arm 2	0.4	3.31	0.23	0.4	3.07	0.29 (A)
Arm 3	0.8	4.72	0.43	0.9	4.70	0.46 (A)
Arm 4	0.1	2.48	0.07	0.1	2.45	0.09 (A)
2024 Do Something – Construction Phase						
Arm 1	1.0	4.93	0.48 (A)	0.4	3.16	0.27 (A)
Arm 2	0.4	3.29	0.23 (A)	0.4	3.09	0.29 (A)
Arm 3	0.9	4.75	0.43 (A)	0.9	4.70	0.46 (A)
Arm 4	0.1	2.48	0.07 (A)	0.1	2.45	0.09 (A)

Table 12-13 Junction 4 Existing Layout – ARCADY Results – BY, DN and DS - Construction.

The modelling results indicate that Junction 4 is currently operating well within capacity during both peak hours and would continue to do so for the for the 2024 Do Nothing scenario, should the development not take place.

For the 2024 Do Something – Construction Phase, the results indicate that Junction 4 would also operate well within capacity during both peak hours with the highest RFC recorded at 0.48 and a corresponding LOS of ‘A’ occurring on Arm 1 in the AM peak hour. No significant queues or delays are recorded, which demonstrate that Junction 4 would have sufficient

capacity to accommodate the estimated traffic arising from the construction of the proposed development (civil infrastructure only).

From the peak hour analysis results as summarised above, it can be determined that the traffic effects during the construction phase of the proposed civil infrastructure will be ***brief*** in terms of duration – occurring during the network peak hours only, and ***imperceptible negative*** in terms of magnitude – changes on the operational capacity of the junctions will be minor.

Additional Construction Traffic Impacts

In addition to the traffic impacts on each local junction during the peak hours as discussed above, there is also potential for construction traffic to impact from a noise, vibration and dust perspective in relation to the local road network. Deliveries to/from the site by HGV will impact on noise and vibration levels, whilst dust may result from vehicles travelling along gravel roads and from general earthworks activities. The potential for inappropriate parking, particularly along the L1140 whilst waiting for access to the site may also impact local users. There is also potential for conflicts with pedestrian/cyclist movements during the construction of the proposed upgrade works on the L1140 (shared active travel facility and roundabout modification).

It can be determined that the additional construction traffic effects as outlined above will be ***temporary*** in terms of duration and ***moderate negative*** in terms of magnitude.

12.5.2. Operational Phase

Trip Generation – Operational Phase

To assess the likely impact of the traffic generation arising from the future-planned commercial buildings, TRICS software has been consulted. Trip rates for the future-planned commercial buildings were obtained using TRICS database for the '02 - EMPLOYMENT' land use and 'F - WAREHOUSING (COMMERCIAL)' category. TRICS output report, including TRICS trip rates table, is included in **Appendix 12** of this document. Trip generation calculation for the potential future commercial buildings within Zones A and F is shown in **Table 12-14** below.

It is envisaged that Zone A will consist of 7 no. commercial buildings ranging in size from c. 4,000 sqm to c. 10,000 sqm (total of 45,315 sqm in Zone A). For Zone F, the estimative is 6 no. commercial buildings with areas that vary between c. 2,000 sqm and c. 7,000 sqm (total of 27,830 sqm in Zone F).

Zones Zone A (45,315 sqm) Zone F (27,830 sqm)	Peak Hours Trips – Operational Phase			
	Vehicles (excluding HV)		HV	
	Arrivals	Departures	Arrivals	Departures
Zone A (Morning Peak)	149	57	27	27
Zone A (Evening Peak)	44	143	12	15
Zone F (Morning Peak)	92	35	16	16
Zone F (Evening Peak)	27	88	8	9
Total (Morning Peak) – vehicles	241	92	43	43
Total (Evening Peak) – vehicles	71	231	20	24
Total (Morning Peak) – PCU	241	92	99	99
Total (Evening Peak) – PCU	71	231	46	55

Table 12-14 Trip Generation – Operational Phase.

HV traffic figures presented above were also converted to PCU based on the 2.3 factor for Heavy Goods Vehicle (HGV/OGV2) as set out in the TII, Project Appraisal Guidelines for National Roads Unit 5.2 – Data Collection, October 2016 – PE-PAG-02016.

TRICS morning and evening peak hours were identified as 08:30hrs - 09:30hrs and 17:30hrs - 18:30hrs, respectively. These peak hours are different from the network peak hours identified from IDASO traffic survey (detailed in Section 3.2.3), however, for the purpose of the subject assessment and to undertake a conservative appraisal of the analysed junctions, the trips calculated in **Table 12-14** were assumed to occur during the surveyed network peak hours.

Trip Distribution – Operational Phase

The likely catchments for the future-planned commercial buildings are currently unknown and will be established during the planning process of each future commercial development. However, given the location of the subject site and the envisaged land use for the future-planned commercial buildings, it has been assumed that Dublin City and environs, including Dublin Port, Dublin Airport and the several residential zones will be the origin and destination of the various LV and HV trips to/from the future commercial buildings. Based on that, the trip distribution characteristics assumed for the operational phase are as follows:

- 60% from/to south via M1 motorway.
- 20% from/to north via M1 motorway.
- 5% from/to north via R132.
- 10% from/to south via R132.

- 5% from/to west via Bhailsigh Road (L1140).

Traffic Increase on Assessed Junctions – Construction Phase

The AM and PM peak hours traffic increase expected to be generated by the future-planned commercial buildings during the operational phase is provided in **Table 12-15** below.

Junction No.	Surveyed Flows (pcu)		Operational Traffic (pcu)		Operational Traffic (% Increase)	
	AM P.H.	PM P.H	AM P.H.	PM P.H	AM P.H.	PM P.H
J1	121	97	531	402	439%	414%
J2	574	869	504	382	88%	44%
J3	1,241	1,225	262	255	21%	21%
J4	1,678	1,586	80	60	5%	4%

Table 12-15 Surveyed Two-way Traffic and Expected Traffic Increase – Operational Phase.

For the operational phase, with the traffic associated with the future-planned commercial buildings in place on the road network, Junction 1 is expected to receive a two-way traffic increase higher than 400% in both peak hours.

The estimated traffic increase for Junction 2 is 88% in the AM peak hour and 44% in the PM, while the traffic increase for Junctions 3 and 4 are expected to be significantly lower, at 21% and 5%, respectively, for both peak hours.

The effects of the peak hour operational trips associated with the future-planned commercial buildings on Junction 1 will therefore be ***brief significant negative***, while the effects on Junction 2 will be ***brief moderate negative*** and the effects on Junctions 3 and 4 will be ***brief slight negative***.

Assessed Scenarios – Operational Phase

The future-planned commercial buildings (which will be subject to future planning applications) have been assumed to be fully operational by 2026. In line with the 'Traffic and Transport Assessment Guidelines' published by the National Transport Authority (NTA) / Transport Infrastructure Ireland (TII) the following years have been assessed in the Operational Phase:

- 2026 Do Nothing: with 2023 surveyed flows factored up.
- 2026 Do Something – Operational Phase: with 2023 surveyed flows factored up + trips to/from future-planned commercial buildings.
- 2031 Do Nothing: with 2023 surveyed flows factored up.

- 2031 Do Something – Operational Phase: with 2023 surveyed flows factored up + trips to/from the future-planned commercial buildings.
- 2041 Do Nothing: with 2023 surveyed flows factored up.
- 2041 Do Something – Operational Phase: with 2023 surveyed flows factored up + trips to/from the future-planned commercial buildings.

For all Do Something - Operational Phase scenarios Junction 1 has been modelled based on its modified layout as proposed under the subject application (Refer to **Figure 12-8**).

2023 surveyed flows were factored up into future baseline traffic flows based on '*Table 6.2: Link-Based Growth Rates: Country Annual Growth Rates (excluding Metropolitan Areas)*' within the TII Publications – Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, October 2021 (PE-PAG-02017). The traffic growth rates are:

- Light Vehicles (LV) – 2023 to 2026: 1.0550
- Heavy Vehicles (HV) – 2023 to 2026: 1.0981
- Light Vehicles (LV) – 2023 to 2031: 1.1400
- Heavy Vehicles (HV) – 2023 to 2031: 1.2614
- Light Vehicles (LV) – 2023 to 2041: 1.2113
- Heavy Vehicles (HV) – 2023 to 2041: 1.4509

Traffic forecast figures for all assessed scenarios are provided in **Appendix 12.**

Analysis Results – Operational Phase

A summary of the ARCADY analysis results for the Operational Phase is provided below.

Junction 1

The arms of the existing Junction 1 were labelled as follows within the ARCADY model:

- **Arm 1**: L1140 (E)
- **Arm 2**: Southern Approach – not opened to traffic.
- **Arm 3**: L1140 (W)
- **Arm 4**: Northern Approach – not opened to traffic.

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:15 to 17:15)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2026 Do Nothing						
Arm 1	0.1	3.38	0.08 (A)	0.0	3.32	0.04 (A)
Arm 2	-	-	-	-	-	-
Arm 3	0.0	2.97	0.04 (A)	0.0	3.00	0.05 (A)
Arm 4	-	-	-	-	-	-
2031 Do Nothing						
Arm 1	0.1	3.40	0.08 (A)	0.1	3.36	0.05 (A)
Arm 2	-	-	-	-	-	-
Arm 3	0.0	2.98	0.04 (A)	0.1	3.02	0.05 (A)
Arm 4	-	-	-	-	-	-
2041 Do Nothing						
Arm 1	0.1	3.45	0.09 (A)	0.1	3.38	0.05 (A)
Arm 2	-	-	-	-	-	-
Arm 3	0.0	2.99	0.04 (A)	0.1	3.02	0.05 (A)
Arm 4	-	-	-	-	-	-

Table 12-16 Junction 1 Existing Layout – ARCADY Results – DN - Operational.

The modelling results as summarised above indicate that Junction 1 would operate well within capacity for the 2026 Do Nothing scenario during both peak hours and would continue to do so for all future Do Nothing scenarios should the proposed development not take place.

The arms of the proposed modified Junction 1 were labelled as follows within the ARCADY model:

- **Arm 1**: L1140 (E)
- **Arm 2**: Access Road to Zone F (S)
- **Arm 3**: L1140 (W)
- **Arm 4**: Access Road to Zone A (N)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:15 to 17:15)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2026 Do Something – Operational Phase						
Arm 1	0.6	4.56	0.34 (A)	0.2	3.54	0.13 (A)
Arm 2	0.1	2.60	0.05 (A)	0.1	2.26	0.06 (A)
Arm 3	0.1	3.27	0.06 (A)	0.1	3.11	0.05 (A)
Arm 4	0.1	3.12	0.09 (A)	0.2	2.98	0.13 (A)
2031 Do Something – Operational Phase						
Arm 1	0.6	4.59	0.34 (A)	0.2	3.56	0.14 (A)
Arm 2	0.1	2.61	0.05 (A)	0.1	2.26	0.06 (A)
Arm 3	0.1	3.28	0.06 (A)	0.1	3.11	0.06 (A)
Arm 4	0.1	3.12	0.09 (A)	0.2	2.98	0.13 (A)
2041 Do Something – Operational Phase						
Arm 1	0.6	4.63	0.35 (A)	0.2	3.57	0.14 (A)
Arm 2	0.1	2.62	0.05 (A)	0.1	2.26	0.06 (A)
Arm 3	0.1	3.29	0.06 (A)	0.1	3.12	0.06 (A)
Arm 4	0.1	3.12	0.09 (A)	0.2	2.99	0.13 (A)

Table 12-17 Junction 1 Proposed Layout – ARCADY Results – DS - Operational.

The modelling results for the proposed Junction 1 (modified layout) indicate that it would operate well within capacity for the 2026 Do Something – Operational Phase scenario during both peak hours and would continue to do so for the worst-case Operational Phase scenario (2041 Do Something) with the highest RFC recorded at 0.35 and a corresponding LOS of 'A' occurring on Arm 1 in the AM. No major queues or delays are recorded.

Junction 2

The arms of Junction 2 were labelled as follows within the ARCADY model:

- **Arm 1**: M1 Northbound On Slip (N) – exit only
- **Arm 2**: L1140 (E)
- **Arm 3**: M1 Northbound Off Slip (S)
- **Arm 4**: L1140 (W)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:30 to 17:30)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2026 Do Nothing						
Arm 2	0.2	3.12	0.17 (A)	0.4	3.29	0.25 (A)
Arm 3	0.4	4.37	0.27 (A)	0.8	5.38	0.43 (A)
Arm 4	0.0	3.17	0.04 (A)	0.1	3.93	0.07 (A)
2031 Do Nothing						
Arm 2	0.3	3.20	0.18 (A)	0.4	3.41	0.27 (A)
Arm 3	0.5	4.64	0.30 (A)	0.9	5.89	0.47 (A)
Arm 4	0.0	3.27	0.04 (A)	0.1	4.16	0.08 (A)
2041 Do Nothing						
Arm 2	0.3	3.31	0.19 (A)	0.4	3.49	0.29 (A)
Arm 3	0.6	4.95	0.33 (A)	1.1	6.46	0.51 (A)
Arm 4	0.1	3.38	0.05 (A)	0.1	4.36	0.09 (A)
2026 Do Something – Operational Phase						
Arm 2	0.4	3.45	0.25 (A)	0.4	3.46	0.28 (A)
Arm 3	1.0	6.27	0.47 (A)	1.1	6.38	0.50 (A)
Arm 4	0.3	4.52	0.21 (A)	0.6	6.24	0.38 (A)
2031 Do Something – Operational Phase						
Arm 2	0.4	3.54	0.26 (A)	0.5	3.58	0.30 (A)
Arm 3	1.2	6.79	0.50 (A)	1.3	7.11	0.55 (A)
Arm 4	0.3	4.69	0.22 (A)	0.7	6.78	0.40 (A)
2041 Do Something – Operational Phase						
Arm 2	0.4	3.60	0.28 (A)	0.5	3.67	0.32 (A)
Arm 3	1.3	7.36	0.53 (A)	1.5	7.86	0.59 (A)
Arm 4	0.3	0.23	0.23 (A)	0.8	7.30	0.42 (A)

Table 12-18 Junction 2 Existing Layout – ARCADY Results – DN and DS - Operational.

The modelling results as summarised above indicate that Junction 2 would operate well within capacity for the 2026 Do Something – Operational Phase scenario during both peak hours and would continue to do so for the 2041 Do Something - Operational Phase scenario with the highest RFC recorded at 0.59 and a corresponding LOS of ‘A’ occurring on Arm 3 in the PM. No significant queues or delays are recorded.

Junction 3

The arms of Junction 3 were labelled as follows within the ARCADY model:

- **Arm 1**: M1 Southbound Off Slip (N)
- **Arm 2**: L1140 (E)
- **Arm 3**: M1 Southbound On Slip (S) – exit only
- **Arm 4**: L1140 (W)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:30 to 17:30)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2026 Do Nothing						
Arm 1	0.4	4.41	0.28 (A)	0.2	4.20	0.17 (A)
Arm 2	0.7	3.58	0.39 (A)	0.6	3.31	0.37 (A)
Arm 4	0.4	3.42	0.24 (A)	0.6	3.59	0.35 (A)
2031 Do Nothing						
Arm 1	0.5	4.71	0.30 (A)	0.3	4.45	0.19 (A)
Arm 2	0.8	3.84	0.42 (A)	0.7	3.50	0.40 (A)
Arm 4	0.4	3.55	0.26 (A)	0.6	3.76	0.38 (A)
2041 Do Nothing						
Arm 1	0.6	5.03	0.33 (A)	0.3	4.69	0.20 (A)
Arm 2	0.9	4.11	0.46 (A)	0.8	3.68	0.42 (A)
Arm 4	0.5	3.70	0.28 (A)	0.7	3.95	0.40 (A)
2026 Do Something – Operational Phase						
Arm 1	0.6	5.45	0.36 (A)	0.3	5.14	0.22 (A)
Arm 2	0.9	4.38	0.46 (A)	0.7	3.91	0.41 (A)
Arm 4	0.6	3.96	0.34 (A)	1.0	4.68	0.50 (A)
2031 Do Something – Operational Phase						
Arm 1	0.7	5.90	0.40 (A)	0.4	5.49	0.24 (A)
Arm 2	1.1	4.75	0.49 (A)	0.8	4.15	0.44 (A)
Arm 4	0.7	4.11	0.36 (A)	1.2	4.96	0.52 (A)
2041 Do Something – Operational Phase						
Arm 1	0.8	6.38	0.43 (A)	0.4	5.83	0.26 (A)
Arm 2	1.2	5.15	0.53 (A)	1.0	4.41	0.47 (A)
Arm 4	0.7	4.28	0.38 (A)	1.3	5.22	0.55 (A)

Table 12-19 Junction 3 Existing Layout – ARCADY Results – DN and DS - Operational.

The modelling results as summarised above indicate that Junction 3 would operate well within capacity for the 2026 Do Something – Operational Phase scenario during both peak hours and would continue to do so for the 2041 Do Something - Operational Phase scenario with the highest RFC recorded at 0.55 and a corresponding LOS of 'A' occurring on Arm 4 in the PM. No significant queues or delays are recorded.

Junction 4

The arms of Junction 4 were labelled as follows within the ARCADY model:

- **Arm 1**: R132 (NE)
- **Arm 2**: R132 (SE)
- **Arm 3**: L1140 (SW)
- **Arm 4**: Access Road to Applegreen Petrol Station (W)

Arm	AM Peak Hour (07:45 to 08:45)			PM Peak Hour (16:30 to 17:30)		
	Queue (pcu)	Delay (s)	RFC (LOS)	Queue (pcu)	Delay (s)	RFC (LOS)
2026 Do Nothing						
Arm 1	1.1	5.12	0.50 (A)	0.4	3.19	0.28 (A)
Arm 2	0.4	3.38	0.24 (A)	0.5	3.13	0.30 (A)
Arm 3	0.9	4.89	0.45 (A)	0.9	4.86	0.47 (A)
Arm 4	0.1	2.52	0.08 (A)	0.1	2.48	0.09 (A)
2031 Do Nothing						
Arm 1	1.3	5.84	0.55 (A)	0.4	3.35	0.30 (A)
Arm 2	0.4	3.58	0.27 (A)	0.5	3.32	0.33 (A)
Arm 3	1.1	5.36	0.49 (A)	1.1	5.31	0.51 (A)
Arm 4	0.1	2.62	0.09 (A)	0.1	2.59	0.10 (A)
2041 Do Nothing						
Arm 1	1.5	6.61	0.60 (A)	0.5	3.49	0.32 (A)
Arm 2	0.5	3.84	0.29 (A)	0.6	3.49	0.35 (A)
Arm 3	1.3	5.88	0.53 (A)	1.3	5.79	0.55 (A)
Arm 4	0.1	2.74	0.09 (A)	0.1	2.68	0.11 (A)
2026 Do Something – Operational Phase						
Arm 1	1.1	5.38	0.52 (A)	0.4	3.29	0.29 (A)

Arm 2	0.4	3.50	0.27 (A)	0.5	3.20	0.31 (A)
Arm 3	1.0	5.10	0.47 (A)	1.1	5.17	0.51 (A)
Arm 4	0.1	2.55	0.08 (A)	0.1	2.53	0.09 (A)
2031 Do Something – Operational Phase						
Arm 1	1.4	6.14	0.57 (A)	0.5	3.44	0.31 (A)
Arm 2	0.5	3.72	0.29 (A)	0.6	3.37	0.34 (A)
Arm 3	1.2	5.60	0.51 (A)	1.3	5.70	0.55 (A)
Arm 4	0.1	2.67	0.09 (A)	0.1	2.64	0.10 (A)
2041 Do Something – Operational Phase						
Arm 1	1.7	6.99	0.61 (A)	0.5	3.57	0.33 (A)
Arm 2	0.6	3.98	0.32 (A)	0.6	3.55	0.36 (A)
Arm 3	1.4	6.19	0.55 (A)	1.5	6.22	0.58 (A)
Arm 4	0.1	2.78	0.10 (A)	0.1	2.74	0.11 (A)

Table 12-20 Junction 4 Existing Layout – ARCADY Results – DN and DS - Operational.

The modelling results as summarised above indicate that Junction 4 would operate well within capacity for the 2026 Do Something – Operational Phase scenario during both peak hours and would continue to do so for the 2041 Do Something - Operational Phase scenario with the highest RFC recorded at 0.55 and a corresponding LOS of 'A' occurring on Arm 4 in the PM. No significant queues or delays are recorded.

From the peak hour analysis results as summarised above, it can be determined that the traffic effects during the operational phase of the future-planned commercial buildings will be ***brief*** in terms of duration – occurring only during the network peak hours and ***moderate negative*** in terms of magnitude – even though all junctions will operate well within capacity for all assessed scenarios, changes to their operational capacity will be moderate. Outside the network peak hours, however, the traffic effects during the operational phase are likely to be ***permanent*** in terms of duration, but ***not significant*** in terms of magnitude.

12.6. Mitigation Measures

This section discusses mitigation measures to reduce the impacts of the proposed development on the surrounding area during the construction and operational phases.

12.6.1. Construction Phase

The analysis of the local road network has shown that all junctions would operate within capacity for the construction phase during both peak hours and the changes to the junction's operational capacities will be minor. It can therefore be determined that the traffic effects

during the construction phase of the proposed civil infrastructure will be ***brief*** in terms of duration – occurring during the network peak hours only, and ***imperceptible negative*** in terms of magnitude – changes on the operational capacity of the junctions will be minor.

A Construction Environmental Management Plan (CEMP) has been prepared for the subject development in order to provide guidance on how to minimise the potential impact of the construction stage of the proposed development on the safety and amenity of other users of the public road. The CEMP, which accompanies the documentation package under a separate cover, considers the following aspects:

- Dust and dirt control measures;
- Noise assessment and control measures;
- Routes to be used by vehicles;
- Working hours of the site;
- Details of construction traffic forecasts;
- Times when vehicle movements and deliveries will be made to the site;
- Facilities for loading and unloading;
- Facilities for parking cars and other vehicles.

The specific measures will include, but not limited to the following:

- Issue of instructions and maps on getting to site to each supplier sub-contractor to avoid 'lost' construction traffic travelling on unapproved routes;
- Ongoing assessment of the most appropriate routes for construction traffic to and from the site;
- Use of banksman to control the entry and exit of construction vehicles;
- Not allowing construction traffic to wait on public roads;
- Schedule the delivery of materials daily;
- Provision of vehicle and wheel washing facilities on site.

These are further outlined in the CEMP.

Further to the above, a detailed Construction Management Plan (CMP) and a Construction Traffic Management Plan (CTMP) will also be prepared by the main contractor prior to the construction stage. These documents, which shall be prepared in coordination and agreement with the Local Authority, will outline, but not limited to, site logistics and indicate the following:

- Vehicle entry and exit routes to/from the site;
- Diversion of pedestrian and cycling routes;
- Location of loading and unloading areas;
- Location of material storage areas;
- Banksmen locations.

The subject application documents also include a Mobility Management Plan (MMP) which outlines a number of actions that can be implemented to help encourage construction workers and staff to choose more sustainable ways of transportation to commute to and from the construction site and reduce the use of private car, particularly alone.

Through the implementation of the above detailed Plans prior to the construction phase, it is anticipated that the effect of the traffic on the surrounding environment during the overall construction phase will be ***short-term*** in nature and ***slight negative*** in terms of magnitude.

12.6.2. Operational Phase

The assessment results have shown that both the existing and proposed local junctions would also operate well within capacity for all Operational Phase scenarios during both peak hours even though changes to their operational capacities will be moderate. Therefore, it can be determined that the peak hour traffic effects during the operational phase of the future-planned commercial buildings will be ***brief*** in terms of duration – occurring only during the network peak hours and ***moderate negative*** in terms of magnitude. Outside the network peak hours, however, the traffic effects during the operational phase are likely to be ***permanent*** in terms of duration, but ***not significant*** in terms of magnitude.

In order to encourage future staff of the future-planned commercial buildings to reduce the dependence on private car (particularly alone) and avail of sustainable forms of transport such as walking, cycling and public transport, the accompanying Mobility Management Plan (MMP) sets out a number of specific actions to be implemented during the operational phase such as:

- Advising staff about the presence of new and secure active travel facilities within the site and along the L1140 such as dedicated pedestrian crossings, wide footpaths and cycle infrastructure enhancing active travel connectivity between the site and the facilities along the R132.
- Providing information about tax incentives for public transport users such as TaxSaver Commuter Ticket Scheme.

- Providing Guidance for staff on local bus routes and nearest bus stops.
- Providing information about the benefits of carpooling.
- Providing secure cycle parking to cater for the future-planned commercial buildings in accordance with council's standards and requirements.

The proposed active travel facility along the L1140 will significantly improve the pedestrian and cycle connectivity and safety between the site and the facilities along the R132. This will result in a ***permanent*** and ***positive*** effect in terms of sustainable transport options.

12.7. Residual Impacts

12.7.1. Construction Phase

Provided the mitigation measures and management procedures outlined in the Construction Environment Management Plan (CEMP), the Construction Management Plan (CMP), the Construction Traffic Management Plan (CTMP) and the Mobility Management Plan (MMP) are incorporated prior and during the construction phase, the residual impact upon the local receiving environment is predicted to be ***short-term*** in nature and ***slight negative*** in terms of magnitude.

12.7.2. Operational Phase

The analysis of the local road network has shown that both the existing and proposed upgraded junctions would operate within capacity for all assessed scenarios during both the AM and the PM peak hours even though changes to their operational capacity will be moderate. Therefore, it can be determined that the peak hour traffic effects during the operational phase of the future-planned commercial buildings will be ***brief*** in terms of duration – occurring only during the network peak hours and ***moderate negative*** in terms of magnitude. Outside the network peak hours, however, the traffic effects during the operational phase are likely to be ***permanent*** in terms of duration, but ***not significant*** in terms of magnitude.

Whilst the estimated increase in traffic over the baseline conditions is considered moderate, the proposed upgraded roundabout at the site entrance will have a ***significant positive*** impact in terms of quality, increasing safety for all users, and will be ***permanent*** in terms of duration.

The new roads extending within Zone A and Zone F sites and their associated facilities will also have a ***very significant positive*** and ***permanent*** impact on the safety and quality of all future users.

The provision of the new proposed shared active travel facility along the L1140 will improve connectivity and safety between the proposed development and the public transport facilities along R132 and will result in a ***very significant positive*** and ***permanent*** effect in terms of sustainable transport.

12.7.3. Potential Cumulative Impacts

It was determined that the traffic effects during the construction phase of the proposed civil infrastructure will be ***brief*** in terms of duration – occurring during the network peak hours only, and ***imperceptible negative*** in terms of magnitude – changes on the operational capacity of the junctions will be minor.

Other additional traffic impacts associated with the project included potential for construction traffic to impact from a noise, vibration and dust perspective in relation to the local road network. Deliveries to/from the site by HGV will impact on noise and vibration levels, whilst dust may result from vehicles travelling along gravel roads and from general earthworks activities. The potential for inappropriate parking, particularly along the L1140 whilst waiting for access to the site may also impact local users. There is also potential for conflicts with pedestrian/cyclist movements during the construction of the proposed upgrade works on the L1140 (shared active travel facility and roundabout modification).

It can be determined that the additional construction traffic effects as outlined above will be ***temporary*** in terms of duration and ***moderate negative*** in terms of magnitude.

Given the short term nature of impacts identified and other mitigation measures to put in place in relation to dust and noise along with the implementation of the CEMP along with the identification of other projects in proximity to the proposed development cumulative impacts have not been identified and are deemed unlikely.

12.8. Monitoring

12.8.1. Construction Phase

During the construction phase the following monitoring is advised:

- Construction vehicle routes.
- Construction vehicle parking.
- Staff travel patterns to and from the construction site.
- Internal and external road conditions.
- Construction activities hours of works.

