



# JACOBS ISLAND



## Volume II

Environmental Impact Assessment Report

# JACOBS ISLAND VOL II

## Contents

### CHAPTER ONE | INTRODUCTION

1.1 BACKGROUND CONTEXT.....	1
1.2 PURPOSE OF EIA.....	1
1.3 EIA METHODOLOGY.....	2
1.4 EIA SCREENING & SCOPING.....	3
1.5 PURPOSE & STRUCTURE OF THE EIAR.....	4
1.6 EIAR TEAM & QUALIFICATIONS.....	5
1.7 CUMULATIVE IMPACTS .....	8
1.8 DIFFICULTIES ENCOUNTERED .....	9
1.9 AVAILABILITY OF EIAR DOCUMENTATION.....	9
1.10 EIAR QUALITY CONTROL & REVIEW .....	9

### CHAPTER TWO | PROJECT DESCRIPTION

2.1 INTRODUCTION .....	1
2.2 DESCRIPTION OF THE PROJECT.....	1
2.3 EXISTING ENVIRONMENT/BASELINE SCENARIO .....	1
2.4 CONSTRUCTION PHASE.....	5
2.5 OPERATIONAL PHASE .....	8
2.6 IMPACT ASSESSMENT .....	10
2.7 MITIGATION, MONITORING & RESIDUAL IMPACTS .....	11
2.8 REFERENCES.....	14

### CHAPTER THREE | ALTERNATIVES CONSIDERED

3.1 INTRODUCTION .....	1
3.2 ALTERNATIVE LOCATIONS .....	1
3.3 DO-NOTHING ALTERNATIVE.....	1
3.4 ALTERNATIVE USES .....	2
3.5 ALTERNATIVE LAYOUTS.....	2
3.6 COMPARISON OF ENVIRONMENTAL IMPACTS – CONSTRUCTION PHASE .....	9
3.7 COMPARISON OF ENVIRONMENTAL IMPACTS – OPERATIONAL PHASE .....	10
3.8 MAIN REASONS FOR THE OPTION CHOSEN.....	12

### CHAPTER FOUR TOWNSCAPE & VISUAL

4.1 INTRODUCTION .....	1
4.2 RELEVANT LEGISLATION, PLANNING POLICIES & GUIDANCE .....	1
4.3 METHODOLOGY .....	7
4.4 BASELINE ENVIRONMENT.....	15
4.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT .....	17
4.6 POTENTIAL EFFECTS (RESIDUAL EFFECTS) .....	17
4.7 MITIGATION MEASURES .....	23
4.8 MONITORING .....	23
4.9 SUMMARY .....	24





CHAPTER THIRTEEN | POPULATION AND HUMAN HEALTH

13.1 INTRODUCTION .....	1
13.2 DESCRIPTION OF EXISTING BASELINE ENVIRONMENT .....	2
13.3 LAND USE .....	6
13.4 IMPACT ASSESSMENT .....	15
13.5 MITIGATION MEASURES & MONITORING.....	26
13.5 CUMULATIVE IMPACTS.....	27
13.6 DIFFICULTIES IN COMPILING INFORMATION .....	27
13.7 REFERENCES .....	28

CHAPTER FOURTEEN | INTERACTION OF IMPACTS

14.1 CHAPTER AUTHOR .....	1
14.2 CHAPTER CONTEXT .....	1
14.3 DESCRIPTION OF SIGNIFICANT INTERACTIONS .....	1

CHAPTER FIFTEEN | SUMMARY OF MITIGATION MEASURES

15.1 INTRODUCTION .....	1
15.2 MITIGATION MEASURES PROPOSED .....	1



JACOBS ISLAND



CHAPTER ONE  
Introduction

# CHAPTER ONE

## Contents

I	Introduction .....	I
1.1	BACKGROUND CONTEXT .....	1
1.2	PURPOSE OF EIA .....	1
1.3	EIA METHODOLOGY.....	2
1.4	EIA SCREENING & SCOPING .....	3
1.5	PURPOSE & STRUCTURE OF THE EIAR.....	4
1.6	EIAR TEAM & QUALIFICATIONS .....	5
1.7	CUMULATIVE IMPACTS .....	8
1.8	DIFFICULTIES ENCOUNTERED .....	9
1.9	AVAILABILITY OF EIAR DOCUMENTATION .....	9
1.10	EIAR QUALITY CONTROL & REVIEW .....	9

# CHAPTER ONE

## INTRODUCTION

### 1.1 BACKGROUND CONTEXT

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of Hibernia Star Limited to assess the likely significant environmental effects of a proposed Strategic Housing Development [SHD] at Jacob's Island, Ballinure, Mahon, Co. Cork.

The EIAR has been completed in accordance with Directive 2011/92/EU (as amended by 2014/52/EU) and relevant Irish legislation as well as in conformity with guidance in the European Commission's 'Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report' (2017) and EPA's Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (2022).

The site is located within the wider settlement of Mahon as illustrated in Figure 1.1 as shown.



Figure 1.1 Site Location Map

The proposed development consists of the construction of a Strategic Housing Development of 489 no. apartments, creche and offices in 5 no. buildings ranging in height from part-1 to part-8 no. storeys over lower ground and semi-basement podium levels. The proposed development will be constructed on lands of c. 3.95 hectares in area in Jacob's Island, to the south of the N40 South Link Road. A full description of the proposed development is provided in Chapter 2 of this EIAR.

### 1.2 PURPOSE OF EIA

EIA requirements are now governed by Directive 2014/52/EU, which amends Directive 2011/92/EU ("the EIA Directive"). The primary function of the EIA Directive is to ensure that projects that are likely to have significant effects on the environment are subjected to an assessment of their likely impacts.

Ireland's obligations under the EIA Directive have been transposed into Irish law and, in particular, the planning consent process through the provisions of Part X of the Planning and Development Act 2000, as amended, and the Planning and Development Regulations, 2001, as amended.

Article 1(1)(g) of the 2014 EIA Directive (2014/52/EU) outlines the stages and steps taken when completing an EIA.

- i. the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);
- ii. the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;
- iii. the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;
- iv. the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and
- v. the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a.

This is reflected in Article 171A of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which states that 'Environmental Impact Assessment' means a process—

- (a) consisting of—
  - i. the preparation of an environmental impact assessment report by the applicant in accordance with this Act and regulations made thereunder,
  - ii. the carrying out of consultations in accordance with this Act and regulations made thereunder,
  - iii. the examination by the planning authority or the Board, as the case may be, of—
    - (I) the information contained in the environmental impact assessment report,
    - (II) any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and
    - (III) any relevant information received through the consultations carried out pursuant to subparagraph (ii)



- iv. the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and
  - (v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and
- (b) which includes—
- (i) an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following:
    - (I) population and human health;
    - (II) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;
    - (III) land, soil, water, air and climate;
    - (IV) material assets, cultural heritage and the landscape;
    - (V) the interaction between the factors mentioned in clauses (I) to (IV), and
  - (ii) as regards the factors mentioned in subparagraph (i)(I) to (V), such examination, analysis and evaluation of the expected direct and indirect significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents or disasters, or both major accidents and disasters, that are relevant to that development;

This EIAR has been prepared in accordance with the relevant provisions of the EIA Directive, the Planning and Development Acts and Planning and Development Regulations. In addition, the EIAR conforms to the guidance contained in the relevant EU and Irish guidance in respect of the preparation of an EIAR.

The objective of the EIA Directive is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for EIA, prior to development consent being given, of developments that are likely to have significant effects on the environment.

In addition to the legislation and guidelines referenced above, the Department of Housing, Local Government and Heritage's 'Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment' (2018) provide practical guidance to An Bord Pleanála on procedural issues and the EIA process, and outline the key changes introduced by Directive 2014/52/EU.

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

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

The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and the environmental impact assessment should identify, describe and assess in an appropriate

manner, in the light of each individual case, the direct and indirect significant effects of a project on the prescribed environmental factors which are:

- (a) population and human health;
- (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- (c) land, soil, water, air and climate;
- (d) material assets, cultural heritage and the landscape;
- (e) the interaction between the factors referred to in points (a) to (d).

The EPA published 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports', in May 2022. This EIAR has been prepared having regard to this guidance.

This EIAR documents the assessment process of the prescribed environmental factors in relation to the proposed strategic housing development at Jacob's Island, Ballinure, Cork.

## 1.3 EIA METHODOLOGY

As per Article 5(1) of the 2014 Directive, an EIAR should provide the following information:

- Description of Project;
- Description of Baseline Scenario;
- Description of Likely Significant Effects;
- Description of Avoidance / Mitigation Measures;
- Description of Reasonable Alternatives (and rationale for chosen option); and
- A Non-Technical Summary.

Annex IV of the Directive sets out a more detailed outline of the information required in an EIAR. The subject EIAR has been prepared in full accordance with these stated requirements of Annex IV.

In addition to the 2014 Directive, this EIAR has been informed by, but not limited to:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, (Department of Housing, Local Government and Heritage, August 2018);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, (EPA, May 2022);
- Environmental Impact Assessment of Projects: Guidance on Screening (European Commission, 2017);
- Environmental Impact Assessment of Projects: Guidance on Scoping (European Commission, 2017);
- Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Advice Notes for Preparing Environmental Impact Statements, Draft, (EPA, September 2015);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union, 2013).
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems - Key Issues Consultation Paper, Department of Housing, Planning, Community and Local Government, 2017.
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017).

We would also note that the pre-application discussions with the Planning Authority informed the content of the EIAR. The EIA process has been managed to ensure that the EIAR documentation and relevant analysis are confined to topics which are explicitly described in the legislation, and where environmental impacts may arise. Evaluation and analysis have been limited to topics where the indirect, secondary or cumulative impacts are either wholly or dominantly due to the project under consideration.

The EIA process can be broadly described as set out in figure 1.2 as shown.

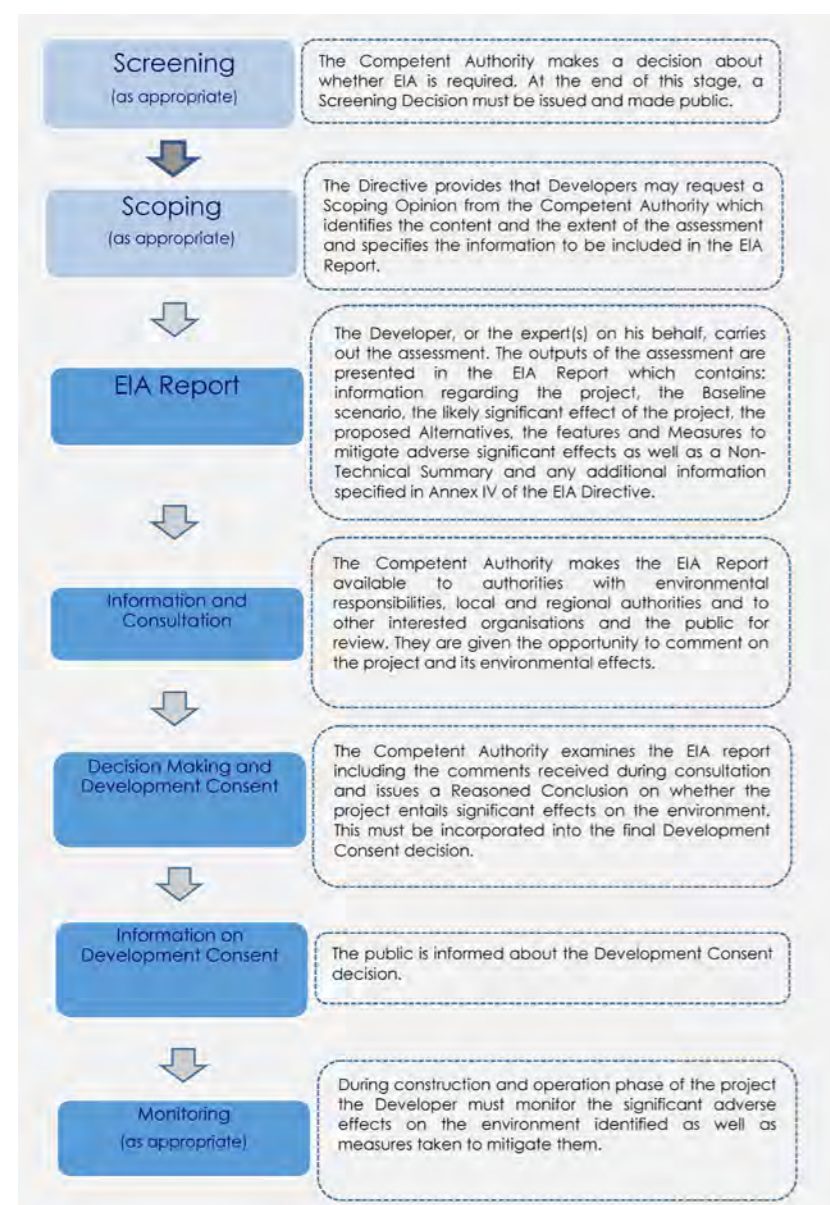


Figure 1.2 EIA Process (Source: Page 12 of Preparation of guidance documents for the implementation of EIA Directive (Directive 2011/92/EU as amended by 2014/52/EU).

## 1.4 EIA SCREENING & SCOPING

Screening is the term used to describe the process for determining whether a proposed development requires an EIA by reference to mandatory legislative threshold requirements or by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

Article 93 of, and Schedule 5 to, the Planning and Development Regulations 2001 set out the classes of development for which a planning application must be accompanied by an environmental impact assessment report (EIAR).

Part 1 and Part 2 Schedule 5 of the Planning and Development Regulations, 2001 prescribes the categories of, and thresholds for, prescribed development requiring EIA.

The subject proposal does not come under any of the prescribed development contained in Part 1 of Schedule 5.

By way of example, paragraph 10(b) of Part 2 of Schedule 5, which refers to Infrastructure Projects includes, includes:

- “(i) Construction of more than 500 dwellings
- (ii) Construction of a car-park providing more than 400 spaces, other than a car-park provided as part of, and incidental to the primary purpose of, a development.
- (iii) Construction of a shopping centre with a gross floor space exceeding 10,000 square metres.
- (iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.

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

However, Section 172 of the 2000 Act also sets out the basis on which an EIA will be required for such a “sub-threshold” development. In accordance with Schedule 7 (1)(B) the Criteria for determining whether development listed in Part 2 of Schedule 5, the assessment of whether a project should be subject to An Environmental Impact Assessment should include:

“cumulation with other existing development and/or development the subject of a consent for proposed development for the purposes of section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment”.

Based on the provision of Schedule 7 (1)(B) and in cumulation with other development on Jacob’s Island including the permitted Strategic Housing Development scheme (Reg. Ref. ABP-301991-18, as amended by ABP-310378-21) for 437 no. residential units, retail space and childcare facility and proposed Hotel & Office scheme (currently at Request for Further Information stage) (Cork City Council Reg. Ref. 22/40809), an EIA is considered to be required.

In circumstances where, as in this case, a planning application for a sub-threshold development is accompanied by an EIAR and a request for a screening determination was not made, then the application shall be dealt with as if the EIAR

had been submitted in accordance with section 172(1) of the Act.

EIA Scoping is the process of determining the content and extent of the matters which should be considered in the environmental information contained in an EIAR.

The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, (EPA, May 2022) state that scoping is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. Scoping is defined in the European Commission EIAR guidance (EC, 2017) as:

“The process of identifying the content and extent of the information to be submitted to the Competent Authority under the EIA process.”

Whilst section 7(1)(b) of the Planning and Development (Housing) and Residential Tenancies Act 2016, as amended, enables a request for a scoping opinion to be submitted to An Bord Pleanála, such a scoping opinion is not mandatory and was not sought in this instance. Rather, in this case, the content of this EIAR was informed by an informal scoping process carried out by the applicant, the design team and appointed EIAR consultants to identify the core issues likely to be most important during the Environmental Impact Assessment process.

In determining the extent and content of this EIAR, the authors have carefully considered the applicable EU and Irish legislative requirements, relevant EU and Irish guidance and pre-planning consultation meetings held with Cork City Council and An Bord Pleanála in accordance with Section 247 and Section 5 of the Planning and Development Act 2000. In addition, the following prescribed bodies were notified of the extent of the proposed development and of the fact that an EIAR was being prepared:

1. Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media
2. The Heritage Council
3. An Taisce
4. Irish Water
5. Transport Infrastructure Ireland
6. National Transport Authority
7. Cork City Childcare Committee
8. Irish Aviation Authority
9. Operator of Cork Airport
10. National Parks and Wildlife Services
11. Department of Housing, Local Government, and Heritage
12. Inland Fisheries Ireland (Southwest Region)
13. Office of Public Works

The particulars sent to the above bodies are contained in Appendix 1-1 with any responses received contained in Appendix 1-2.

## 1.5 PURPOSE & STRUCTURE OF THE EIAR

The primary purpose of this EIAR is to inform the EIA process, by identifying likely significant environmental impacts resulting from the proposed development, to describe the means and extent by which they can be reduced or mitigated, to interpret and communicate information about the likely impacts and provide an input into the decision-making planning process.

The fundamental principles to be followed when preparing an EIAR are:

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

The EIAR document provides information on any identified effects arising as a consequence of the proposed development. The EIAR documents the manner in which the project design incorporated mitigation measures; including impact avoidance, reduction or amelioration; to explain the manner in which significant effects will be avoided.

The key purpose of this EIAR document is to enable the competent authority to form a reasoned conclusion, in the context of the decision-making process, on the significant effects of the project on the environment, based on the examination of the EIA Report.

Pursuant to the provisions of Article 5(1) of the EIA Directive, where an environmental impact assessment is required, the developer shall prepare and submit an EIAR which shall include at least:

- (a) a description of the project comprising information on the site, design, size and other relevant features of the project;
- (b) a description of the likely significant effects of the project on the environment;
- (c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
- (d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
- (e) a non-technical summary of the information referred to in points (a) to (d); and
- (f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

The EIAR shall include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. In addition, the developer shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under European Union or national legislation, in preparing the EIAR.

The EIAR is divided into 3 volumes:

- the non-technical summary comprising a concise, but comprehensive description of the project, its environment, the effects of the project on the environment, the proposed mitigation measures, and the proposed monitoring arrangements;
- The main report consisting of 15 chapters as outlined in the table of contents;
- The Appendices numbered in accordance with the chapter that they relate to.

Each chapter includes the following elements:

#### **Introduction and Methodology**

#### **Description of Existing Environment/Baseline Scenario**

**Impact Assessment** which considers the following effects as necessary.

- Indirect Effects
- Cumulative Effects.
- Do-Nothing Effects
- Worst Case Effects
- Indeterminable Effects
- Synergistic Effects

**Mitigation Measures (including Monitoring)** – Description of mitigation measures proposed for both construction and operational phases of the proposed development.

#### **Residual Impacts**

**Identify, and assess significance of, any residual impacts.**

**Difficulties in Compiling Information** - Any difficulties/restrictions on gathering information if applicable is stated.