The specific compliance exercises to be undertaken in relation to the range of measures detailed in the final Construction Management Plan (CMP) and Construction Traffic Management Plan (CTMP) will be agreed with the Planning Authority.

12.8.2. Operational Phase

During the operational phase, the following monitoring is advised in order to further reduce the potential traffic effects associated with the future-planned commercial buildings:

- Car parking and associated occupancy.
- Cycle parking and associated occupancy.
- Public transport serving the area, including location of closes but stops, service frequency and routes, and commuting times from key destinations.
- Local active travel facilities and routes.

In addition to the Mobility Management Plan prepared for the subject application, all planning applications for future-planned commercial buildings shall also contain a Mobility Management Plans to detail the plans on how to monitor and implement the measures to promote sustainable transport. These reports shall be monitored and updated at regular intervals, which will enable tracking in terms of reduction in the dependence on private car journeys and a shift towards sustainable transport options such as walking, cycling and the use of public transport.

12.9. References

- Fingal Development Plan 2023 – 2029.
- Traffic and Transport Assessment Guidelines, TII / NRA, May 2014.
- Project Appraisal Guidelines for National Roads Unit 5.2 – Data Collection, TII, October 2016.
- Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, October 2021.
- Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts, TII, October 2016
- GDA Cycle Network Plan, NTA, 2022.

13. Waste Management

13.1. Introduction

This Chapter of the EIAR has been compiled by Rowan Engineering Consultants Ltd (REC) and assesses the potential effects of the proposed Project and the waste that may occur as a result. This chapter has been prepared to address the issues associated with waste management during the construction and operational phase of the proposed development.

A site-specific Resource Waste Management Plan (RWMP) and a Construction Environmental Management Plan (CEMP) has been prepared to deal with waste generation and environmental protection during the construction phase of the proposed development and are included as **Appendix 12** and **14** of this EIAR.

13.2. Methodology

The assessment of the impacts of the proposed development arising from the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

The following sources were consulted to identify, current and potential future requirements for waste management:

- Fingal County Development Plan (FCDP) 2023-2029;
- Eastern - Midlands Region, Waste Management Plan (EMRWMP) 2015 - 2021;
- National Waste Reports various dates from 1998-2012, Environmental Protection Agency (EPA), 2014;
- Ireland – Progress towards EU Waste Targets (National Statistics), EPA, 2023;
- A Resource Opportunity, Waste Management Policy in Ireland, Department of Environment Community and Local Government (DoECLG), 2012;
- Taking Stock and Moving Forward, DoECLG, 2004; and,
- Preventing and Recycling Waste – Delivering Change, DoECLG, 2002.
- Environmental Protection Agency (EPA) (2021) Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects;
- Provisions of the Waste Management Acts, 1996-2011 and associated Regulations;
- Construction Industry Research and Information Association (CIRIA) document 133 Waste Minimisation in Construction;

- TII (2017) Guidelines for the Management of Waste from National Road Construction Projects.
- National Construction & Demolition Waste Council (NCDWC) 2006 Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects;
- Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021;
- Fingal Development Plan 2023-2029, Chapters 11 Infrastructure and Utilities and Chapter 14 Development Management Standards;

This chapter is based on the proposed development as described in Chapter 2 of this EIAR, and considers the Legislative context, Construction and Operational phases.

13.2.1. European Union, National and Regional Waste Policies and Legislation

The Irish Government issued a policy statement in September 1998, Changing Our Ways[2], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five-year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the Changing Our Ways report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled 'Recycling of Construction and Demolition Waste' [3] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020, the Irish Government published a policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan, 'A Waste Action Plan for a Circular Economy' [4] (WAPCE), replaces the previous national waste management plan, "A Resource Opportunity" (2012), and was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to an altered economical model, where climate and environmental challenges are turned into opportunities.

[2] Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998)
[3] Forum for the Construction Industry – *Recycling of Construction and Demolition Waste*
[4] Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) [5] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The Circular Economy and Miscellaneous Provisions Act 2022 [6] was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, which retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

The Environmental Protection Agency (EPA) of Ireland issued 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' in November 2021[7]. The guidelines provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project, including consideration of the deconstruction of a project. These guidelines have been followed in the preparation of this document and include the following elements:

[5] DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)
[6] The Circular Economy and Miscellaneous Provisions Act 2022
[7] Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Design teams roles and approach;
- Relevant EU, national and local waste policy, legislation and guidelines;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for Resource Waste Manager (RM) and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a bespoke RWMP for developments. The new guidance classifies developments on a two-tiered system. Developments which do not exceed any of the following thresholds may be classed as Tier 1 development, which require a simplified RWMP:

- New residential development of less than 10 dwellings;
- Retrofit of 20 dwellings or less;
- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2;
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and
- Demolition projects generating in total less than 100m^3 in volume of C&D waste.

A development which exceeds one or more of these thresholds is classed as Tier-2 project. In accordance with the above criteria, the proposed M1 Business Park can be classified as Tier-2 development. The proposed development exceeds the threshold of generating more than a 100m^3 in volume of C&D waste.

The proposed development is located in the local authority area of Fingal County Council, which falls under the Eastern-Midlands Waste Region (EMWR). The Waste Management Plan for the Eastern-Midlands Region 2015 – 2021, consisting of 12 constituent local authorities, is the regional waste management plan to the administrative area.

The Eastern Midlands Region Waste Management plan is a statutory document prepared by the local authorities of the region. It covers the period from 2015 to 2021 and is currently being updated. It is underpinned by National and European waste legislation and the work carried

out will ensure the continued management of waste in a safe and sustainable manner. The vision for the plan is to reconsider our approach and attitudes towards managing waste.

The primary focus will be to view waste as a valuable resource in conjunction with making better use of current resources along with the reduction of leakage of material, to include energy, as we make the transition from a linear to a circular economy. While there will be many areas to cover and many crossovers within the implementation of the plan the eight Strategic Objectives within the plan will see an overall achievement of the outlined goals.

The Plan sets forth the following targets to be achieved in the Eastern-Midlands Region:

- 1% reduction per annum in the quality of household waste generated per capita over the period of the Eastern Midlands Region Waste Management plan;
- Reduce to 0% the direct disposal of unprocessed municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices;
- Achieve a recycling rate of 50% of managed municipal waste by 2020.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste, which includes a €75 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2015.

13.2.2. Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the development are:

- Waste Management Act 1996 as amended;
- Environmental Protection Agency Act 1992 as amended;
- Litter Pollution Act 1997 as amended;
- The Circular Economy and Miscellaneous Provisions Act 2022; and
- Planning and Development Act 2000 (as amended).

One of the guiding principles of European waste legislation, which has in turn been incorporated into the Waste Management Act 1996 as amended and subsequent Irish legislation, is the principle of “Duty of Care”. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following

on from this is the concept of “Polluter Pays” whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the Developer ensures that the waste contractors engaged by demolition and construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments or a Waste or Industrial Emissions Licence granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

13.2.3. Desk Study

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the construction and operational phases; and,
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

13.3. Baseline Conditions

13.3.1. Waste Management in Fingal

The EPA Waste Report 2012 (published in 2014) described a continued decrease in the generation of municipal solid waste from the 2007 peak and that Ireland was achieving legislated requirements for most waste streams such as packaging, waste electrical equipment and batteries. The Report highlights that some future targets were at risk including end of life vehicles and biodegradable municipal waste from landfills. The Report highlighted

that as the country moved out of recession, continued investment and focus was required to ensure that waste targets were achieved.

The EPA National Statistics press release issued on the 31st January 2018 outlined that Ireland was continuing to achieve, or was on target to achieve waste targets for packaging, electrical and electronic equipment, batteries, accumulators and the diversion of biodegradable municipal waste streams from landfill. Targets for the recovery and recycling of end-of-life vehicles is still not being achieved.

In terms of the baseline conditions, the environment is defined by Fingal County Council with the requirements set out in the Eastern-Midlands Region, Waste Management Plan (EMRWMP) 2015-2021. This Plan has identified a number of policies which will be implemented to achieve the key Plan objectives of:

- 1% reduction per annum in the quantity of household waste generated per capita over the period of the Plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and,
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill in favour of higher pre-treatment processes and indigenous recovery processes.

The EMRWMP 2015-2021 advocates a shift in the current approach to the management of waste by viewing it as a valuable material resource. It presents a focus around the integration of a circular economy, in terms of viewing our waste material as valuable material resources and by also making better use of our resources to deliver economic and environmental benefits.

The Fingal CDP 2023-2029 identified the long-term targets for the Fingal region in terms of waste management, alongside a commitment to implement the EMRWMP.

"Fingal County Council's approach to waste management is consistent with the EU Waste Hierarchy and the circular economy approach to waste which promotes the principles of prevention, re-use, recycling, energy recovery and sustainable disposal."

"In the waste sector, policy is focused on a shift towards a 'circular economy', encompassing three core principles: designing out waste and pollution; keeping products and material in use; and regenerating natural systems."

"Fingal will continue to facilitate the implementation of national legislation and national and regional waste management policy having regard to the waste hierarchy, including the Eastern Midlands Region Waste Management Plan 2015–2021 (EMRWMP), which informs these

Development Plan policies and objectives. The implementation of the EMRWMP must ensure that European and national mandatory targets are achieved."

It is the policy of the Council, as set out in the Regional Waste Management Plan, to:

- *Prevent or minimise the production of waste in the first instance;*
- *Reduce, re-use and recycle to the maximum extent possible;*
- *Endeavour to recover energy from waste where possible; and,*
- *Ensure the efficient and safe disposal of any residual waste.*

It is also important to note that a *National Waste Management Plan for a Circular Economy* is currently in preparation and is in Draft phase, and this will replace the three existing Regional Waste Management Plans once finalised.

13.3.2. Waste Management Infrastructure

In terms of physical waste infrastructure in the region, there are numerous waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for appropriate management and treatment of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and waste-to-energy facilities. It is concluded that there is adequate permitted and licensed waste infrastructure in the region to accommodate the waste quantities that will be produced as a result of the proposed development.

13.3.3. Waste Management Policy Context

Among the policies and objectives relating to waste management, Fingal County Council outlined the following in the FCDP:

> ***Policy CAP25 – Circular Economy:*** *Support the shift towards the circular economy approach as set out in the National Waste Policy for 2020–2025.*
>
> ***Policy CAP26 – Waste Management Plans for Construction and Demolition Projects:*** *Have regard to existing Best Practice Guidance on Waste Management Plans for Construction and Demolition Projects as well as any future updates to these Guidelines in order to ensure the consistent application of planning requirements.*
>
> ***Policy IUP20 – Implementation of Existing Waste Management Policy:*** *Support the implementation of existing waste management policy and promote education and awareness on all issues associated with waste management, both at industry and community level, including the promotion of waste reduction by encouraging reuse,*

recycling and recovery of waste. Fingal County Council will continue to promote and support the objectives of the Eastern and Midlands Region Waste Management Plan 2015–2021, or such plans as may be updated.

Policy IUP21 – Environmental Policy, Legislation and Guidance: *Have regard to European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes.*

Policy IUP22 – Transition from A Waste Economy Towards A Green Circular Economy: *Support the principles of transition from a waste economy towards a green circular economy and implement good waste management and best practices to enable Fingal to become self-sufficient in terms of resource and waste management and to enhance employment and increase the value recovery and recirculation of resources, in accordance with the Whole of Government Circular Economy Strategy 2022.*

Policy IUP23 – Segregated Public Waste Bins and Compactor Bins: *Promote a Countywide system of segregated public waste bins and segregated compactor bins.*

Objective IUO28 – Eastern Midlands Region Waste Management Plan: *Implement the provisions of the Eastern Midlands Region Waste Management Plan 2015–2021 or any subsequent Waste Management Plan applicable within the lifetime of the Development Plan. All prospective developments in the County will be expected to take account of the provisions of the Regional Waste Management Plan and adhere to the requirements of that Plan.*

Objective IUO29 – Sustainable Waste Recovery and Disposal: *Provide for, promote and facilitate high quality sustainable waste recovery and disposal infrastructure/technology in keeping with the EU waste hierarchy, national legislation and regional waste management policy to adequately cater for Fingal's growing population.*

Objective IUO30 – Hazardous Waste: *Adhere to the recommendations of the National Hazardous Waste Management Plan 2014–2020 and any subsequent plan, and to co-operate with the EPA and other agencies in the planning, organisation and supervision of the disposal of hazardous waste streams, including hazardous waste identified during construction and demolition projects. To continue to promote the use of clean technology and minimisation of hazardous waste production in all development within the County.*

Policy IUP24 – Recycling / Re-Use: *Promote and encourage the establishment of re-use, recycling and repair activities to prevent and minimise waste generation and disposal, in accordance with the Eastern Midlands Region Waste Management Plan 2015–2021 (or any subsequent plan).*

Policy IUP25 – Litter Management: *Support the implementation of the Fingal Litter Management Plan 2019 and any subsequent plans through enforcement of the litter bye-laws, street cleaning and continued roll out of education and awareness campaigns.*

Objective IUO31 – Network of Bring Infrastructure: *Provide for and maintain the network of bring infrastructure within the County (i.e. recycling centres, civic amenity facilities, bring banks) to facilitate the recycling and recovery of hazardous and non-hazardous municipal wastes and ensure the provision of adequately sized public recycling facilities in accessible locations throughout the County.*

Objective IUO32 – Bring Bank Facilities: *Seek to identify suitable sites for new bring bank facilities to ensure that developing settlements have ease of access to such facilities over the Plan period, subject to funding and resources available.*

Objective IUO33 – Home Composting: *Continue to promote home composting and explore the potential for composting in rural areas and promote the development of composting (digestor) plants for organic solid waste at appropriate locations within the County. Continue to promote developments to manage food waste in accordance with the requirements of the Waste Management (Food Waste) Regulations.*

Objective IUO34 – Waste Management in New Developments: *Require the provision of appropriate, well designed, accessible space to support the storage, separation and collection of as many waste and recycling streams as possible in all new commercial and residential developments within the County. See also Chapter 14, Development Management Standards (Section 14.20.12: Waste Management).*

Objective IUO35 – Education and Awareness: *Continue to raise environmental awareness of waste prevention and minimisation and reduction in illegal dumping through the continuation of Council based initiatives, with particular emphasis placed on the involvement of local schools, community organisations, individual households and businesses.*

Objective IUO36 – Partnership Approach: *Continue to develop the Council's partnership approach with the Tidy Towns Associations, community groups, farming*

organisations, trade unions, the business community, the local media, sporting organisations, tourism bodies and Gardaí in the support and fostering of anti-litter initiatives within the County.

13.4. Characteristics of the proposed Development

As detailed within **Section 2.1** of this report, the proposed development would entail the demolition of all existing structures located on Zone A and F due to their derelict and unsafe condition. **Figure 13-1** indicated the location of the structures and Table 2-1 summarises the approximate footprints of the structures.

The areas demarcated below in Table 2-1 as “general site clearance” consists of greenfield areas, which will entail the removal and stockpiling of topsoil and organic material, which will be reused on site following the completion of the works. All other excavation works for the proposed access roads, utilities and other services would result in surplus materials. These materials, replaced by engineering materials such as subbase, pipes, clean sand and gravels, would be reused on site for the levelling of individual land parcels which will be developed in the future.

Insofar as practical, all non-hazardous materials arising from the demolition of the structures located in Zone A and F, will be segregated, sorted, and transported to appropriate recycling facilities. All hazardous materials or contaminated materials will be managed by appropriate professionals and transported to appropriate hazardous waste disposal facilities.

The resurfacing of the Bhailsigh Road (L1140) roundabout provides a big opportunity for the reuse of granular materials for instance subbase, concrete kerbs and asphalt materials. For subbase materials, a portion can be mixed in with subsoils to strengthen the bearing capacity of the insitu soils. Subbase can also be reclaimed, stockpiled and reused if carried out properly. Asphalt materials once milled can be reused in the production of new asphalt pavement layers. They can also be used on a temporary basis for the use of temporary parking areas, stockpile areas, access roads and contractor’s compounds, which decreases the volume of imported materials needed on a temporary basis. Following the completion of the works, these temporary surfaces can be cleared and materials transported to appropriate recycling, reuse or disposal facilities.

For the pedestrian and cycle linkages along Bhailsigh Road and the R132 to Applegreen, site clearance will entail removal and stockpiling of topsoil, which would be reused for site reinstatement. The existing Armco crash barriers will be relocated to provide sufficient width for the construction of the 3m wide shared paths. Depending on the condition of the barriers,

and subject to the approval by Fingal County Council (FCC) and Transport Infrastructure Ireland (TII), the barriers and tanalised poles can be reused.

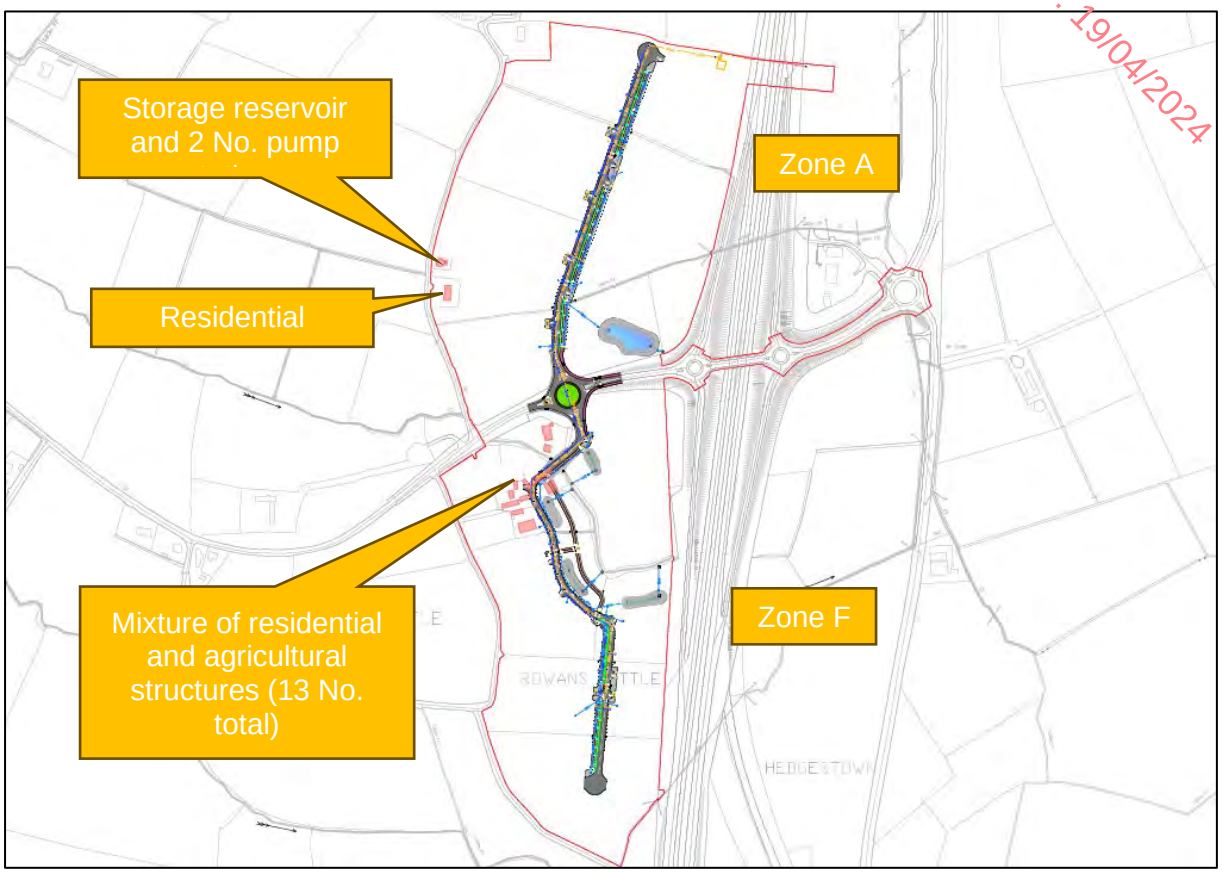


Figure 13-1: Site Layout and demolition works

Table 13-1: Summary of site clearance and demolition works

Item Description	Measurement
Zone A	
General site clearance for proposed civil works	17,500 m^2
Residential dwelling	192 m^2
Water storage reservoir	104 m^2
2 No. pump stations	20.5 m^2
Bhailsigh Road (L1140) and R132	

General site clearance for proposed civil works	2,900 m^2
Resurfacing of Bhailsigh Road roundabout	4,000 m^2
Relocation of existing Armco crash barriers	820 m
Zone F	
General site clearance for proposed civil works	21,500 m^2
Residential Structures including Garages (Structure No. 2, 4, 11, 12, 13)	528 m^2
Agricultural Structures including sheds (Structure No. 1, 3, 5-10)	1,110 m^2

13.5. Design Approach

The '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*' guidelines into the preliminary design, to help future review processes to identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second life and management post demolition and construction. Further details on these design principals can be found within the aforementioned guidance document.

The design team have undertaken the design process in line with the international best practice principles to firstly prevent wastes, reuse where possible and thereafter sustainably reduce and recover materials. The below sections have been the focal point of the design process and material selections and will continued to be analysed and investigated throughout the design process and when selecting material.

The following approaches presented are based on international principles optimises resources and reduces waste on construction projects through:

- Prevention of wastes as far as practicable;
- Reuse of suitable materials;
- Recycling materials at the source;
- Selecting suppliers based on Green Procurement Principles;
- Off-Site Construction provides a controlled space for fabrication, thus reducing wastes;
- Materials Optimisation; and

- Flexibility and Deconstruction.

13.5.1. Designing for Prevention, Reuse and Recycling

The following aspects were investigated during the preliminary design stage of the proposed development:

- Establishing the potential for any reusable site assets (structures, equipment, materials, soils, etc.);
- Assessing any existing structures/hardstanding areas on the site that can be refurbished either in part or wholly; and
- Enabling the optimum recovery of materials on site, and where materials cannot be reused, recycling is given precedence above transporting materials to waste storage facilities.

13.5.2. Designing for Green Procurement

Waste prevention measures such as the reuse of materials has been incorporated into the preliminary design of the proposed development. During the detailed design stage where material quantities will be finalised, further measures to reduce wastes will be implemented into the contract documents. Green procurement strategies in construction can help reduce waste and promote sustainability. The following Green Procurement methods will be further developed into the detailed design:

- Selecting construction materials that have a high percentage of recycled content or are made from renewable resources;
- Selecting materials that are locally sourced, reducing transportation costs and the associated carbon footprint;
- Prioritising products that are certified by third-party sustainability organisations;
- Encouraging suppliers to reduce packaging waste by using minimal packaging and recyclable or biodegradable materials;
- Specifying products that are designed for durability and longevity, reducing the need for replacement and associated waste;

13.5.3. Designing for Off-Site Construction

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use offsite construction is typically cost led but there are significant benefits for resource management. Some further considerations

for procurement which are being investigated as part of the planning stage design process are listed as follows:

- Modular buildings as these can displace the use of concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc.;
    - Modular structures are typically pre-fitted with fixed plasterboard and installed insulation, eliminating these residual streams from site.
- Use of pre-cast structural concrete panels which can reduce the residual volumes of concrete blocks, mortars, plasters, etc.;
- The use of prefabricated composite panels for walls and roofing to reduce residual volumes of insulation and plasterboards;
- Using pre-cast hollow-core flooring instead of in-situ ready mix flooring or timber flooring to reduce the residual volumes of concrete/formwork and wood/packaging, respectively; and

Designing for the preferential use of offsite modular units.

13.5.4. Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities. This includes investigating the use of standardised sizes for certain materials to help reduce the number of off-cuts produced on site, focusing on promotion and development of off-site manufacture.

13.5.5. Designing for Flexibility and Deconstruction

Design flexibility has and will be investigated throughout the design process to ensure that where possible products only contain materials that can be recycled and are designed to be easily disassembled. Material efficiency is being considered for the duration and end of life of a building project to produce; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction.

13.6. Proposed Waste Management Strategy at the Site

The waste management strategy for the site is detailed within the attached Resource and Waste Management Plan presented within **Appendix 12** and proposed strategy is summarised below.

The management of construction and demolition waste will reflect the waste management hierarchy, with waste prevention and minimisation being the first priority, followed by reuse and recycling. During site clearance and construction works, there are numerous opportunities for the beneficial reuse and recycling of materials. The subsequent use of recycled materials in construction works also reduces the quantities of waste which ultimately needs to be consigned to landfill sites.

The Contractor will develop and implement a plan and manage all waste with a goal of achieving the waste hierarchy in accordance with the relevant statutory provisions as shown in **Figure 13-2** below.

Figure 13-2: Waste Management Hierarchy as outlined in the EPA Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects (2021).

13.6.1. Source Segregation

Wastes generated on the construction site will be identified and segregated according to their respective categories, as described by the European Waste Catalogue (EWC). Where possible, metal, timber, glass and other recyclable material will be segregated and removed off-site to a permitted/licensed facility for recycling.

In order to achieve this, designated waste storage areas will be created at the construction compound or other suitable locations for the storage of segregated wastes prior to transport for recovery/disposal at suitably licensed/permitted facilities. Suitably sized containers for each waste stream will be provided within the waste storage area and will be supervised by the Resource and Waste Manager who will be appointed by the Main Contractor. This will be the person responsible for the management of waste during the construction of the project.

The number and sizing of containers will be agreed with Waste Contractors in advance of construction works commencing. Source segregation of waste will result in cost savings to the project as well as providing an environmentally sound route for the management of all construction and demolition wastes.

13.6.2. Reuse

Possibilities for reuse of clean, non-hazardous excavation material as fill on the site or in landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use. Ground Investigations (GI) included Waste Acceptance Criteria (WAC) testing shall be carried out on samples on a continuous basis throughout construction.

GI and WAC testing was carried out in October 2023. The majority of samples in Zone A and F tested as Non-Hazardous, except for TP09 located in Zone F, which included a “potentially hazardous amount of chromium in chromium (VI) oxide. Further testing in this location will be carried out prior to the procurement phase to accurately determine the potential for contamination. TP09 is located near the western boundary of Zone F, just south of the agricultural buildings highlighted in Figure 2-3.

13.6.3. Material Management

In order to prevent and minimise the generation of waste, the Contractor will be required to ensure that raw materials are ordered so that the timing of delivery, the quantity delivered, and the storage is not conducive to the creation of unnecessary waste. The Contractor, in conjunction with the material suppliers, will be required to develop a programme showing the estimated delivery dates and quantities for each specific material associated with each element of construction and demolition works.

It is essential that the planning, construction and demolition works are undertaken in close collaboration with waste management contractors, in order to determine the best techniques for managing waste and to ensure an efficient recovery of materials for recycling. The Contractor will be required to continuously seek to improve the waste management process on-site during all stages of construction and maximise opportunities for reuse and recycling where they exist. The RWMP will be included as an agenda item at the weekly construction meetings. In addition, the plan will be communicated to the whole team (including the Client) at the monthly meetings. This will include any updates to earlier versions of the document.

13.6.4. Waste Auditing

The Contractor will record the quantity (in tonnes) and types of waste and materials leaving the site during the construction phase. The name, address and authorisation details of all facilities and locations to which waste and materials from the construction phase are delivered will be recorded along with the quantity of waste (in tonnes) delivered to each facility. Records will show all material recovered and disposed of.

The waste management strategy for the project will follow the accepted waste hierarchy and the Contractor will implement the following types of measures to reduce waste and maximise opportunities for recycling, insofar as practicable:

- Materials for construction activities will be ordered as to require the minimum possible storage time;
- Materials will be ordered, where possible, in correct quantities to prevent wastage;
- Appointment of a Resource and Waste Manager, who will be responsible for handling, storage and delivery of materials to the proposed development;
- Ensure that stored material is protected from damage from plant and environmental factors such as rain and wind;
- Secure storage areas to prevent unauthorised access;
- Establish a waste management compound to handle incoming waste from construction activities – this should facilitate the segregation of key waste streams to maximise the opportunity to re-use, recycle and return wastes generated on-site;
- Provide a separate secured area for dealing with hazardous waste; and,
- Provide separate facilities for the storage of fuels and chemicals.

13.7. Predicted Impacts

13.7.1. Construction Phase

This section details the potential waste impacts primarily associated with the construction of the proposed development. As the operational phase will be subject to separate subsequent planning applications the operational phase has been considered at a high level only.

It is anticipated that the construction of the proposed development will be phased. The construction of the access roads will be progressed as the demand for the individual land parcels identified in the Scott Tallon Walker Masterplan increases over time. It is anticipated that Phase 1 will consist of a construction period of 8 months, with Phase 2 involving a construction period of 6 months. Phase 1 would entail the construction of all the services, utilities and drainage infrastructure required to service both Zone A and F in its entirety.

Identified Waste Streams

Non-Hazardous Waste Streams

There will be soil, stones, clay and made ground excavated to facilitate construction of the development. During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

A general list of non-hazardous wastes which will arise from the construction works are:

- Topsoil, sub-soil, stones, made ground fill from excavations;
- Excess new concrete and bricks;
- Excess asphalt and tar products;
- Scrap metal;
- Cardboard and other packaging;
- Plastic including wrapping and packaging;
- Waste wood;
- Paper;
- Glass;
- Waste from portable toilets;
- Canteen and food wastes; and
- Damaged materials.

Potentially Hazardous Waste Streams

Contaminated Soils

Environmental testing was carried out on 12 samples (6 per zone) from the investigation and the results are shown in the Investigation report submitted with this application. For material to be removed from site, Suite I (Rilta Suite) testing was carried out to determine if the material

is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill. Following this analysis of the solid test results, the leachate results generally remained within the Inert thresholds.

The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material. The majority of samples in Zone A and F tested as Non-Hazardous, except for TP09 located in Zone F, which included a "potentially hazardous amount of chromium in chromium (VI) oxide. Further testing in this location will be carried out prior to the procurement phase to accurately determine the potential for contamination.

If any potentially contaminated material is encountered, it will need to be segregated from clean / inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' 14 using the HazWasteOnline™ application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC 15, which establishes the criteria for the acceptance of waste at landfills.

In the event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify the Employer's Representative and FCC Waste Department and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

Due to a mixture of historic landfills and land reclamation, there are a number of locations in Fingal where contaminated land arises. Any contaminated land will require appropriate remediation prior to re-development, including, in some instances, removal of material from a site which may require a licence under the Waste Management Act 1996 (as amended), prior to the undertaking of such works. In all cases involving contaminated land, it is the policy of Fingal County Council to require the highest standards of remediation and where appropriate to consult with the Environmental Protection Agency and other relevant bodies to resolve the

environmental pollution created by contaminated land. Decontamination activities should ensure there is no off-site migration of contaminants via runoff, soils or groundwater and the area is available for use.

Fuels/Oils and other Hydrocarbons

Fuels and oils are classed as hazardous materials; any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel / oil waste generated at the site.

Other Known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste may be generated from during construction and demolition activities or temporary site offices. These wastes, if generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

Table 13-2: Waste types likely to be generated as a result of the Construction Phase

Waste Material	LoW / EWC Code

Concrete, bricks, tiles and ceramics	17 01
Bricks	17 01 01
Tiles	17 01 02
Ceramics	17 01 03
Mixture of concrete, bricks, tiles and ceramics	17 01 07
Wood, glass and plastic	17 02
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and products	17 03 01
Bituminous mixtures containing other than those mentioned in 17 03 01	17 03 02
Metals (including their alloys)	17 04
Copper, bronze, brass	17 04 01
Aluminium	17 04 02
Lead	17 04 03
Zinc	17 04 04
Iron and Steel	17 04 05
Tin	17 04 06
Mixed Metals	17 04 07
Soul and stones containing hazardous substances	17 05 04
Soils and stones, other than those mentioned in 17 05 03*	17 06 04

Insulation and Construction Materials	17 06 05
Construction materials containing asbestos	17 08 02
Gypsum based construction material	17 09 04
Mixed C&D waste not mentioned in 17 09 01 to 17 09 03	17 09 04
Paper and cardboard	20 01 01
Wood other than mentioned in 20 01 37	20 01 38
Soil and Stones	20 02 02
Mixed Municipal Waster	20 03 01
Hydraulic oils	13 01 01
Fuel oils and diesel	13 07 01
Aqueous liquid waste other than those mentioned in 16 10 01 (portable toilet wastes)	16 10 02

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the detailed design and construction process.

The demolition stage will involve the excavation of existing structures, minor hardstanding areas, roads, and kerbs. The demolition areas are identified in the planning drawings provided with this application. The anticipated demolition waste and rates of reuse, recycling / recovery and disposal are shown in **Table 13-3.**

Table 13-3: Estimated off-site reuse, recycle and disposal rates for demolition waste

Waste Type	**Est. Tonnes**	**Reuse/Recycle**		**Recovery**		**Disposal**	
		%	**Tonnes**	**%**	**Tonnes**	**%**	**Tonnes**
Concrete/Masonry	1,400	1190	10%	140	5%	70	1190

Wood	800	160	10%	80	70%	560	160
Metals	800	760	5%	40	0%	0	760
Glass	30	27	10%	3	0%	0	27
Asphalt	1,200	1020	10%	120	5%	60	1020
Soils/Gravels	3,500	2800	15%	525	5%	175	2800
Other	100	20	10%	10	70%	70	20
Total	**7,800**	**6000**		**900**		**900**	**6000**

13.7.2. Operational Phase

It is considered that minimal volumes of municipal waste streams will be generated on site during the course of site activities during the operational phase. These would be generated as a result of general commercial activities once the site is operational.

Waste arising at the site will be proactively managed and its value as a material resource will be recognised. The waste types that are likely to be generated as part of the site activities associated with the operational phase of the proposed development and their associated European Waste Catalogue (EWC) codes are listed in Table 13-4 below. As this EIAR does not consider the future development of Warehouses the operational stage has not been considered further within this chapter and will need to assessed as part of subsequent planning applications for the individual warehouse plots.

Table 13-4: Waste types likely to be generated as a result of the Operational Phase

EWC	Classification
150101	Packaging – Cardboard and Wood for Recycling
150102	Packaging - Plastic for Recycling
200101	Paper and Cardboard
170203	Plastic

200301	Mixed Municipal Waste
200108	Biodegradable kitchen and canteen waste

13.7.3. Potential Cumulative Impacts

Based on a review of the planning application viewer there are no committed developments in proximity to the subject site which are likely to give rise to cumulative impacts associated with it. Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely. No significant cumulative effects are foreseen on Waste from a cumulative impact.

In relation to the proposed indicative masterplan no potential impacts are currently identified which could not be managed appropriately to reduce any impacts to low , insignificant. It is however noted that specific details on the operations to occupy the indicative warehouse units are unknown at this stage and will be subject to subsequent individual planning applications when detailed designs have been confirmed. Waste management impacts should be reviewed again at this stage when appropriate details are available to ensure envisaged impacts remain low insignificant once appropriate mitigation measures have been implemented.

13.8. Mitigation Measures

As detailed in **Section 13.5** and **Section 13.6** above mitigation measures have been considered at the design stage of the project and by proposed Management Waste Strategy in line with Waste Management Hierarchy to prevent waste as the most preferable step. The following mitigation measures are implemented on the waste which can not be prevented.

13.8.1. Construction Phase

A CEMP and RWMP (**Appendices 4 and 12**) have been prepared setting out a framework in relation to waste generation and appropriate waste management procedures during the construction phase of the proposed Project.

Compliance with the CEMP and RWMP will be a mandatory requirement for the appointed contractor including all personnel and appointed sub-contractors at the site.

The CEMP has been developed to reflect the waste management hierarchy and details the measures that will be implemented on site to minimise waste generation, manage materials

on-site effectively and to prioritise reuse and recycling opportunities at the site having regard to the resource value of even discarded materials.

The CEMP and RWMP details the mitigation measures that will be implemented on site during the construction phase, to improve and minimise waste generation, manage materials on-site effectively and to prioritise the reuse and recycling opportunities on-site.

Training on the requirements of both the CEMP and RWMP will be provided to all construction site staff and sub-contractors by the appointed contractor as part of their site induction. Records of this training will be maintained and filed appropriately on-site.

13.8.2. Proposed Waste Management Options

Waste materials generated will be segregated on-site, where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source, where feasible. All waste receptacles leaving the site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Fingal region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

During construction, some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off-site in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate Certificate of Registration / permit / licence.

Written records will be maintained by the contractor(s), detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and Certificate of Registration / permit / licence for the receiving waste facility for all waste removed off-site for appropriate reuse, recycling, recovery and / or disposal.

Dedicated bunded storage containers will be provided for hazardous wastes which may arise, such as batteries, paints, oils, chemicals, if required.

The anticipated management of the main waste streams is outlined as follows:

13.8.3. Soils, Stone, Gravel, Clay and Made Ground

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

When material is removed off-site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011, which requires that certain conditions be met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Article 27. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. Article 27 will be investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 as amended, the Waste Management (Collection Permit) Regulations 2007 as amended and the Waste Management (Facility Permit & Registration) Regulations 2007 as amended. Once all

available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

13.8.4. Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be removed off-site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from Fingal County Council.

13.8.5. Silt and Sludge

During the construction phase, silt and petrochemical interception will be carried out on run-off and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed off-site.

13.8.6. Concrete, Bricks, Tiles and Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible. If concrete is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from Fingal County Council.

13.8.7. Plastics

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

13.8.8. Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues, etc., will be disposed of in a separate skip and recycled off-site.

13.8.9. Metal

Metals will be segregated, where practical, and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

13.8.10. Glass

Glass materials will be segregated for recycling, where possible.

13.8.11. Waste Electrical & Electronic Equipment (WEEE)

Any WEEE will be stored in dedicated covered cages / receptacles / pallets pending collection for recycling.

13.8.12. Other Recyclable Waste

Where any other recyclable wastes, such as cardboard and soft plastic, are generated, these will be segregated at source into dedicated skips and removed off-site.

13.8.13. Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip / receptacle will be examined by a member of the waste team (see Section 9.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

13.8.14. Asbestos Containing Materials

Any asbestos or ACM found on-site should be removed by a suitably competent contractor and disposed of as asbestos waste before the demolition works begin. All asbestos removal work or encapsulation work must be carried out in accordance with S.I. No. 589 of 2010 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.

13.8.15. Other Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

13.8.16. On-Site Crushing

It is currently not envisaged that the crushing of waste materials will occur on-site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from Fingal County Council, and the destination of the accepting waste facility will be supplied to the Fingal County Council waste unit.

13.8.17. Operational Phase

The operational phase of the project will be subject to separate subsequent planning applications which will assess the impacts associated with proposed development as appropriate. It is considered that minimal volumes of municipal waste streams will be generated on site during the course of site activities during the operational phase. These would be generated as a result of general commercial activities once the site is operational. Appropriate waste management procedures will be implemented at the site once the site is operational in line with legislative requirements and environmental best practise.

13.9. Residual Impacts

After the Design Approach, Waste Management Strategy and proposed mitigation measures are implemented as outlined in **Section 13.5**, **Section 13.6** and **Section 13.8** along with the implementation of the CEMP and RWMP during the construction phase any residual impacts are considered not significant - imperceptible during the construction phase.

It is considered that minimal volumes of municipal waste streams will be generated from commercial activities during the operational phase. Whilst this is a longer-term impact, it is considered not significant-imperceptible with the implementation of appropriate waste management procedures in line with legislative requirements and environmental best practise.

13.10. References

- Department of Environment, Community and Local Government (now the Department of Communications, Climate, Action and Environment), 2002, Preventing and Recycling Waste – Delivering Change;
- Department of Environment, Community and Local Government, 2012, A Resource Opportunity, Waste Management Policy in Ireland;
- Department of Environment, Community and Local Government, 2004, Taking Stock and Moving Forward;

- Dublin City Council, 2015, Eastern-Midlands Region, Waste Management Plan (EMRWMP) 2015-2021;
- Environmental Protection Agency, 1998-2014, National Waste Reports;
- Environmental Protection Agency, 2023, Ireland – Progress towards EU Waste Targets (National Statistics); and,
- Fingal County Council, 2023, Fingal County Development Plan, 2023-2029.

14. Archaeology, Cultural Heritage and Architectural Heritage

14.1. Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR), commissioned by Vida M1 Limited addresses the effects on the archaeological, architectural and cultural heritage of the application site and the surrounding area of a proposal for the provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and motorway, referred to as Zones A and F, at Rowans Big and Little, County Fingal. The development will consist of:

- Demolition of a single-storey 200-square-metre (m^2) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- Demolition of 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;
- Provision of civil infrastructure to service future-planned commercial properties on the lands located on the western side of the M1 Business Park and M1 motorway, referred to as Zone A and F;
- Zone A and F lands are located north and south of Bhailsigh Road (L1140), respectively, which connect to Junction 5 of the M1 Motorway and are located in the townlands of Rowan's Big and Rowan's Little;
- Preparation of indicative Masterplan for Zone A and F which contains layouts of the future planned commercial properties, consisting of mixed-use, warehousing and distribution units including associated loading bays for HGVs, service compounds, ESBN substations and parking areas to service each commercial unit site, which would be subject to individual planning permission applications;
- Provision of civil infrastructure designed to service various mixed-use buildings consisting of 20k- to 105k-square-feet (ft^2) units with the potential to combine plots should larger units be required;
- In Zone A and F, the civil infrastructure will consist of primary access roads including pedestrian/cycle paths, watermains, surface water and foul drainage networks. utility ducting for services consisting of power and telecommunications;
- The primary access roads into Zone A and F will consist of 7.5-metre-wide single-carriageways originating from Bhailsigh Road (L1140) roundabout including segregated cycle tracks and pedestrian footpaths with associated verges;

- Upgrading of the existing Balrickard stream crossing located in Zone F in accordance with the Office of Public Works Section 50 of the Arterial Drainage Act (1945), guidelines;
- Individual access spurs will be provided from the primary access road to each of the future-planned commercial land parcels;
- Provision of pipelines and associated infrastructure for watermains to service future-planned commercial properties; and
- Provision of surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as attenuation ponds, raingardens, bioretention ponds, Nature-based Solutions (NBS) and conveyance networks.

The site location and study area are indicated in **Figure 14-1.**

14.2. Methodology

14.2.1. Scope of Work / Methodology

This study which complies with the requirements of Directive EIA 2014/52/EU is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, considering current knowledge and methods of assessment. It consists of a collation of existing written and graphic information to identify the likely context, character, significance, and sensitivity of the known or potential cultural heritage, archaeological and structural resource using an appropriate methodology (EPA 2002, 2003 and 2022).

The study involved detailed investigation of the archaeological, architectural and cultural heritage background of the development site, the landholding and the surrounding area extending 1km from the development boundary (see Figure 14-1). This area was examined using information from the Record of Monuments and Places of County Dublin, the Fingal County Development Plan, lists of excavations and cartographic and documentary sources. Field inspections were carried out on the 3rd of August and the 24th of November 2023 to identify and assess any known archaeological sites and architectural structures and previously unrecorded features and portable finds within the area of landholding.

An effect assessment and mitigation strategy have been prepared. An effect assessment is undertaken to outline potential adverse impacts that the proposed development may have on

the cultural resource, while a mitigation strategy is designed to avoid, reduce, or offset such adverse impacts.

The application site is located in the townlands of Rowans Big and Rowans Little approximately 2.5km south-west of Balbriggan and directly next to interchange 5 of the M1 Motorway (see Figure 14-1).

Extracts from the Record of Monuments and Places for County Dublin are presented on a map of the local area around the site in Figure 14-1. RMP sites included on the Records of Monuments and Places statutory mapping are identified by black circles. The application site is shown in red.

14.2.2. Contributors / Author(s)

The assessment was prepared by Dr. Charles Mount who is a member of the Institute of Archaeologists of Ireland and has more than thirty years of cultural heritage assessment experience. He holds M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management.

14.2.3. Limitations / Difficulties Encountered

No difficulties were encountered during the desktop study, field survey or in the preparation of this report.

14.2.4. Regulatory Background

The following paragraphs set out the regulatory background regarding cultural impact assessments in Ireland in general and the site-specific planning background relevant to this cultural impact assessment.

14.2.5. Legislation

No specific Irish legislation exists governing cultural heritage assessments.

14.2.6. Planning Policy and Development Control

The Fingal County Development Plan 2023-29 is the statutory plan detailing the development objectives/policies of the local authority. The plan includes objectives and policies, relevant to this assessment, i.e. regarding archaeological, architectural and cultural heritage.

14.2.7. Heritage and Culture

Volume 1, Chapter 10 of the Fingal County Development Plan sets out the policies on built and cultural heritage within the county. The Council will ensure the conservation, management, protection and enhancement of the archaeological, architectural and cultural heritage of the County, which are valuable and finite resources, through good management, sensitive interventions and sympathetic development.

The Council's policies and objectives regarding archaeological heritage are:

Policy HCAP2 – Importance of Archaeological Resource

Recognise the importance of our archaeological resource and provide appropriate objectives to ensure its appropriate retention, promotion and recording. .

Policy HCAP3 – Record of Monuments and Places/ Sites and Monuments Record

Safeguard archaeological sites, monuments, objects and their settings listed in the Record of Monuments and Places (RMP), Sites and Monuments Record (SMR), underwater cultural heritage including protected wrecks and any additional newly discovered archaeological remains.

Policy HCAP4 – Preservation-in-situ

Favour the preservation in-situ (or at a minimum preservation by record) of all sites and features of historical and archaeological interest.

Objective HCAO1 – Preservation-in-situ

Favour the preservation in situ or at a minimum preservation by record, of archaeological sites, monuments, features or objects in their settings. In securing such preservation the Council will have regard to the advice and recommendations of the National Monuments Service of the Department of the Housing, Local Government and Heritage.

Objective HCAO2 – Protection of RMPs/SMRs

Protect all archaeological sites and monuments, underwater archaeology, and archaeological objects, which are listed in the Record of Monuments and Places, Wreck Inventory of Ireland and all sites and features of archaeological and historic interest discovered subsequent to the publication of the Record of Monuments and Places, and to seek their preservation in situ (or at a minimum, preservation by record) through the planning process.

Objective HCAO3 – Management of Archaeological Resource

Encourage and promote the appropriate management and maintenance of the County's archaeological heritage, including historical burial grounds and underwater cultural heritage in accordance with conservation principles and best practice guidelines.

Objective HCAO4 – Industrial or Military Heritage

Secure the preservation in-situ of significant examples of industrial or military heritage.

Objective HCAO5 – Community Monuments Fund

Support the implementation of the Community Monuments Fund in order to ensure the monitoring and adaptation of archaeological monuments and mitigate against damage caused by climate change.

Objective HCAO6 – Climate Change and the Archaeological Resource

Co-operate with other agencies in the investigation of climate change on archaeological sites and monuments and to develop suitable adaptation measures to strengthen resilience and reduce the vulnerability of archaeological heritage in line with the National Climate Change Sectoral Adaptation Plan for Built and Archaeological Heritage 2019.

Policy HCAP5 – Development Design

Incorporate heritage features into infrastructure design at an early stage in the development planning and management process to protect and promote the cultural heritage resource and create awareness and interpretation.

Objective HCAO7 – Archaeology and Development Design

Ensure archaeological remains are identified and fully considered at the very earliest stages of the development process, that schemes are designed to avoid impacting on the archaeological heritage.

Objective HCAO8 – Archaeological Impact Assessment

Require that proposals for linear development over one kilometre in length; proposals for development involving ground clearance of more than half a hectare; or developments in proximity to areas with a density of known archaeological monuments and history of discovery; to include an Archaeological Impact Assessment and refer such applications to the relevant Prescribed Bodies.

Objective HCAO9 – Archaeology in the Landscape

Ensure that in general development will not be permitted which would result in the removal of archaeological monuments with above ground features, protected wrecks and that this will be especially the case in relation to archaeological monuments which form significant features in the landscape.

Objective HCAO10 – Context of Archaeological Monuments

Ensure that development within the vicinity of a Recorded Monument or Zone of Archaeological Notification does not seriously detract from the setting of the feature and is sited and designed appropriately.

Objective HCAO11 – Impacts of large-scale development

Ensure that proposals for large scale developments and infrastructure projects consider the impacts on the archaeological heritage and seek to avoid them.

Objective HCAO12 – Coastal and Maritime Heritage

Co-operate with other agencies in the assessment of the potential for climate change to impact on coastal, riverine, inter-tidal and sub-tidal sites and their environments including shipwreck sites.

Objective HCAO13 – Findings of Archaeological Activity

Encourage reference to or incorporation of significant archaeological finds into development schemes, where appropriate and sensitively designed, through layout, in situ and virtual presentation of archaeological finds and by using historic place names and the Irish language where appropriate.

Objective HCAO14 – Archaeology in Open Space

Retain and manage appropriately archaeological monuments within open space areas in or beside developments, ensuring that such monuments are subject to an appropriate conservation management plan, are presented appropriately and are not left vulnerable,

whether in the immediate or longer term, to dangers to their physical integrity or possibility of loss of amenity.

Policy HCAP6 – Promotion

Promote the tourism potential of Fingal's cultural heritage and improve legibility by providing guidance for appropriate interpretation in line with the Fingal Heritage Signage and Trails Guidance 2021.

Policy HCAP7 – Community Initiatives

Support community initiatives and projects regarding preservation, presentation and access to archaeological heritage and underwater cultural heritage, provided such are compatible with appropriate conservation policies and standards, having regard to the guidance and advice of the Department of Housing, Local Government and Heritage.

Objective HCAO15 – Best Practice

Promote best practice for archaeological excavation by ensuring that they are undertaken according to best practice as outlined by the National Monuments Service, Department of Housing, Local Government and Heritage, The National Museum of Ireland and the Institute of Archaeologists of Ireland.

Objective HCAO16 – Conservation Plans

Manage the archaeological sites and monuments that Fingal County Council owns or is responsible for according to best practice and according to Conservation Plans where they exist.

Objective HCAO17 – Dissemination

Ensure the public dissemination of the findings of licenced archaeological activity in Fingal through the Dublin County Archaeological GIS project, publications, public lectures and events to promote awareness of, and access to, Fingal's archaeological inheritance and foster high quality community archaeology.

Objective HCAO18 – Public Awareness

Raise public awareness of the cultural heritage and improve legibility by providing appropriate interpretation in areas, sites, villages, and buildings of archaeological and historic significance.

Objective HCAO19 – Community Archaeology Strategy

Continue to implement the findings of the Community Archaeology Strategy for Fingal.

Objective HCAO20 – Cultural Tourism

Support the growth of cultural tourism in the County, including the potential for niche heritage based tourism products by facilitating the development of heritage events, infrastructure such as heritage trails, walkways and cycleways etc. and activities such as community excavation.

Objective HCAO21 – Climate Change

Promote awareness and the appropriate adaptation of Ireland's built and archaeological heritage to deal with the effects of climate change.

The Council's policies and objectives regarding architectural heritage are:

Policy HCAP8 – Protection of Architectural Heritage

Ensure the conservation, management, protection and enhancement of the architectural heritage of Fingal through the designation of Protected Structures and Architectural Conservation Areas, the safeguarding of designed landscapes and historic gardens, and the recognition of structures and elements with no specific statutory designation that contribute positively to the vernacular, industrial, maritime or 20th century heritage of the County.

Policy HCAP9 – Re-use of Architectural Heritage

Champion the maintenance, repair, re-use and sensitive retro-fitting of the architectural heritage and older building stock of the County as a cornerstone of its sustainable development policy and will require that adaptative re-use and regeneration adheres to best conservation practice.

Policy HCAP10 – Retention

Continue to support and encourage the sympathetic and appropriate reuse, rehabilitation and retention of protected structures and historic buildings ensuring the special interest, character and setting of the building or structure is preserved.

Policy HCAP11 – Conservation of Architectural Heritage

Conserve and protect buildings, structures and sites of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest by adding or retaining them on the Record of Protected Structures or by designating groups of structures as Architectural Conservation Areas.

Policy HCAP12 – Interventions to Protected Structures

Ensure that direct or indirect interventions to Protected Structures or adjoining development affecting them are guided by architectural conservation principles so that they are sympathetic, sensitive and appropriate to the special interest, appearance, character, and setting of the Protected Structure and are sensitively scaled and designed.

Policy HCAP13 – Retention of Protected Structures

Require the retention and appropriate active use of Protected Structures.

Policy HCAP14 – Architectural Conservation Areas

Protect the special interest and character of all areas which have been designated as an Architectural Conservation Area (ACA). Development within or affecting an ACA must contribute positively to its character and distinctiveness and take opportunities to protect and enhance the character and appearance of the area and it's setting wherever possible. Development shall not harm buildings, spaces, original street patterns, archaeological sites, historic boundaries or features, which contribute positively to the ACA.

Policy HCAP15 – Character of Architectural Conservation Areas

Support and encourage the sympathetic and appropriate adaptive reuse, refurbishment, and upgrading of protected structures and buildings or structures that contribute to the character of an Architectural Conservation Area ensuring that their special interest, character and setting is retained. Prohibit development that seeks the demolition of a Protected Structure or buildings that contribute to the character of an ACA in almost all circumstances.

Policy HCAP16 – Conservation Best Practice

Promote best conservation practice and encourage the use of appropriately qualified and experienced conservation professionals, contractors, and craft persons.

Objective HCAO22 – Record of Protected Structures

Review the Record of Protected Structures (RPS) to assess current entries and to add structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest as appropriate.

Objective HCAO23 – Expansion of Record of Protected Structures

Expand the RPS to include structures of industrial, maritime, vernacular and twentieth century heritage where they are of sufficient significance and complete the assessment of the few remaining Ministerial Recommendations from the National Inventory of Architectural Heritage (NIAH) Survey of Fingal.

Objective HCAO24 – Alteration and Development of Protected Structures and ACAs

Require proposals for any development, modification, alteration, extension or energy retrofitting affecting a Protected Structure and/or its setting or a building that contributes to the character of an ACA are sensitively sited and designed, are compatible with the special character, and are appropriate in terms of the proposed scale, mass, height, density, architectural treatment, layout, materials, impact on architectural or historic features.

Objective HCAO25 – Architectural Heritage Impact Statement

Require an Architectural Heritage Impact Statement as part of the planning documentation for development that has the potential to affect the relationship between the Protected Structure and any complex of adjoining associated buildings, designed landscape features, or designed views or vistas from or to the structure. This particularly relates to large landholdings such as country estates, institutional complexes, and industrial sites where groups of structures have a functional connection or historical relationship with the principal building.

Objective HCAO26 – Use of Protected Structures

Where required to support active use or facilitate suitable adaptive re-use of Protected Structures the Council may in certain circumstances consider the relaxation of site zoning restrictions to secure the preservation and conservation of the Protected Structure where the use proposed is compatible with the existing structure. This will only be permitted where the development is consistent with conservation policies and the proper planning and sustainable development of the area.

Objective HCAO27 – Protected Structures within Larger Developments

Where permission is being sought for a development in which works to the Protected Structure are one element of a larger proposal, the Council will seek for the repair and refurbishment of the Protected Structure to be contained and completed within the first phase.

Objective HCAO28 – Conservation Plans for Protected Structures

Demonstrate best practice in relation to the management, care and maintenance of Protected Structures by continuing the programme of commissioning Conservation Plans for the

principal heritage properties in the Council's ownership (several of which are also ACAs), implement the policies and actions of these Conservation Plans where they exist, and ensure the Plans are used by all sections of the Council to inform and direct the design of interventions within the heritage properties, both to buildings and landscapes.

Objective HCAO29 – Protected Structures Audit

Carry out an audit and assess the condition of all Protected Structures within the Council's ownership and pilot a management/maintenance plan as a template for these structures.