**References** - Any external references in the report cited and listed at the end of each chapter.

All impacts or effects are described in following terms as in accordance with the “Description of Effects” outlined in Table 3.4 of the 2022 EPA Guidelines on Information to be Contained in Environmental Impact Assessment Reports.

**Quality:** Positive, Neutral, Negative/Adverse

**Significance:** Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, Profound

**Extent:** Size of area, the number of sites and proportion of a population etc.

**Context:** How the effect’s extent, duration or frequency compares to established conditions.

**Probability:** Likely, unlikely

**Duration:** Momentary (seconds to minutes); Brief (less than a day), Temporary <1 yr; Short-term 1-7 yrs, Medium Term 7-15yrs, Long Term 15-60 yrs, Permanent >60 yrs, Reversible (can be undone), Frequency (once, rarely, occasionally, frequently, constantly or hourly, daily, weekly, monthly, annually).

A Natura Impact Statement has also been prepared regarding the proposed development. Following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests of the SAC and SPA and the implementation of the proposed mitigation measures, it has been concluded by the authors of this report that the project will not have any adverse effects on the integrity of the Great Island Channel Special Area of Conservation (SAC) and Cork Harbour Special Protection Area (SPA), or any European site.

## **1.6 EIAR TEAM & QUALIFICATIONS**

HW Planning has coordinated the subject EIAR. Environmental specialist consultants were also commissioned for the various technical chapters of the EIAR document which are mandatorily required as per the EIA Directive and Planning and Development Regulations 2018.

The amended EIA Directive (Directive 2014/52/EU) states the following in relation to the persons responsible for preparing the environmental impact assessment reports:

“Experts involved in the preparation of environmental impact assessment reports should be qualified and competent. Sufficient expertise, in the relevant field of the project concerned, is required for the purpose of its examination by the competent authorities in order to ensure that the information provided by the developer is complete and of a high level of quality”

Each environmental specialist was required to characterise the receiving baseline environment; evaluate its significance and sensitivity; predict how the receiving environment will interact with the proposed development and to work with the EIA project design team to devise measures to mitigate any adverse environmental impacts identified.

In accordance with the EIA Directive 2014/52/EU, we confirm that the EIAR has been carried out by fully qualified and competent experts in their relevant fields as outlined in this chapter. A full list of all consultants and the corresponding chapters that have been prepared is detailed below.

**Planning Consultants:** HW Planning

**Address:** 5 Joyce House, Barrack Square, Ballincollig, Co. Cork

**Chapters Prepared:** Chapter 1 – Introduction, Chapter 2 - Project Description, Chapter 3 - Alternatives Considered, Chapter 13 - Population & Human Health, Chapter 14 - Interaction of Impacts and Chapter 15 - Summary of Mitigation Measures

**Personnel:** Harry Walsh, (BA HONS, Master of Regional and Urban Planning, MIPI), Director at HW Planning.

Harry has 22 years' experience in the planning profession comprising Local Authority roles and private practice. Harry has acted as planning lead on a wide variety of projects which have required EIAR's including the development of the 'Shannonpark Urban Expansion Area' in Carrigaline, Co. Cork and the proposed expansion of the whiskey maturation facility at Ballymona North, Dungourney, Co. Cork on behalf of Irish Distillers Limited.

**Landscape and Visual Impact Architects:** Aecom

**Address:** 1<sup>st</sup> Floor, Montrose House, Carrigaline Road, Douglas, Cork

**Chapters Prepared:** Chapter 4 – Landscape & Visual Impact

**Personnel:** Katheryn Blade, Landscape Architects/LVIA, Joerg Schulze, Associate Director.

Kathryn Blade is a Landscape Architect who has specialist experience in conducting Landscape and Visual Impact assessments for projects ranging from urban and suburban developments to renewable energy projects as well as industrial, electricity, and road infrastructure developments. She has a comprehensive track record in developing and managing landscape and visual impact assessments for both public and private clients. Kathryn is currently a Licentiate Member of the Landscape Institute and is on the pathway to achieving full Chartership (CMLI) status. Kathryn holds a BSc (Hons) in Landscape Architecture from University College Dublin. She is currently undertaking an RTPI and IPI accredited Professional Master's program in Spatial Planning with Technical University Dublin (former DIT). Kathryn has developed and prepared EIA & EIAR chapters as part of the AECOM Landscape and Visual Impact Assessment team, including character assessments, feasibility studies, site suitability assessments and associated mapping. She has also produced residential visual impact assessments of individual private properties, manages the production of photomontages and the preparation of ZTV/TVI mapping and has been supervising the required maintenance period for mitigation planting schemes.

Joerg Schulze is a qualified Landscape Architect since 2003 and a corporate member of the Irish Landscape Institute since 2008. He has over 18 years' professional experience working for clients in the private and public sectors. He has a comprehensive track record in developing and managing landscape and visual impact assessments of large residential, commercial, industrial, infrastructural, renewable energy, tourism and civic developments throughout the island of Ireland. He has extensive experience in all stages of the planning, design, tender and implementation process, contract management and as consultant for EIAR, EIA and Part 8 applications. He has also prepared residential visual impact assessments, manages the production of photomontages and the preparation of zones of theoretical visibility and theoretical visual intensity mapping. Joerg is a regular expert witness at Oral Hearings.

**Project Civil Engineers/Traffic Consultants:** Sweco

**Address:** Sweco, Glandore, 3<sup>rd</sup> Floor City Quarter, Lapps Quay, Cork

**Chapters Prepared:** Chapter 5 - Material Assets – Traffic & Transportation and Chapter 8 – Water (Hydrology and Hydrogeology)

**Personnel:** Tara O'Leary, Technical Director, John Ryan (Technical Manager), Mary Creedon B.E. (Civil), Chartered Engineer MIEI MIHT.

## Chapter 5

Tara O'Leary CTPP (Chartered Transport Planning Professional) BEng (Hons) MIGHT, has over 20 years' experience in the transport planning and engineering industry.

John Ryan (Bachelor of Civil and Environmental Engineering, Chartered Engineer, Masters In Business Economics) has over 16 years experience on traffic and transportation projects across Ireland and the UK. He has successfully designed and managed a range of public and private sector projects including design and construction of roads, Active Travel projects, cycleways, bridges, public realms, shared spaces and canal projects. John has excellent experience in road design, road safety, traffic assessment, DMURS and the National Cycle Manual. He has a comprehensive track record in developing and managing transportation projects for residential, commercial, industrial, infrastructural, renewable energy, tourism and civic developments throughout the island of Ireland. He has extensive experience in all stages of the planning, design, tender and implementation process, contract management and as consultant for planning applications. John has fulfilled the role of expert witness at Oral Hearings.

## Chapter 8

Mary Creedon B.E. (Civil), Chartered Engineer MIEI, MIHT, has over 34 years' experience in civil engineering (drainage and hydrology) and the construction industry.

**Project Structural and M & E Engineers:** MMOS Consulting, Civil & Structural Engineers

**Address:** MMOS, Lane Business Park, Monahan Road, Cork

**Chapters Prepared:** Chapter 6 - Material Assets – Services, Infrastructure & Utilities and Chapter 7 – Land & Soils

**Personnel:** Martin Murphy BSc Eng CEng FIEI, Director and Bianca Leonessa BEng (Hons) MIEI, Civil Structural Engineer

Martin is a director of MMOS with 22 years' experience as a consulting Civil and Structural Engineer. Martin is a chartered engineer and is a fellow of Engineers Ireland. Martin has direct experience in a number of projects in the vicinity of the proposed development as follows:

- Jacobs Island Residential Development (2001 – 2009)
- Mahon Point Retail Part circa 2007.
- City Gate Office Development (2004 – 2008)
- City Gate Park Office Development (2011 – 2014)

Bianca is a Civil & Structural Engineer with 3 years' experience in Ireland, working mainly on housing developments from planning stage to detailed design and site works inspections. She holds a BEng (Hons) in Civil Engineering from the Federal University of Technology in Parana, Brazil, and she is a member of Engineers Ireland.

**Project Ecologist:** Atkins Ireland

**Address:** Unit 2B, 2200 Cork Airport Business Park, Cork, T12 R279

**Chapters Prepared:** Chapter 9 - Biodiversity

**Personnel:** Dr. Paul O' Donoghue (BSc PhD CEnV MCIEEM), Associate Director, John Deasy, (BSc in Environmental and Earth Systems; an MSc in Marine Science and an MSc in Ecological Assessment Ecologist), Caroline Shiel (Ph.D), Ross Macklin PhD (candidate), B.Sc. (Hons) MCIEEM., MIFM, HDip GIS, PDip IPM

Paul O'Donoghue has over 18 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e. Appropriate Assessment under Article 6(3) of the EU Habitats Directive). Paul carried out the technical review of this report.

John Deasy has 6 years' experience as an ecologist. John previously worked with Atkins, but now operates as a freelance ecologist with extensive experience in habitat surveying; mammal and bird surveys etc. John undertook the preliminary ecological survey of the site.

Caroline Shiel has 30 years' experience in the field of bat research and in conducting bat surveys. Her B.Sc. thesis was an investigation of the diet of four species of Irish bat. This research was published in the Journal of Zoology, London. Her Ph.D. research was on the ecology of the internationally important Leisler's bat, *Nyctalus leisleri* in Ireland, conducted using radio-telemetry. Caroline has extensive experience in carrying out bat surveys for building, road construction and wind farm construction. She also routinely undertakes badger surveys, in relation to road construction and other development projects, as well as surveys of invasive plant species. Caroline also routinely conducts bat, otter, freshwater crayfish and bird surveys in relation to masonry bridges for local authorities as part of their bridge rehabilitation programmes. Caroline has been employed as an Ecological Clerk of Works (ECOW) to supervise and provide advice on ecological and environmental issues for numerous infrastructural project.

Ross Macklin is an aquatic, fisheries and mammalian ecologist with over 15 years' professional experience in Ireland. He is director of Triturus Environmental Ltd. Ross has a BSc in Applied Ecology and diplomas in integrated Pest Management and GIS. He is currently completing his PhD in fisheries ecology. He has considerable experience in a wide range of ecological and environmental projects including EIAR, EclA, CEMP and AA/NIS reporting, as well as biodiversity, water quality monitoring, invasive species, mammalian surveys and fisheries management. He also has expert identification skills in fisheries, macrophytes, freshwater invertebrates and protected species. His diverse project experience includes work on renewable energy developments, flood relief schemes, road schemes, waste management, blueways/greenways, biodiversity projects, non-volant mammal monitoring, fisheries management projects and catchment wide water quality management. He has worked extensively within the catchment of Cork Harbour on mammal monitoring projects for Pfizer, Irving Oil, Cork LNG and Transport Infrastructure Ireland and is an expert in his field. He recently completed and was lead author of the Dublin City Otter survey which was the largest urban otter survey completed in the history of the state. He also has conducted numerous badger surveys over his career and has been trained by the mammal society in the use of trail camera technology.

**Environmental Consultant:** AWN Consulting

**Address:** The Tecpro Building, Clonshaugh Business & Technology Park, Dublin 17

**Chapters Prepared:** Chapter 10 - Noise & Vibration, Chapter 12 – Air Quality & Climate

**Personnel:** Niamh Nolan, Environmental Consultant BSc MSc AMIAQM AMIEnvSc and Leo Williams Acoustic Consultant

Niamh Nolan is an environmental consultant in the air quality and climate section of AWN Consulting. She holds a BSocSci (Hons) in Social Policy and Geography from University College Dublin. She is an Associate Member of the Institute of Air Quality Management (AMIAQM) and the Institute of Environmental Science (AMIEnvSc). She has experience in mapping software primarily in QGIS and she specialises in the area of air quality, climate and sustainability.

Leo Williams, Acoustic Consultant at AWN Consulting. Holds a BAI and MAI in Mechanical & Manufacturing Engineering from Trinity College Dublin. He has completed the Institute of Acoustics (IoA) Diploma in Room Acoustics and Noise Control and is a Member of the IoA. He has over 5 years' experience as an environmental consultant specialising in Acoustics and Environmental Impact Assessment. He has authored numerous EIAR chapters for various developments including residential schemes, mixed-use developments, greenways and wind farms.

**Built Heritage/Archaeology:** Lane Purcell

**Address:** Eithne Ville, 64 Father Mathew Road, Turners Cross, Cork

**Chapters Prepared:** Chapter 11 - Cultural Heritage

**Personnel:** Musetta O'Leary (BA Archaeology and Geography, NUI Cork, 1998. MA Archaeology, NUI Cork, 2000.)

Musetta has over 15 years of experience in all aspects of archaeological consultancy. She has co-ordinated and authored the Cultural Heritage section of numerous diverse EIAR projects for road construction, industrial, residential and sporting developments, energy delivery and quarrying. She has presented expert witness evidence at numerous oral hearings.

Some of the various projects include the M20 Cork to Limerick Motorway; Belvelly Port Facility, Marino Point, Co. Cork; Horizon Mall, Parkway, Co. Limerick; Horgan's Quay Mixed Use Development, Cork City; Shannon LNG Terminal, Co. Kerry and Coolbane Quarry, Co. Cork.

**Project Architects:** O'Mahony Pike Architects

**Address:** One South Mall, Cork

**Chapters Prepared:** N/A

**Personnel:** Conor Kinsella, B.Sc.Arch.Sc., B.Arch., MRIAL, (DIRECTOR).

After studying in Dublin and Barcelona, Conor joined OMP in 1996 and set up the Cork Office in 2005. Furthering OMP's competencies in housing, he instigated and led research projects, developing a two-storey family housing model for Dublin, deliverable at densities of between 35-50/Ha, subsequently feeding into projects such as Pelletstown and Adamstown. He developed a dual-aspect apartment model for the London/UK market that incorporates the new London Housing Design Guide's standards while improving on the efficiency of the corridor single aspect schemes that prevail in the UK. More recently, Conor has developed affordable models for the delivery of apartments, particularly within the Build-to-Rent sector. He was involved in the stakeholder working group (set up by the Department of Housing, Planning & Local Government) to review, assess and advise on the 2018 Design Standards for New Apartments. Conor has been part of many competition successes with OMP, such as the Ballymun Housing, Cherry Orchard Affordable Housing, City Block 3 and City Block 9 in Docklands, Hanover Quay Development, Rathmines Swimming Pool, European and Battersea Power Station Ph. 1 competition.

## 1.7 CUMULATIVE IMPACTS

The potential environmental effects of the proposed development have not been assessed in isolation and other relevant permitted or proposed projects in the vicinity of the site which may result in cumulative environmental impacts have also been considered. Each of the projects listed in Table 1.1 have been assessed for potential cumulative impacts. These projects were identified by using Cork City Council's Planning Enquiry Systems and An Bord Pleanála's website.

Application Reference	Applicant(s)	Description	Outcome/Current Status
ABP Ref.: TA28.313216	Estuary View Entreprises 2020 Limited	'The Meadows' Bessborough	Due 25 <sup>th</sup> July 2022
ABP Ref.: TA28.313206	Estuary View Entreprises 2020 Limited	'The Farm' Bessborough	Due 25 <sup>th</sup> July 2022
Cork City Council Ref.: 22/40809	Hibernia Star Limited	Construction of an office and hotel development at Jacob's Island, Ballinure, Mahon, Cork	Request for Further Information
ABP Ref.: TR28.310378	Montip Horizon Limited	Amendments to previously permitted strategic housing development reference ABP-301991-18 to increase the number of units from 413 no. units to 437 no. units and amendments to Blocks 4, 7, 8, 9 and 10 at Jacob's Island, Ballinure, Mahon, Cork	Granted (11 <sup>th</sup> February 2022)
Cork City Council Ref.: 19/38875	O'Flynn Construction Co. Unlimited Company	Construction of 12,004 sq m of office floorspace at Blackrock Business Park, Bessboro Road, Mahon, Cork	Granted (11 <sup>th</sup> March 2020)
Cork City Council Ref.: 18/37820 and ABP Ref. PL. 302784	Bessboro Warehouse Holdings Limited	Demolition of the existing buildings and construction of 135 no. residential units at Bessboro Road, Mahon, Cork	Granted (28 <sup>th</sup> February 2019)
ABP Ref.: TA.301991.	Montip Horizon Limited	Construction of 413 no. apartments, neighbourhood centre, creche, road improvement works including upgrades to the Mahon Link Road (R852) to the North of the N40 interchange to incorporate a dedicated bus lane and all site development works at Jacob's Island, Ballinure, Mahon, Cork	Granted (3 <sup>rd</sup> October 2018)

Table 1.1 Cumulative Impacts

### 1.7.1 PLANS

The zoning and policy objectives for the site are those in the Cork City Development Plan 2015-2021 until the Cork City Development Plan 2022-2028 comes into effect on the 8<sup>th</sup> August 2022. The 2014 Mahon Local Area Plan (LAP) has lapsed. As a reference document it outlines the City Council's policy objectives for the subject lands and the wider Jacob's Island.

The Plans considered were the Cork City Development Plan 2015-2021, Draft Cork City Development Plan 2022 -2028 and the Mahon Local Area Plan 2014.

#### Cork City Development Plan 2015 - 2021

The Cork City Development Plan (CDP) outlines policies and objectives for realising the vision for Cork City through a series of seven interconnected goals. These goals aim to:

- increase population and households to create a compact sustainable city;
- to achieve a higher quality of life, promote social inclusion and make the city an attractive and healthy place to live, work, visit and invest in;
- to support the revitalisation of the economy;
- to promote sustainable modes of transport and integration of land use and transport;
- to maintain and capitalise on Cork's unique form and character; to tackle climate change through reducing energy usage, reducing emissions, adapt to climate change and mitigate against flood risk; and
- to protect and expand the green infrastructure of the city.

The selected development scenario in the Core Strategy focuses development in the City Centre and selected Key Development/Regeneration Areas and Key Centres. The CDP identifies South Mahon as one such 'Key Development Area'.

#### Draft Cork City Development Plan 2022 – 2028

The Core Strategy of the Draft Plan identifies South Mahon as a 'City Regeneration and Expansion Area'. The strategic vision for Cork City as set out in the Draft Plan is based on nine strategic growth objectives: Compact Liveable Growth; Delivering Homes and Communities; Transport and Mobility; Climate and Environment, Green & Blue Infrastructure, Open Space and Biodiversity, Economy and Employment Heritage, Arts and Culture, Environmental Infrastructure, Placemaking and Managing Development.

Appendix 2(A) of the Draft Cork City Development Plan 2022 - 2028 contains the Strategic Environmental Assessment (SEA) Statement. Section 6 of this SEA Statement describes the different development scenarios that were assessed by Cork City Council as part of the preparation of the Development Plan and the SEA process and the reasons for choosing the selected alternative, in the light of the reasonable alternatives dealt with in accordance with Article 9 of the European Directive (2001/42/EC) on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive).

Three alternative scenarios were considered during the preparation of the Draft Cork City Development Plan 2022 -2028.

- Alternative 1: City-wide Growth Scenario;
- Alternative 2: Transport Oriented Development Scenario
- Alternative 3: Compact Liveable Growth Scenario.