Policy HCAP17 – Maintenance and Energy Retrofitting

Promote good housekeeping principles of routine maintenance checks, with repair and conservation of building fabric where required as a mechanism to assist with achieving the best thermal performance from a building. Support and promote the sensitive retro fitting of energy efficiency measure and the use of renewable energy sources in traditional and historic buildings, including Protected Structures. Ensure that the measures are compatible with traditional construction methods and materials and do not have a detrimental physical, aesthetic or visual impact on the structure.

Objective HCAO30 – Retrofitting Pilot Project

Demonstrate best practice on energy retrofitting of historic buildings through a pilot project using suitable case studies to improve comfort levels and reduce energy consumption for the occupier.

Policy HCAP18 – Designed Landscape Features, Settings and Views

Protect the setting, significant views, and built features of historic designed landscapes and promote the conservation of their essential character, both built and natural.

Policy HCAP19 – Development and Historic Demesnes

Resist proposals or developments that would lead to the loss or, or cause harm to the character, principal components or setting of historic designed landscapes and demesnes of significance in the County.

Policy HCAP20 – Conservation and Woodland Management Plans

Support the commissioning of Conservation Plans and Woodland Management Plans and the cataloguing of the collections for the historic designed landscapes in the Council's ownership.

Encourage private owners to undertake Conservation Plans and Woodland Management Plans for their historic landscapes.

Objective HCAO31 – Protection of Designed Landscapes

Identify the historic designed landscapes of significance in the County and determine the appropriate mechanism to ensure their future protection. Several of the most significant are already designated, as Architectural Conservation Areas.

Objective HCAO32 – Designed Landscape Appraisal

Require that proposals for development within historic designed landscapes include a Designed Landscape Appraisal (including an ecological assessment) as part of the planning documentation to fully consider the potential impacts of the proposal. The appraisal should be carried out prior to the initial design of any development, in order that this evaluation to inform the design which must be sensitive to and respect the built heritage elements and green space values of the site.

Objective HCAO33 – Conservation Plans

Continue the programme of commissioning Conservation Plans for the principal heritage properties in the Council's ownership that contain historic designed landscapes.

Objective HCAO34 – Perimeter of Phoenix Park

Ensure that development within Fingal along the perimeter of the Phoenix Park adheres to the Office of Public Works' (OPW), Phoenix Park Conservation Management Plan, does not have a detrimental impact on the Park, does not damage any of the built elements along its boundary, or interrupt any important vistas into or out of it.

Policy HCAP21 – Built Heritage Assets

Protect and enhance the historic environment and built heritage assets, including elements of historic street furniture, paving and historic boundary treatments. Policy HCAP22 – Retention and Reuse of Existing Building Stock Seek the retention, appreciation and appropriate revitalisation of the historic and vernacular building stock, and 20th century built heritage of Fingal in both the urban and rural areas of the County by deterring the replacement buildings with modern structures and by protecting (through the use of Architectural Conservation Areas and the Record of Protected Structures and in the normal course of Development Management) these buildings where they contribute to the character of an area and/or where

they are rare examples of a structure type, a distinctive piece of architecture or have an innate value. (See also Table 14.26)

Policy HCAP23 – Heritage-led Regeneration

Require that adaptative re-use of older buildings and historic centre heritage-led regeneration adheres to best conservation practice and principles. There will be a presumption against the demolition of older buildings where restoration or adaption is a feasible option.

Policy HCAP24 – Works to Vernacular Buildings

Works to vernacular buildings should adhere to best conservation practice and use traditional, especially vernacular, building methods and materials.

Policy HCAP25 – Retention of Historic Fabric

Encourage the retention of the original or historic fabric such as windows, doors, wall renders, roof coverings, shopfronts, pub fronts and other significant features of older or historic buildings, whether protected or not.

Policy HCAP26 – Historic Townscapes

Recognise the importance of historic townscapes or streetscapes in creating a sense of place when the urban fabric or groups of buildings are read together and how the gradual attrition of historic fabric or detailing, or the demolition and replacement of individual modest buildings can fundamentally alter the character of the place.

Objective HCAO35 – Appropriate Maintenance, Repair and Re-use

Advocate for and support appropriate maintenance, repair, re-use and sensitive retro-fitting of the architectural heritage, vernacular buildings and the older building stock of the County, whether protected or not, to deliver the Council's sustainable development policy.

Objective HCAO36 –Extensions to Vernacular Dwellings

Require that the size, scale, design, form, layout and materials of extensions to vernacular dwellings or conversions of historic outbuildings take direction from the historic building stock of Fingal and are in keeping and sympathetic with the existing structure.

Objective HCAO37 – Thatched Buildings Audit

Audit and map the historic thatched buildings of Fingal and devise measures to assist their continued survival.

Objective HCAO38 – Infill Development

Support the development of sustainable backland and infill development that is appropriate in scale and character to historic town and village centres, that transitions appropriately, accommodates surviving structures where appropriate and retains the historic streetscape form.

Objective HCAO39 – Character of Historic Townscapes

Maintain and enhance the character and quality of historic townscapes or streetscapes by seeking those interventions to the exteriors of existing buildings are appropriately detailed and use good quality materials. Original finishes/fabric should be retained or replicated.

Objective HCAO40 – Public Realm Works

Require that public realm works, proposed infrastructural and public utility works do not remove historic street furniture such as limestone or granite kerbs, cobblestones, cast-iron post boxes, water pumps, milestones and historic street-lamp standards, except where an exceptional need has been clearly established.

Objective HCAO41 – Modern Street Furniture

Sensitively design, locate and rationalise modern street furniture and elements such as utility boxes, cables, bins, bike racks, poles, wires, antenna and signage. Defunct or obsolete telephone boxes/kiosks should be removed rather than replaced.

Objective HCAO42 – Undergrounding Cables

Underground cables and wires in historic urban environments or designated sites, such as SAAO's and ACAs, where appropriate, and where it does not detrimentally impact on other elements of heritage e.g. archaeology, natural heritage.

Objective HCAO43 – Historic Street Elements Audit

Commission a study to map historic street furniture, stone setts, historic kerbing and historic pavers/ flags, and associated features in the public realm, to be protected, conserved or reintroduced.

Policy HCAP27 – Recognition of Industrial Heritage

Recognise the value of the industrial heritage of the County and seek to protect and retain it through designation or appropriately scaled and designed development for its continued or adaptive re-use, taking direction from the ICOMOS (International Council on Monuments and

Sites) and TICCIH (The International Committee for the Conservation of the Industrial Heritage) Principles for the Conservation of Industrial Heritage (The Dublin Principles).

Policy HCAP28 – Awareness of Industrial Heritage

Promote awareness of Fingal's industrial, military, maritime, canal and railway heritage.

Objective HCAO44 – Fingal industrial Heritage Survey Update and publish the Fingal Industrial Heritage Survey to outline the history of the development of industry in the County and use it to identify significant industrial heritage structures that should be added to the Record of Protected Structure or industrial heritage complexes that should be designated as Architectural Conservation Areas.

Objective HCAO45 – Development and Industrial Heritage

Utilise the information provided within the Fingal Industrial Heritage Survey when assessing development proposals for surviving industrial heritage sites.

Objective HCAO46 – Preservation of Industrial Heritage

Secure the preservation in-situ of significant examples of industrial, military and nautical heritage that form part of our post-medieval archaeological heritage, and examples of which may date from periods up to and including the 20th century.

Objective HCAO47 – Historic Harbours

Ensure that repairs and new insertions to the historic harbours, piers and quays are appropriate in the materials used and, in the design, and scale of any new structures or equipment.

Objective HCAO48 – Historic Bridges

Seek the retention and appropriate repair/maintenance of the historic road and rail bridges of the County whether Protected Structures or not.

Objective HCAO49 – Royal Canal

Protect and enhance the built and natural heritage of the Royal Canal and ensure that development along it or within its vicinity is sensitively designed and does not have a detrimental effect on the character of the Canal, its built elements and its natural heritage values. Works to the built fabric of Royal Canal should have regard to the Waterways Ireland's Heritage Plan and Guidelines for Conservation of the Built Heritage – Repair and maintenance of heritage structures on the inland waterways of Ireland 2015.

14.2.8. Development Management Standards

Volume 1, Chapter 14 of the Fingal County Development Plan sets out the development standards and criteria to ensure development occurs in an orderly and efficient manner.

Archaeological Heritage

Objective DMSO167 – Archaeological Sites

Exempted development does not apply to any development that would consist of or comprise the alteration of any archaeological site.

Objective DMSO168 – Requirement for the Employment of an Archaeologist

Where a development site is in proximity to recorded monuments (RMPs)/sites and monuments record (SMR) and/or areas with a density of known archaeological monuments and history of discovery; within a Zone of Archaeological Notification, is over 0.5 hectares in size, or for linear developments more than 1 km in length, the applicant shall employ a suitably qualified archaeologist to carry out an Archaeological Impact Assessment (AIA) at pre-planning stage and report on any necessary site investigation works

prior to an application being lodged.

Objective DMSO169 – Archaeological Impact Assessment

All development proposals which may have implications for archaeological

heritage shall be accompanied by an Archaeological Impact Assessment.

This assessment will consist of the following:

- *Site inspection/walk-over survey,*
- *Archaeological heritage of the receiving area,*
- *Examination of upstanding or visible features or structures,*
- *Topographical assessment including historic townland boundaries,*
- *Physical description and photographic record of the archaeological feature, site or object,*
- *Examination of existing or new aerial photographs or satellite or other remote sensing imagery,*
- *Geophysical survey, archaeological test excavation, where appropriate, which should be carried out by suitable qualified professionals (geophysicists and archaeologists),*
- *Identification of potential direct and in-direct impacts of the proposed development on archaeological remains,*
- *Identification of climate change vulnerability,*
- *Mitigation measures to ameliorate any such impacts of the proposed development on the definition of the buffer area surrounding the monument which will preserve the setting and visual amenity of the site,*
- *Provision of details on protection measures to be used on site.*

Objective DMSO170 – Conservation and Management Plan

If a monument included in the Record of Monuments and Places (RMP)/Sites & Monuments Record (SMR) lies within the open space requirement of any development, a conservation and management plan for that monument will be required as part of the overall landscape plan for that proposed open space.

Objective DMSO171 – Visual Impact Assessment

A Visual Impact Assessment may be required for development proposals in the vicinity of upstanding remains.

Objective DMSO172 – Protection of Historic Townland Boundaries

Avoid detrimental impacts on historic townland boundaries. Should an historic townland boundary or section thereof be impacted a survey and photographic record should be undertaken prior to removal.

Objective DMSO173 – Referral of Development Proposals to Minister

All planning applications and other development proposals which are in, or might affect, sites and features of historical and archaeological interest, will be referred to the Minister through the Department of Housing, Local Government and Heritage and to the Heritage Council. In considering such planning applications, the Planning Authority will have regard to the views and recommendations of the National Monuments Service, Department of Housing, Local Government and Heritage and other interested bodies.

Objective DMSO174 – Archaeological Excavation

Where preservation in situ is not feasible, sites of archaeological and/or industrial heritage interest shall be subject to a full archaeological excavation and post excavation analysis according to best practice in advance of redevelopment. This can only be permitted by licence from the National Monuments Service of the Department of Housing, Local Government and Heritage.

Objective DMSO175 – Preliminary Excavation Report

Where permission is given for archaeological excavations these investigations must be carried out by a suitably qualified and licensed archaeologist and are to be fully recorded in line with best practice. A preliminary excavation report in digital and hard copy shall be submitted to the Planning Authority for the attention of the Heritage Officer within four weeks of the completion of the excavation and a detailed final report submitted within twelve months of the completion of the excavation.

Objective DMSO176 – Publication and/or Public Outreach of Archaeological Excavations

Dependent on scale and/or significance of archaeological excavations, provision should be made for publication and/or public outreach, to share the results of the archaeological resolutions with the general public.

Objective DMSO177 – Unrecorded Archaeological Object or Site

The developer must ensure that when an unrecorded archaeological object or site is discovered any works that threaten the object or site are immediately suspended until direction is given by the Department of Housing, Local Government and Heritage on the matter.

Objective DMSO178 – Archaeology in the Planning Process

Applicants shall have regard to Archaeology in the Planning Process Office of the Planning Regulator, 2021 and Archaeology and Development Guidelines Good Practices for Developers Heritage Council, 2000.

Objective DMSO179 – Excavation Reports Guidelines

All archaeological reports submitted with a planning application and/or prepared in compliance with planning permission shall be produced in accordance with Excavation Reports Guidelines for Authors, NMS, 2006.

Objective DMSO180 – Archaeological Best Practice

Archaeological work shall be carried out in accordance with current archaeological best practice policy and guidance published by the National Monuments Service, and with reference to technical guidelines issued by the Institute of Archaeologists of Ireland and Transport Infrastructure Ireland. Where National technical best practice guidelines are unavailable, internationally recognised best practice guidance may apply.

Objective DSMO181 – Archaeology Services and Contracts

Where archaeology services are incorporated into fixed priced contracts, the contract shall be prepared with regard to Standard and Guidance Procedures for Archaeological Services in Fixed Price Contracts used in the Republic of Ireland, IAI, 2012.

Objective DMSO182 – Archaeological Excavation Strategy and Guidelines

Archaeological excavations shall comprise a specialist-led environmental site strategy and conducted in accordance with, IAI, 2007.

Objective DMSO183 – Works to a Protected Structure

All planning applications for works to a Protected Structure shall have regard to the direction in Table 14.21 and provide the documentation set out in Table 14.22.

Objective DMSO184 – Architectural Heritage Impact Assessment

Where necessary, the Planning Authority shall require a detailed Architectural Heritage Impact Assessment for an application for works to a Protected Structure. This shall be carried out in accordance with Table 14.23 and Appendix B of the Department of the Arts Heritage and Gaeltacht's Architectural Heritage Protection Guidelines for Planning Authorities.

Objective DMSO185 – Demolition or Alteration of Protected Structures

Prevent the demolition or inappropriate alteration of Protected Structures.

Objective DMSO186 – Retention of Existing Building Stock within an ACA

Retain the existing building stock within an ACA where possible and ensure that any new development or alteration of a building within or adjoining an ACA positively enhances the character of the area and is appropriate in terms of the proposed design, including: scale, mass, height, proportions, density, layout, materials, plot ratio, and building lines.

Objective DMSO187 – Planning Applications within an ACA

All planning applications for works in an Architectural Conservation Area shall have regard to the information outlined in Table 14.24.

Objective DMSO188 – Signage on a Protected Structure

All planning applications for signage on a Protected Structure or within an Architectural Conservation Area shall have regard to the Guidelines outlined in Table 14.25.

Designed Landscape Heritage

Objective DMSO189 – Designed Landscape Appraisal

A Designed Landscape Appraisal should accompany any development proposal for an historic demesne and/or designed landscape, to include:

- *Identification and description of the original development, history, structures, features and boundaries of the designed landscape.*
- *Ecological assessment, including identification of any protected habitats or species.*
- *Evaluation of the significance of the historical landscape, including the identification of significant built and landscape features within the site that must be retained.*
- *Determination of the carrying capacity of the lands which should not be exceeded, to be agreed with the Council.*
- *Assessment of the development proposal and its impact on the designed landscape.*
- *Recommendations for mitigation and management of the built and natural heritage.*

Objective DMSO190 – Structures Contributing to Distinctive Character

Where development is proposed for a site that contains a vernacular or historic building, 20th Century building of merit and/or structures that contribute to the distinctive character of the rural or urban areas of Fingal then the scheme should have regard to the direction in Table 14.26.

Industrial Heritage

Objective DMSO191 – Fingal Industrial Heritage Survey

Proposed developments shall have regard to the Fingal Industrial Heritage Survey and should evaluate any above and below ground industrial heritage features. Where industrial remains are identified, the application may be required to engage the services of an industrial heritage expert to prepare a specialist report.

Objective DMSO192 – Adaptive Re-Use of Industrial Heritage Structures

Proposals that involve the adaptive re-use of industrial heritage structures shall be undertaken in a sensitive manner, ensuring that any change does not seriously impact on the intrinsic character of the structure and that all works are carried out in accordance with best practice conservation.

14.2.9. Baseline Study Methodology

Research has been undertaken in two phases. The first phase comprised a paper survey of all available archaeological, architectural, historical, and cartographic sources. The second phase involved a field inspection and archaeological and architectural assessment of the proposed development area.

14.2.10. Paper Study

This is a document search. The following sources were examined and a list of sites and areas of archaeological potential compiled:

- Record of Monuments and Places County Dublin (including Fingal)
- The Sites and Monuments Record
- Available remote sensing imagery
- Cartographic and written sources relating to the study area
- Fingal County Development Plan 2023-29
- The National Inventory of Architectural Heritage

The Record of Monuments and Places

This was established under section 12 (1) of the 1994 National Monuments (Amendment) Act and provides that the Minister shall establish and maintain a record of monuments and places where the Minister believes there are monuments, such record to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect of each county in the State. The associated files contain information of documentary sources and field inspections where these have taken place. All available information on these sites is provided in Appendix 14-1.

Note that although the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was signed into law by the President on October 13, 2023, the act had not been commenced at the time this assessment was prepared. This assessment uses the National

Monuments Acts 1930-2014, which were still in force at the time the assessment was completed.

Sites and Monuments Record

The Sites and Monuments Record (SMR) is a non-statutory record of monuments and places maintained by the Dept. of Housing, Local Government and Heritage. All available information on these sites is provided in Appendix 14-2.

Cartographic Sources

This included seventeenth century mapping as well the 1st and 2nd editions of the Ordnance Survey six-inch maps and documentary sources provide more general historical and archaeological background.

The County Development Plan

This notes structures listed for preservation.

Field Inspection

Field inspections were carried out to determine the location, extent and ascertain the significance of any archaeological sites and architectural structures and to identify any previously unrecorded or suspected sites and potable finds.

14.3. Receiving Environment

14.3.1. The Landscape

The application site is located in the townlands of Rowans Big and Rowans Little approximately 2.5km south-west of Balbriggan and directly next to interchange 5 of the M1 Motorway. The application site is situated in agricultural land in lowland and undulating countryside.

14.3.2. The Study Area

The overall study area extends 1km from the application site and is shown in Figure 14-1.

14.3.3. Archaeological and Historical Background

The following is a brief summation of the main types of sites and monuments that are known from the study area along with the historical development of the study area. It is intended as a guide to the types of sites and monuments that might be encountered in the study area. The application site is situated in the townlands of Rowans Big and Rowans Little, in the barony of Balrothery East (originally barony of Nethercross), and the civil parish of Lusk.

The Prehistoric Period

Prehistoric activity in the study area is indicated by the discovery of a Bronze Age cist and pit burial (RMP DU005-041---, SMR DU005-079----) and two Ring-ditches (SMR DU005-182---- and Licence No. 95E0250) in Courtlough townland.

The Early Medieval Period

In the Early Medieval period (500 AD-1170 AD) the study area formed part of the local kingdom of Saithne, later the cantred of Fyngal North (MacCotter 2008, 165). Classically settlement at this period is indicated by the presence of enclosed farmsteads known as ringforts, when enclosed with earthen banks, and cashels when enclosed by stone walls. There are ringforts known in the study area in Balrickard (RMP DU004-016---) and Rowans Big (RMP DU004-017---) townlands, and enclosures that may be the remains of ringforts in Rowans Little (RMP DU004-026---) Jordanstown (RMP DU005-034---), Walshestown (SMR DU004-069---, SMR DU004-070---, and SMRDU004-090---) that indicate early Medieval settlement in the study area.

The Later Medieval Period

Following the Anglo-Norman conquest of Dublin in 1171 and the visit of King Henry II to Ireland Fingal became part of the lands of the crown (Orpen Vol. 1, 369). Manorialism describes the organisation of the feudal rural economy and society characterised by the vesting of legal and economic power in a lord supported economically from his own direct landholding and from the obligatory contributions of a legally subject part of the peasant population under his jurisdiction. In Ireland, the Lord's manor house was also often enclosed by a rectangular moat and these sites are referred to as moated sites. There are no moated sites known in the study area and the closest known example externally is at Newtowncorduff (RMP DU008-016----) 5km to the south.

The Post-Medieval Period

In the 1547 extent of the Rectory of Lusk the Three Rowans were recorded as paying a tithe of corn and hay to the rectory for the support of the Precentor of the Cathedral of St. Patrick, Dublin (Mason 1820, 36). The Down Survey records that in 1641 the Great Roanes and the Middle Roanes (Rowans Big and Little) was held by William Travers but by 1670 was held by the Archbishop of Dublin (http://downsurvey.tcd.ie). By the nineteenth century Griffith's Valuation records that the application site had come into the hands of James Shiels and the Earl of Howth (https://www.askaboutireland.ie/griffith-valuation/).

14.3.4. Buildings

Protected Structures

The Fingal County Development Plan 2023-29 and the Record of Protected Structures was examined as part of the baseline study for this chapter of the EIAR. The review established that there are no Protected Structures situated within the application site or within the study area.

National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) which is maintained by the Dept. of Housing, Local Government and Heritage was examined as part of the baseline study for this chapter of the EIAR on the 20th of November 2023. The review established that there are no structures included in the NIAH situated within the application site or in the study area.

Field Inspection

On the 3rd of August and the 24th of November 2023 fieldwork was carried out to identify any additional upstanding non-designated structures in or near the proposed application site. This involved assessing all upstanding structures that are within the application site and within 100m of the proposed development (see Figure 14-1). There are twelve structures situated in this area that have no special architectural interest (see below). Eleven of these structures are proposed for demolition. See Table 14-1 below.

Table 14-1: Upstanding non-designated structures in and near the proposed application site.

No.	1
Structure type	House

Townland	Rowans Big
Designation	None
Data source	Ordnance Survey Map
Perceived Significance:	No special architectural interest.
Quality of effect:	Neutral
Significance of effect	None
Description	Five-bay single-storey house, pre-1836, with corrugated roof and projecting entrance porch. No special architectural interest.
Image	Plate 14-1

No.	2
Structure type	House
Townland	Rowans Big
Designation	None
Data source	Ordnance Survey Map
Perceived Significance:	No special architectural interest.
Quality of effect:	Negative/adverse Effects Demolition
Significance of effect	Not significant
Description	Bungalow, built under planning Reg. No. F85A/1108. Fingal Co. Council has granted permission for the demolition of the house Reg. No. F05A/1375.

Image	Plate 14-2

No.	3
Structure type	House
Townland	Rowans Little
Designation	None
Data source	Ordnance Survey Map
Perceived Significance:	No special architectural interest.
Quality of effect:	Negative/adverse Effects Demolition
Significance of effect	Not significant
Description	Late twentieth century house with tiled roof. The building is now completely overgrown and inaccessible.
Image	Plate 14-3

No.	4
Structure type	Farmstead
Townland	Rowans Little
Designation	None
Data source	Ordnance Survey Map
Perceived Significance:	No special architectural interest.

Quality of effect:	Negative/adverse Effects Demolition
Significance of effect	Not significant
Description	The farmstead consists of a farmhouse and eight outbuildings. The house is a six-bay single-storey house, pre-1836, with corrugated dormer roof and projecting entrance porch. No special architectural interest. The outbuildings consist of partly stone and clay built sheds with slate and corrugated roofs and galvanised sheds.
Image	Plate 14-4 – 14-12

14.3.5. Archaeology

Recorded Monuments

Examination of the Record of Monuments and Places for Co. Dublin indicated that there are no Recorded Monuments located within the application site (see Figure 14-1 and Appendix 14-1).

The closest Recorded Monument externally to the proposed extraction area is DU004-017---Rowans Big Ringfort (see Figure 14-1). The monument, which is situated c.0.26km north of the application site, is described in the RMP as:

> *DU004-017--- Rowans Big Ringfort - unclassified*
>
> *Situated on a gentle E-facing slope under tillage west of the M1. An aerial photograph taken in 1972 (FSI 4.507/8) shows a roughly circular cropmark (diam. c. 20m) of an enclosure with an opening in the SW quadrant. Not visible at ground level.*

This levelled monument is not visible at ground level and will not be directly or indirectly effected by the proposal.

The remaining Recorded Monuments in the study area are situated further from the application site and are considered too far distant to be directly or indirectly effected by the proposal.

Note that in accordance with the Historic and Archaeological Heritage and Miscellaneous Provisions Bill 2023 the RMP will be replaced by the Register of Monuments, but the RMP was still legally in force when this assessment was prepared.

Sites and Monuments Record

Examination of the Sites and Monuments Record (SMR) which is maintained by the Dept. of Housing, Local Government and Heritage on the 25th of November 2023 indicated that there are no SMRs located within the application site. There are several SMRs in the study area externally to the application site (see Figure 14-1 and Appendix 14-2). The closest SMR to the proposed application site, DU004-069----, is the site of a cropmark enclosure. It is located c.0.28km to the south-west of the proposed application site and is considered too far distant to be directly or indirectly effected by the proposal. The remaining SMRs in the study area more distant and are also considered too far distant to be directly or indirectly effected by the proposal.

Cartographic Sources

The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch map of the area were examined. The only additional feature indicated on the mapping is a lime kiln indicated near the north-west edge of Area 15 on the OS 1st edition map. This feature is not indicated on the 25 inch first edition or the later OS 1:5,000 mapping and is not visible at ground level. The analysis did not indicate any other previously unrecorded archaeological sites or structures in the application site or vicinity (see Figure 14-2 and Figure 14-3).

Place Name Evidence

The place names were extracted from the cartography to facilitate the search for structures and monuments and small finds, to help identify any unrecorded monuments or structures, to search for any published papers and documents related to the study area and to assist in the study of the historical development of the area. The English translations of the townland names of the study presented above below are based on Logainm.ie.

Balrickard:	Rickard's town
Belgee:	wind town
Courtlough:	court of the lake
Hedgestown:	Hoiste's town
Hynespark:	Hyne's town
Jordanstown:	Jordan's town
Knightstown	town of the knight
Knock:	hill
Nevitt:	land of the Nevitt family

Ring of Commons:	section of common land
Rowans Big:	reddish land
Rowans Little:	reddish land
Tooman:	mound, burial-place
Walshestown:	Walshe's town

There are no cultural heritage items indicated in the application site. The placenames refer mostly to proprietors names and topography. Tooman is a mound, burial-place and there is a Ring-ditch (DU004-024----) just to the north of it in Walshestown townland.

Stray finds

Standard corpus studies of artifacts for the study area were consulted to identify stray finds including: Irish battle axes Simpson 1990; An analysis of Irish early Bronze Age hoards containing copper or bronze objects O'Flaherty 1995; Hoards of the Irish Later Bronze Age Eogan 1983; La Tène in Ireland Raftery 1984; The Funerary Bowls and Vases of the Irish Bronze Age Ó Ríordáin and Waddell 1993; and The axes of the Early Bronze Age in Ireland Harbison 1969. No finds were noted.

The Bord Gáis Éireann Pipeline to the West Project

A review of https://www.gasnetworks.ie/home/safety/dial-before-you-dig indicates that the route of the Bord Gáis Éireann Pipeline to the West runs through the application area in a north-south direction through areas 1, 3, 4, 5, 6, 15, 17, 18 and 19. The topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified on the pipeline route as it crossed the application area (see Grogan *et al.* 2007).

Archaeological investigations in the study area

The excavations Bulletin at www.excavations.ie was examined to identify any licensed archaeological investigations carried out in the application site or the study area . There have been no investigations in the application site. Several investigations have been carried out in the study area that uncovered a prehistoric ring-ditch and prehistoric pits in Courtlough townland, two enclosures in Walshestown townland, a circular, three sub-circular, a rectilinear and a multi-ditched enclosure in Nevitt townland, and a double D-shaped enclosure in Johnstown townland (see below).

Rowans Big/Rowans Little Licence number: 97E0111 Site type: No archaeology found.
The final portion of the Balbriggan Bypass was monitored between 7 April and 7 October 1997. It was carried out in compliance with the recommendations made in an EIS.

Courtlough Licence number: 95E0250 Site type: Ring-ditch
The site was identified on an aerial photograph as a cropmark. It lay on the line of a proposed slip-road joining the Balbriggan bypass, so a small investigative excavation was carried out. The site lay on slightly rising ground beside a stream. Excavation revealed patches of burnt soil and ash spread over the topsoil, which was a hard grey clay. The burnt material was quite patchy, and very thin in places, but was thicker in one area, and centred round a slight bowl-shaped hollow. It was overlain by approximately 0.3m of topsoil. No artefacts were found.

One area of possible archaeological significance was found in Area 4, Stamullen. It was found to consist of three shallow patches of burnt clay, ash and moist clay. No artefacts were recovered although some fragments of burnt animal bone and a cow tooth were found. The area had already been crossed by the gas pipeline and thus was disturbed. The deposits were therefore considered non-archaeological. Otherwise no areas of archaeological significance were uncovered.

Courtlough Licence number: 03E0283 Site type: Monitoring
Monitoring was carried out in July 2003 on a portion of a large-scale development at Courtlough, near Balbriggan, Co. Dublin. Monitoring under this licence was confined to Area B, which covered 10.12ha. One archaeological site was discovered during the monitoring. It was a series of pits and post-holes, only partially exposed within the access road footprint, with 0.19–0.25m of fine-grained, loamy, brown topsoil removed from above the site. No further archaeological material was uncovered during the monitoring of any other component of this project.

Courtlough Licence number: 03E1076 SMR DU004-048---- Site type: Prehistoric pits
A series of pits and two post-holes were excavated in July 2003 at Courtlough, near Balbriggan, Co. Dublin. The site was discovered during monitoring of a development access road, which formed a component of a development monitored under licence 03E0283. Approximately 0.19–0.25m of fine-grained, loamy, brown topsoil was removed from above the site. The archaeological deposits were confined to an area c. 4m north–south by 5.5m, at the western edge of the access road footprint. Excavation, however, revealed a series of pits, post-pits and spreads of heat-shattered stones associated with a single phase of

archaeological activity. These features were cut into the natural subsoil and a buried sod layer. The archaeological activity evident at the site was a shallow depression filled with heat-shattered stones. This was subsequently cut by an oblong pit, measuring 1.52m north-west/south-east by 0.94m by 0.4m (depth), containing five fills, and an adjacent elongated trench, measuring 2.73m east–west by 0.92m by 0.1–0.39m (depth), with a post-hole cut into either end. Contemporary with this activity but not stratigraphically linked was a pit containing a charcoal-rich fill, which was partially truncated by a shallow depression. The only find from the site was a small piece of flint debitage; a small fragment of unidentified burnt bone was also recovered.

Nevitt/Tooman/Jordandstown/Johnstown/Walshestown/Knightstown Licence number: 05E1063 SMR DU004-072---- Early medieval

The site lies beside the M1 motorway to the west of Lusk in Fingal. Testing was undertaken between 12 and 28 September 2005. In all, 27 trenches were excavated. The site is c. 236ha in size. Geophysical survey showed eight areas of anomalies with the potential to be archaeological in nature. They ranged from a large complex (A) located in the south-east corner of the area to relatively isolated geophysical responses such as G and H. In addition to the geophysical anomalies, an examination of a number of aerial photographs of the study area showed three circular features directly to the north of the proposed development area.

Site A

No test-trenches were inserted directly over the geophysical anomalies, as this site is to be preserved in situ. The geophysical survey showed a large complex of probable archaeological features around Site A. The site consists of a central elliptical feature surrounded by what appears to be associated field systems. The morphology of the site suggested that it is probably an early medieval ecclesiastical enclosure such as that found at Oldtown. However, due to the broad range of geophysical responses it is possible that it is a multi-phase site containing the remains of more than one era. Long linear trenches were excavated to the west and north-west of the site in order to establish its extent. In these trenches no features which could definitively be linked to Site A were uncovered. Indeed the only archaeological features present were a scatter of small pits and linear features to the north-west of the site, which were filled with sandy clay that contained quantities of charcoal. While these are definitely archaeological in nature, they are not the large-scale structural works which are represented in the geophysical survey. They may very well be associated with Site A but are peripheral in nature.

Site B

The geophysical survey showed a D-shaped enclosure with a single straight ditch and a double curved ditch. Two test-trenches were inserted over the anomaly. The testing verified the presence of the D-shaped enclosure. No datable artefactual evidence was recovered from the site, although some clinker and slag were recovered from the straight external ditch. Clinker is a form of slag that adheres to the sides of a kiln and may indicate that a kiln was located not too far away and that the site could have had an industrial function, as well as a date of Iron Age or later.

Site C

Site C is a series of linear and curved features which was discovered during the geophysical survey. A single trench was inserted over this anomaly to ascertain the nature and extent of these features. The features were archaeological in nature, but, as no datable artefacts were recovered, it is not possible to date them.

Site D

Site D is subcircular enclosure situated in the central portion of the area under examination. It is 33m in diameter. As well as the surrounding ditch there were a number of internal features, some of which were suggestive of dwellings. As well as this, domestic waste such as animal bone and burnt material was recovered from the fill of the ditch. This is highly suggestive of an enclosed settlement site. No datable artefacts were recovered from the site, leaving the date of it in doubt.

Site E

Site E is a rectilinear enclosure situated in the northern portion of the potential development area. The site was bisected by a large drainage ditch. The nature of the archaeological features to the north and south of the drainage ditch which bisects the site varies quite considerably. To the south of the ditch a number of deep, substantial features are present and were clearly visible on the geophysical survey. To the north of the ditch the features, while present, were ephemeral, with the ditch which supposedly marked the edge of the rectilinear enclosure being only 0.3m in depth. This difference is to some degree represented in the geophysical survey, with the responses being stronger to the south of the bisecting ditch. All the features represented on the southern portion of the geophysical survey were uncovered during the test excavation and found to be substantial. Only one of the features, 8.1, the northern enclosing ditch, shown to the north of the ditch, was uncovered and found to be ephemeral in nature.

Site F

Site F is a natural watercourse. It is not archaeological in nature.

Site G

Site G is a small scatter of archaeological features lying on gently sloping tillage land. It has no structured morphology and no datable finds were recovered from the features.

Site H

Site H is geological in nature, a raised seam of thicker clay and broken rock. It is of no archaeological significance.

Sites other than those identified through geophysical survey.

Two other areas produced archaeological results. The first of these were the crop circle investigated to the north of the development footprint. In the two trenches inserted, the circular features which were identified from the aerial photography were picked up. These features were situated on a south-facing slope overlooking the river valley. However, no internal features were recorded. No datable artefacts were recovered from the circular feature, again leaving the date of the site unknown.

The final area in which archaeological features were discovered was in Trench 3. Here two small pits were uncovered after an area 50m by 20m was stripped. There appear to be no other features associated with any structure or other archaeological deposits. No site type or date can be assigned to them.

Nevitt Licence number: 01E1155 No archaeological significance

Two small pits were identified during the monitoring of topsoil-stripping and drainage trenches carried out on the second contract of the Airport–Balbriggan Bypass. These features were excavated and deemed to be of no archaeological significance.

Nevitt Licence number: 02E0053 No archaeological significance

A series of ditches was identified during the monitoring of drainage trenches carried out on the second contract of the Airport–Balbriggan Bypass. The site was excavated and deemed to be of no archaeological significance.

14.3.6. Remote sensing imagery

Examination of the Ordnance Survey 1995, 1999-2000 and 2004-5, 2005-6, and MapGenie 2013-14 imagery as well as Google earth imagery from 2005, 2006, 2008, 2009, 2013, 2015, 2016, 2017, 2018, 2019, 2020, 2021, and Bing imagery did not indicate any additional cultural heritage sites in the application area. LiDAR imagery (TII_2481) taken for TII in 2010-11 didn't indicate any additional archaeological or cultural heritage sites in the application site. Although it did indicate the route of the Bord Gáis Éireann Pipeline to the West as it runs through areas 6, 15, 17, 18 and 19 (see Figure 14-4).

14.3.7. Field Assessment

A field assessment of the proposed development area was carried out on the 3rd of August and the 24th of November 2023 to identify any previously unknown archaeological, architectural or cultural heritage sites See plate 14-13 for the numbered fieldwork areas.

Area 1

Rectilinear-shaped east-sloping field of tillage, enclosed by low banks and ditches with hedgerow and some trees. Standing crop at time of visit. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-14). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 2

A small rectilinear part of a field of east-sloping greenfield next to the M1 motorway There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-15).

Area 3

Rectilinear-shaped field of southeast-sloping tillage, enclosed by low banks and ditches with hedgerow and some trees. Standing crop at time of visit. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-16). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 4

Trapezoidal-shaped field of east sloping tillage, enclosed by low banks and ditches with hedgerow and some trees. Standing crop at time of visit. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-17). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 5

Trapezoidal-shaped field of northeast sloping tillage, enclosed by low banks and ditches with hedgerow and some trees. Standing crop at time of visit. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-18). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 6

Rectilinear-shaped field of east-sloping tillage, enclosed by low banks and ditches with hedgerow and some trees. Standing crop at time of visit. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-19). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 7

Triangular-shaped field of south sloping rough pasture enclosed by banks, drains and hedgerow with trees. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-20).

Area 8

This is the existing access road from the ‘Bhailsigh Road’ (L1140). It is proposed to develop a new site access, cycle lane and pedestrian route and an upgrade to the existing infrastructure. There was no visible indication of any archaeological, architectural or cultural heritage material along the existing road at ground level (see Plate 14-21).

Area 9

Roughly rectilinear-shaped garden surrounding a house, completely overgrown and inaccessible. There was no visible indication of any archaeological, or significant architectural or cultural heritage material at ground level (see Plate 14-22).

Area 10

Rectilinear -shaped area of flat, partly overgrown pasture, enclosed by hedgerow and fences. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-23).

Area 11

Convex-shaped heavily overgrown field enclosed by hedgerow trees and concrete wall. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-24).

Area 12

Rectilinear -shaped area of flat pasture, enclosed by hedgerow, ditches and wire. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-25).

Area 13

Rectilinear -shaped area of flat overgrown pasture, enclosed by hedgerow, ditches and wire. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-26).

Area 14

Rectilinear-shaped area of flat pasture enclosed by ditches. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-27).

Area 15

Roughly rectilinear-shaped area of east-sloping pasture, enclosed by hedgerow and drainage ditches. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-28). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline

development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 16

Rectilinear-shaped area flat pasture, enclosed by hedgerow and ditches. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-29).

Area 17

Rectilinear-shaped area slightly domed field of pasture, enclosed by ditches and hedgerow. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-30). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 18

Rectilinear-shaped area flat pasture, enclosed by ditches and hedgerow. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-31). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

Area 19

Roughly triangular-shaped area of southeast-sloping pasture, enclosed by hedgerow and ditches. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level (see Plate 14-32). The route of the Bord Gáis Éireann Pipeline to the West runs through the area in a north-south direction. Topsoil stripping of the pipeline development was archaeologically monitored in 2002, but no archaeological material was identified.

14.4. Predicted Impacts

14.4.1. Construction Phase Impacts

Direct effects

No direct effects on any known items of archaeology, cultural heritage or buildings of significant architectural heritage in the application site or the vicinity during the construction stage have been identified by the assessment. There is a potential for unknown subsurface items of indeterminable archaeological significance to occur, that could potentially be directly affected by the proposal.

Indirect effects

No indirect effects on any known items of archaeology, cultural heritage or buildings of significant architectural heritage interest in the application site or the vicinity during the construction stage have been identified by the assessment.

14.4.2. Operational Phase Effects

Direct effects

No direct effects on any known items of archaeology, cultural heritage or buildings of significant architectural heritage interest in the application site or the vicinity during the operational stage have been identified by the assessment.

Indirect effects

No indirect effects on any known items of archaeology, cultural heritage or buildings of significant architectural heritage interest in the application site or the vicinity during the operational stage have been identified by the assessment.

14.4.3. Unplanned events

Direct effects

No direct effects on any known items of archaeology, cultural heritage or buildings of significant architectural heritage interest in the application site or the vicinity arising from unplanned events have been identified by the assessment.

Indirect effects

No indirect effects on any known items of archaeology, cultural heritage or buildings of significant architectural heritage interest in the application site or the vicinity arising from unplanned events have been identified by the assessment.

14.5. Cumulative effects

Effects arising in respect of existing developments are considered within the assessment of the receiving environment. In accordance with EIA legislation (see Section 1.9), a search was undertaken for approved developments, not yet commenced, of relevance to the consideration of cumulative effects in respect of archaeology, cultural heritage or buildings of significant architectural heritage interest and none were identified.

In relation to the proposed masterplan a list of screened projects in the vicinity of the masterplan site which may lead to cumulative impacts was reviewed in the context of the cultural heritage assessment, and assessed to see if there are any interactions between the cultural heritage assessments and the projects. The assessment is detailed below.

There are no known archaeological, architectural or cultural heritage assets present in the masterplan site. The proposed masterplan will have no direct impact on archaeological, architectural or cultural heritage. The list of screened projects in the vicinity of the masterplan site which may lead to cumulative impacts was reviewed in the context of the cultural heritage assessment. As there are no archaeological, architectural or cultural heritage assets present in the application site no effects will arise, and therefore no cumulative effects will arise.

14.6. ‘Do-nothing’ effects

If the proposed development were not to proceed the effects of the development on archaeology, cultural heritage or buildings of significant architectural heritage interest would not arise.

14.7. Worst-Case Scenario

In the worst case scenario, soil-stripping associated with the development may have a significant, irreversible negative/adverse effect on unknown subsurface archaeological material of indeterminable significance to occur without preservation by record taking place. The risk is unquantifiable and therefore the significance of the overall effect is moderate.

14.8. Mitigation Measures

Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the application site topsoil-stripping should be monitored by a qualified archaeologist under licence from the national Monuments Service. Any archaeological

material identified during archaeological monitoring should be preserved *in situ* or by record as appropriate under licence from the National Monuments Service.

14.9. Residual Effects

No residual effects on any known items of archaeology, cultural heritage or buildings of significant architectural heritage interest in the application site or the vicinity arising from the project have been identified by the assessment.

14.10. Interactions with other effects

No known items of archaeology, cultural heritage or buildings of significant architectural heritage interest have been identified in the application site or the vicinity by the assessment and therefore no interactions with any other environmental factor has been identified.

14.11. Monitoring

Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the application site topsoil-stripping should be monitored by a qualified archaeologist under licence from the national Monuments Service. Any archaeological material identified during archaeological monitoring should be preserved *in situ* or by record as appropriate under licence from the National Monuments Service.

14.12. References

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14.13. Plates

Plate 14-1: View of Structure 1.

Plate 14-2: View of Structure 2.

Plate 14-3: View of Structure 3.

Plate 14-4: View of Structure 4 Farmstead: Farmhouse.

Plate 14-5: View of Structure 4 Farmstead: Outbuilding.

Plate 14-6: View of Structure 4 Farmstead: Outbuilding.

Plate 14-7: View of Structure 4 Farmstead: Outbuilding.

Plate 14-8: View of Structure 4 Farmstead: Outbuilding.

Plate 14-9: View of Structure 4 Farmstead: Outbuilding.

Plate 14-10: View of Structure 4 Farmstead: Outbuilding.

Plate 14-11: View of Structure 4 Farmstead: Outbuilding.

Plate 14-12: View of Structure 4 Farmstead: Outbuilding.

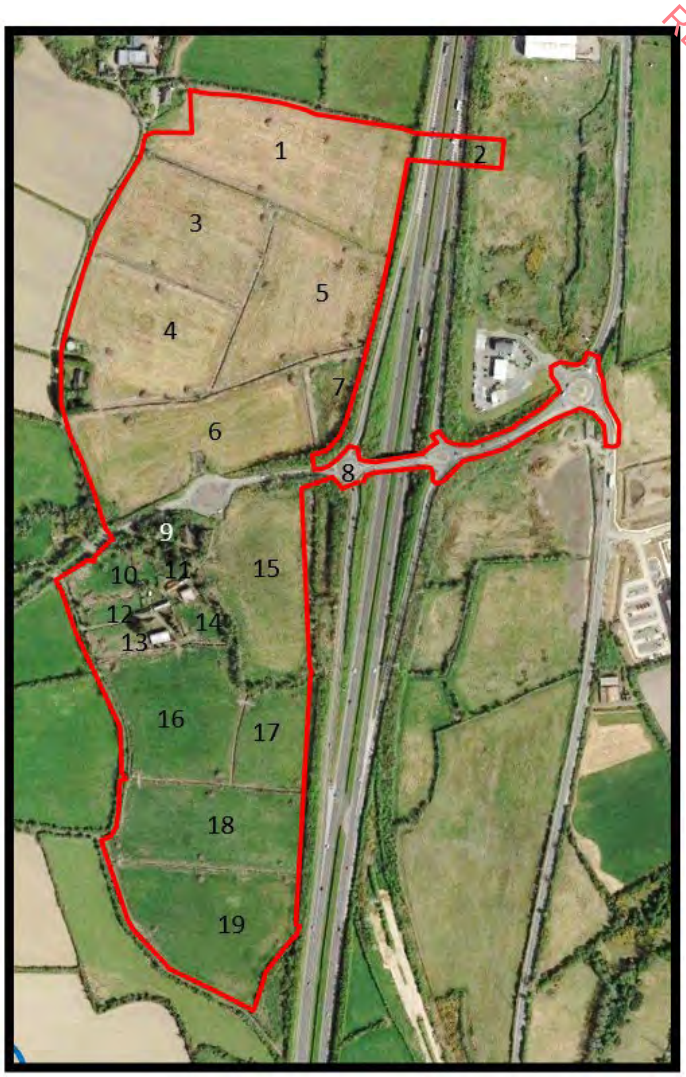

Plate 14-13: Aerial image of the application site from Google earth taken in April 2021 showing the proposed application site outlined in red and numbered fieldwork areas.

Plate 14-14: Panoramic view of Area 1 looking north-west.

Plate 14-15: View of Area 2 looking north.

Plate 14-16: Panoramic view of Area 3 looking south-west.

Plate 14-17: Panoramic view of Area 4 looking south-east.

Plate 14-18: Panoramic view of Area 5 looking south-west.

Plate 14-19: Panoramic view of Area 6 looking south-west.

Plate 14-20: Panoramic view of Area 7 looking north.

Plate 14-21: View of Area 8 looking north-east.

Plate 14-22: View of Area 9 looking east.

Plate 14-23: Panoramic view of Area 10 looking southeast.

Plate 14-24: Panoramic view of Area 11 looking north.

Plate 14-25: Panoramic view of Area 12 looking east.

Plate 14-26: Panoramic view of Area 13 looking west.

Plate 14-27: Panoramic view of Area 14 looking northwest.

Plate 14-28: Panoramic view of Area 15 looking northeast.

Plate 14-29: Panoramic view of Area 16 looking southwest.

Plate 14-30: Panoramic view of Area 17 looking south.

Plate 14-31: Panoramic view of Area 18 looking northeast.

Plate 14-32: Panoramic view of Area 19 looking north.

14.14. Figures

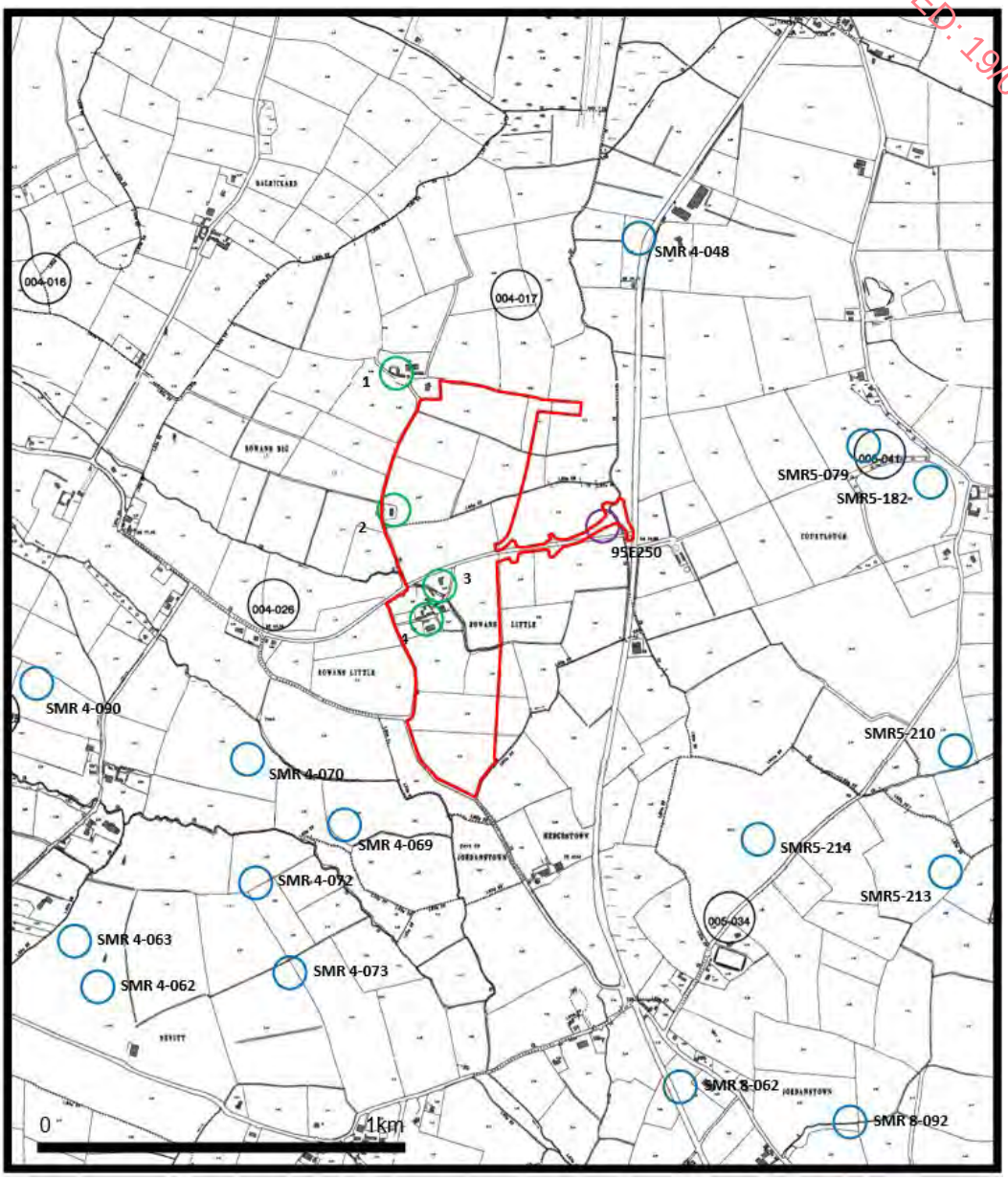

Figure 14-1: The study area. The red line is application area. RMP sites are indicated with black circles and SMR sites with blue circles. Structures in the vicinity of the application site on historic mapping on indicated with green circles.

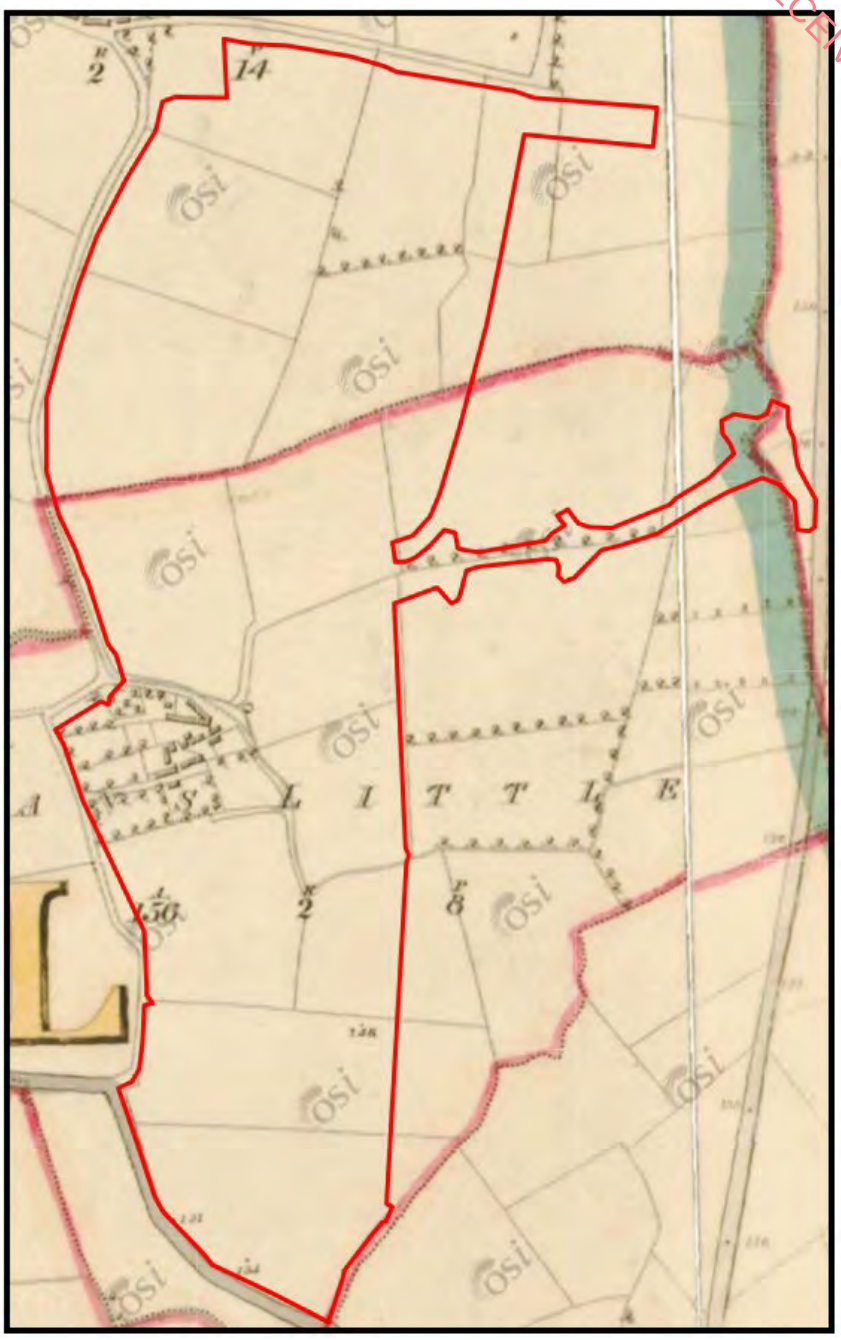

Figure 14-2: The application site outlined in red, superimposed on the OS 1st edition six-inch map.