The scenarios look at options for development within each Strategic Planning Area. Scenario 3 was identified as the preferred scenario following the evaluation of the three proposed alternative scenarios for their respective impacts on the environment was undertaken utilising the 8 no. Strategic Environmental Objectives (SEOs), which are detailed in Table 5.1 of Appendix 2(A) of the Draft Plan.

The potential impact on the environment of the Draft Cork City Development Plan 2022 – 2028 was assessed for cumulative impact and were considered in the preparation of this EIAR, having regard to the SEOs detailed in Table 5-1.

## 1.8 DIFFICULTIES ENCOUNTERED

No particular difficulties were encountered in compiling any of the specified information contained in the EIAR, such that that the prediction of impacts has not been possible. The relevant chapters of the EIAR, identify any specific difficulties which were encountered during preparation of this EIAR.

## 1.9 AVAILABILITY OF EIAR DOCUMENTATION

This EIAR will be available in printed form at the offices of Cork City Council (City Hall, Anglesea Street, Cork, T12 T997) and An Bord Pleanála (64 Marlborough St, Rotunda, Dublin 1, D01 V902).

The EIAR will also be available to view electronically at the following websites: [www.jacobsislandshd.ie](http://www.jacobsislandshd.ie)

## 1.10 EIAR QUALITY CONTROL & REVIEW

HW Planning oversaw the preparation of this EIAR. A key aspect of the EIAR has been to make the documentation as accessible and clear as possible to the public and other relevant stakeholders. This EIAR has been prepared in accordance with the relevant legislation regarding the preparation of EIARs including the 'Guidelines on the Information to be Contained in an Environmental Impact Assessment Report, Environmental Protection Agency, 2022' and 'Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems - Key Issues Consultation Paper, Department of Environment, Community and Local Government, 2017'.

## 1.11 TYPOGRAPHICAL ERRORS

Every effort has been made to ensure that the content and findings of this EIAR is consistent and error free. However, it is acknowledged that some minor grammatical/spelling and typographical errors may occur. These typographical minor inconsistencies are unlikely to result in any material impacts on the overall findings and conclusions of the EIAR.





JACOBS ISLAND



CHAPTER TWO  
Project Description

# CHAPTER TWO

## Contents

2	PROJECT DESCRIPTION .....	3
2.1	INTRODUCTION .....	1
2.2	DESCRIPTION OF THE PROJECT .....	1
2.3	EXISTING ENVIRONMENT/BASELINE SCENARIO .....	1
2.4	CONSTRUCTION PHASE.....	5
2.5	OPERATIONAL PHASE .....	8
2.6	IMPACT ASSESSMENT .....	10
2.7	MITIGATION, MONITORING & RESIDUAL IMPACTS .....	11
2.8	REFERENCES .....	14

## CHAPTER TWO

### PROJECT DESCRIPTION

#### 2.1 INTRODUCTION

The EIA Directive requires that an EIAR should provide an overview of:

- the location, site, design, size, etc.;
- the physical characteristics of Project (including any demolition or land-use requirements);
- the characteristics of the operational phase of the Project;
- any residues, emissions, or waste expected during either the construction or the operational phase.

As the European Commission's EIAR Guidelines state, the requirement to include a description of the project in the EIA Report is not new, however, the key difference brought about by the 2014 amendments is the inclusion of relevant requisite demolition works during the construction and operational phases. In addition, an estimate of residues and emissions during the construction phase is to be included, where previously such estimates concerned only the operational phase. Article 5 requires other relevant features of the Project to be included. In addition, a description of the location of the Project is now specifically required by Annex IV. Finally, the operational phase of the Project is not limited to production processes, as it was previously.

In addition, the lists of characteristics given in Annex IV, have been expanded upon:

- any requisite demolition works must now be described, where relevant;
- energy demand and energy used should be described in context of the operational phase;
- natural resources must now be described in the context of the operational phase;
- the list of expected residue and emission estimates is no longer exhaustive, and subsoil has been added as type of pollution; and
- estimates of quantities and types of waste produced must now be given.

This chapter describes the nature, location and specific characteristics of the proposed development during construction and operational phases in accordance with the 2014 Directive.

#### 2.2 DESCRIPTION OF THE PROJECT

The proposed development comprises the construction of a Strategic Housing Development of 489 no. apartments, creche and offices in 5 no. buildings ranging in height from part-1 to part-8 no. storeys over lower ground and semi-basement podium levels. The development will contain 1 no. studio, 161 no. 1 bedroom apartments and 327 no. 2 bedroom apartments.

Blocks 12 and 13 will contain ancillary commercial areas including a creche (381 sq m) and offices (4,143 sq m). The development will also contain supporting internal resident amenity spaces (576 sq m) and external communal amenity spaces.

- Block 11 is part-3 to part-6 no. storeys over semi-basement podium and lower ground levels and will contain 101 no. apartments.
- Block 12 is part-1 to part-4 no. storeys over undercroft car parking and lower ground level office building (4,143 sq m) comprising 2,934 sq m of office floor area.
- Block 13 is part-2 to part-8 no. storeys over lower ground levels and will contain a crèche over 2 no. levels (381 sq m) and 39 no. apartments.
- Block 14 is part-3 to part-6 no. storeys over lower ground level and contains 130 no. apartments.
- Block 15 is part-3 to part-6 no. storeys over semi-basement, podium and lower ground level and contains 219 no. apartments and ancillary resident amenity spaces (576 sq m).

The proposed development also provides for hard and soft landscaping, boundary treatments, public realm works, car parking, bicycle parking, bin stores, signage, lighting, PV panels, sprinkler and water tank, substations, plant rooms and all ancillary site development works above and below ground. Access will be provided from the existing Jacob's Islands access road/Longshore Avenue.

The subject lands are situated within the Cork City boundary and zoned for 'Mixed-use Development' in the Draft Cork City Development Plan 2022 - 2028 confirming their suitability for mixed-use development.

#### 2.3 EXISTING ENVIRONMENT/BASELINE SCENARIO

##### 2.3.1 LOCATIONAL CONTEXT

The subject lands at Jacob's Island are located in South Mahon, a rapidly growing south-eastern suburb of the Cork City. South Mahon was designated as a 'Key Development Area' in the Cork City Development Plan 2015 and as a 'City Regeneration and Expansion Area' in the Draft Cork City Development Plan 2022 - 2028 (Draft CDP). The site is strategically located to the south of the N40 South link Road, and beside the Passage West Greenway and the River Lee/Lough Mahon Waterfront Greenway, the latter accessed via the Joe McHugh Park to the south. Given the above it benefits from excellent walking and cycling links to the adjacent Mahon District Centre, and key strategic employment areas to the north, east and west.



Figure 2.1 Masterplan Area

The subject site of approximately 3.95 hectares in area, was historically part of the Lakeland House demesne, situated in the townland of Ballinure. The remaining cellar from the previously demolish country house remains interred to the north of the site. The subject lands form the southern and larger portion of Hibernia Star Limited's mixed-use masterplan layout for the remaining undeveloped lands at Jacob's Island. The development of these lands had its genesis in 1997 when the development of Jacob's Island, in the ownership of Cork City Council, was subject to a competitive tender. The scheme proposed by McCarthy Developments Limited & O'Callaghan Properties was selected as the winning tender with a design concept for mixed use development. Two planning permissions have subsequently been granted on the site for mixed use development: in 2000 for a Trade Centre and 150 room hotel (T.P. 24611/00 refers) and in 2007/2008 for a mixed use development including 325 no. apartments, a 184 no. bedroom hotel, convenience store, café, medical unit, dentist, crèche building, in 7 no. blocks ranging in height from 2 to 21 storeys, (T.P. 07/32686 /PL28.232275 refers). The new Hibernia Star Limited's masterplan for the remaining lands, prepared by O'Mahony Pike Architects, is consistent with the original mixed-use ambitions for these lands.

The northern portion of the masterplan area is currently the subject of a planning application for a hotel and offices (22/40809 refers), with the proposals for the subject site, complementing this with the inclusions of proposed residential, creche and office uses.

The subject lands are currently predominantly inaccessible scrubland, located to the north of the existing Jacob's Islands access road/Longshore Avenue. The prevailing land use to the south and east of the subject site is residential development, which varies in scale and density, from The Haven and Longshore housing estates to the south, to the

higher density apartment complex at The Sanctuary to the east. The masterplan area is bounded to the north by the N40, across which is located the Mahon District Centre.

Jacob's Island is served by the 215 and the 215A services, which currently operate at a 15-minute combined frequency. These services route directly into Jacob's Island and are provided with a dedicated bus turnaround area outside the existing Sanctuary development. This turnaround area acts as the outbound terminus for these services and the bus stop has been upgraded to provide a high-quality, sheltered waiting area for passengers. This area is earmarked for considerable growth and investment in the coming years. The Cork Metropolitan Area Transport Strategy (CMATS) makes provision for new BusConnects routes next to the subject lands, and longer term, provision of a high frequency Light Rail Transit (LRT) network. It is envisaged that CMATS and BusConnects and LRT will significantly improve the public transport service of the settlement into the future.

As noted previously the subject site, in addition to public transport connectivity, has easy access to existing pedestrian/cycle infrastructure, including connections to the Passage West Greenway and the River Lee/Lough Mahon Waterfront Greenway.



Figure 2.2 Connectivity Map

According to Cork Metropolitan Area Transport Plan (CMATS) "Greenway networks comprise of traffic free or low-trafficked routes and typically comprise of re-purposed derelict railway lines, routes through parks or alongside rivers".

Mahon is one of Cork’s most sustainable locations, benefiting from strong existing and proposed pedestrian and cycle infrastructure, which includes direct access onto both adjacent greenways. Many of these linkages are entirely separate from the road network and provide pedestrian access to Joe McHugh Park to the south and Mahon to the north. These existing links offer current and future residents convenient and safe pedestrian access to employment, retail and amenity opportunities in and beyond Mahon. The existing pedestrian and cycling route at Joe McHugh Park (which were developed in conjunction with the existing residential development) continues along the western edge of Lough Mahon and links the site with Blackrock and onto the City Centre. This route is identified as part of the River Lee/Lough Mahon Waterfront Greenway in the Cork Metropolitan Area Cycle Network Plan. The Plan included a Quality of Service (QoS) assessment of the existing cycling infrastructure to establish how the facilities meet the needs of cyclists. The Plan’s assessment of the River Lee/Lough Mahon Waterfront Greenway concluded that “There is currently a two-way shared pedestrian/cycle path along this route with a QoS of A+. There are currently no dedicated facilities at Castle Road and The Marina.”

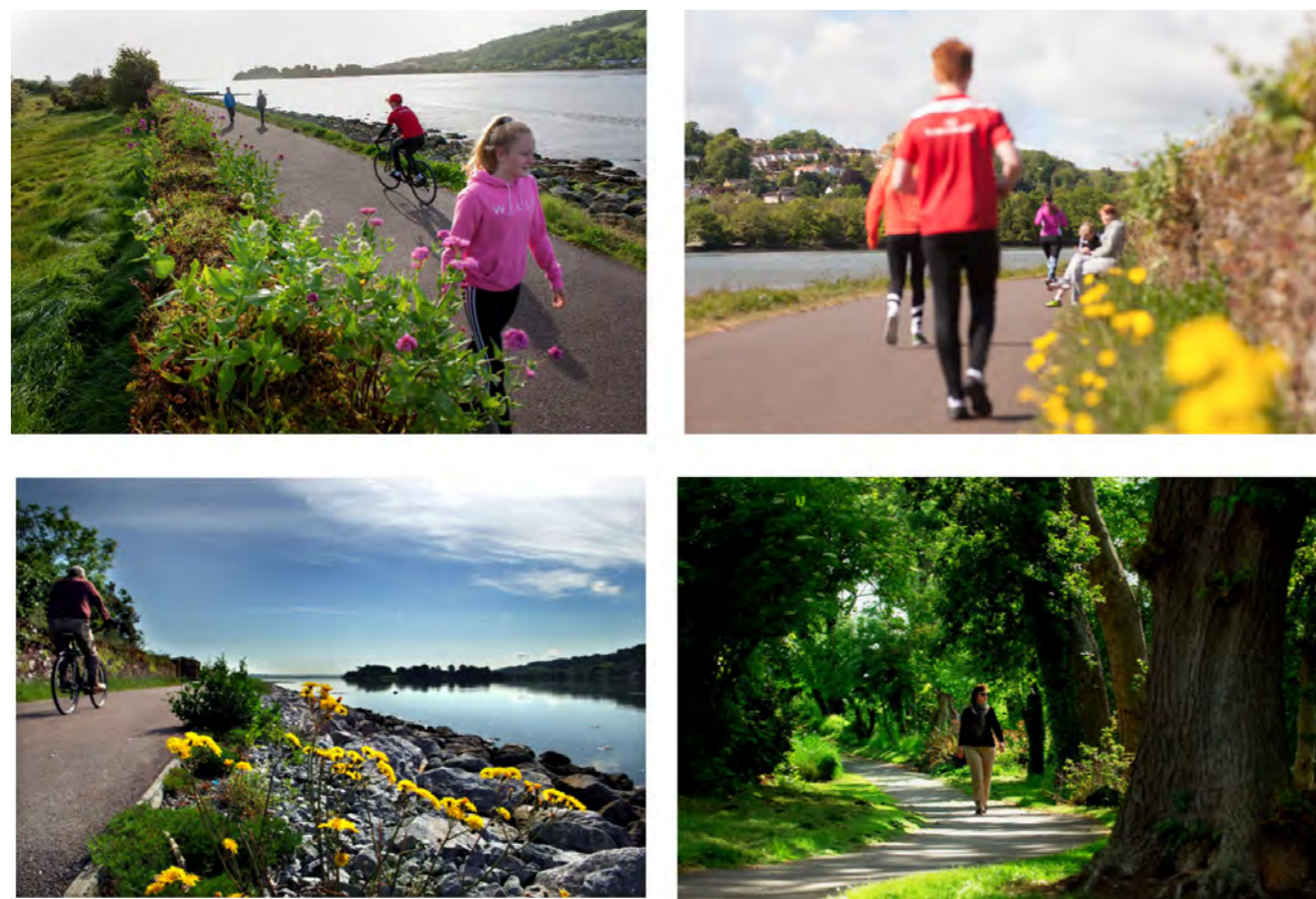


Figure 2.3 Existing Greenway Images

In terms of proposed infrastructure, it notes that “it is proposed to maintain existing facilities that provides a shared walking and cycling path along the waterfront. Castle Road and The Marina form part of this route, which are sufficiently traffic calmed to facilitate cyclists in a mixed street environment. The River Lee/Lough Mahon Waterfront Greenway, CSE-GW2, intersects with the Passage West Greenway PW-GW1 to the west of Jacob’s Island and this route provides a further link to the Cork Heritage Park Greenway CSE-GW3 just to the north of the N40”. Cars have since been removed from the Marina, further extending this safe, segregated route. The subject lands are located in a sustainable and well-

connected location that is eminently suitable for compact and high density urban development. The existing Jacob’s Island access road has been designed to support connections to future development.

As detailed in Chapter 4 of this EIAR, the subject lands are to the south of the N40 in a relatively flat, low-lying area along the shores of Lough Mahon. The majority of the proposed site and its immediate environs is designated as ‘Urban Sylvan Character’ Landscape Character Area (LCA) in the Cork City Landscape Study 2008, which ‘enhances the green rural character of the city landscape’. The LCA immediately to the south of the subject area is ‘Sub-urban Residential’. The Chapter 4 identifies the most important tree groups as those to the south of the island, around the former Lakelands House boathouse. The wider study area includes Areas of High Landscape Value to the south of Jacob’s Island and Landscape Preservation Zones to the west of island, none of these designations are present on the subject site. The setting is distinguished by the combination of Lough Mahon to the east and south and the influence of the N40 national road to the north. Section 4.6.3 of this EIAR concludes that

“the landscape sensitivity and value of an ‘Urban Sylvan Character’ area is high-medium. The susceptibility of this part of the landscape to accommodate change is medium due to the existing nature of the character area and its classification.”

Chapter 6 notes that as part of the works for the original Jacob’s Island development (planning reference 00/24609), the surface water, wastewater and water network for Jacobs Island was designed with capacity to accommodate the entire development of the island. Similarly, existing infrastructure for electricity, gas and telecoms can support the proposed development.

As detailed in EIAR Chapter 7, the historic land-use of the site was agricultural, with the lands subsequently used for allotments. The development of the N40 in the 1990s and the Jacob’s Island access road in 2006 resulted in the underutilisation of these lands, with the exception of temporary construction compound use. The dominant soil type of the site and immediate area is ‘made ground’ derived from man-made or artificial materials (Made). This generally overlies Cohesive Glacial Deposits that rests on Granular Glacial Deposits that overlies bedrock. The geological formation underlying the lands comprises Carboniferous limestone, of Waulsortian, Little Island & Lough Mahon formations. No bedrock outcrop was identified on the site.

Chapter 8 notes that the proposed development site does not contain any watercourse, with the nearest water features being the Tramore River, located to the south, and Lough Mahon which is located to the east of the site. The site slopes to the south-west and the south-east towards these features.

The lands are not identified as an area susceptible to flood risk with no historic data indicating flooding occurrences.

A ‘Regionally Important Aquifer’ underlies the area, oriented in an east-west direction, this is unlikely to receive any direct discharge from the site given its depth. According to the GSI the groundwater vulnerability classification for the proposed development site is ‘High (H)’.

Chapter 8 notes the presence of an existing surface water drainage network which includes 600 mm diameter and 900 diameter surface water sewers adjacent to the foreshore leading to an outfall located to the north of the site. The surface water sewer outfalls directly into the Lough Mahon Estuary via a non-return valve.

As detailed in EIAR Chapter 10, the dominant existing noise sources at the site is traffic noise emanating from the N40 and the local access road. Chapter 11 that in 2020 the EPA reported (EPA, 2021a) that Ireland was compliant with EU legal air quality limits at all locations, however Chapter 11 considers that was largely due to the reduction in traffic due to Covid-19 restrictions. The baseline air quality at the site can be characterised as being good with no long-term exceedances of the National Air Quality Standards Regulations limit values of individual pollutants.

In terms of Greenhouse Gas (GHG) emissions. EPA data published in 2021 states that Ireland will exceed its 2020 annual limit as set under EU targets by an estimated 6.73 Mt. Emissions from the transport and energy sectors have been the second and third largest contributors respectively in recent years. While GHG emission reductions have been recorded in 6 of the last 10 years, compliance with the annual EU targets has not been met for five years in a row. The projections indicate that Ireland can meet its non-ETS EU targets over the period 2021 – 2030 assuming full implementation of the Climate Action Plan and the use of the flexibilities available (EPA, 2021c).

Chapter 12 notes our cultural heritage provides a link with our past, is part of our identity and who we are as a people. There are no recorded archaeological sites or protected structures within the subject lands, though a number of medieval and post-medieval features are located within 2km of the site. However, Chapter 12 indicates that the proposed development site lies within the former demesne lands of Lakeland House, which was demolished in c. 1920. The only surviving remnants of the house and demesne are a cellar which lies within the proposed development site and the remains of a warehouse situated 130m outside the development site to the south, both first identified in 1994. Archaeological testing (03E0580) was carried out again in the area of the proposed development site in 2003, noting broken glass and pottery. The proposed development site has been subject to much ground disturbance, initially in the early 19<sup>th</sup> Century with the development of Lakeland House, and subsequently with the construction of the N40 to the north of the site, and with the site being used as a compound/dumping area during the construction of the residential developments on Jacob's Island.