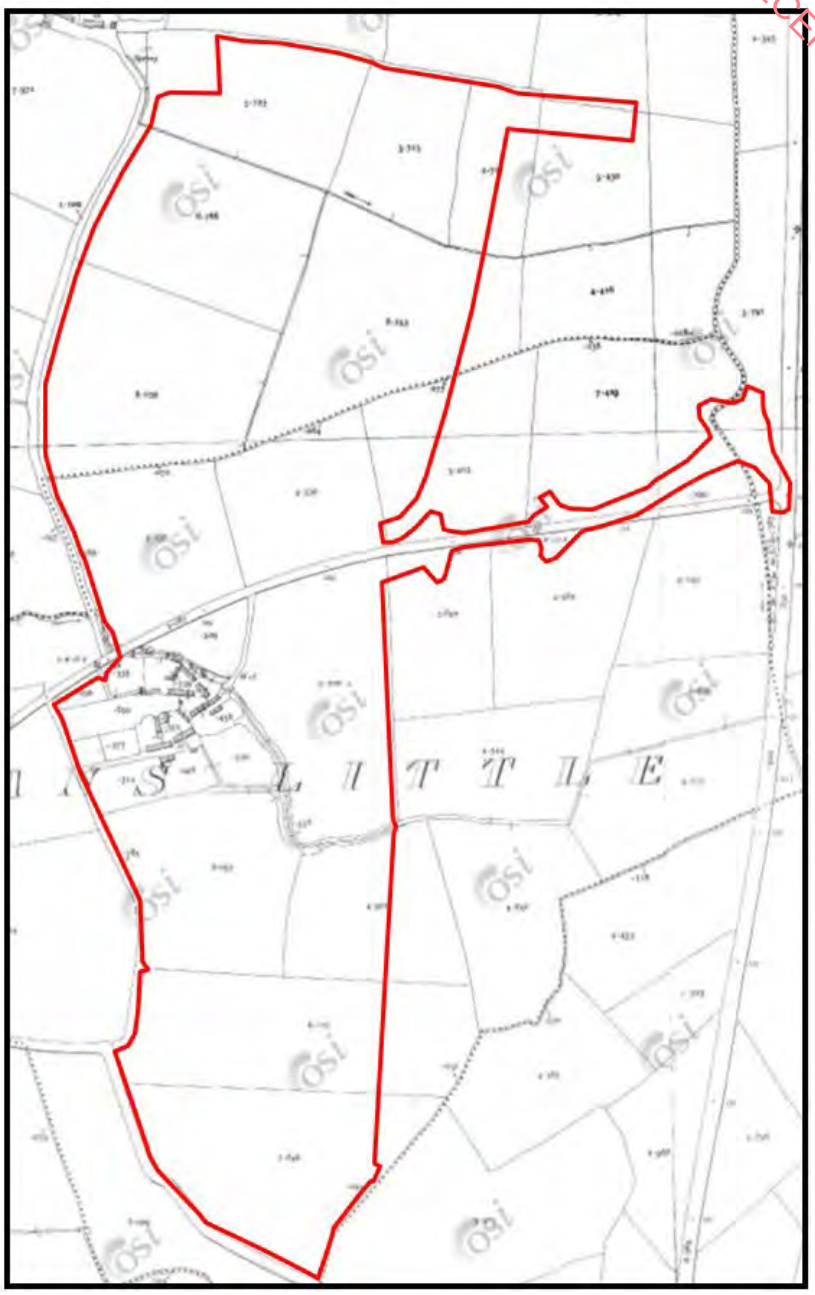

Figure 14-3: The application site outlined in red, superimposed on the OS 25-inch 1st edition six-inch map.

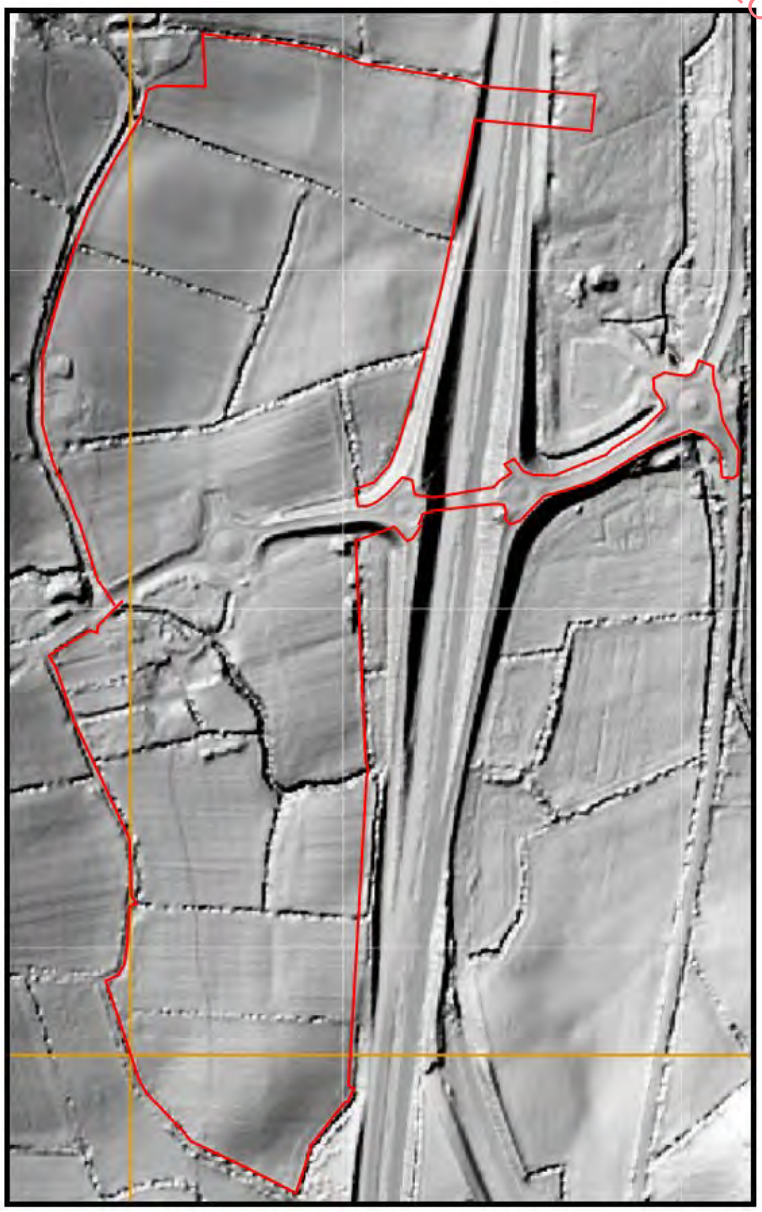

Figure 14-4: Contains Irish Public Sector Data (Geological Survey Ireland & Transport Infrastructure Ireland) licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence.

15. Material Assets

15.1. Introduction

This Chapter of the EIAR has been compiled by Rowan Engineering Consultants Ltd and is based on information contained within the attached planning application drawing pack and Engineering & Planning Reported attached in **Appendix 2**. Potential effects of the proposed Project on relevant material assets are assessed throughout this Chapter.

This Chapter should be read in conjunction with other relevant Chapters within this EIAR, including the following:

- Chapter 2: Proposed Project Description
- Chapter 8: Hydrogeology
- Chapter 9: Air Quality & Climate
- Chapter 10: Noise & Vibration
- Chapter 12: Traffic & Transport
- Chapter 13: Waste Management

The material assets considered as part of the assessment were those major utilities associated with the facility; existing and proposed.

15.2. Methodology

The following sources were consulted in order to identify, current and potential future requirements for the major utilities:

- Uisce Eireann

Additionally, this Chapter has been prepared regarding the following:

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

Upon reviewing the guidelines, while accounting for various factors outlined in this report, the material assets detailed within this chapter consider built services and utilities.

This Chapter assesses the potential effects of the proposed development on the following:

- Existing Road Network

- Surface water;
- Foul Drainage;
- Water Supply,
- Electricity & Telecommunications Ducting
- Mains Water;
- Gas;

15.3. Existing Environment

15.3.1. Existing Buildings

The proposed development site is located within lands predominantly used for agriculture however there are also a no. of existing buildings within the development redline which are due to be demolished:

- A single-storey 200-square-metre (m²) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;

15.3.2. Existing Road Network

Internal Roads

No formalised internal roads are available in Zone A or F. Gravel tracks and/or agricultural tram lines exist in Zone A and F which generally leads around drainage ditches, croplands and pastures. Zone A and F are accessible via spurs constructed on the existing Bhailsigh Road (L1140) roundabout. An existing 7.7m wide Balrickard stream crossing is available near the access spur originating from the roundabout. The crossing consists of a 1.2m x 0.7m box culvert and is shown in **Figure 15-1** below.

Figure 15-1 Existing 7.7m wide Balrickard stream crossing

Bhailsigh Road and R132

Bhailsigh Road (L1140) consists of a single carriageway with a speed limit of 60 km/h. Between the roundabout and the Junction No. 5 (Dublin-outbound) roundabout, the lane widths vary between 3.66m to 3.86m. A 1.9m grass verge is available with Armco crash barriers located along both road shoulders, which extends the full length between the two roundabouts. The embankment falls off steeply on either side of the crash barrier with the slopes containing mature hedges and trees. The carriageway cross fall equates to 1.15% between the kerbs with the vertical alignment rising by 2.33m at a relatively constant slope of 1.3% to the Junction No. 5 roundabout. Further detaisl and figures are presented within the Engineering and Planning Report.

15.3.3. Gas

There is a existing 250mm diameter steel high-pressure (70-bar) distribution gas main which runs through Zone A and F as shown on **Figure 15-2** below.

No works to the gas main are proposed as part of the proposed development and it has been designed to avoid interaction or impacts to the gas main.

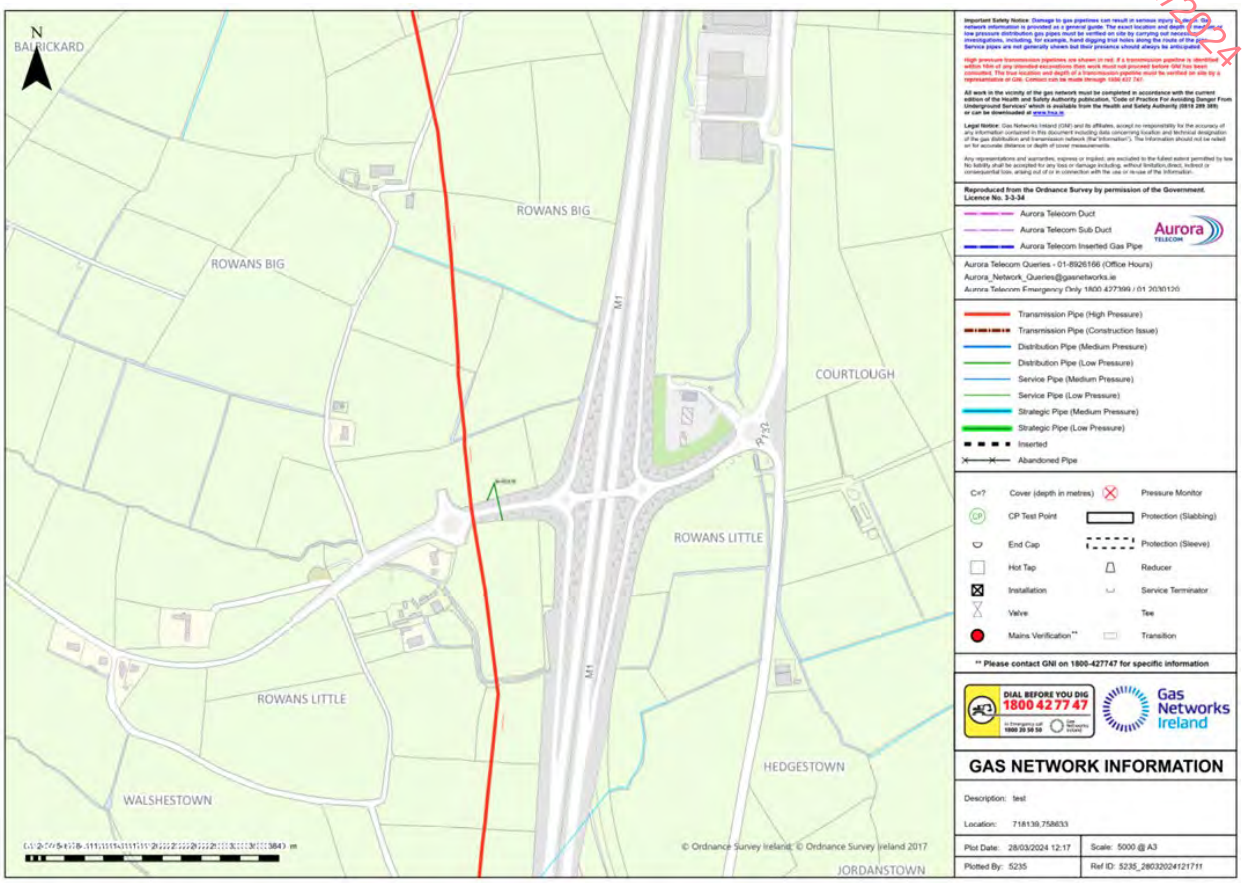

Figure 15-2: Gas infrastructure within the Site.

15.3.4. Existing Electrical Supply

The existing ESB electrical supply networks are displayed on **Figure 15-3** below. As indicated, a 250 kVA transformer is available on the northeastern corner of Zone A, which feeds the 10kVA Medium Voltage (MV) line feeding the disused reservoir pump stations mentioned previously. Another MV line feeds the existing residential dwelling located to the northwest of Zone A which originates from Walshestown. Low Voltage (LV) feeds are available to the residential dwellings located in Zone F as shown on the aforementioned drawing.

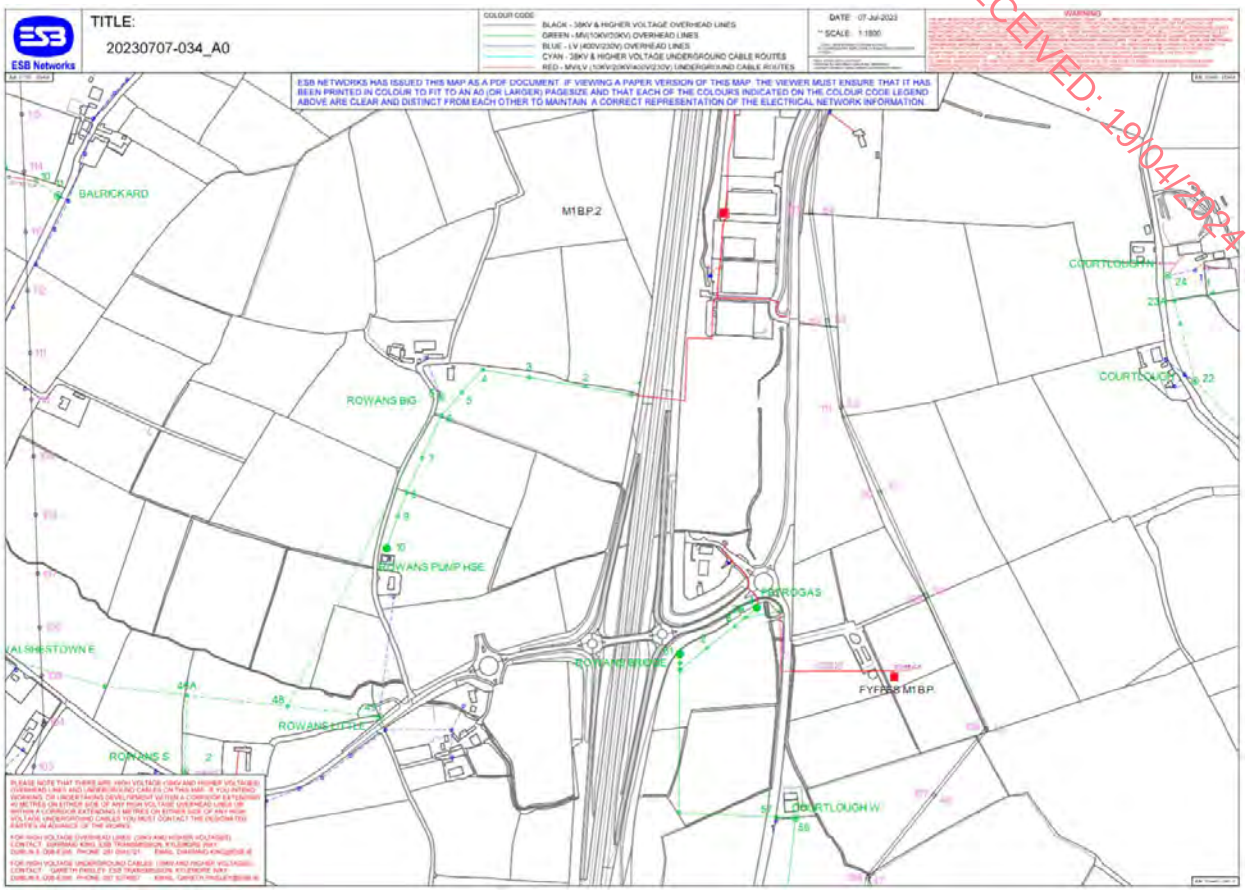

Figure 15-3 Existing Electrical Infrastructure within the Site.

15.3.5. Existing Telecommunications

Existing Open EIR ducting is available on the northern road shoulder of Bhailsigh Road (L1140). An Eircom manhole was surveyed on the northeastern corner of Zone A, though no further information could be obtained regarding this manhole.

15.3.6. Existing Public Lighting

The existing lighting infrastructure along Bhailsigh Road/R132 is shown in **Figure 15-4** below.

No other existing lighting exists within the redline of the site.

An assessment of the existing public lighting infrastructure located along Bhailsigh Road (L1140) and the R132 to determine if supplementary lighting would be required for the proposed

pedestrian and cycle linkages to Applegreen. The assessment concluded that sufficient lux levels are provided in accordance with IS EN 13201:2015 / BS 5489-1:2020 for pathways/subsidiary roads/pedestrian areas – Class P2, by the existing infrastructure and no supplementary lighting is required along the arterial and regional roads.

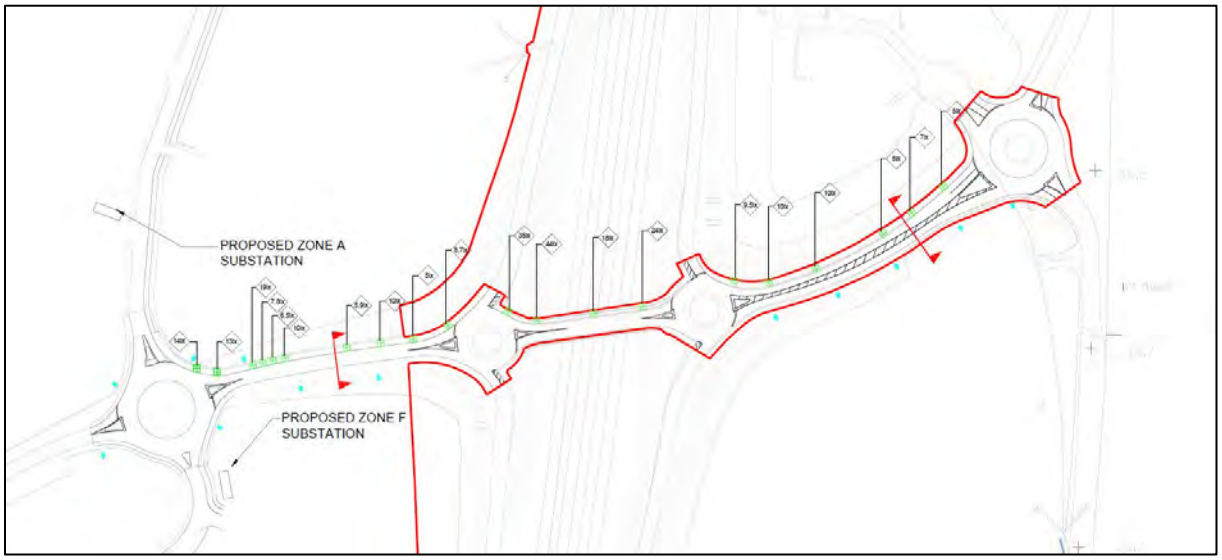

Figure 15-4 Existing Lux levels on Bhailsigh Road/R132

15.3.2 Waste Management

Currently, there is no waste Management infrastructure at the proposed development site.

15.4. Potential Effects

The potential effects of waste generated on site are discussed in Chapter 12 and within the RWMP presented in **Appendix 12**. Potential effects on built services are addressed in this section.

15.4.1. Do nothing

The proposed development site is located within a site zoned for General Employment. Leaving this site untouched and without future development of enabling works for a subsequent Business Park would not support or align with zoning objectives for this area.

The proposed development of enabling works together with a future planned Business Park will assist in enhancing General Employment in which the land is appropriately zoned for. Leaving the proposed development site unutilised would have a negative impact on the area and its environs and result in a major loss of employment.

Furthermore, the provision of future commercial resources and employment opportunities within a rural setting located on the outskirts of an urban region will be advantageous to the local community.

15.5. Effects on Utilities

The following section summarises the proposed Utilities as part of the proposed development, full details can be found in the attached Planning and Engineering Report within Appendix 2 of this EIAR and planning pack drawings.

15.5.1. Existing Buildings

The proposed development site is located within lands predominantly used for agriculture however there are also a no. of existing buildings within the development redline which are due to be demolished:

- A single-storey 200-square-metre (m²) house, an abandoned water storage reservoir and associated pump stations, all located on the western boundary of Zone A;
- 13 No. existing buildings consisting of agricultural sheds, stables, warehouses and residential dwellings located in Zone F;

The heritage value of the buildings has been assessed within Chapter 13 and the correct procedures to be implemented during their demolition is detailed within the CEMP.

15.5.2. Proposed Alteration to the Road Network

Pedestrian and Cycle Linkages

no pedestrian or cycle facilities are available along the R132 or Bhailsigh Road (L1140) between the proposed development and the nearest public transport infrastructure link which is located near Applegreen. The nearest public transport infrastructure link is located 300m north of the Applegreen Roundabout on the R132, consisting of the Bus Éireann Grooms Stop (I.D. 100231) running between Dublin and Drogheda.

In line with other Fingal County Council projects planned along the R132 (R132 Blake's Cross to Minister's Road) to facilitate connectivity for pedestrian and cyclists and to promote the use of sustainable transport methods, a 3m-wide shared pedestrian and cycle pathways are proposed from the Applegreen R132 roundabout to the proposed development entrances located on the Bhailsigh Road (L1140) roundabout. The proposal includes shared paths on both carriageway shoulders, which will connect to existing pathways located around the R132 roundabout. The shared paths are proposed to tie into the existing 2m wide concrete footpaths located on the Junction No. 5 bridge crossing. No modifications or upgrading of the existing 2m footpaths are proposed.

15.5.3. Alterations to Bhailsigh Road (L1140) Roundabout

As indicated on Figures 2-3 and 2-4, the existing Bhailsigh Road (L1140) roundabout was constructed with access spurs to Zone A (north) and Zone F (south). Minor amendments are proposed to the kerblines, access spurs and islands of the roundabout which was constructed in c. June 2008 to comply with the present-day design standards of TII. To cater for the future pedestrian and cyclists' movements accessing the proposed development, a Toucan Crossing is proposed on Bhailsigh Road (L1140). New uncontrolled pedestrian crossings are proposed upon entering the proposed Business Park sites.

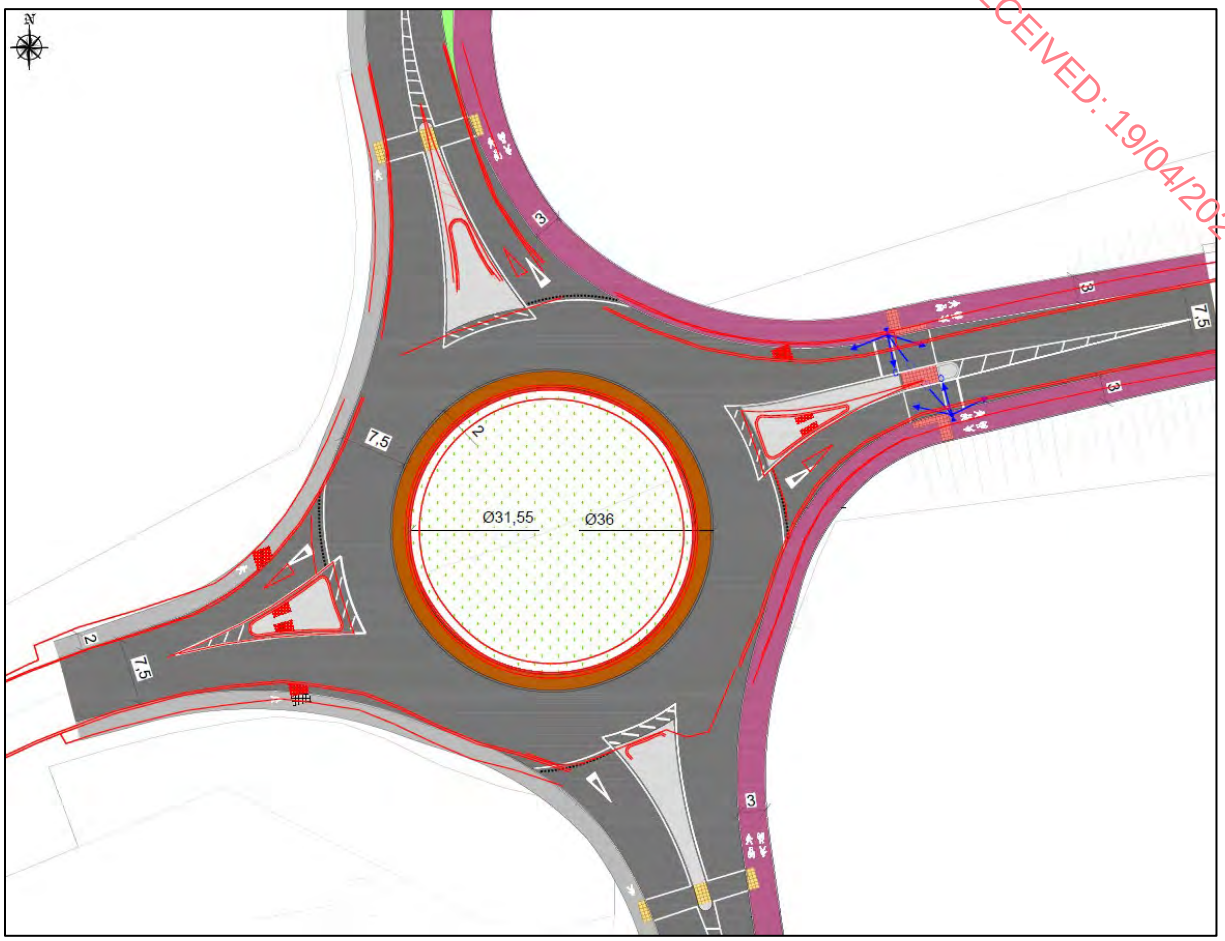

Figure 15-5 Proposed alterations to Bhailsigh Road (L1140) roundabout.

15.5.4. Proposed Internal Access Roads

The proposed internal access roads for Zone A and F consists of 7.5m wide, single carriageways as shown on attached Drawings 16_206A-CSE-GEN-XX-DR-C-1610 to 1615 with summary drawings for Zone A & F shown below in **Figure 15-6** and **Figure 15-7.**

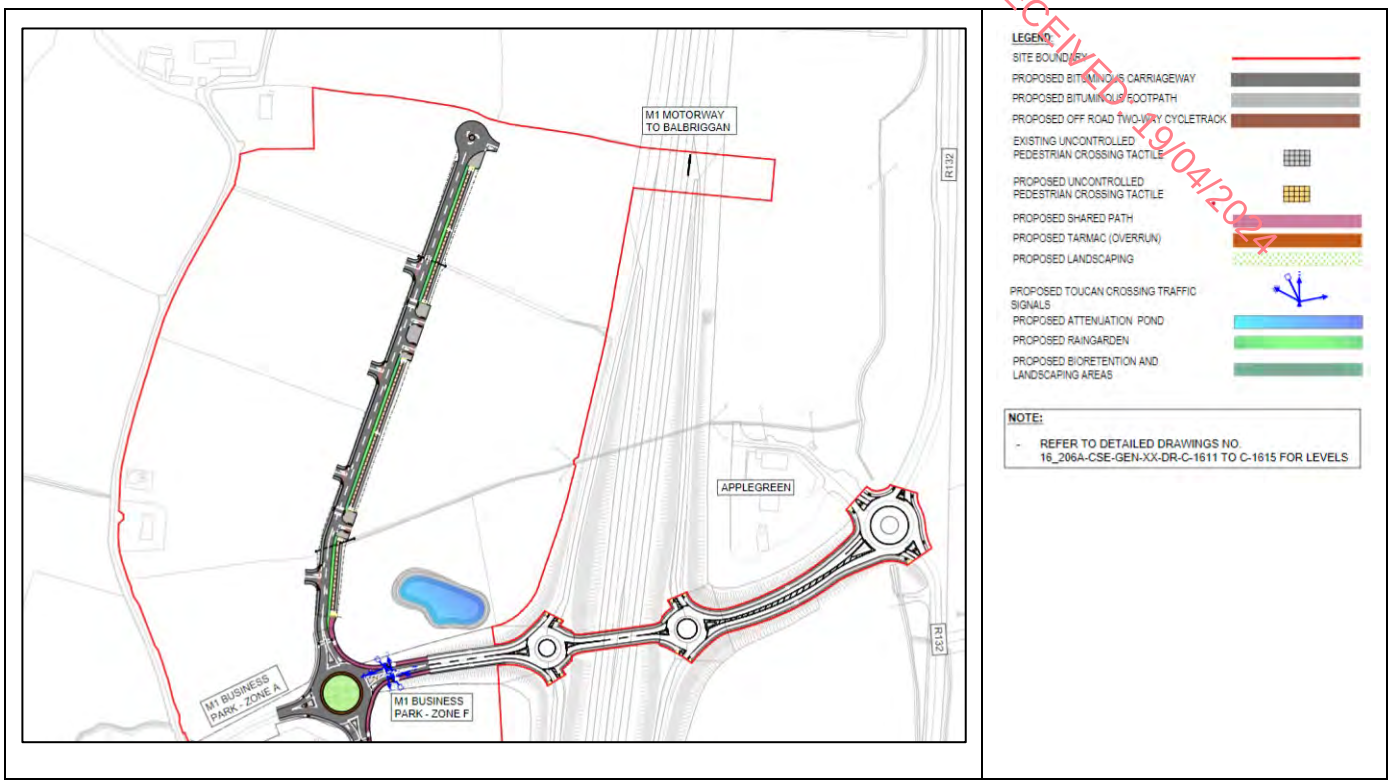

Figure 15-6: Proposed Internal Access Routes within Zone A

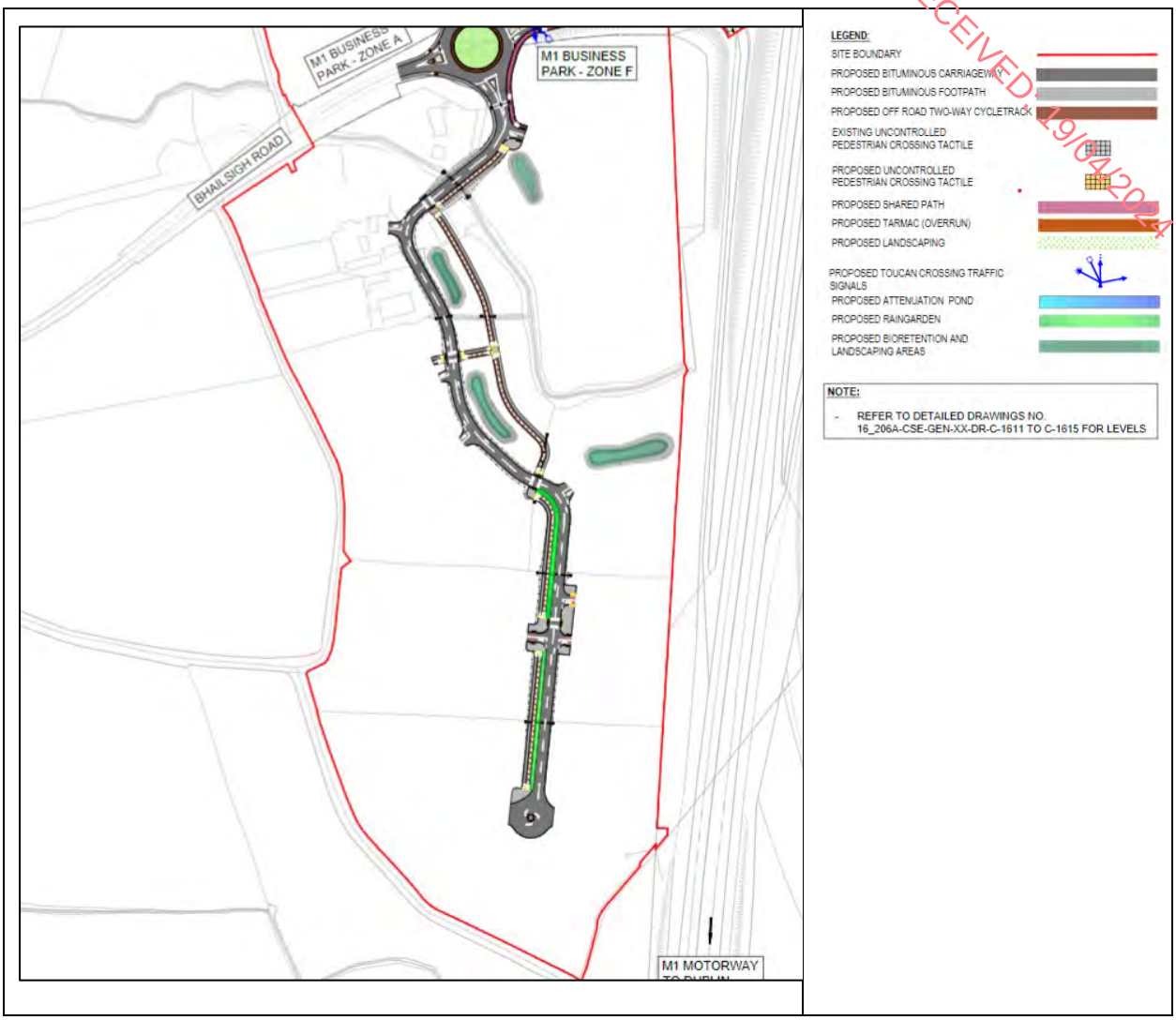

Figure 15-7: Proposed Internal Access Routes within Zone F

For Zone A, 2m wide pedestrian footpaths are proposed on both shoulders along with a 3m wide, two-way cycle track which is to be constructed along the eastern carriageway shoulder as indicated on **Figure 15-8** below. The road crossfall equates to 2% which falls towards the 2.5m wide raingarden which will serve as the primary collection point for surface water runoff from the roadway, cycle track and footpaths.

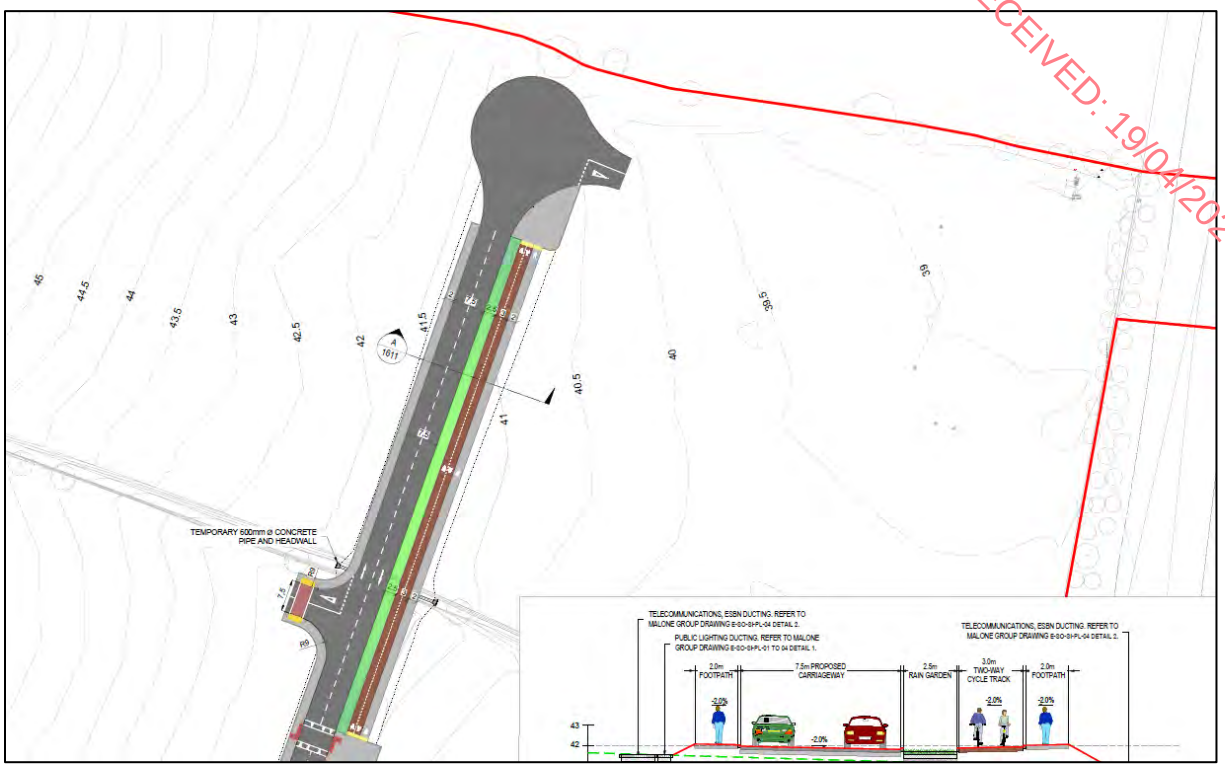

Figure 15-8; Example Cross section of proposed internal access route within Zone A

Figure 15-9 shows the internal access road layout for Zone F where it originates from the Bhailsigh Road (L1140) roundabout. Similar to Zone A, the single carriageway width equates to 7.5m with 2m wide footpaths and a 3m wide two-way cycle track available on the road shoulders just past the proposed Balrickard Stream crossing where the footpath and cycle track deviates from the carriageway and heads southeast through the 48m wide riparian corridor. The pedestrian and cycle infrastructure utilises the "Middle Zone" of the riparian corridor as demarcated in the Inland Fisheries Ireland (IFI) guidelines "*Planning For Watercourses In The Urban Environment*" published in November 2020. (This is assessed further in the Chapter 6 Biodiversity).

The topography of the northern section of Zone A drains towards the Balrickard Stream which will be crossed via a proposed 1.2m x 0.9m box culvert as indicated on **Figure 15-9.** Instead of utilising raingardens in this section similar to Zone A, the drainage will consist of gullies and distribution pipelines discharging to bioretention ponds which will be located in the riparian corridor "Outer Zone" as highlighted in the above IFI guideline document. Refer to Drawing 16_206A-CSE-GEN-XX-DR-C-1965 included in application for the riparian corridor details.

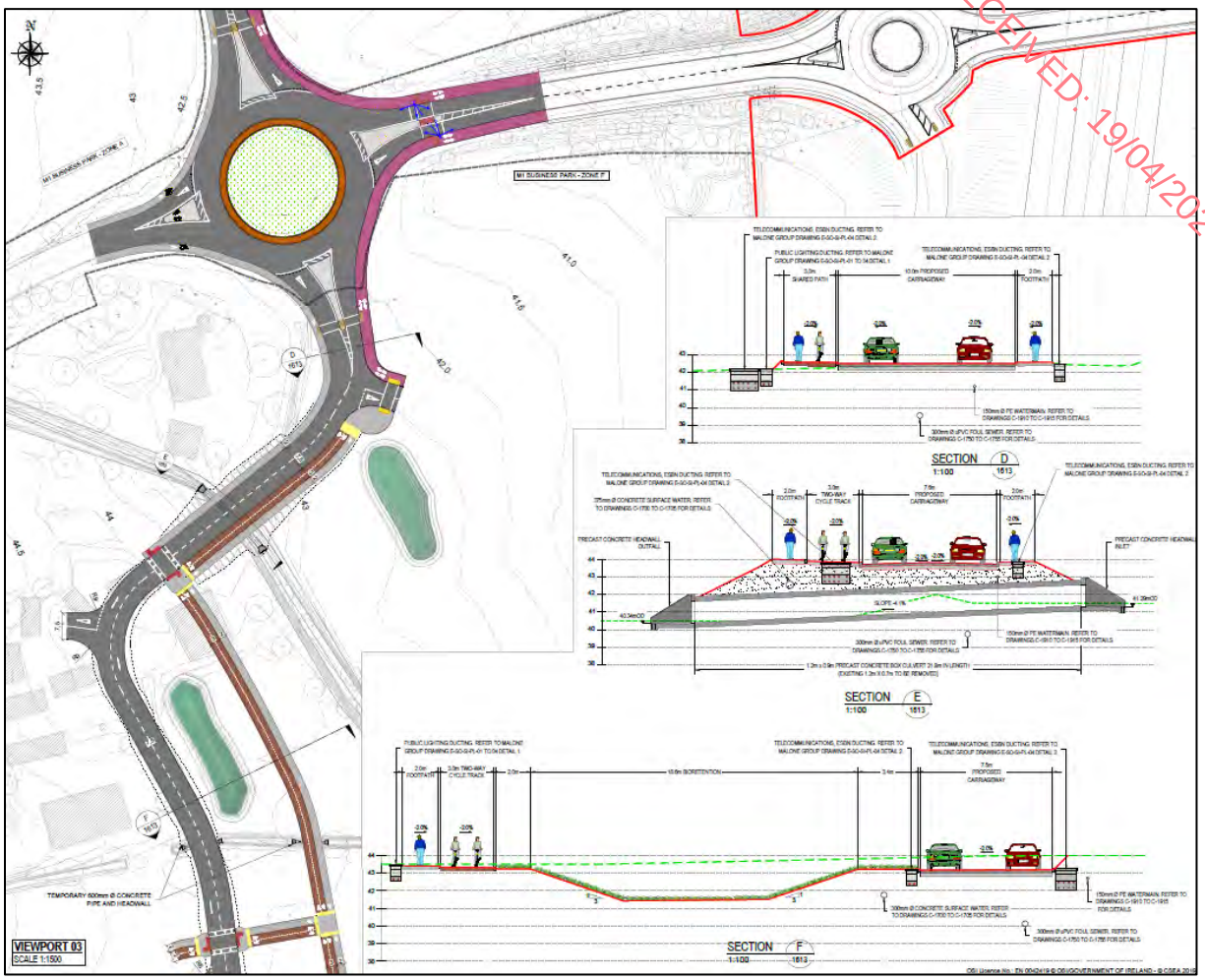

Figure 15-9: Zone F internal access roads Section D, E and F

As shown on **Figure 15-13** the pedestrian and cycle paths reconnect to the main carriageway in the southern section of Zone F, where the cross section changes to a similar layout of that in Zone A, where raingardens are reintroduced as shown on **Figure 14 10** and Section G. As shown in **Figure 14 10** and 3-15, cul-de-Sac style turning circles are proposed in the event that Heavy Goods Vehicles (HGVs) erroneously drives to the end of the access roads and needs to turn around.

Figure 15-10: Zone F internal access road

As shown in **Figure 15-9,** Section E, to cross the Balrickard Stream, it is proposed to remove and upgrade the existing 1.2m x 0.7m box culvert indicated in Figure 3-1. In line with the OPW Section 50 Application guidelines, the minimum diameter of culvert shall be 0.9m to facilitate access for maintenance purposes, thus the culvert will be upgraded to a 1.2m x 0.9m precast concrete culvert with precast concrete bases and headwalls. The use of precast concrete structures negates any risk of spillages of cementitious materials, minimising impacts and duration of works occurring within the stream. To ensure mammal are able to traverse the extended culvert crossing, it is proposed to install mammal passages/ledges in the culverts as indicated in **Figure 15-11**

Figure 15-11: Example of mammal ledges

15.5.5. Gas

There is gas infrastructure existing within the proposed development site which is not be altered.

15.5.6. Electrical Supply and Telecommunication Ducting

Public lighting is proposed onsite, which will necessitate 2 x 15kVA connections to the existing 250kVA pole mounted transformer located on the northeastern corner of Zone A. An ESBN Connection Application will be submitted following the confirmation of the planning application reference number. The existing 250kVA transformer has sufficient capacity to cater for the Zone A and F public lighting requirements. All future developments will be subject to their own ESBN connection applications and availability of supply in the local network can only be assessed once power consumption/requirements are known.

Telecommunications ducting will be provided to service future developments within the proposed Zone A and F. Future connections applications to service providers will be required to service individual land parcels. A typical detail of telecommunications and power ducting is shown in the **Figure 15-9** below.

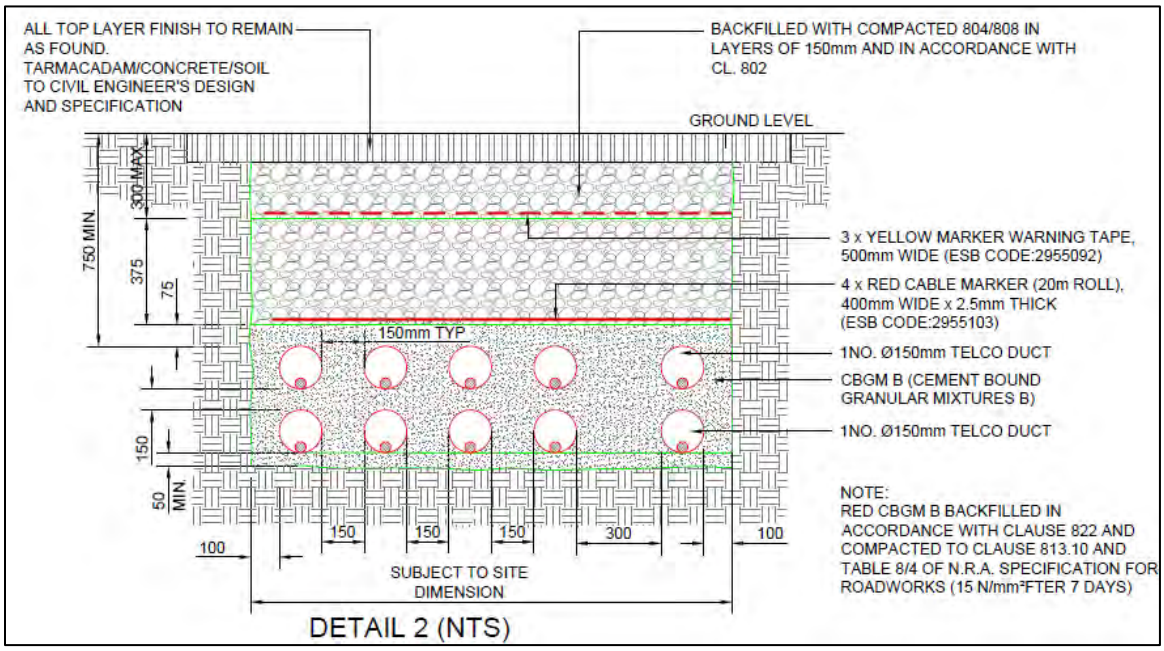

Figure 15-12: Electrical and telecommunications ducting detail

Ultimately, the proposed development will result in an increase in demand on utilities. Nonetheless, the appropriate government bodies consulted, i.e., Uisce Eireann, ESB, Fingal Co Council etc., will determine if adequate capacity is available in the surrounding area and deem if proposed connections to and from the site are acceptable.

It is envisaged that significant engagement and consultation with the roads department of Fingal County Council and transport and Infrastructure Ireland (TII) will be necessary during the construction phase of the development to ensure any impacts are mitigated.

Potential Impacts to Material Assets will be alleviated due to engagement taking place prior to and during the construction phase. Surface and stormwater will be managed by onsite Sustainable Urban Drainage Systems (SUDs) features such as attenuation ponds, raingardens, swales, nature-based solutions (NBS) and conveyance networks.

Works required to provide connections to and from the site are minor in nature and are not expected to have a significant impact on the site and its enabling works.

15.5.7. Surface Water Drainage

Surface Water connections are proposed as part of the proposed development, as well as surface water drainage infrastructure for the access road and associated infrastructure consisting of Sustainable Urban Drainage Systems features such as raingardens, bioretention ponds, attenuation ponds, hydro brakes, Nature-based Solutions (NBS) and conveyance networks.

The full design strategy and design details of the proposed surface water management systems for the development are presented within the attached Engineering and Planning Report.

15.5.8. Foul Drainage

There is no available foul drainage on the Western portion of the M1 Motorway where the proposed development site is located.

It is proposed to drain by gravity from the southern portion of Zone F all the way to the northern section of Zone A via a 300mm diameter foul sewer pipeline at a slope of 1:300. A pump station and 24-hour emergency storage tank are proposed on the northeastern corner of Zone A, where

wastewater would be pumped underneath the M1 Motorway via a new 125mm diameter ductile iron rising main, which will be sleeved through an existing abandoned 200mm diameter watermain. The figure below displays the layout of the above pumping station, emergency storage tank and rising main.

The proposed rising main will discharge to a new manhole located on the eastern side of the motorway, which will be connected to the existing 300mm diameter foul sewer which drains northwards towards the M1 Business Park WWTP.

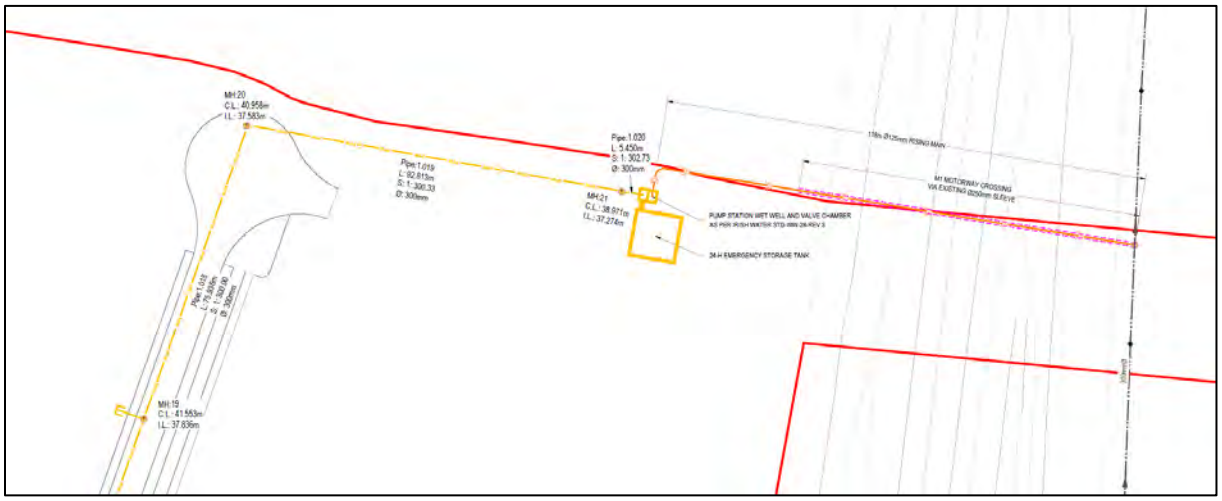

Figure 15-13 Layout of proposed pumping station and rising main

In accordance with the Uisce Éireann Code of Practice, a 24-hour emergency storage tank will be provided which equates to a storage volume of 200m^3 based on the DWF. The in-situ concrete tank shall be designed to have a minimum factor of safety against floatation for the empty emergency storage structure subjected to groundwater upward pressure of 1.2. The pump station design shall be carried out in accordance with the Uisce Éireann standard details.

The proposed foul drainage infrastructure was modelled using InfoDrainage Ultimate 2024 Version 2024.0 to analyse the velocities of the network (full details presented in Appendix C of the Engineering Planning Report (Appendix 2 of EIAR). As the future development discharge patterns for the commercial units are unknown, a hypothetical discharge pattern was used,

consisting of a double-peak hydrograph, with one peak occurring at 11:00am and another between 15:00pm-17:00pm. The first peak equals the design flow peak calculated in the demand figures included in Appendix C of the Engineering Planning Report. The model shall be updated as discharge patterns becomes available in the planning for future developments. The Figure below shows an example of the trade discharge pattern.

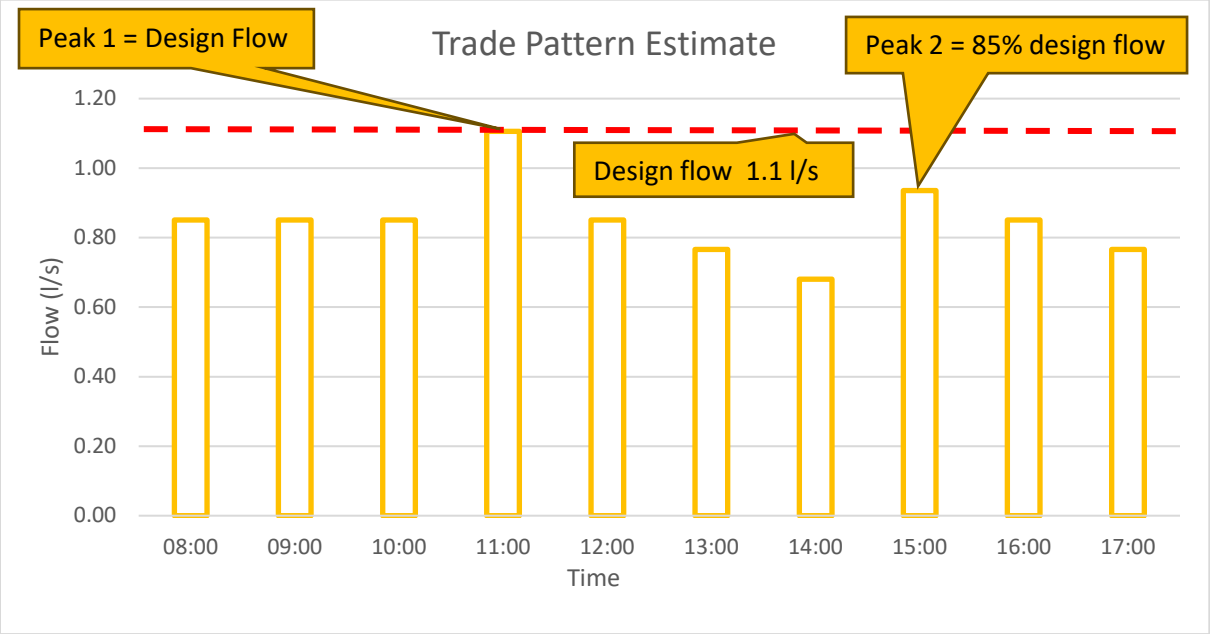

Figure 15-14 Trade discharge pattern Zone A Building A1 Example

From the dynamic modelling carried out, the maximum inflow of 18.6 l/s was recorded, thus a pump capacity of 20 l/s was utilised which activates at a storage depth of 250mm. This resulted in 86% storage availability in the emergency storage tank. On the eastern side of the motorway, an energy dissipating manhole will be provided to reduce the velocities of the rising main before being connected to the existing 300mm diameter foul main, which drains to the existing M1 Business Park WWTP.

15.5.9. Water Supply

Figure 15-1 shows the layout of the existing water supply mains located along the northern and western boundary of Zone A. No existing pipelines are available for Zone F.

The Figure below on the left indicates two pipelines crossing the M1 Motorway into Zone A consisting of a 150mm and 200mm diameter pipeline feeding to/from the storage reservoir located on the western boundary and that the pipelines are under private ownership, indicated by green linework. This reservoir and pump station was constructed c. 2001-2005 with the first M1 Business Park building located on the eastern side of the motorway. According to the Savills Leak Detection Report compiled in January 2022, one pump station is utilised for domestic supply and the other for fire pumps. The figure below on the right indicates that the 200mm diameter pipeline is abandoned and closed with a gate/sluice valve on the eastern side of the motorway. This 200mm watermain will be utilised for the foul sewer crossing.