Chapter 13 identifies that the site is situated proximate to several key strategic employment areas, local services and amenities, including Mahon District Centre which includes a wide retail offer and extensive services. Furthermore, there is a permitted neighbourhood centre adjacent to the subject site. Chapter 13 identifies 7 no. existing creches/ childcare facilities, 2 no. primary schools and 1 no. secondary school within the Mahon neighbourhood. The Passage West Greenway and the River Lee/Lough Mahon Waterfront Greenway, are both accessible from the subject site, providing access to the wider Mahon Neighbourhood Study Area, which is well served by a mix of open spaces, recreational and sporting amenities. The site is also situated adjacent to an existing bus stop serving the No. 215/215A Cloghroe – Mahon Point/Jacobs Island to Churchyard Lane bus route providing a combined c 10 – 15 minute peak service to the City Centre, Blackpool and Blarney.

Mahon is amongst Cork's strongest performing areas in terms of population and employment growth during the last two intercensal periods 2006-2016. The Mahon Neighbourhood Study Area accounted for 3% or 6,421 persons of the extended Cork City population of 210,853 persons. The worker:job ratio of 3.294, compares very favourably with the ratios of Cork City and Suburbs at 1.169. However, only 6.8% of these jobs are held by local workers, resulting in large outward and inward commuting flows which seem to indicate a mismatch between the local jobs available in Mahon and the skills of the resident workforce.

A summary of all significant pending and permitted planning applications for residential development in the area are provided in Table 2.1 below. The locations of these applications are illustrated on the accompanying Figure 2.4.

Application Reference	Applicant(s)	Description	Outcome/Current Status
ABP Ref.: TA28.313216	Estuary View Enterprises 2020 Limited	'The Meadows' Bessborough	Due 25th July 2022
ABP Ref.: TA28.313206	Estuary View Enterprises 2020 Limited	'The Farm' Bessborough	Due 25th July 2022
Cork City Council Ref.: 22/40809	Hibernia Star Limited	Construction of an office and hotel development at Jacob's Island, Ballinure, Mahon, Cork	Request for Further Information
ABP Ref.: TR28.310378	Montip Horizon Limited	Amendments to previously permitted strategic housing development reference ABP-301991-18 to increase the number of units from 413 no. units to 437 no. units and amendments to Blocks 4, 7, 8, 9 and 10 at Jacob's Island, Ballinure, Mahon, Cork	Granted (11th February 2022)
Cork City Council Ref.: 19/38875	O'Flynn Construction Co. Unlimited Company	Construction of 12,004 sq m of office floorspace at Blackrock Business Park, Bessboro Road, Mahon, Cork	Granted (11th March 2020)
Cork City Council Ref.: 18/37820 and ABP Ref. PL. 302784	Bessboro Warehouse Holdings Limited	Demolition of the existing buildings and construction of 135 no. residential units at Bessboro Road, Mahon, Cork	Granted (28th February 2019)
ABP Ref.: TA.301991.	Montip Horizon Limited	Construction of 413 no. apartments, neighbourhood centre, creche, road improvement works including upgrades to the Mahon Link Road (R852) to the North of the N40 interchange to incorporate a dedicated bus lane and all site development works at Jacob's Island, Ballinure, Mahon, Cork	Granted (3rd October 2018)

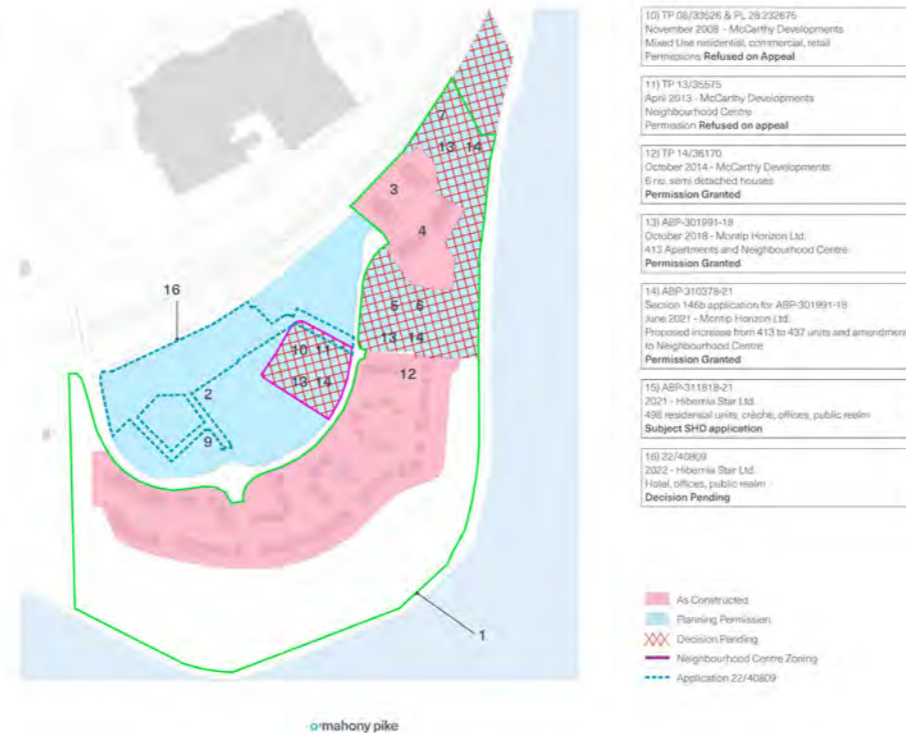
Table 2.1 Other recently permitted or pending developments in Ballinure (Multi-unit applications only).

PLANNING HISTORY

2000-2022

A summary of the planning applications for the site is summarised below and described in more detail in the planning consultants report.

1) TP 00/24609 November 2000 - McCarthy Developments 431 residential units <b>Permission Granted</b>
2) TP 00/24611 October 2000 - O'Gallagher Properties Retail and integrated commercial, leisure and office development <b>Permission Granted</b>
3) TP 06/20340 February 2006 - McCarthy Developments Additional Floors to Block 1 & 2 of permitted 00/24609 <b>Permission Granted</b>
4) TP 06/20373 February 2006 - McCarthy Developments Additional Floors to Block 5 & 6 of permitted 00/24609 <b>Permission Granted</b>
5) TP 06/20294 November 2005 - McCarthy Developments Additional Floors to Block 7 from 6 to 8 storey <b>Permission Granted</b>
6) TP 06/20618 March 2006 - McCarthy Developments 2 Additional Floors to Block 9 under TP 00/24609 <b>Permission Granted</b>
7) TP 07/32289 & PL 28.226312 August 2007 - McCarthy Developments residential <b>Permission Split Decision</b>
8) TP 07/32847 & PL 28.228153 December 2007 - McCarthy Developments Mixed use residential, retail, commercial <b>Permission Refused on Appeal</b>
9) TP 07/32686 & PL 28.232275 December 2007 - Rigs Mixed use upls, hotel, retail and services <b>Permission Granted on appeal with alterations</b>



CHAPTER 01 | CONTEXT

Figure 2.4 Planning Activity in Jacob's Island

2.3.2 OFFICE CONTEXT

As previously noted, the Mahon neighbourhood area is an existing substantial employment hub in Cork with 8,308 local jobs recorded in the 2016 census, representing 8.27% of the city's jobs. In the Draft Cork City Development Plan 2022 – 2028, the Core Strategy identifies Mahon as an area for growth consolidation and enhancement, with the subject lands zoned Z04 – Mixed Use Development. Specific Objective 10.86 – relating to Jacob's Island sets out to:

'To provide for mixed use development on Jacob's Island to accommodate the mix of uses set out under the Z0 5 Mixed Use Development Zoning Objective to include an hotel and up to 15,000 square metres of business and technology office use.'

Proposed Material Alteration 1.307 to the Draft Plan proposes to amend Objective 10.86 as follows

'To provide for mixed use development on Jacob's Island to accommodate the mix of uses set out under the Z0 5 Mixed Use Development Zoning Objective to include an hotel and up to 15,000 20,000 square metres of business and technology office use.'

Alongside this, Objective 7.3 of the Draft Plan focuses on economic clusters and specifically references Mahon in the context of the city's innovation corridor, which spans the city, running between Mahon and the Cork Science and Innovation Park. Objective 7.3 aims to support expansion of existing clusters and consolidating the innovation ecosystem. Section 7.43 of the Draft Plan notes that office uses form a vital part of Cork City economy and provide a significant amount of employment. Furthermore Section 7.44 notes that offices tend to have a high density of employment and are best suited to locations accessible to public transport, such as the subject site.

The expansion of office-based employment opportunities in the area will allow Mahon to consolidate its growth as an economic cluster and by generating more jobs further enhance Mahon as a place to live and work.

2.4 CONSTRUCTION PHASE

This section provides an overview of the construction phase of the proposed development. In addition, a 'Construction and Environmental Management Plan' (CEMP) prepared by MMOS Consulting Engineers is included as Appendix 2-1 of this EIAR. All measures set out in this section of the EIAR and the CEMP will be implemented during the construction phase of the project.

2.4.1 CONSTRUCTION PROGRAMME AND PHASING

Construction access to the site will be provided via the Jacobs Island Spine Road. The proposed development will be constructed on a phased basis and on a block-by-block basis from North-East to South-West. The construction period of the various blocks ranges from 18 – 36 months, and it is envisaged that there will be overlapping of phases. It is estimated that first occupation on the site will be 2025. The construction will involve the carrying out of the following works as set out in the indicative construction sequence in the CEMP.

- Site clearance and reduced levels. It is envisaged that the works will require the excavation to formation level resulting in approximately 18,000 m3 of excavated material, which is proposed to be kept onsite to be reutilized during ground works and landscaping in this development.
- Piled foundations and perimeter retaining walls.
- Construction basement slab and associated water proofing.
- Erection of concrete stairs and lift cores to roof level.
- Construction of concrete columns and intermediate upper basement and ground floor concrete slabs.
- Erection of structural frame super structure and floor slabs.
- Construction of glazing and solid facades in accordance with the architect's drawings.
- Roof completions.
- Internal completions and fitout works.
- External works.

A temporary construction compound will be located to the centre of the site, which will subsequently be developed as the central park area (Appendix 2.1 CEMP refers). The site compound which will contain:

- Site offices, canteen and toilet / changing facilities c/w temporary water supplies and wastewater treatment unit.
- Secure compound and containers for storage of materials and plant.
- Temporary vehicle parking areas.
- Contained area for machinery refuelling and construction chemical storage.

- Contained area for washing out of concrete and mortar trucks.
- An automatic wheel-washing unit shall be installed and maintained at the entrance to the site. This will be available for use at all times. Maintenance will include for cleaning out of the equipment and disposal of any material gathered within. The required equipment for supplying water and power to the wheel washing facility shall be made available and maintained in good working order. At the end of the construction phase, the wheel washing facilities shall be removed from site.

Secure site hoarding will be employed around any works outside of the site, with controlled access points. Site entry will be restricted to personnel solely involved in the construction process during working hours and unauthorised access out of hours will be prevented. Due to the nature and location of the site the main gate will remain closed at all times. The gate will be opened for deliveries, and it will be closed again once unloaded. If the gate is to remain open for prolonged periods, such as large concrete pours, a flag man will be placed at the gate for the duration it remains open to ensure there is no unauthorised entries.

Water supply for the construction facilities will be taken from the mains supply which is adjacent the site.

## 2.4.2 CONSTRUCTION STAGE METHODOLOGY

### 2.4.2.1 Pre-commencement Activities

Before works commences, several preparatory activities will be carried out. Prior to undertaking groundworks, existing ground levels will be confirmed. In addition, advance of and during site establishment, a series of trial holes will be undertaken to establish the ground water levels.

### 2.4.2.2 Enabling Works

The initial enabling works, as described in the CEMP, will enable the main access road to facilitate construction access to the site, which will principally be from Jacobs Island Spine Road.

This will be followed by the erection of temporary site fencing. It is noted that the location of hoarding on the public street will be subject to a separate agreement and or licence between the main contractor and Cork City Council. The following is however envisaged.

- A 2.4 m high decorative hoarding will be provided along the Jacobs Island Spine Road and N40 South Link Road. Lights will be provided to illuminate the hoarding. Note that the hoarding is likely to encompass the site within the Hotel & Office planning application as well as the subject site.
- This will be followed by site clearance and enabling ground works. The presence of high impact invasive species were recorded within the masterplan site area. O'Donovan Agri Environmental has been employed to carry out treatment of these invasive plants on site. These plants shall be grubbed and either chipped or removed from site. The site will be monitored for re-growth and any saplings will be pulled and disposed of appropriately or treated by an application of a suitable herbicide.
- The enabling works will include the creation of level platforms, accessible from the main access road, upon which the site compound and materials storage area will be constructed. Good practice measures will be employed on site to prevent uncontrolled runoff by the use of a special impermeable bunded slab. This will be followed by the creation of silt traps to further prevent construction run-off. Once the site compounds are established, measures to reduce the potential risk of impacts to retained trees will be put in place.
- The construction works will require the erection of at least 4 no. tower cranes within the development site. It is noted that the location and operation of the tower cranes will be co-ordinated by the main contractor but are likely to be located centrally.

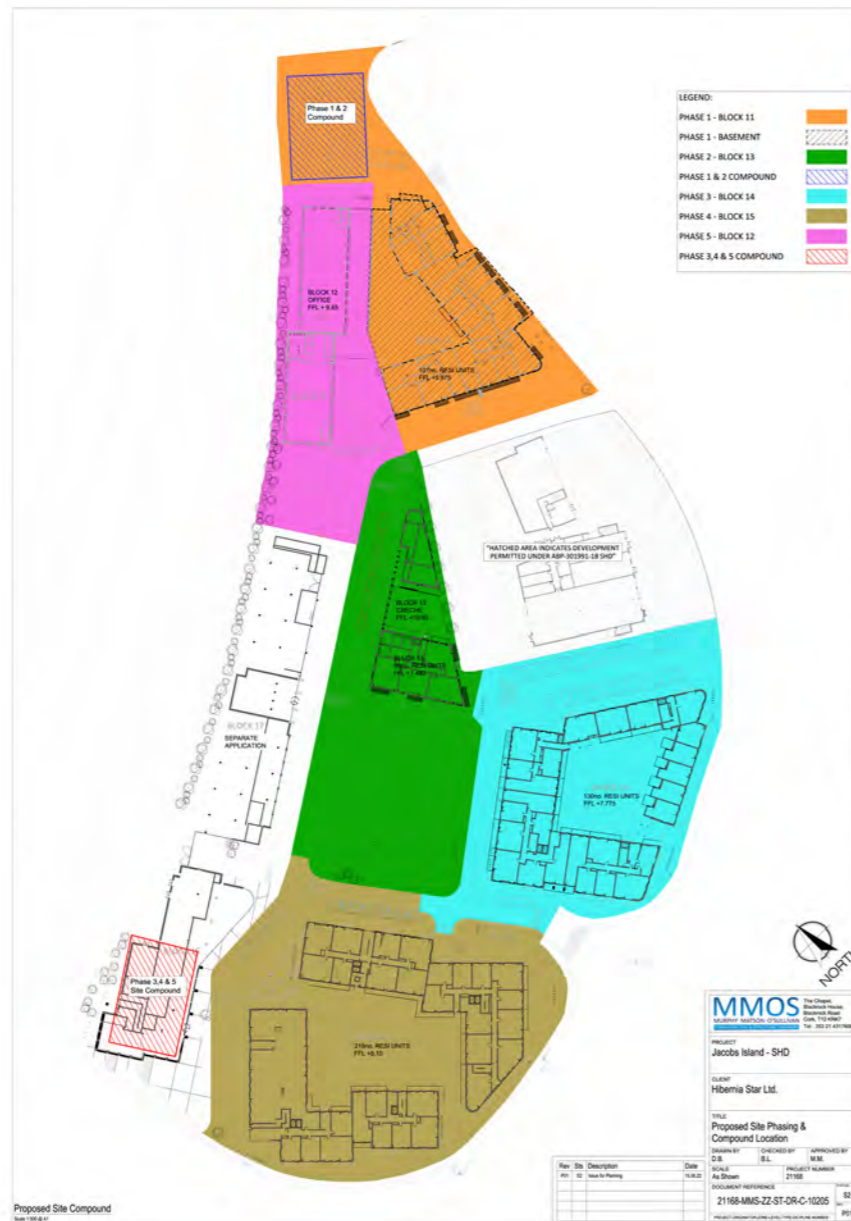


Figure 2.5 Compound Plan



### 2.4.2.3 Construction

The following processes will be carried out in accordance with the requirements of the CEMP.

#### **Bulk Excavation**

Following the site clearance excavation/level reduction works will commence. This will require the excavation of c. 18,000m<sup>3</sup> material which will be retained on site for reuse in ground works and landscaping.

#### **Piling**

All buildings structures will be supported on piled foundations. Formation levels across the site will vary between 5.65m OD (Block 11) and 7.5m OD (Block 15). It is proposed that the piling methodology will be continuous flight auger type piles (CFA Piles) so as to limit noise and vibration to the adjoining residential area.

During the piling installation works an independent specialist will be employed to monitor the noise levels at the site perimeter and vibration levels at specified locations.

#### **Civil Works**

The initial civil concrete works will involve the pouring of the foundations for each of the prepared buildings in this phase. Once the foundations are poured and have cured it will allow the building envelope to be erected.

#### **Basement Construction**

A basement car parking area is proposed in Block 15, again the foundations for the building will likely consist of piled foundations. All basement drainage will be located beneath this slab and will be tanked to prevent future water ingress. The drainage will then connect to the main network in the public road by gravity.

The suspended podium slab will be formed in a concrete frame. This structure will also provide horizontal restraint to the perimeter retaining sheet piled walls and will facilitate the sequenced removal of any temporary propping as required.

The basement structure will require large concrete pour volumes, which will likely require works outside of normal construction hours to be agreed with Cork City Council in advance and will require particular traffic management.

#### **Superstructure Construction**

The buildings will likely be constructed as a concrete framed flat slab type structure with columns in rectangular shapes to suit the party wall layouts and required sound resistance. The stair core walls will be reinforced concrete or precast concrete.

#### **Building Facades**

The building façades will vary depending on the building use. Where possibly an emphasis will be placed on off-site construction including modular unitised facades and precast panels. This will facilitate a swift form of construction and will also reduce site waste.

#### **Fit out works**

The internal fitout of each building will be on a phased basis and will be subject to final tenant requirements. The fitout works will include mechanical and electrical works, partitions, and finishes. The emphasis will be on lean construction to ensure minimal construction waste.

#### **Landscaping**

Landscaping works will commence on the completion of the building facades. Landscaping works will be undertaken within the site perimeter, particularly to the north that is bounded by N40 South Ring Road.