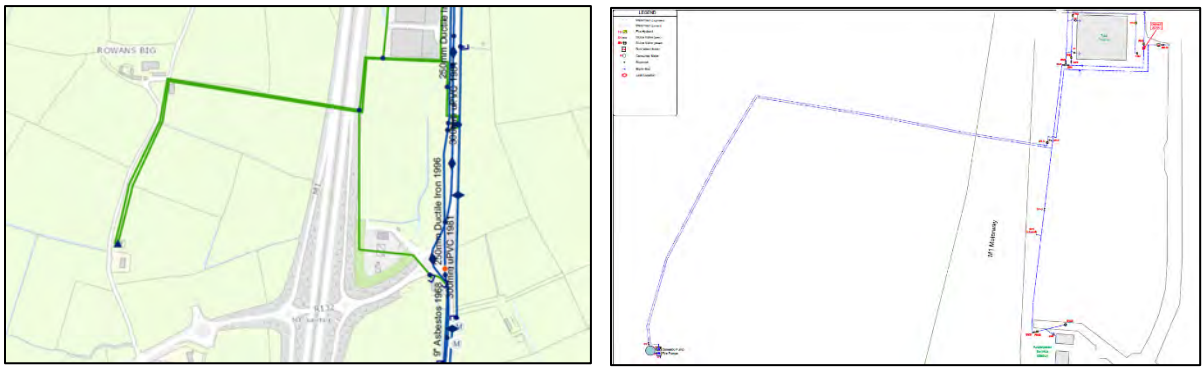

Figure 15-15 Existing water supply infrastructure Zone A

A connection point to the existing 150mm diameter pipeline is proposed, which is located on the northern boundary of Zone A, which will feed both Zone A and Zone F via a proposed 150mm diameter uPVC main. Proposed watermain details are shown in Drawings included within Appendix D of the attached Engineering Planning Report within Appendix 2 of this EIAR.

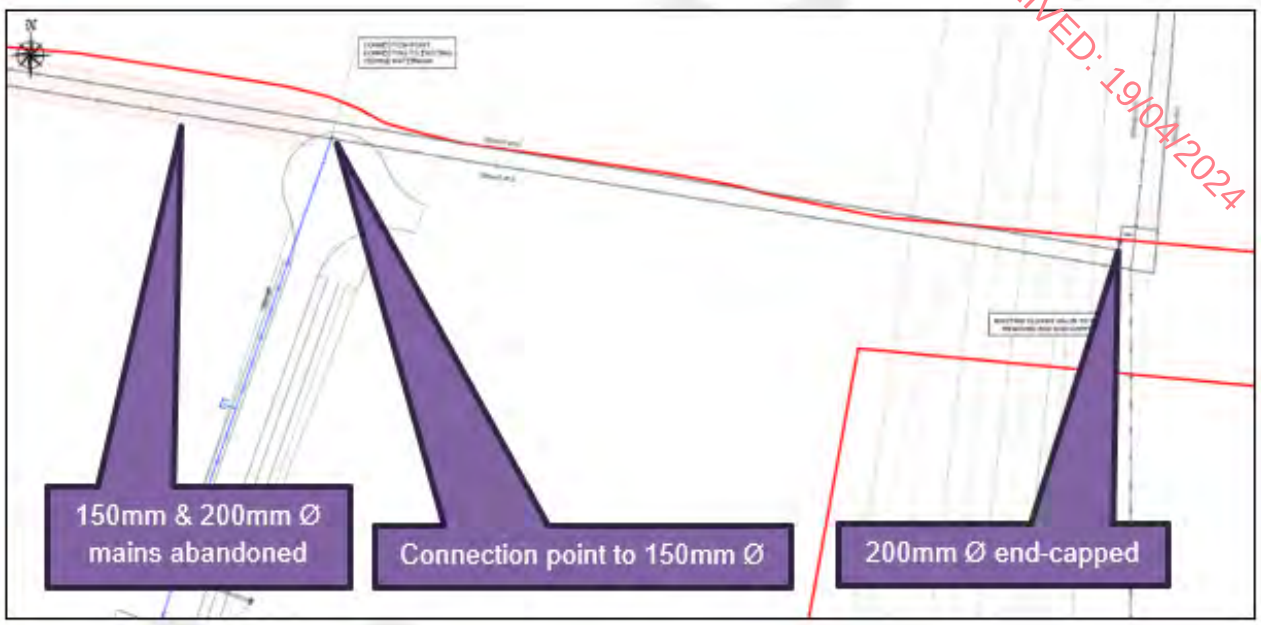

Figure 15-16 Proposed watermain connection point for Zone A and F

15.6. Predicted Impacts

15.6.1. Construction and Operational Phase

Owing to the nature of the proposed development, together with a short-term duration of works envisaged, the construction and operational phases can be considered as a one phase/process.

Site activities will be undertaken in accordance with the requirements of the:

- EIAR and any subsequent planning permissions;
- Construction Environmental Management Plan;
- Resource & Waste Management Plan
- Legislative requirements and environmental best practise.

A large amount of stakeholder engagement is required with existing service providers in order to obtain the legislative and planning requirements to connect to and upgrade existing services within the proposed development boundary and to ensure minimal impacts to existing services during the construction phase.

If this stakeholder engagement and legislative and planning requirements take place no significant impacts are predicted in relation to the construction and operational phase of the proposed enabling works.

15.6.2. Potential Cumulative Impacts

Based on a review of the planning application viewer there are no committed developments in proximity to the subject site which are likely to give rise to cumulative impacts with it. Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely. No significant cumulative effects are foreseen on Material Assets from a cumulative impact perspective.

With regard to the indicative masterplan for the proposed development predicted impacts are likely to take place primarily during the construction and operational phase of the enabling works included within this planning application. However it is acknowledged that little detail is currently available for the masterplan in relation to Material Assets. The masterplan will be subject to subsequent planning applications and Material Assets impact assessment should be completed within these subsequent planning applications when more detail is available.

15.7. Mitigation Measures

15.7.1. Construction

Any impacts which may arise during the construction phase are not envisaged to be significant due to the nature of the activity proposed, i.e., enabling works. As previously outlined, the construction period will be short term and any potential impacts will managed by the CEMP and will temporary in nature.

In the event that the roundabout upgrading works highlighted above are completed and access should be prevented to the undeveloped Zone A and F sites, interim closures of the access spurs shall be maintained by the applicant as per the example shown in Figure 15-17below (taken from the Grange Castle Business Park located in South Dublin).

Figure 15-17: Interim closure example of newly constructed access road

The contractor employed on site will enforce measures to ensure there are no disruptions to existing services. Additionally, the contractor will adhere to the requirements of Uisce Eireann, TII, Fingal County Council and ESB upon the permittance of the aforementioned connections required to and from the proposed development site.

15.7.2. Operational

Operational Mitigation measures will be assessed as part of the individual planning applications for the warehouse developments and has not been considered as part of this application.

15.8. Residual Impacts

Considering the nature of the project, together with a short construction duration, subject to appropriate mitigation measures as detailed in appropriate chapters of this report, it is expected that there will be no significant adverse direct, indirect or cumulative residual impacts on the existing and proposed material assets at the proposed development site

There will be no significant residual impacts to utilities due to the proposed development.

16. Cumulative Impacts and Interaction of the Foregoing

16.1. Introduction

This chapter assesses the cumulative and interactive impacts between various environmental aspects which could potentially arise from the proposed development.

Cumulative impacts comprise any alterations to the environment from an action, in combination with other actions. For example, cumulative impacts can include interactions between various effects or actions within the proposed development, together with interactions between surrounding developments in close proximity to the proposed development.

Interactive impacts address interactions between particular environmental aspects, for example, Air Quality and Population and Human Health. While many environmental factors are inter-related to some extent, the significant interactions and interdependencies were considered when preparing the Environmental Impact Assessment Report.

Consequently, these interactions were integrated into the individual Chapters 4 to 15 of this EIAR.

Each environmental factor which could potentially be implicated at the proposed development site has been considered as follows:

- Effects on Biodiversity
- Effects on Land, Soils and Geology
- Effects on Hydrology and Hydrogeology
- Effects on Air Quality together with Dust emissions
- Effects caused by Noise & Vibrations
- Effects on Archaeology & Cultural Heritage
- Effects on Landscape & Visual
- Impacts on Material Assets
- Impacts on nearby sensitive receptors

16.2. Guidance

Relevant guidance taken into consideration in the preparation of this Chapter includes:

- European Commission (1999) Guidelines for the Assessment of Indirect and Cumulative Effects as well as Impact Interactions, (Office for Official Publications of the European Communities 1999).

- EPA (2015) revised Guidelines on the information to be contained in Environmental Impact Statements, draft, 2015
- EPA (2015) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, Draft, 2015.
- EPA (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports
- Department of Housing, Planning and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanala on carrying out Environmental Impact Assessment

A summary of the general environmental interactions is presented in **Table 16-1 overleaf.**

Table 16-1: Potential Interactions (Where C= Construction; O= Operational)

Inter-relationship Matrix	Traffic & Transport	Noise & Vibration	Soils & Geology	Hydrology, Water Quality & Hydrogeology	Air Quality & Climate	Landscape & Visual	Biodiversity	Population & Human Health	Cultural Heritage	Waste Management	Material Assets
Traffic & Transport											
Noise & Vibration	CO										
Soils & Geology											
Water Quality & Hydrogeology	CO		CO								
Air Quality & Climate	CO		CO								
Landscape and Visual	C		C								
Biodiversity											
Population & Human Health	CO	C	CO	CO	C	C					
Cultural Heritage		.									
Waste Management	CO		C	C							
Material Assets											

16.3. Potential Interactions

16.3.1. Biodiversity and Landscape and Visual

As noted in Chapter 6 Biodiversity the residual impact upon the local receiving environment is predicted that the overall impact on the ecology of the proposed development will result in a long term minor adverse, not significant, residual impact on the ecology of the site and locality overall. The Landscape Visual Chapter 11 noted the proposed development and associated site works will have some modest impacts to landform and land cover at site scale, though in context of the wider setting, these will be minor and unlikely to be noticed beyond the immediate context of the site. Therefore, no residual impacts interactions from Biodiversity to the landscape and visual are anticipated.

16.3.2. Noise & Vibration and Hydrogeology

As previously outlined in Chapter 10, no significant noise generation is expected from the construction and/or operational phase of the proposed development. Vibration is also expected to be insignificant. Nonetheless, mitigation measures will be deployed to ensure that Noise and vibration for them proposed development are adequately controlled. Therefore, no significant residual impacts on the hydrogeological setting of the site is envisaged.

16.3.3. Noise & Vibration and Population and Human Health

Noise modelling was carried out as part of this assessment in order to determine potential impacts from noise on the surrounding population. In terms of construction noise, due to the short-term nature of the works together with appropriate mitigation measures to be deployed, potential health impacts associated with construction noise is not significant; providing that noise emissions are controlled to comply with the recommended significance thresholds (See Chapter 10).

An appointed contractor will be required to monitor levels of noise and vibration during critical construction periods at nearby sensitive locations and/or development site boundaries. Further details are outlined in Chapter 10.

16.3.4. Noise & Vibration and Biodiversity

As previously outlined, due to the short-term nature of construction phase, together with mitigation measures enforced, noise and vibration impacts are expected to be negligible.

The proposed development site comprises a greenfield site and is not considered to be of high ecological value. Additionally, there are no ecological sites of significance within or bounding the proposed development site.

Furthermore, the proposed development site is located adjacent to a primarily busy motorway; the M1. Therefore, this area would already be susceptible to some level of disruption due to nearby persistent traffic.

16.3.5. Traffic and Transportation and Hydrology

Accidental spills and leakages from trucks during both the construction and operational phase of the proposed development could potentially implicate the hydrological network in vicinity to the site.

Nonetheless, mitigation measures will be deployed in order to avoid negative impacts, which includes the enforcing of a Construction Environmental Management Plan (CEMP). The CEMP will address sufficient construction management practices that will be employed to circumvent the risk of pollution to hydrological networks surrounding the site.

16.3.6. Traffic and Transportation and Population and Human Health

A Construction Environmental Management Plan (CEMP) will be enforced once construction works commence onsite to ensure impacts on the surrounding road network are controlled and reduced where necessary.

With regards to Air Quality and Noise & Vibration which could potentially emanate from additional vehicles onsite during proposed works, it has previously been established in Chapters 9 and 10, that impacts on Air Quality and from Noise and Vibration will be short term and insignificant.

Impacts from the proposed development in relation to Air Quality and Noise & Vibration, (see Chapters 9 and 10, respectively) are expected to be imperceptible.

16.3.7. Biodiversity and Hydrology

Biodiversity and the hydrological network surrounding the site could be impacted if accidental fuel spillages were to occur. In order to circumvent this, a CEMP has been prepared and will be enforced by an appointed contractor once construction works commence.

Furthermore, ecological buffer zones will be implemented on site where required and along the watercourse, the Balrickard Stream (EPA Code 08B23) which is a minor tributary of the Bracken River, to safeguard the habitats and species of interest in proximity to the development site.

Construction and operational Mitigation Measures will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (ZoI) including the onsite drainage ditch, Balrickard Stream and Bracken River.

Once mitigation measures are implanted as outlined in Chapter 6 no residual impacts to Hydrology are anticipated.

16.3.8. Air Quality and Population and Human Health

Mitigation measures will also be deployed in order to reduce impacts from dust on the surrounding population, including, the locating of any noisy plant as far away from sensitive properties as is reasonably practicable and the use of vibration isolated support structures where necessary.

Furthermore, a Dust Management Plan (DMP) will be prepared in order to circumvent and minimise dust emissions from the site.

During unfavourable meteorological conditions, 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.

Additional measures to control impacts on Air Quality and dust suppression are outlined in Chapter 9 and in the CEMP.

16.3.9. Air Quality and Climate

Increased traffic associated with the proposed development during the construction phase are considered to be low, with a maximum of 36 daily heavy good vehicles (HGV) movements per day (total to and from the site).

Due to the small number of construction vehicles combined with the short duration of works, the potential impacts on climate from the proposed development is envisaged to be insignificant.

16.3.10. Landscape and Visual and Population and Human Health

Construction related visibility from public and residential receptors is inevitable. Nonetheless, construction works are expected to take place over a short period of time (c. 12-18 months). As a result, construction works are considered short term in nature.

The operational phase is not expected to have perceptible visual impacts from receptors in proximity. No additional screening or planting is required due to the scale of the proposed development and sites location adjacent to a busy motorway.

Furthermore, the proposed development does not require any significant excavation which will alter the landscape. The sites location is also fairly discrete, set in a sparsely populated area within a site which is predominantly surrounded by hedgerow vegetation.

The application site lands have an extremely limited visual influence on the surrounding area, and therefore, the surrounding population will not be impacted visually by the proposed development.

16.3.11. Land and Air Quality

The construction phase will involve excavation of land and soils. Nonetheless, there is limited potential impact on air quality during the short construction phase of the proposed development from construction dust and the potential for nuisance dust.

Additionally, dust minimisation measures, (see Chapter 7), together with the CEMP (see Appendix 4 of this report will be enforced to circumvent potential impacts on any nearby sensitive receptors.

16.3.12. Land and Noise & Vibration

As previously outlined, due to the short-term nature of construction phase, together with mitigation measures enforced, noise and vibration impacts are expected to be negligible.

16.3.13. Land and Cultural Heritage

Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the application site, topsoil-stripping should be monitored by a qualified archaeologist under licence from the national Monuments Service. Any archaeological material identified during archaeological monitoring should be preserved *in situ* or by record as appropriate under licence from the National Monuments Service.

16.3.14. Land and Water

The construction phase will require excavations and associated works which could potentially implicate the hydrological network in proximity of the site due to runoff.

Nonetheless, appropriate mitigation measures will be enforced, as outlined within the CEMP (see Appendix 4), which will detail measures to ensure no significant impacts are posed on the surrounding hydrological network as a result of the proposed development.

16.3.15. Air Quality and Biodiversity

Owing to the small number of construction vehicles and equipment to be used during the construction, together with the relatively short construction period, potential impacts to air quality are envisaged to be negligible.

Dust emissions during construction phase are expected to be limited due to extent of works which are of short duration. Nonetheless, numerous mitigation measures are proposed to ensure there are no significant impacts on Biodiversity.

16.4. Conclusions

The following conclusions were made in relation to the cumulative assessment:

Table 16-2: Consideration of Cumulative Impacts

Environmental Aspects	Discussion
Traffic & Transport	The analysis of the local road network has denoted that all junctions would operate within capacity for the construction phase during peak hours. As a result, it has been confirmed that impacts on the traffic network surrounding the site will be brief and will occur during peak hours only, being imperceptible negative in terms of magnitude. Thus, there are no cumulative impacts with regard to additional traffic from the proposed development site and the surrounding traffic network. Potential impacts during the operational phase will also be brief in terms of duration and will be moderate negative in terms of duration. Nonetheless, a suite of mitigation measures will be deployed in order to ensure no significant impacts are incurred on the surrounding road network during the construction and operational phase of the proposed development. Additionally, a Construction Traffic Management Plan, Construction Management Plan and Mobility Management Plan will detail measures

Environmental Aspects	Discussion
	to reach compliance as well as implement measures to promote sustainable transport (See Chapter 12 for further details).
Noise	Four Noise Monitoring Locations were selected for the noise survey within and in proximity to the site. Traffic from the M1 motorway was accountable for dominant noise from all four NML's. The predominant site activities during the construction phase will include site clearance, demolition works, ground excavation works and provision of infrastructure, road construction and landscaping. Potential impacts during the construction phase will be short term and negligible once mitigation measures are established. With regard to the operational phase, traffic information has been provided from Traffic Consultants (Clifton Scannell Emerson Associates Consulting Engineers) to Rowan, in order to predict future noise levels from additional traffic in the surrounding road network of the proposed development site. From the information provided, calculated noise levels were found to be less than 2.9 dB and are therefore considered negligible. On this basis, there will be no cumulative impacts with regard to Noise impacts. Nonetheless, numerous mitigation measures are to be deployed during the construction phase (See Chapter 10 for further details). Mitigation measures during the operational phase are unnecessary. With regard to the wider masterplan for the proposed development each unit will be subject to subsequent planning applications and may change from the indicative masterplan. Without very specific details on each unit, it is not possible to assess noise impact, other than it will be somewhat greater than what is currently present now. There will be cumulative impacts. However, the current noise climate is significant, due to the motorway presence, so it should be possible to include

Environmental Aspects	Discussion
	additional commercial operations within the development without significant impacts on the existing receptors.
Soils & Geology	There will be some moderate changes to soils and geology to the proposed development site during the construction and operational phase. Numerous mitigation measures will be enforced to ensure no significant impacts are incurred on the soils and geology of the site, for example, storage of waste fuels and materials in a designated area (See Chapter 8 for further detail). Effective implementation of the mitigation measures specified will result in there being no significant residual impacts on land, soils and geology as a result of the construction and operation of the Proposed Development, there are therefore no cumulative effects identified from the proposed project. Based on a review of the planning application viewer on 15 April 2024 there are no committed developments in proximity to the Proposed Development that are likely to give rise to cumulative impacts with it. An indicative masterplan for the M1 Business Park has been provided under separate cover. The masterplan is not currently permitted and does not form part of the Proposed Development. Should there be applications for planning permissions in the future that are consistent with the provided masterplan, an assessment will be completed as part of those future proposed developments of their cumulative impacts with then existing or approved developments. Currently, the total potential cumulative impact that it is practically possible to consider is set out below. The masterplan envisages the development of individual commercial/industrial plots within the Business Park, the specification or other details of which do not exist at this time. Broadly, should commercial/industrial plots be developed within the masterplan area

Environmental Aspects	Discussion
	consecutively, using best practice industry mitigation measures, the cumulative impacts in the construction phase are likely to be unchanged (slight to moderate) for geology, lands or soils for the reasons outlined in Section 7.6. Should the developments occur concurrently the erosion and compaction impacts are potentially moderate, direct, adverse, temporary impacts, however these impacts would be reduced imperceptible with the implementation of best practise measures as outlined in mitigation measures at Section 7.6. Operational stage impacts are likely to represent a permanent loss of soils as an agricultural resource. Should all the plots within the masterplan are be developed for industrial or commercial use, this would represent a likely, medium, direct, adverse, permanent effect with a moderate impact ranking. Other assessed impacts as present in Section 7.5 are likely to be unchanged.
Hydrology	Excavations required for enabling works could have the potential to impact the hydrological context surrounding the proposed development site. During the operational phase, the presence of the proposed development road, pathway and cycle land surfaces will cause a permanent change in drainage and surface flow patterns at the site. Additionally, spills/leaks from vehicles during both the operational and construction phase could potentially impacts hydrology. Nonetheless, potential impacts will be circumvented with a suite of mitigation measures deployed (See Chapter 8 for further details). A Construction Environmental Management Plan will also be enforced to avoid any potential significant impacts on the surrounding hydrological network of the proposed development site. One the appropriate mitigation measures have been implemented impacts during the construction and operational phase are deemed

Environmental Aspects	Discussion
	imperceptible therefore no cumulative effects identified from the proposed project. Based on a review of the planning application viewer on 15 April 2024 there are no committed developments in proximity to the Proposed Development that are likely to give rise to cumulative impacts with it. An indicative masterplan for the M1 Business Park has been provided under separate cover. The masterplan is not currently permitted and does not form part of the Proposed Development. Should there be applications for planning permissions in the future that are consistent with the provided masterplan, an assessment will be completed as part of those future proposed developments of their cumulative impacts with then existing or approved developments. Currently, the total potential cumulative impact that it is practically possible to consider is set out below. The masterplan envisages the development of individual commercial/industrial plots within the Business Park, the specification or other details of which do not exist at this time. Broadly, should commercial/industrial plots be developed within the masterplan area consecutively, using best practice industry mitigation measures, the cumulative impacts in the construction phase are likely to be identical for hydrology and hydrogeology (slight to moderate) to those assessed below for the Proposed Development. Broadly, during the operational stage should hard standing be increased across the plots it will reduce natural infiltration and required management of surface drainage with potential slight to moderate impacts on hydrology and hydrogeology. However, recharge to the bedrock aquifer is minimal at the Site and appropriately designed construction work mitigation measures and operational phase sustainable urban drainage systems are likely to reduce the cumulative impact to imperceptible on hydrogeology and hydrology.

Environmental Aspects	Discussion
Air Quality and Climate	When dust mitigation measures detailed in the mitigation section of Chapter 9, fugitive emissions of dust and particulate matter from the site will be minor and not significant in nature posing no nuisance at nearby receptors. Greenhouse gases (GHG) emissions from the proposed development site, including construction and operation, are of a minor scale with little contribution to overall emission levels on a regional or national scale. It was concluded that there would be no significant cumulative impacts, when considered with the other developments. On this basis, there will be no cumulative impacts with regard to air quality and dust emissions. With regard to the proposed indicative masterplan, traffic data has been considered in line with the traffic data presented within Chapter 12. Impacts to air quality from the proposed traffic numbers associated with the future indicative masterplan were deemed to negligible and imperceptible. Other impacts associated with the indicative masterplan at this stage of the project are unknown and should be assessed as part of the subsequent planning applications to be submitted for the individual warehouses when more detailed designs are available.
Landscape and Visual	Given the site's scale and its nature as enabling works, in preparation for future development, the proposed development is considered to be of modest consequence in terms of effects to landscape character and views. On this basis, there will be no significant cumulative impacts when considered with other developments. The only other consideration is the future development of the zoned business park that these enabling works will facilitate. In that future context, the enabling works represent a very minor and associated (required) component of the overall masterplan. The two elements

Environmental Aspects	Discussion
	should not be considered in isolation to each other or even cumulative to each other as they are integral parts of the same future development that is envisaged by the land-use zoning for this area. Neither would exist without the other in the planned future scenario. Notwithstanding, the enabling works are generally internal to the site and as it is developed in accordance with the masterplan, they will become increasingly screened by the business park developments, which will incorporate their own screen planting measures. These developments will each be subject to their own planning applications and assessments.
Biodiversity	Based on a review of the planning application viewer there are no committed developments in proximity to the subject site which are likely to give rise to cumulative impacts with it. Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant and localised. No significant cumulative effects are foreseen on biodiversity from cumulative impacts. The proposed development is also located within a wider masterplan area, the habitats of which have been outlined in the Fossit (2000) habitat map (**Figure 6.11**). The future development of the masterplan area will be subject to additional design, biodiversity impact assessment, mitigation and consent. This will include landscape design and biodiversity enhancement to mitigate effects if encountered. As with the current design for the proposed development ecological input will be incorporated into the design and mitigation measures will be in place. Based on a review of the planning application viewer there are no committed developments in proximity to the subject site which are likely to give rise to cumulative impacts with it. Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not

Environmental Aspects	Discussion
	significant and localised. No significant cumulative effects are foreseen on biodiversity from cumulative impacts.
Population and Human Health	There many positive impacts associated with the proposed development in terms of economy and employment. Other business park developments are likewise contributing in a similar positive manner. Any cumulative (adverse) impacts for the local communities, amenities and tourism resources would be associated with the potential for additional disruption in terms of noise, dust, traffic and visual amenity. However, after mitigation has been applied during the construction and operation of the proposed development no impacts are deemed to be imperceptible to low. Therefore no cumulative effects are identified to population and human health. With regard to the wider indicative masterplan currently proposed no specific mitigation measures are currently envisaged as required for the operational phase of the proposed development with respect to population and human health, with any impacts of the development considered positive. It is however noted that little detail is currently available on the businesses to occupy the proposed warehouses, these developments will be subject to subsequent planning applications and should be assessed in detail at the stage of planning application to ensure warehouse unit specific mitigation measures are identified.
Cultural Heritage	The proposed Project does not result in any direct or indirect impact on recorded archaeological monuments or protected structures. There will be no visual impacts from the proposed Project on the surrounding

Environmental Aspects	Discussion
	heritage resources therefore no cumulative impacts have been identified from the proposed development in relation to cultural heritage. In relation to the proposed masterplan a list of screened projects in the vicinity of the masterplan site which may lead to cumulative impacts was reviewed in the context of the cultural heritage assessment, and assessed to see if there are any interactions between the cultural heritage assessments and the projects. The assessment is detailed below. There are no known archaeological, architectural or cultural heritage assets present in the masterplan site. The proposed masterplan will have no direct impact on archaeological, architectural or cultural heritage. The list of screened projects in the vicinity of the masterplan site which may lead to cumulative impacts was reviewed in the context of the cultural heritage assessment. As there are no archaeological, architectural or cultural heritage assets present in the application site no effects will arise, and therefore no cumulative effects will arise.
Waste Management	Waste management for the project has been considered at design stage and a number of management strategies have been implemented to reduce waste impacts associated with the proposed project as detailed in **Chapter 13**. After the Design Approach, Waste Management Strategy and mitigation measures are implemented as along with the implementation of the CEMP and RWMP any residual impacts are considered not significant - imperceptible during the construction phase. As a result cumulative effects from the proposed development have not been identified. In relation to the proposed indicative masterplan no potential impacts are currently identified which could not be managed appropriately to reduce any impacts to low , insignificant. It is however noted that specific details on the operations to occupy the indicative warehouse units are

Environmental Aspects	Discussion
	unknown at this stage and will be subject to subsequent individual planning applications when detailed designs have been confirmed. Waste management impacts should be reviewed again at this stage when appropriate details are available to ensure envisaged impacts remain low insignificant once appropriate mitigation measures have been implemented.
Material Assets	After stakeholder engagement and mitigation measures have been implemented impacts to Material Assets it is expected that there will be no significant adverse direct, indirect or cumulative residual impacts on the existing and proposed material assets at the proposed development site. With regard to the indicative masterplan for the proposed development predicted impacts are likely to take place primarily during the construction and operational phase of the enabling works included within this planning application. However it is acknowledged that little detail is currently available for the masterplan in relation to Material Assets. The masterplan will be subject to subsequent planning applications and Material Assets impact assessment should be reviewed within these subsequent planning applications when more detailed designs are available.

Ultimately, no additional mitigation measures above those already provided for in Chapters 5 – 15 were required to account for potential cumulative impacts with other development.