### 2.4.3 WORKING HOURS

Construction works will occur within the hours outlined below.

- 07.30am – 06.00pm\* (Monday – Friday inclusive)
- 07.30am – 4.00pm\* (Saturday)

It is proposed that exceptionally, and with the prior agreement of the planning authority, working hours may be extended and/or works may take place on a Sunday and/or Bank Holiday at times when critical elements of work need to be advanced. Longer working days can occur when there is a planned concrete pour. If extended working hours are required, these will be agreed in advance with the Planning Authority. Accordingly, traffic generated by core construction personnel will be mainly during the off-peaks and will not have a significant adverse impact on the road network.

### 2.4.4 CONSTRUCTION TRAFFIC MANAGEMENT PLAN

Heavy goods vehicle truck movements into and out of the site are expected to peak during the basement excavation works and large concrete pours. Note that the excavated material will be relocated internal within the site and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period.

People movement (in and out) and associated car trips during each construction stage will be c. 20 no. during basement excavation stage and rising to c. 50 no. during construction with an increase to 60 no. as the frame is being progressed. The numbers on site will maintain at this level during the façade construction but will increase to between 60-70 during internal M&E installation.

Typically, the trips to and from the site will be by private car and vans accommodating 1-2 workers. Some sub-contractors will use minibus transport when in larger crews, such as concrete contractors, M&E, and facades. Public transportation will also be availed of by individual workers. Typically, construction workers will remain on site from between morning start to evening time.

A Construction Traffic Management Plan (CTMP) will be prepared in advance of the works and will be submitted to the planning authority in advance of the works commencing on site. This will provide detail in relation to construction access, delivery routes and times of delivery in the plan.

Any works completed outside site boundary will be fully barriered with such work covered by a method statement and agreed in advance with the local authority. All plant driving on the public roads will be accompanied by a vehicle banksman. For works outside the boundary which may impede the traffic/pedestrians on the public road a separate

traffic the site boundary a clear pedestrian access will be provided to the areas of work and appropriate signage placed. Pedestrian boundary will be delineated with pedestrian barriers.

Whether inside the site boundary or on the public road all plant will give way to pedestrians and will be carefully controlled by operatives and site banksman.

### 2.4.5 WASTE MANAGEMENT

Section 9 of the CEMP (Appendix 2-1) details measures that will be implemented to address waste arising from construction phase of the proposed development. It notes that a detailed construction water management plan will be submitted to the planning authority for agreement prior to commencement of works.

A key objective of the construction strategy of the site is to minimise the amounts of material which leaves the site as waste during construction. All wastes will be managed, collected, stored, and segregated in temporary segregated areas and reused or recycled where possible. It is estimated that 51% of waste will comprise soil and stones. In the event that this cannot be reused on site offsite options include land remediation/infill on other sites in the area. Where removal off-site is necessary, it will be undertaken by licensed waste management contractors at regular intervals during the works.

## 2.5 OPERATIONAL PHASE

### 2.5.1 RESIDENTIAL DEVELOPMENT

The proposed mixed-use development includes residential use, 1 no. creche and shared resident facilities. In addition the proposed development includes the provision of a variety of public open spaces, amenity walks and pedestrian/vehicular connections. An overview of the key statistics of the proposed residential development is provided in table 2.2 as shown.

Key Figures of Proposed SHD Development	
No. of units	489
Site Area	3.95 hectares
Developable Site Area	3.55 hectares
Density	137.7 units/hectare (developable area)
Plot Ratio	1:1.3
Open Space provision	4,350m <sup>2</sup> (12.3%)
Creche Details	380.6 m <sup>2</sup> (53 child places)
Total Residential Car Parking spaces	246 + 6 car club spaces
Total Residential Bicycle spaces (including creche)	819 (residents), 245 (visitor), 4 (creche) - Total 1068
Total Creche Car Parking Spaces.	6
Access	Access off the existing Jacob's Island Access Road

Table 2.2 – Key Statistics of Proposed Residential Development

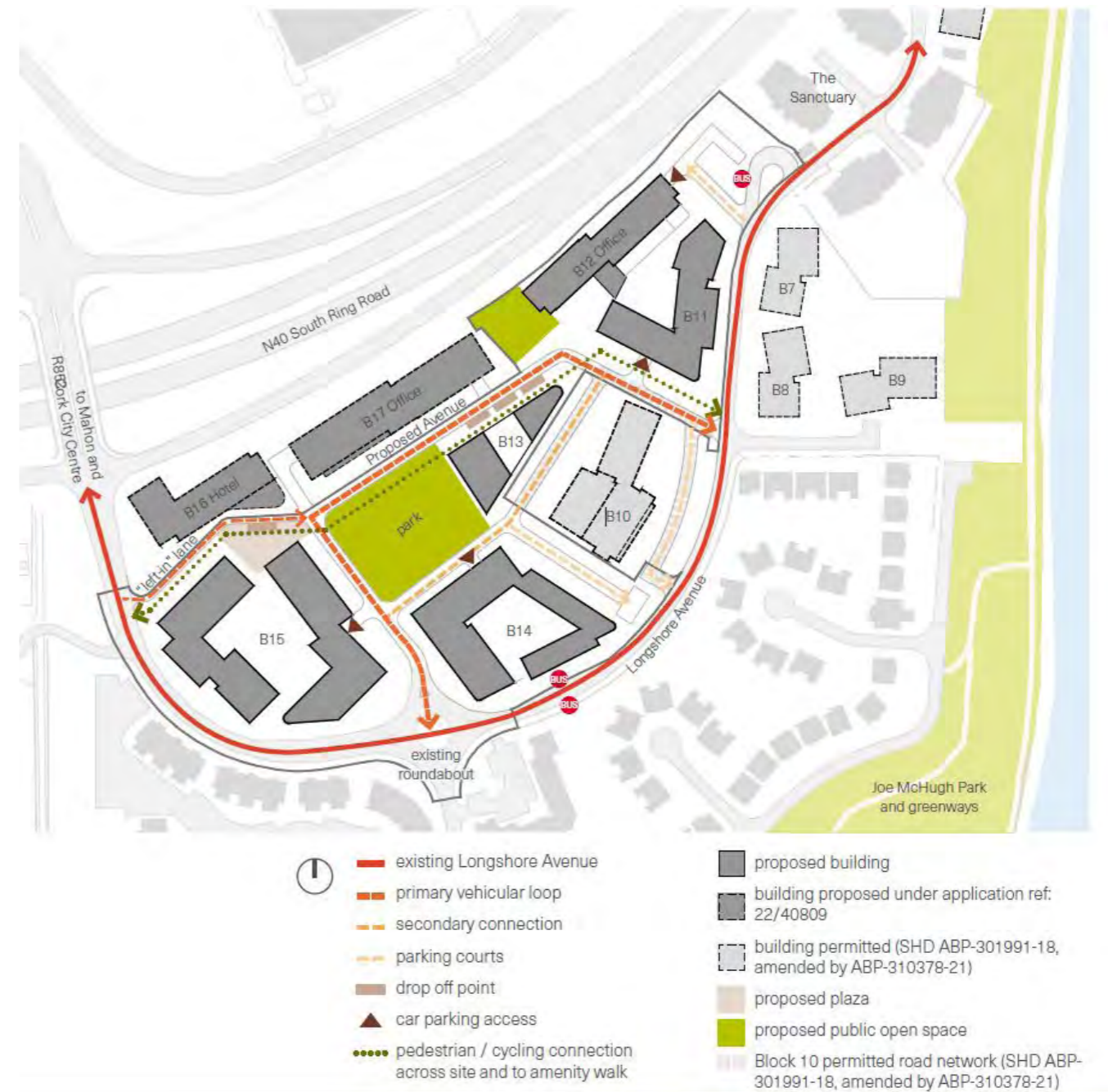


Figure 2.6 Proposed Residential Development

### 2.5.2 OFFICE DEVELOPMENT

The proposed development includes a 5 storey office development in Block 12, to the north of the site. The office development includes a gross internal floor area of 4,143.4m<sup>2</sup> office space, 37 no. surface car parking spaces and 32 no. undercroft parking spaces. An overview of the key statistics of the proposed residential development is provided in table 2.3 as shown.

Key Figures of Proposed Office Development	
Site Area	3.95 hectares
Developable Site Area	3.55 hectares
Office floor area	4,112.4 sqm (net) 2,934 sqm (net)
No. of car parking spaces	69 (32 undercroft, 37 surface)
No. of bicycle parking spaces.	80 no. spaces serving office building.
Access	Access off the existing Jacob's Island Access Road

*Table 2.3 – Key Statistics of Proposed Office Development*

### 2.5.3 ACCESS, CONNECTIVITY & PUBLIC REALM

As referenced above, the proposed development utilises the existing Jacob's Island access road to provide vehicular access to the proposed developments for both the residential and office elements of the develop. The main vehicular access to Jacob's Island is via the grade separated junction 10 of the N40 South Ring Road which allows access to the N40 in both directions as well as to Mahon along the R852 Mahon Link Road. Access to the proposed development will be via 4 no. entrances off the access road, including one permitted under ABP-301991-18 (amended under ABP-310378-21). The proposed development also provides for enhanced pedestrian access through the site to the wider Jacob's Island, via a series of proposed new pedestrian and cycle paths and shared surface routes that offer a number of options for navigating through the site and linking with the adjacent River Lee/Lough Mahon Waterfront Greenway to the east and the Passage West Greenway to the west and with existing pedestrian infrastructure to access Mahon District Centre. The 215 and 215A bus service can be accessed along the Jacobs Island access road, with access to the high frequency 202/202A bus route available from outside of the nearby Mahon Point Shopping Centre.

The proposed pedestrian links to the site will not only provide direct and convenient access to the Mahon District Centre, but also satisfy existing informal desire lines that run through the site, which function as short-cuts between development in Jacob's Island and Mahon. These works will result in a significant improvement in terms of pedestrian and cycling linkages and access to public transport opportunities from the existing 'do nothing' scenario.

### 2.5.4 PROPOSED LAYOUT & LANDSCAPE STRATEGY

The masterplan for the subject site and the adjoining lands to the north (currently subject to a planning application for a hotel and office – planning ref 22/40809 ) was developed in response to existing context, the original 1997 Masterplan and the 2014 Mahon LAP and 2015 Cork City Development Plan.

- Local landmark building (tower) to mark the access into Jacob's Island and Mahon.

- Strong elevation to N40 South Ring to highlight Jacob's Island and Mahon's Commercial Hub.
- Buildings organised to facilitate permeability through the site, especially in regard to the existing pedestrian desire lines.
- Noise mitigation measures integrated into the masterplan: positioning of less-sensitive uses adjacent to the N40, to act as noise barrier for the rest of the site and enhance the residential amenity.
- Office and hotel uses considered suitable in this location: facades can be designed in efficient ways to protect internal spaces from noise.
- Varying levels across the site mitigated by central open space and level changes integrated into building designs.
- Strong frontages line to all streetscapes, defining character and ensuring overlooking and activity within the public realm.

The landscape design rationale for the proposed development is based on the following principles:

- Permeability, with connection to the surrounding built environment and to the wider Lee to Sea pathway and Joe McHugh Park,
- The development of a strong central open space which will develop as a focal point for residents
- A coherent design which physically and visually connects the open spaces,
- The provision of a strong visual landscape which provides year-round interest
- The development of communal amenity areas which can cater for passive and active recreation for all abilities and age groups.
- The creation of 'green streets' and strong landscape buffer areas between the public and private realm.

The proposed layout, pedestrian links, amenity areas/walks and landscaping treatments will result that the proposed development will not only provide for the amenities of future residents of the scheme, but also serve as a local 'destination' in its own right, benefiting the existing residents of the Jacob's Island.

### 2.5.5 ENGINEERING AND SERVICING

The Chapters 5 and 6 of this EAIR and the Engineering Infrastructure Report prepared by MMOS Consulting Civil & Structural Engineers (Appendix 2-3) detail the proposed engineering and servicing details relating to the proposed development. An overview of the main servicing proposals relating to the proposed development is as follows.

- The internal estate roads have been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS). In line with DMURS there will be separate active travel routes through the site segregated from traffic along the main routes parallel to the liner park with some of the more minor routes having a shared use function.
- The proposed surface water drainage system is in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS), in that attenuation is not required where the point of outfall is into an estuary, as is the case in the subject site. It also adheres to Sustainable Urban Drainage Systems (SUDS) principles through the provision of interception storage in green roofs and podium landscaping and hydrocarbon interceptors and non-return valves utilised in connections to the existing drainage network. In addition, tree pits, swales, soakaways, and another SUDs measure will be considered following an onsite infiltration tests.

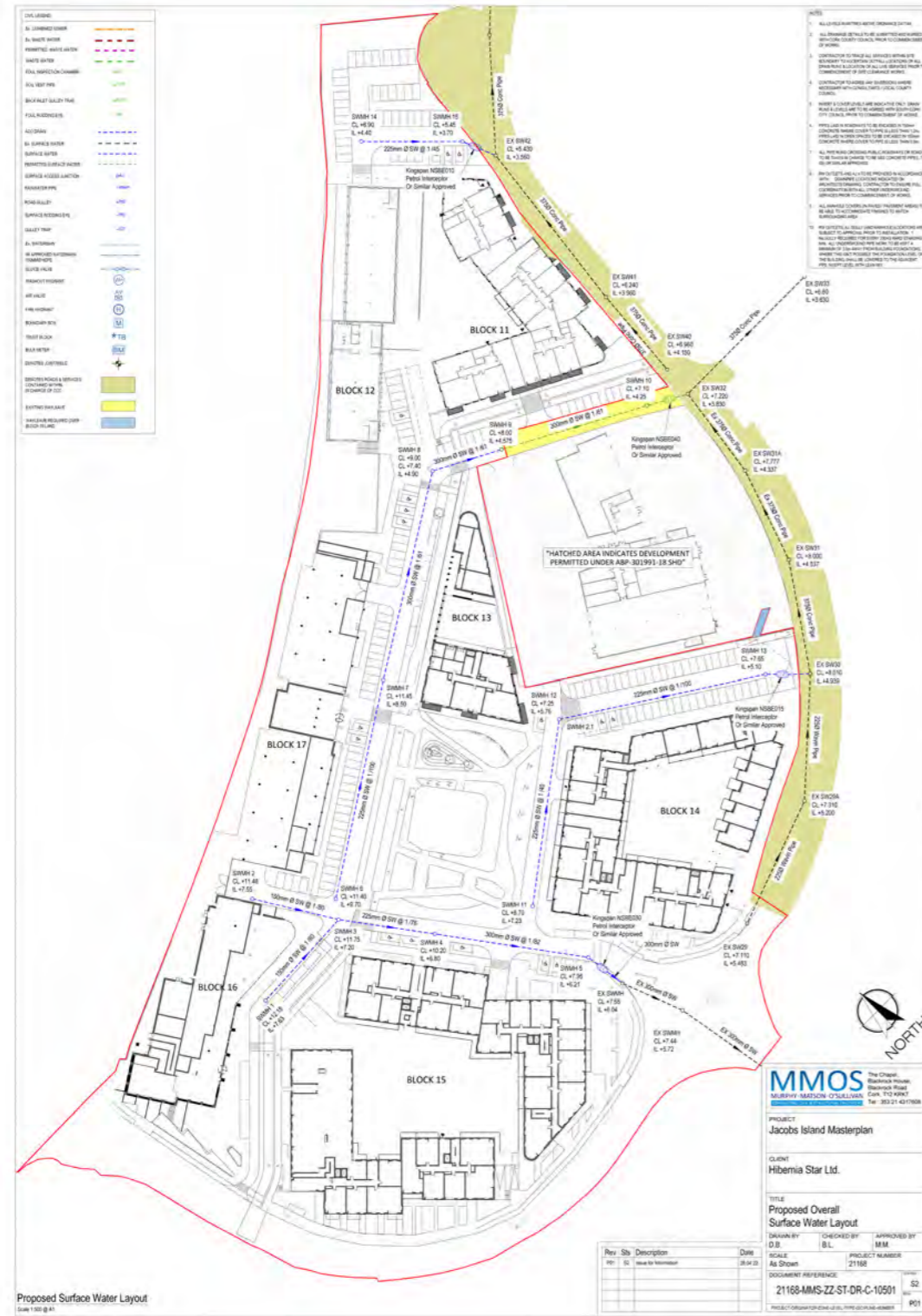


Figure 2.7 Location of existing Irish Water wastewater infrastructure

The foul drainage for the proposed development will be drained and gathered in stacks below basement floor level and directed to the proposed new foul network onsite, which is proposed to discharge to the existing foul sewer manholes (FS31 and FS35). Irish Water has confirmed that there is sufficient capacity to adequately process the additional input from the operational demand of the proposed development. A Confirmation of Feasibility from Irish Water accompanies the Engineering Design Report (Appendix 2-3 (Appendix G) refers).

The proposals for the water supply will involve taking a feed from the existing watermain located outside the site running along the residential access roads. Sluice valves will be provided at appropriate locations to facilitate isolation and purging of the system. As per Irish Water requirements, the proposed development will have an onsite water storage tank to satisfy the 24-hour water demand storage requirement to cater for possible shut-downs in the system. A Confirmation of Feasibility from Irish Water accompanies the Engineering Infrastructure Report (Appendix 2-3 (Appendix G) refers).

### 2.5.6 FLOOD RISK

A Site-specific Flood Risk Assessment was undertaken by MMOS Consulting Civil & Structural Engineers in Chapter 2 of the Engineering Infrastructure Report (Appendix 2-3). It concluded that the highly vulnerable residential land use type, proposed on the subject site is deemed to be appropriate within the Flood Zone C category that applies to the lands. Therefore, a justification test is not required. A 10% climate change allowance has been included in the drainage design. There is no risk of tidal or fluvial flooding impacting on the proposed development. No increase in stormwater runoff rate will result from the proposed development and no increased risk of flooding elsewhere will arise due to the proposed development. Therefore the residual risk of flooding can be managed by good building design and maintenance and management practices.

### 2.5.7 ENERGY SYSTEMS

The Building Lifecycle Report prepared by Aramark (Appendix 2-2 of this EIAR) details proposed building methods and materials to promote sustainability and reduce unnecessary fuel consumption. All lighting to be energy efficient with provision made for low energy lamps such as Compact Fluorescent Lamps (CFLs) which use 80% less electricity and last up to 10 times longer than ordinary light bulbs in the dwellings.

## 2.6 IMPACT ASSESSMENT

### 2.6.1 DO-NOTHING SCENARIO

A 'do nothing scenario' will result in no predicted impacts at the subject lands, and the site would remain in its existing undeveloped brownfield state. The proposed public realm works including footpaths, cycles lanes and enhanced connectivity would not occur.

Over time, in the 'do nothing scenario' the subject lands would remain undeveloped. It is considered likely that the zoned lands to the north, (currently subject to application planning ref 22/40809) will be developed for hotel and office use, resulting in an increasingly urban setting in the area.

If the proposed development of 489 no. units does not proceed the population of Mahon and the wider city will continue to be adversely impacted due to housing shortages. It will result in the continuation of the recent trend of underperformance of the Study Area in terms of population growth. With a growth rate of 2.7% in the last intercensal period, this designated 'Strategic Growth' area experienced lower growth than the city as a whole, contrary to national and regional policies of co-locating employment, public transport and population growth.

Similarly, in the 'do nothing' scenario, the lands will remain inaccessible for public recreational use. The potential public health benefits and GHG reduction arising from the increased use of sustainable travel due to the proposed enhanced pedestrian and cycling connectivity through the site will not ensue. Nor will the proposed enhancement of public facilities and amenities in the form of public open space and a creche. Notwithstanding the above, in this scenario there will be no additional impacts on the receiving environment or on population and human health factors.

Over time it is considered the do-nothing scenario will result in an inefficient use of serviced lands, which will have convenient access to public transport opportunities and local amenities.

### 2.6.2 CONSTRUCTION PHASE

The construction phase will be short-term in nature and will be implemented in accordance with the requirements of the accompanying CEMP (Appendix 2.1 refers). Without the implementation of the proposed mitigation measures, the construction stage of the development could result in potential significant indirect, cumulative and residual effects on the surrounding environment such as impacts on the local road network, potential ground/water contamination, noise, vibration, dust, air quality, daylight and sunlight impacts, pollution and waste management.

### 2.6.3 OPERATIONAL PHASE

Once constructed, the proposed development will be permanent in nature. The proposed development will result in the construction of an additional 489 no. residential units, 4,143.4m<sup>2</sup> of office space and a 53 no. child place creche.

The 2016 Census confirms that the average household size of the Mahon neighbourhood is c. 2.82 no. persons per household which translates that the proposed development may provide for an uplift in population of approximately 1,379 no. persons consistent with adopted planning policy objectives of concentrating population growth around high frequency public transport links in existing settlements. Alongside this the proposed provision of adjacent employment and residential uses is in line with national and local policies about the co-location of these uses to encourage sustainable travel patterns. It will also enable the sustainable consolidation of the existing employment hub of the Mahon through clustered growth.

The proposed residential development will result in several positive effects in the local area by providing sustainable housing units which will serve under-catered for aspects of the current housing market and address the current housing shortage in the Metropolitan Cork Area. It should be noted that the average household size in the Mahon area at 2.8 persons per household is significantly above the city and state average and represents the dominance of the traditional, suburban house type in the area.

The development will support the continued operations of local public transport routes and justify future improvements and investment in local bus routes and proposed Light Rail Transit identified in CMATS.

The proposed increase in population has potential for significant effects on the demand for local services such as water, wastewater, roads, childcare/educational, and on recreation and amenity provision locally without appropriate mitigation measures. When assessed cumulatively with other developments taking place in the area (as detailed in Chapter 1 of this EIAR), the proposed development will result in the increase in housing stock and population in the areas and local employment opportunities. It will also have a positive impact to the local pedestrian and cyclist environment as well as enhancing access to childcare, open space amenity areas and public transport opportunities.

## 2.7 MITIGATION, MONITORING & RESIDUAL IMPACTS

Chapter 15 of this EIAR, 'Summary of Mitigation Measures and Monitoring' provides a list of all proposed mitigation and monitoring procedures to be implemented during the operational and construction phases of the project.

### 2.7.1 CONSTRUCTION PHASE

The CEMP prepared by MMOS Consulting Engineers details the proposed mitigation and monitoring procedures which will be implemented during the construction phase of the proposed development. The CEMP includes requirements for monitoring to be carried out in accordance with the requirements of the EIAR and the control measures in line with the following current best practice guidelines:

- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;
- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin;
- Murnane et al (2002) Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156; and
- Murphy, D. (2004) Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.

The following is a short summary of principal mitigation and monitoring measures proposed.

- Zero pollution incidents
- Segregation of site waste to include timber, general waste and other materials
- Completion of environmental checklists
- Fuel spill kits to be present on each site at all times
- Reduce waste, water and energy use on the project including within all of the site offices;
- Reduce the carbon footprint of the development;
- Reduce the amount of construction waste and excavated material generated which goes to landfill;
- Recycle construction waste where possible;
- Maximise beneficial reuse of the materials: and
- Undertake and outline Waste Audit Procedure;
- Ensure that all waste documentation (waste transfer docket, permits etc.) is available for inspection at the site office / in head office;
- Ensure all works are carried out in adherence with the Invasive Species Management Plan (Appendix 2.1 (Appendix ii) and Section 2.7.1.5 below refer);
- Ensure all works are carried out in adherence with the noise and vibration impact reduction measures outlined in Section 8 of the CEMP and set out in Section 2.7.1.7 below.
- Ensure all measures outlined in Section 4.3 of the CEMP to prevent water pollution and set out in Section 2.7.1.4 below are adhered to.
- Ensure all measures as set out in Section 6 of the CEMP and outlined in Section 2.7.1.6 below in relation to construction traffic management are adhered to.

## 2.7.1.1 Training and Awareness

The waste manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and salvage on site.

The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for the waste management on site.

He/she will be also trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and know how to implement the construction and demolition waste management plan.

The training of the site crew is the responsibility of the waste manager. A waste training program will be organised. A basic awareness course will be held for all site crew to outline the C&D waste management plan and to detail the segregation of waste materials at source. This may be incorporated into the induction course, or safety-training course.

This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A subsection on hazardous wastes will be incorporated and the particular dangers of each hazardous waste will be explained.

## 2.7.1.2 Tree Felling

Tree Protection Fencing will be installed prior to other works commencing on site in relation to any trees to be retained and will remain in place for the duration of construction. Fence panels shall be open mesh to ensure continued light and air circulation, with 150mm ground clearance to ensure continued small fauna movement. All trees and other vegetation to be retained, shall be clearly marked on site.

## 2.7.1.3 Construction Impact Assessment

- The moving and storage of excess material has been kept to a minimum and has informed the phased delivery of the scheme.
- Excavated material will be stored on-site to be re-used for later stages of the development.
- Control measures to protect surface waters from contamination will be put in place prior to the commencement of any site works.

## 2.7.1.4 Control of Surface Water Run-off

A plan for the management of surface water runoff from the site during the construction operations shall be prepared. The following operations will require particular attention.

- A designated fuel transfer area should be provided on site, and this is typically a good practice on well managed construction sites. The contractor will be required to install an impermeable paved and bunded area that is capable of handling and intercepting a fuel spillage. All tanks should be fully bunded and placed on a firm and secure foundation as per the following sketch from CIRIA C532.
- Concrete should always be placed in a controlled method to prevent spillages as is good construction

practice. Where possible concrete should be placed using a concrete pump. As noted above it is important that the machinery is well maintained.

- At the delivery and wash down point it is important that measures are employed to prevent spillages from concrete delivery trucks contaminating the ground.

## 2.7.1.5 Biodiversity and Invasive Species

The presence of high impact invasive species were recorded within the masterplan site area. O'Donovan Agri Environmental have been employed to carry out treatment of these invasive plants on site. The medium impact plant Butterfly Bush was observed within the present site. These plants shall be grubbed and either chipped or removed from site. The site will be monitored for re-growth and any saplings will be pulled and disposed of appropriately or treated by an application of a suitable herbicide.

Biosecurity protocols shall be implemented during the proposed project to prevent the re-introduction of invasive species, in particular those listed on the 3<sup>rd</sup> Schedule of the EC (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), to site and the further spread of diseases.

The following measures will be adopted:

- In the event that further invasive species are identified an Invasive Species Management Plan shall be prepared and implemented by the Contractor. This shall include plant specific control measures for any invasive species identified; and
- Biosecurity measures will be undertaken to prevent the importation of invasive species from contaminated areas into the study area.
- For any material entering the site, the supplier must provide an assurance that it is free of invasive species.
- Machinery or plant to be inspected upon arrival and departure from site and cleaned when necessary.
- Ensure all site users are aware of invasive species management plan and treatment methodologies. This can be achieved through "toolbox talks" before works begin on the site.
- Adequate site hygiene signage should be erected in relation to the management of non-native invasive species material.

## 2.7.1.6 Traffic Management

In addition to the CEMP, a Construction Traffic Management Plan (CTMP) will be prepared prior to commencement for Local Authority approval, which details the proposed traffic management/mitigation measures during construction.

Measures include:

- Appropriate construction signage shall be placed on the local road network during construction. This signage will be erected in advance to warn other pedestrian and road users of a construction site ahead. These signs will be checked and cleaned regularly so that they are maintained in a good condition
- Any works completed outside site boundary will be fully barriered with such work covered by a method statement and agreed in advance with the local authority. All plant driving on the public roads will be accompanied by a vehicle banksman. For works outside the boundary which may impede the traffic/pedestrians on the public road a separate traffic management plan will be completed.
- Inside the site boundary a clear pedestrian access will be provided to the areas of work and appropriate signage placed. Pedestrian boundary will be delineated with pedestrian barriers.
- Whether inside the site boundary or on the public road all plant will give way to pedestrians and will be

carefully controlled by operatives and site banksman.

- The roads will be monitored throughout the works and a road sweeper will be employed when required for the duration should the roads become dirty. The contractor will liaise with the local authority and all adjoining owners / residents in respect of the timing and movement of the road sweeper activity.
- All deliveries must be notified to the site in advance so that the site will be organised, for the offloading and dictate which crane will be unloading. This is to ensure that delivery trucks, on entering the site, cannot block any of the public roads adjacent to the site. A banks man will be assigned to control all deliveries.
- Due to the nature and location of the site the main gate will remain closed at all times. The foreman will have a key and a spare located at the site reception. The gate will be opened for deliveries, and it will be closed again once unloaded. If the gate is to remain open for prolonged periods, such as large concrete pours, a flag man will be placed at the gate for the duration it remains open to ensure there is no unauthorised entries.
- Any works on public roads outside the site will be co-ordinated and will be co-ordinated with Cork City Council and the adjoining businesses and residents. Secure site hoarding will be employed around any works outside of the site, with controlled access points.

### 2.7.1.7 Noise and Vibration

The control of noise and vibration during the construction phase shall comply with the general recommendations set out in the Code of Practice BS 5228-1:2009 +A1:2014: “Code of practice for noise and vibration control on construction and open sites” together with the specific requirements as set out by Cork City Council. In particular, it is proposed that various practices be adopted during construction, including:

- establishing channels of communication between the contractor/developer, local authority, and residents;
- appointing a site representative responsible for matters relating to noise;
- selection of plant with low inherent potential for generation of noise;
- siting of noisy plant as far away from sensitive properties as permitted by site constraints;
- continual monitoring of noise at the adjacent residential buildings in Jacobs Island.

### 2.7.1.8 Dust Management

Mitigation Measures to be implemented to control dust caused by construction traffic and works include.

- Ensure that dust emissions on-site are managed through the implementation of the dust minimisation measures outlined in Section 7 of the CEMP (Appendix 2.1 refers). These include:
- At all times, the procedures put in place will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, significant dust producing activities will be immediately terminated and satisfactory procedures implemented to rectify the problem before the resumption of the operations.
- The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practise and procedures.
- Dust monitoring will be carried out using a Microdust Pro – Automatic dust monitoring unit. The measure will continue for the duration of the enabling works and the bulk dig which are the periods in which the most dust would be created on site.
- Any additional information referring to the site during the survey period will be noted. A note will also be made if the site is operational or dormant. In addition, the wind direction and weather for the day will be recorded.

The dust minimisation measures will be reviewed at regular intervals during the construction phase, to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust using best practice and procedures.

### 2.7.1.9 Waste Management

As detailed in Section 9 of the CEMP, it is anticipated that excavated material will be reused where possible, on-site or in the vicinity of the site. The objective is to ensure the absolute minimum amount of material leaves the site as waste. All wastes generated during construction will be managed, collected, stored, and segregated in separate areas and removed off site by a licensed waste management contractor at regular intervals.

### 2.7.2 OPERATIONAL PHASE

Once operational, the proposed development will result in several long-term positive impacts for Mahon and the local area. The proposed development will result in the provision of an additional 489 no. residential units, a creche and office at a location which has excellent access to a regular bus route (which is due for future improvements as identified in CMATS) and pedestrian and cycle infrastructure. The proposed development will contribute to an increase in resident and working population, which can support public transport services and local businesses in the general area.

The proposed residential, creche and office uses, in conjunction with the other proposed Masterplan uses (The northern portion of the masterplan area is currently the subject of a planning application for a hotel and offices (22/40809 refers), and the 595m<sup>2</sup> of permitted retail space (ABP-301991-18 as amended by ABP-310378-21), will provide for a diversification to the existing economy and childcare provision in Jacob’s Island. It is expected that the sites’ location adjacent to the terminus of the 215/215A no. bus route and the public realm upgrades proposed, will result in a greater uptake of walking, cycling and public transport opportunities, underpinning national, regional and local planning objectives to improve sustainable modes of transport and reducing dependency on the private vehicle. It is considered that the proposed development is of an appropriate scale, form and quality that can make a significant positive contribution to the settlement and Metropolitan Cork into the future.

The proposed office development will facilitate the consolidation and clustered growth of the existing employment hub at Mahon. The proposed creche facility will provide for the childcare requirements generated from the development, as well as contributing to the childcare provision in the wider settlement.

The proposed landscape/recreation and amenity strategy capitalises on the site’s adjacency to 2 no. greenways and setting adjacent to Lough Mahon by incorporating a series of open spaces, linked by pedestrian and cycle routes between the Joe McHugh Park and Mahon District Centre. The current predominantly scrubland area, is largely inaccessible for ameity use. A central park and ancillary open space areas will be landscaped with replacement planting, which mitigates the necessary loss of existing vegetation cover. Existing informal desire lines through the site will be replaced with formalised pedestrian and cycle linkages through the proposed layout.

The proposed evolution of the site, from existing underutilised lands to proposed mixed-use, will result in an increase in energy consumption and demand on local infrastructural services. The proposed layout and public realm upgrades will enhance accessibility to public transport links, promoting active and sustainable modes of travel. The proposed buildings have been designed to incorporate sustainable building methods and materials, to reduce unnecessary energy usage and capitalise on the sites south facing aspect.

## 2.8 REFERENCES

[www.cso.ie](http://www.cso.ie)

<http://planning.corkcity.ie/searchtypes>

<https://busconnects.ie/busconnects-cork/>





JACOBS ISLAND



CHAPTER THREE  
Alternatives Considered

# CHAPTER THREE

## Contents

3	Alternatives Considered.....	3
3.1	INTRODUCTION .....	1
3.2	ALTERNATIVE LOCATIONS .....	1
3.3	DO-NOTHING ALTERNATIVE.....	1
3.4	ALTERNATIVE USES.....	2
3.5	ALTERNATIVE LAYOUTS .....	2
3.6	COMPARISON OF ENVIRONMENTAL IMPACTS – CONSTRUCTION PHASE.....	9
3.7	COMPARISON OF ENVIRONMENTAL IMPACTS – OPERATIONAL PHASE .....	10
3.8	MAIN REASONS FOR THE OPTION CHOSEN.....	12

# CHAPTER THREE

## ALTERNATIVES CONSIDERED

### 3.1 INTRODUCTION

Article 5(1) of the Directive 2011/92/EU, as amended by Directive 2014/52/EU states that.

- d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
- f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

Annex IV point 2 expands further.

- 2) A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

Article 94 and Schedule 6, paragraph 1(d) of the Planning and Development Regulations 2001, as amended, requires the following information to be furnished in relation to alternatives:

- “(d) A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.”

The purpose of this Chapter is to describe the reasonable alternatives considered by the developer, including alternatives considered through the design and consultation phases of the project, taking into account and comparing environmental effects and illustrating the manner in which, and reasons for, choosing the proposed development.

Regarding ‘Reasonable Alternatives’, the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment’ (2018) states that:

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

Reasonable alternatives may relate to matters such as project design, technology, location, size and scale. The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. **A ‘mini- EIA’ is not required for each alternative studied.”**

Further the 2022 EPA Guidelines on the Information to be Contained in Environmental Impact Assessments are also instructive in stating:

- “Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR... It should be borne in mind that the amended Directive refers to ‘reasonable alternatives... which are relevant to the proposed project and its specific characteristics”.

This chapter provides an outline of the main alternatives examined throughout the design and consultation process to indicate the primary reasons for choosing the proposed development, considering and providing a comparison of the environmental effects.

### 3.2 ALTERNATIVE LOCATIONS

As stated above, regarding alternative locations, Section 3.4.1 of the 2022 EPA Guidelines, recognise that ‘in some instances some of the alternatives described below will not be applicable’ – e.g. there may be no relevant ‘alternative location’...”.

The subject lands are situated in Jacob’s Island, within the South Mahon suburb of Cork City. These lands in conjunction with the adjacent lands to the north, are the only zoned lands within the settlement in the ownership or control of Hibernia Star Limited. Planning application 22/40809 - for an office and hotel development is currently being determined by Cork City Council with regard to the adjacent lands to the north.

The Draft Cork City Development Plan 2022 - 2028, has been subject to Strategic Environmental Assessment which will have taken into account the environmental considerations associated, for example, with the cumulative impact of an area zoned for development on a sensitive landscape.

We note the 2022 EPA Guidelines, which state.

- ‘Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR... It should be borne in mind that the amended Directive refers to ‘reasonable alternatives... which are relevant to the proposed project and its specific characteristics’

### 3.3 DO-NOTHING ALTERNATIVE

In consideration of a ‘do nothing’ scenario on the site, the following would result:

- Serviced and zoned lands, within the rapidly growing, south-eastern suburb of the Cork City would remain undeveloped and in private ownership, in their current disused form.
- Opportunities to address the existing unsustainable commuter travel patterns in Mahon by co-locating residential and employment development would not be realised.

- The lack of passive surveillance which currently pertain along the existing internal access road would remain. Security issues relating to the underutilised current state of the lands would continue to pose risks.
- The 'do nothing' scenario would undermine the viability of proposed and planned upgrades to the adjacent greenways and public transport (and in the longer term the planned Light Rail Transit (LRT)). The critical mass required to support these infrastructure developments would be constrained by the continued under-utilisation of these accessible lands.
- The public realm and public open space provision associated with the proposed development would not be delivered, with an associated loss to the public amenity in the Mahon area.
- Enhanced pedestrian and cycling connectivity via the formalising of existing informal desire lines through the site of would not be delivered.

A "do-nothing" scenario is considered to represent an inappropriate unsustainable and inefficient use of these serviced lands in this highly sustainable location.

Over time, in the 'do nothing scenario', the subject lands would remain undeveloped, overgrown and neglected and predominantly inaccessible for public use. It is considered likely that the zoned lands to the north, (currently subject to application reference 22/40809) will be developed for hotel and office use, as will the permitted block 10 to the east of the site, with a crèche and a retail unit at ground floor level, resulting in an increasingly urban setting in the area. The 'do-nothing scenario' over time will also result in the population of Mahon and the wider city continuing to be adversely impacted due to housing shortages. It will result in the continuation of the recent trend of underperformance of the South Mahon area in terms of population growth.

A "do-nothing" scenario is considered to represent an inappropriate unsustainable and inefficient use of these serviced mixed-use zoned lands within the city boundary.

### 3.4 ALTERNATIVE USES

The subject lands are identified as being within an area of 'ZO 05 Mixed Use' zoning in South Mahon. Regarding these areas, the zoning objective set out in the Draft Cork City Development Plan 2022 - 2028 aims to;

'Zoning Objective 5: To provide and promote a mix of residential and other uses to ensure the creation of a vibrant and sustainable urban area.'

The Draft Plan states that this zoning facilitates a dynamic mix of uses which will interact with each other creating vibrant urban areas with residential, employment and other uses. Vertical and horizontal mixed uses, with active ground floor uses and vibrant street frontages are envisaged.

Permissible uses include residential, general offices, local services, conference centre, education, hospital, hotel, commercial leisure, cultural uses, civic institutions, childcare services, local medical facilities, business and technology / research uses and community and civic uses.

In assessing the most suitable land uses at the subject site, the long planning history of Jacob's Island was had regard to. In 1997 Jacob's Island was in the ownership of Cork City Council who identified it as a strategic development opportunity and its development was subject to a competitive tender. The successful design team were led by Skidmore, Owings and Merrill and the original design concept was for mixed use development on Jacob's Island. Since two planning permissions have been granted on the site for mixed use development.

In determining the current site development strategy, an assessment of the site's existing context was undertaken. The subject lands are bound to the south and east by residential development in the form of the Longshore Drive, Longshore Avenue and The Haven housing schemes and the Sanctuary apartment development. The site is bounded to the north by land which are currently subject to a planning application for hotel and office use (Cork City Council application reference 22/40809). The ground floor of the permitted block 10 to the east includes a crèche and a retail unit. Immediately beyond the N40 to the north is the Mahon District Centre and a number of employment hubs in close proximity.

The site currently benefits from excellent public transport provision in the form of the 215 and 215A bus routes which serve the site and the nearby 202 and 202A which serve Mahon Point. Proposals for Light Rail Transit, serving Mahon, are set to further enhance this provision. The site is also in close proximity to 2 no. greenways, namely the Passage West Greenway and the River Lee/Lough Mahon Waterfront Greenway, which render this a highly connected and accessible location.

It is not considered that land-uses such as large retail floor-area or industrial development would be appropriate in the site's immediate context, given its proximity to existing residential properties and Mahon District Centre and the permitted retail use in the adjacent block 10. It is also considered that an alternative consisting entirely of open space, recreation, community or education uses would not reflect the most efficient use of the lands, due to the accessibility of the site, served by an existing high frequency public transport system with proposals for further enhancement and its adjacency of several significant employments hubs in the immediate area.

Notwithstanding the above, the provision of high-intensive employment, industrial or predominantly open-space development is also inconsistent with the planning policy objectives for this location as outlined in the Draft Cork City Development plan 2022 - 2028.

In this context, the proposed mixed-use residential and office development would contribute towards addressing Mahon's existing and future residential needs, while allowing for the expansion of its role as a strategic employment area. In this context it comprises the most appropriate land-use alternative of the lands, and is in accordance with the proper planning and sustainable development of the area.

### 3.5 ALTERNATIVE LAYOUTS

Throughout the duration of the project, the developer considered several different layouts and options for the development of the subject lands. Each stage of the project required a reappraisal of the design strategy of the project and an evaluation of how each proposed layout responded to the site's context. The design rationale for the proposed development adopted several key principles which underpinned the wider development strategy for the lands including.

- The creation of an appropriately scaled, mixed-use residential/office development which positively contributes to the local area, providing new residential and economic opportunities for Mahon.
- Arrangement of commercial uses adjacent to the entrance to Jacob's Island for ease of access and to provide a strong streetscape.
- A series of public open spaces arranged to facilitate the realisation of movement desire lines between Mahon District Centre and Joe McHugh Park.
- Residential buildings and open spaces to be arranged to minimise impact of noise from N40.
- Buildings forms to relate to existing and permitted development.

3.5.1 ALTERNATIVE A – JULY 2021

A Section 247 pre-application consultation meeting took place on 29th July 2021 with Cork City Council (ref 172/21). The layout presented at the Section 247 meeting is illustrated in Figure 3.2 as shown.



Figure 3.1: Alternative A – Masterplan Area - Urban Strategy July 2021

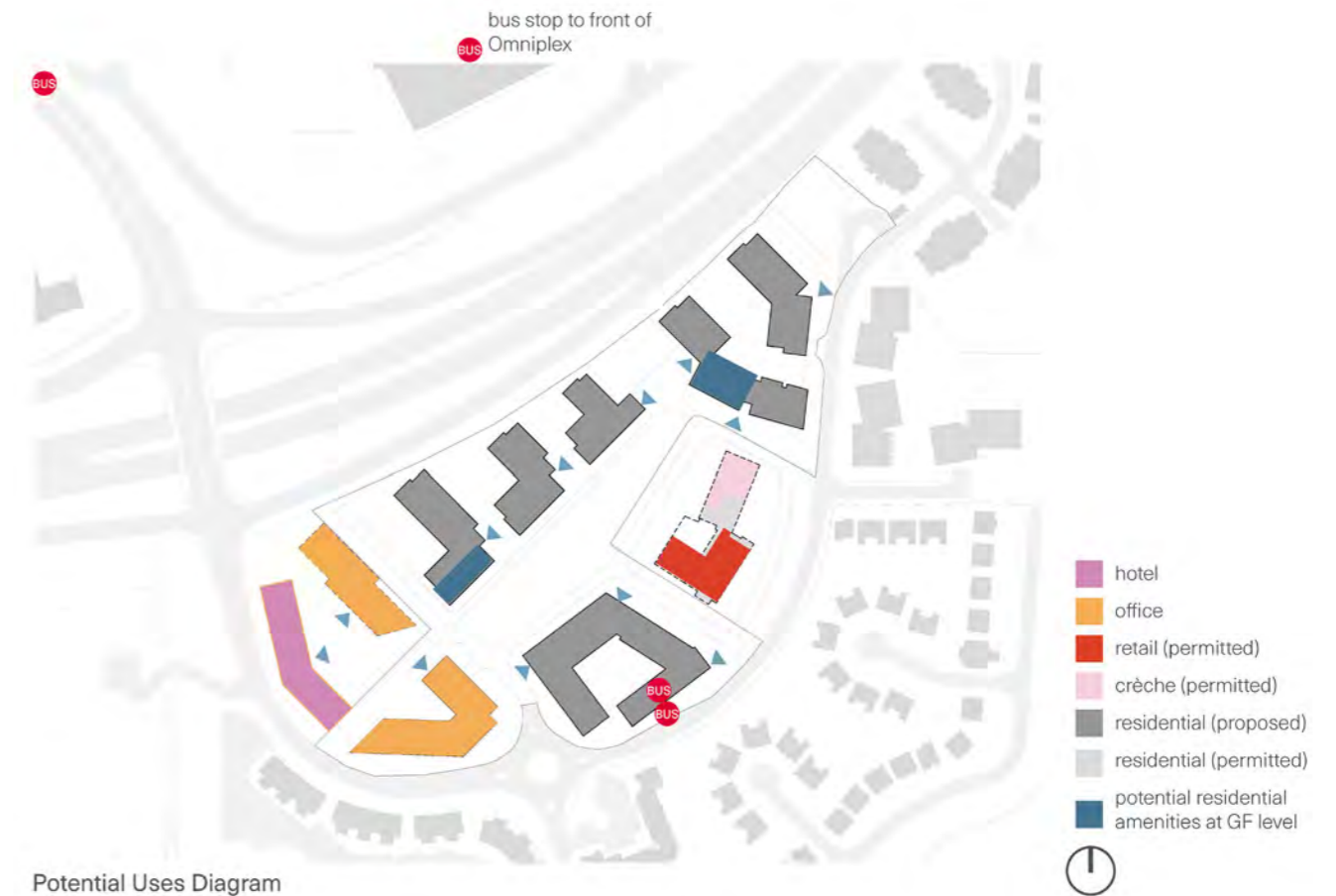


Figure 3.2: Alternative A – Masterplan Area - Potential Uses July 2021

While the Masterplan included proposals for the wider area, Alternative A for the subject site comprised the construction of 577 no. residential units with a mix of studio, 1 bedroom, 2 bedroom and 3 bedroom apartment units. In addition, 4500m<sup>2</sup> of office space was proposed. An overview of the key statistics of Alternative A is summarised in Table 3.1 as shown.

Key Figures of Alternative A Layout	
<b>Total Site Area</b>	3.6 hectares
<b>No. of residential units</b>	577 no. units
<b>Building Footprint</b>	14993m <sup>2</sup>
<b>Site Coverage</b>	41%
<b>Residential Density</b>	159.4 no. residential units per hectare
<b>Housing Mix</b>	31 no. studio apartment units - (5.4%). 238 no. 1 bedroom apartment units - (41.2%) 266 no. 2 bedroom apartment units - (46.1%) 42 no. 3 bedroom duplex apartment units - (7.3%).
<b>Public Open Space (Residential Area)</b>	3690 m <sup>2</sup> - 10.2% of site area
<b>Communal Open Space</b>	4900m <sup>2</sup>
<b>Car Parking (Residential)</b>	285 car spaces.
<b>Car Parking (Offices)</b>	50 car spaces
<b>Office Development</b>	4500m <sup>2</sup>

Table 3.1: Alternative A – July 2021 – Key Statistics

The Council were generally positive towards the proposal, raising the following items that they considered may require further development:

- Relationship of blocks' ground floor layout with street
- Relationship between private and communal open space
- Apartment duplex block frontage
- Apartment design layout, dual aspect and adequate light

- Visual interest from N40
- Noise from N40
- High number of surface car parking spaces
- Advised against formal playgrounds, in favour of informal areas
- Traffic impact

The design rationale for the proposed development was revisited following the planning authority's observations made during the pre-application consultation process, including.

- Noise modelling and initial assessments were received from AWN Consulting Limited subsequent to the S247 consultation and this resulted in alterations to the proposed Masterplan. In response to the noise assessment the proposed residential and commercial uses on the overall Masterplan lands were swapped. The revised Masterplan locates the less vulnerable hotel and offices uses adjacent to the N40 and the more noise sensitive residential uses within the site itself, where they can benefit from a naturally quieter environment;
- Commercial uses, located along the N40, provide a strong urban edge to the N40;
- Urban block layout to contain a series of public spaces, which facilitate the pedestrian desire line between the entrance to the island and Joe McHugh Park;
- Residential buildings and their associated communal spaces to be organised so as to provide strong frontage to streetscapes, and clear definition of public, communal and private spaces;
- Surface parking revisited; and
- Building forms to be designed so as to relate to the existing and permitted development, with playful, staggered blocks to the very north of the proposal echoing the language of development permitted under SHD ABP-301991-18, and blocks further to the south of the proposal to introduce a new architectural language establishing a distinct sense of place for this phase of Jacobs Island, defining strong streetscapes and public spaces.

Alternative B, as discussed below, evolved as a result of these amendments.

### 3.5.2 ALTERNATIVE B – MARCH 2022

A tripartite meeting took place on 4th March 2022 with representatives of the developer, planning authority and An Bord Pleanála. The observations of the planning authority made during the Section 247 meeting were reflected in the Alternative B layout, relating to.

- Relocation of commercial uses adjacent to N4, to present a strong urban edge from the N40 and shield the residential uses and open spaces from noise.
- Reduction in the number of proposed residential units and associated density and a reduction in the office floor area.
- Inclusion of a creche.
- Reduction of surface parking quantum.
- Revised relationships between private, communal and public open space.
- A series of public parks to support pedestrian linkage and to reflect 'desire line' to Mahon District Centre from Joe McHugh Park.
- Revised details relating to street frontage.



Figure 3.3: Alternative B - Masterplan Area - Urban Strategy March 2022



Figure 3.4: Alternative B - Masterplan Area - Proposed Uses March 2022

Alternative B comprised a development of 498 no. residential units (reduced from 577), again with a mix of studio, 1 bedroom, 2 bedroom and 3 bedroom apartment units, however, the 2 bedroom units were now the predominant type. In addition, 4073 m<sup>2</sup> of office space was proposed, reduced from 5000m<sup>2</sup>, with provision for a crèche now included. These reductions are reflected in the overall density of the proposed development which was reduced from 159.4 units/hectare to 147.8 units/hectare. Similarly, the site coverage reduced from 41% to 31%. To address the Council's concerns the surface parking quantum was reduced from 165 no. spaces to 119 no. spaces. An overview of the key statistics of Alternative B is summarised in Table 3.2 as shown.

Key Figures of Alternative B Layout	
<b>Total Site Area</b>	3.95 hectares
<b>No. of residential units</b>	498 no. units
<b>Building Footprint</b>	14993 - 10366m <sup>2</sup>
<b>Site Coverage</b>	31%
<b>Residential Density</b>	147.8 no. residential units per hectare
<b>Housing Mix</b>	3 no. studio apartment units - (0.6%). 161 no. 1 bedroom apartment units - (32.3%) 327 no. 2 bedroom apartment units - (65.7%) 7 no. 3 bedroom duplex apartment units - (1.4%).
<b>Public Open Space (Residential Area)</b>	3616 m <sup>2</sup> - 11.6% of site area
<b>Communal Open Space</b>	3442m <sup>2</sup>
<b>Car Parking (Residential)</b>	259 car spaces.
<b>Car Parking (Offices)</b>	74 car spaces
<b>Office Development</b>	4073m <sup>2</sup>
<b>Creche Development</b>	381 sq m

Table 3.2: Alternative B – March 2022 – Key Statistics



Figure 3.5 Isometric View of Alternative B

Following the receipt of the ABP opinion (ABP- 311818-21) in March 2022, it was considered that Alternative B should be amended having regard to the Boards Opinion which raised the following issues:

- Further consideration required of the integration of the proposed design with those permitted and proposed developments in the immediate vicinity;
- Further consideration required of the architectural approach to Blocks 11- 15 and interaction of the ground floor layouts and the public realm, specifically the movement and flow of pedestrians/cyclists within the carparking strategy and open space design; and
- Further consideration required regarding the creation of a sense of place within the new development.

The meeting minutes of the July 2021 Section 247 meeting and the March 2022 Tripartite Meeting Opinion are contained in Appendix 3-1 of this EIAR.

### 3.5.3 ALTERNATIVE C – PROPOSED DEVELOPMENT

A full description of the proposed development for which permission is sought pursuant to this application is provided in Chapter 2 of this EIAR.

The end result of the various alternations and layout revisions is the proposed development. The number of residential units has been slightly



reduced to 489 no. from the 498 no. that was presented at pre-consultation stage and the 3 bedroom duplex apartment units have been omitted. There is a consequent slight decrease in the density of the scheme from 147.8 units/hectare to 137.7 units/hectare. However, the building footprint and net site coverage have increased, the latter from 31% to 42%. The public open space has been slightly increased and car parking is now predominantly under podium or undercroft (67%), with provision being made for car club spaces. The communal open space of Block 15 has been relocated to the north-west of the block to provide active frontage along the pedestrian desire line that runs through the site. Alongside this, the relocated amenity space, counterbalances and acts in conjunction with the proposed hotel plaza area (Cork City Council Planning Application 22/40809) to animate the main access point to the scheme. A series of character areas have been defined across the scheme, all linked by the central 'Park' area. These areas range in scale and function, from the 'N40 South Link Road' area to 'Local Streets' area, with a variety of public and communal open spaces uses to define their character.



Figure 3.6: Alternative C - Masterplan Area - Urban Strategy June 2022

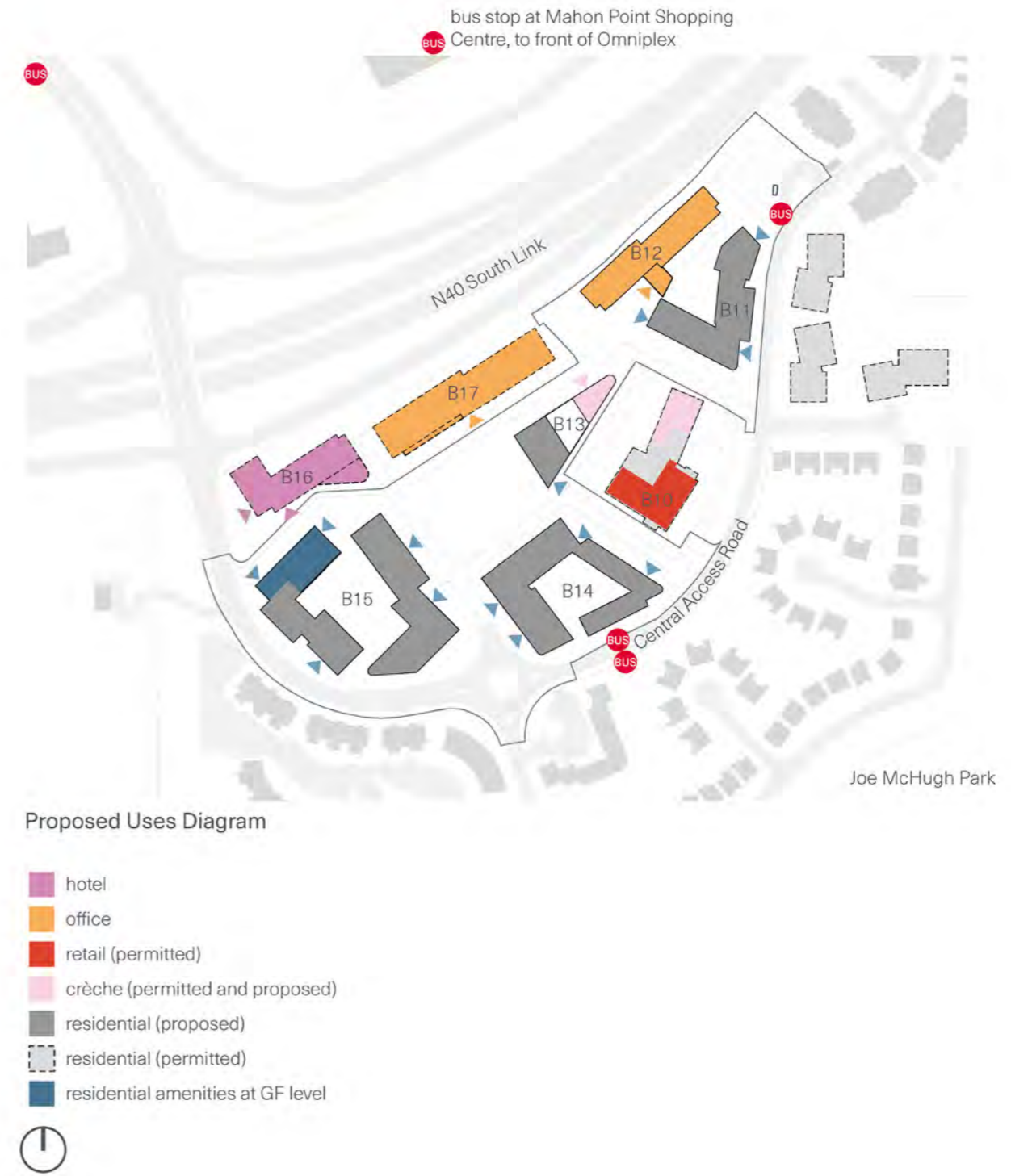


Figure 3.7: Alternative C - Masterplan Area - Proposed Uses June 2022

An overview of the key statistics of the proposed residential development is provided in Table 3.3 as shown.

Key Figures of Alternative C – Proposed SHD Layout	
<b>Total Site Area</b>	3.95 hectares
<b>No. of residential units</b>	489 no. units
<b>Building Footprint</b>	14990 m <sup>2</sup>
<b>Site Coverage</b>	42%
<b>Residential Density</b>	137.7 no. residential units per hectare
<b>Housing Mix</b>	1 no. studio apartment units - (0.6%). 161 no. 1 bedroom apartment units - (32.9%) 327 no. 2 bedroom apartment units - (66.9%)
<b>Public Open Space (Residential Area)</b>	4350 m <sup>2</sup> - 12.3% of site area
<b>Communal Open Space</b>	3470m <sup>2</sup>
<b>Car Parking (Residential)</b>	246 car spaces.
<b>Car Parking (Offices)</b>	75 car spaces
<b>Office Development</b>	4143m <sup>2</sup>
<b>Creche Development</b>	380m <sup>2</sup>

Table 3.3: Key Statistics of Proposed Residential Development



Proposed Uses Diagram

- hotel
- office
- retail (permitted)
- crèche (permitted and proposed)
- residential (proposed)
- residential (permitted)
- residential amenities at GF level

## 3.6 COMPARISON OF ENVIRONMENTAL IMPACTS – CONSTRUCTION PHASE

This section provides a summary of the comparison of environmental impacts during the construction phase between the various alternatives outlined above.

### 3.6.1 LANDSCAPE & VISUAL

It is not considered that landscape and visual considerations differ significantly between the various alternatives described. Each alternative assessed would require similar levels bulk excavation and the removal of existing vegetation, to accommodate the proposed dwellings/roads and underground utilities. The decrease in the number of residential units between Alternatives A-C (577 units reduced to 489) may result in a slight reduction in the construction visual impacts. However, in the context of the wider development, this is not considered to be significant.

### 3.6.2 TRAFFIC & TRANSPORTATION

Due to the lower number of residential units than Alternative A, and to some extent a smaller quantum of office floor space in Alternatives B and C (a reduction of 88 no. apartment units between Alternative A and C), it is likely that there will be some level of decreased construction traffic from Alternative A. It should be noted however that the introduction of a 381m<sup>2</sup> creche in Alternatives B and C offsets the reduction in office space.

The evolution of the scheme to incorporate and formalise current informal pedestrian and cyclist desire lines through the site from the Joe McHugh Park to Mahon District Centre, may potentially result in some short-term negative connectivity impacts, however, this strategy has been consistent, in some form, through all iterations of the layout.

However, the construction mitigation measures identified in the CEMP and the proposed Construction Traffic Management Plan, which will be developed in detail in advance of Alternative C, will ensure that any impacts will not be significant in nature, and any negative impacts will be short term in duration.

### 3.6.3 SERVICES, INFRASTRUCTURE & UTILITIES

It is not considered that services, infrastructure and utilities considerations differ significantly between the various alternatives described. The decrease in the number of residential units between Alternatives A-C, coupled with the smaller quantum of office floor space in the latter alternatives will result in a lower demand for connections to services and utilities. However, in the context of the wider development, this is not considered to be significant.

### 3.6.4 LAND, SOILS & GEOLOGY

It is not considered that land, soils and geology considerations differ significantly between the various alternatives described. While, there was a decrease in proposed site coverage between Alternative A and B, from 41% to 31%, however with Alternative C this had reverted to 42%. Potentially, this could result in Alternative B requiring slightly less excavation works and piling than Alternatives A and C. Alongside that, through the evolution of the scheme design the percentage of public open space has increased from 10.2% to 11.6% to finally 12.3%. This could also reduce the amount of piling and excavation required.

### 3.6.5 WATER & HYDROLOGY

It is not considered that water (hydrology & hydrogeology) considerations differ significantly between the various alternatives described. The principles of the flood defence, surface/foul water strategies have remained relatively consistent across all alternatives proposed.

### 3.6.6 BIODIVERSITY

It is not considered that biodiversity considerations differ significantly between the various alternatives described. Detailed construction mitigation measures were developed as the project evolved and are detailed in the accompanying construction management reports.

### 3.6.7 NOISE & VIBRATION

In the absence of appropriate mitigation measures, noise and vibration levels during construction may decrease from Alternative A - C due to the proposed decrease in housing unit numbers and office floor area. This effect may be offset by the increase in site coverage in Alternative C in comparison to Alternative B. However, as noted in the context of Land, Soils & Geology above, the public open space quantum in Alternative C is larger than the two alternatives, with an associated reduction in earth works and excavation. Overall, however, in the context of the wider development, these differences are not considered to be significant. As detailed in the CEMP, noise and vibration limits will be rigorously monitored throughout construction and will not exceed the standards outlined in the CEMP. It is not considered that noise and vibration considerations differ significantly between the various alternatives described.

### 3.6.8 CULTURAL HERITAGE

It is not considered that cultural heritage considerations differ significantly between the various alternatives described. The design of all three alternatives has been informed by the presence of the cellar, originally associated with Lakeland House, at the north of the site. Its retention in situ with a 10m buffer zone has been a consistent feature of all three alternative designs.

### 3.6.9 AIR QUALITY & CLIMATE

The decrease in the proposed number of residential units and to some extent the reduction in the office floor area across the various alternatives<sup>1</sup>, may result in some decrease in levels of dust emissions during construction. However, with the dust management plan and other mitigation measures enforced, it is considered that any positive impacts relevant to air quality and climate are not significant across all alternatives.

### 3.6.10 POPULATION & HUMAN BEINGS

The decrease in the number of residential units across the various project alternatives, may result in a slight reduction in impacts relating to population and human health. These may include a shorter construction period, lower construction traffic numbers and nuisances such as noise, vibrations and dust. The differential in the number of residential units between Alternatives A-C is 88 no. units.

<sup>1</sup> Note this reduction is offset by the addition of a creche in Alternatives 2 and 3

Although there may still be some inconveniences to the local population resultant from Alternative C, it is considered that with the proposed mitigation measures in place, that these will be temporary/short term in nature and not significant.

Criteria	Alternative A	Alternative B	Alternative C
Landscape & Visual	=	=	=
Traffic & Transportation	X	=	=
Services, Infrastructure & Utilities	X	=	=
Land, Soils & Geology	X	=	=
Water & Hydrology	=	=	=
Biodiversity	=	=	=
Noise & Vibration	X	=	=
Cultural Heritage	=	=	=
Air Quality & Climate	=	=	=
Population & Human Beings	X	=	=

- ✓ Where it has been considered that there has been an improvement from the previous alternative
- = Where the impact is considered similar for all options
- X Where a particular option is considered to have a more negative impact on a particular aspect of the environment than other alternatives.

Table 3.4: Comparison of Impacts

### 3.7 COMPARISON OF ENVIRONMENTAL IMPACTS – OPERATIONAL PHASE

This section provides a summary of the comparison of environmental impacts during the operational phase between the various alternatives outlined above.

#### 3.7.1 LANDSCAPE & VISUAL

It is considered that the evolution of the project from Alternative A -C, results in an enhanced landscape and visual amenity context. The provision of a central amenity parkland and more appropriate public open spaces within the proposed scheme, results in a higher quality residential amenity and allows greater linkages with the existing pedestrian and cycling context. The reorganisation of the functional roles of the blocks to concentrate the larger, commercial blocks adjacent to the N40, thereby sheltering the residential and amenity areas from noise, will enhance the quality of the scheme's amenity areas in Alternative B and C in comparison to Alternative A. The introduction of the 9 storey pavilion (Block 13) in Alternatives 2 and 3, to frame the central park area and provide passive surveillance, will enhance the security and usability of the amenity area. The visual impact of the scheme is also enhanced in Alternative 3 by the counter-posing of the Block 15 communal amenity area with the hotel plaza to produce a balanced, landscaped entry-point to the scheme.

#### 3.7.2 TRAFFIC & TRANSPORTATION

It is also considered that proposed Alternative C results in an improvement in traffic and transportation matters, and specifically pedestrian and cyclist connectivity. Improvements to the streetscape and ground floor active frontage will enhance the usability of the pedestrian/cyclist desire line through the site.

The introduction of a creche in Alternative B and C, which was not proposed in alternative A will result in increased pedestrian, cyclist and car-based trips into the scheme. However, in the context of the wider mixed use character of the proposed layout, with 4143m<sup>2</sup> of office space, this is not considered to be significant.

#### 3.7.3 SERVICES, INFRASTRUCTURE & UTILITIES

The servicing proposals have remained relatively consistent throughout the design phase of the proposed development. As detailed further in Chapter 5 of this EIAR, and the accompanying engineering documentation prepared by Sweco Ireland, the implementation of appropriate measures will ensure that the residual effect of the proposed development on the local road network is both managed and minimised, with the impact described as 'Negative' but 'Slight' and 'Permanent'. This remains the case regardless of Alternative considered. As noted in Chapters 6 and 8 of this EIAR the existing wastewater and stormwater infrastructure networks have sufficient capacity to support the proposed development. The impact on services, infrastructure and utilities may vary slightly across the three alternatives due to the differential of 88 no. residential units. However, it is considered that this variation is not significant across the A-C Alternatives.

#### 3.7.4 LAND, SOILS & GEOLOGY

It is not considered that land and soil considerations differ significantly between the various alternatives described.

### 3.7.5 WATER & HYDROLOGY

As noted in Chapter 8 of this EIA the proposed development is several meters above the CFRAMS flood levels in the adjacent estuary, rendering flood risk unlikely. The rationale of the surface water strategy has remained consistent throughout the duration of the project. The proposed wastewater strategy has remained constant for the duration of the project.

### 3.7.6 BIODIVERSITY

As the design and layout of the scheme has evolved from Alternative A to Alternative C, the creation of the central park, with linked areas of open space, tree retention policies and robust replacement planting strategies will result in an enhanced biodiversity and ecological context for the scheme.

### 3.7.7 NOISE & VIBRATION

Noise and vibration considerations differ significantly between Alternative A and the subsequent alternatives. The noise modelling and initial assessments prepared by Awn Consulting Limited informed the layout change after the S247 meeting with Council. In Alternatives B and C the proposed residential and commercial uses on the overall Masterplan lands were swapped. In these alternatives the less vulnerable hotel and offices uses are adjacent to the N40 and the more noise sensitive residential uses within the site itself, where they can benefit from a naturally quieter environment.

### 3.7.8 CULTURAL HERITAGE

It is not considered that cultural heritage considerations differ significantly between the various alternatives described. An information board is proposed in Alternative C, indicating the presence of the cellar, originally associated with Lakeland House and outlining its history. It is considered that this would result in a slight positive impact in comparison to the previous alternatives.

### 3.7.9 AIR QUALITY & CLIMATE

It is not considered that air quality and climate and considerations differ significantly between the various alternatives described. The decrease in the number of residential units across the various project alternatives, may result in a slight reduction in impacts relating to population and human health.

### 3.7.10 POPULATION & HUMAN BEINGS

The evolution of the proposed layout has resulted in a continuous improvement in terms of human health and impacts on the local population. The proposed noise impact improvements, public realm upgrades, public open space enhancements, formalisation of pedestrian and cycling desire lines, in addition to the delivery of a creche have all evolved since the project inception stage. The provision of new housing and offices has been a key focus since Alternative A. The quantum of units has decreased during the evolution of the project, however, this is offset but associated design improvements. Overall, it is considered that Alternative C would result in a slight positive impact in comparison to the previous alternatives.

Table 3.5 as shown provides an objective comparison analysis of the evolution of the proposed development in context of the categories outlines above.

Criteria	Alternative A	Alternative B	Alternative C
Landscape & Visual	X	✓	✓
Traffic & Transportation	=	=	✓
Services, Infrastructure & Utilities	=	✓	✓
Land, Soils & Geology	=	=	=
Water & Hydrology	=	=	=
Biodiversity	=	=	✓
Noise & Vibration	X	=	=
Cultural Heritage	=	=	✓
Air Quality & Climate	=	=	✓
Population & Human Beings	=	=	✓

✓ Where it has been considered that there has been an improvement from the previous alternative

= Where the impact is considered similar for all options

X Where a particular option is considered to have a more negative impact on a particular aspect of the environment than other alternatives.

*Table 3.5: Comparison of Impacts*

### 3.8 MAIN REASONS FOR THE OPTION CHOSEN

When all construction and operational aspects are assessed, it is objectively considered that 'Alternative C', consisting of 489 no. residential units with supporting internal resident amenity spaces, 4,143m<sup>2</sup> of office space, a creche, landscaping, public realm works and all ancillary site development works is the most appropriate and efficient alternative layout assessed. Alternative C reflects the observations of Cork City Council and An Bord Pleanála made during Section 247 and tripartite discussions, and represents a more efficient development than that previously proposed in Alternatives A and B.

- Alternative C provides for a more appropriate density of residential development, reflective of the site's location at a transition point between low density adjacent suburban residential developments to the south, the Mahon District Centre to the north and the existing and permitted taller buildings to the east. The proposed density, which has reduced during the design process, at 137.7 no. residential units per hectare is still sufficiently high to make efficient use of these sustainable lands, served by the 215 and 215A bus route and within walking and cycling distance, via 2 no. greenways of a number of employment hubs and the urban amenities of Mahon and Cork City.
- The landscape, visual and amenity strategy has evolved throughout the scheme design, to provide for a central amenity park, with a pavilion building framing this space and ensuring passive surveillance. This was not initially envisaged in Alternative A. As the layout evolved this park has become the focal point of a series of open spaces, connected by the pedestrian/cycle route that traverses the site, connecting the Joe McHugh Park to the south with Mahon District Centre to the north. The usability of these open spaces and the quality of the residential amenity has been enhanced by a decision taken in Alternative 2 to swap the functional spaces around, clustering the larger commercial spaces adjacent to the N40, to act as a sound baffle for the more vulnerable residential and amenity uses, which are now located to the south.
- Enhancement to the streetscape and the provision of active street frontage, introduced in Alternative C, will ensure the safety and usability of the pedestrian / cycle route within the site, which satisfies desire lines to local destinations and provides connections with adjacent greenways.
- It is considered that the proposed layout has incrementally improved across all alternative layouts considered and will positively contribute to the future residential and economic growth of the Mahon area. Once operational the proposed development will result in several positive environmental and socio-economic impacts to the locality.



JACOBS ISLAND



CHAPTER FOUR  
Townscape & Visual

# CHAPTER FOUR

## Contents

4	Townscape & Visual .....	4
4.1	INTRODUCTION .....	1
4.2	RELEVANT LEGISLATION, PLANNING POLICIES & GUIDANCE.....	1
4.3	METHODOLOGY .....	7
4.4	BASELINE ENVIRONMENT .....	15
4.5	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT ETHODOLOGY .....	17
4.6	POTENTIAL EFFECTS (RESIDUAL EFFECTS).....	17
4.7	MITIGATION MEASURES .....	23
4.8	MONITORING .....	23
4.9	SUMMARY.....	24



# CHAPTER FOUR

## TOWNSCAPE AND VISUAL

### 4.1 INTRODUCTION

This chapter identifies and assesses the potential effects of the proposed Strategic Housing Development (SHD) at Jacobs Island, Cork on the townscape and visual resource of the study area. It examines the proposed mitigation and compensation measures that will be implemented to prevent, reduce, or offset potential adverse townscape and visual effects or enhance potential beneficial effects.

In the context of this project 'landscape' includes urban landscape or townscape. As the study area is predominantly built-up, the term 'townscape' has been used rather than landscape. Both terms are, however, interchangeable, depending on the nature and context of the area.

The chapter considers how:

- Townscape effects associated with a development relate to changes to the fabric, character, and quality of the townscape resource and how it is experienced; and
- Visual effects relate closely to townscape effects, but also concern changes in views as visual assessment is also concerned with people's perception and response to changes in visual amenity.

Townscape and visual effects are interrelated with other environmental effects but are assessed separately. Whilst elements of the built heritage such as Listed Buildings and Conservation Areas are important elements of the townscape and contribute to its character and influence its quality and value, effects on the significance of these designated features and their setting do not form part of this assessment.

The landscape and visual impact assessment will be supported by a booklet of photomontages (prepared by Pederson Focus), which will be included in Appendix 4.1.

### 4.2 RELEVANT LEGISLATION, PLANNING POLICIES & GUIDANCE

#### European

The Council of Europe Landscape Convention provides guidelines for managing landscapes/townscapes. The Convention is not an EU Directive. Countries that sign and ratify the Convention make a commitment to upholding the principles it contains within the context of their own domestic legal and policy frameworks. The convention was ratified by Ireland in March 2002 and came into effects in Ireland in 2004. The European Landscape Convention requires *"landscape to be integrated into regional and town planning policies and in cultural, environmental, agricultural, social and economic policies, as well as any other policies with possible direct or indirect impacts on Landscape"*.

#### National

The National Landscape Strategy (NLS) for Ireland 2015-2025 was launched in May 2015 and is to be implemented by the Government in the future. The NLS promotes the sustainable protection, management, and planning for the landscape/townscape. The NLS states that the *"National Landscape Strategy will be used to ensure compliance with the European Landscape Convention and to establish principles for protecting and enhancing the townscape(townscape) while positively managing its change. It will provide a high-level policy framework to achieve balance between the protection, management and planning of the landscape by way of supporting actions."* It also states that *"The Strategy sets out Ireland's high-level objectives and actions with regard to landscape (townscape). It also positions landscape in the context of existing Irish and European strategies, policies and objectives, and outlines methods of ensuring co-operation at a sectoral and at a European level by the State."*

#### Urban Development and Building Heights – Guidelines for Planning Authorities, December 2018

These guidelines set out national planning policy guidance on building heights with regard to urban areas. Under the guidance, it is considered that by consolidating and strengthening existing built-up areas, more sustainable development patterns can be achieved by limiting the expansion of towns and cities outwards. These guidelines build upon the strategic policy framework set out in Project Ireland 2040 and the National Planning Framework. With regard to the building heights of new developments, relevant aspects of these guidelines are extracted and listed as follows:

- Increased building height is a significant component in making optimal use of the capacity of sites in urban locations where transport, employment, services, or retail development can achieve a requisite level of intensity for sustainability,
- Taller buildings can assist in reinforcing and contributing to a sense of place within a city or town centre,
- In some cases, statutory development plans have tended to set out overly restrictive maximum height limits in certain locations and crucially without the proper consideration of the wider planning potential of development sites.
- Local Authorities and An Bord Pleanála *"will be required to have regard to the guidelines and apply any specific planning policy requirements (SPPRs) of the guidelines ... in carrying out their functions"*. It should be highlighted that any SPPRs within the guidelines will take precedence over *"any conflicting, policies and objectives of development plans, local area plans and strategic development zone planning schemes"*.

#### Local

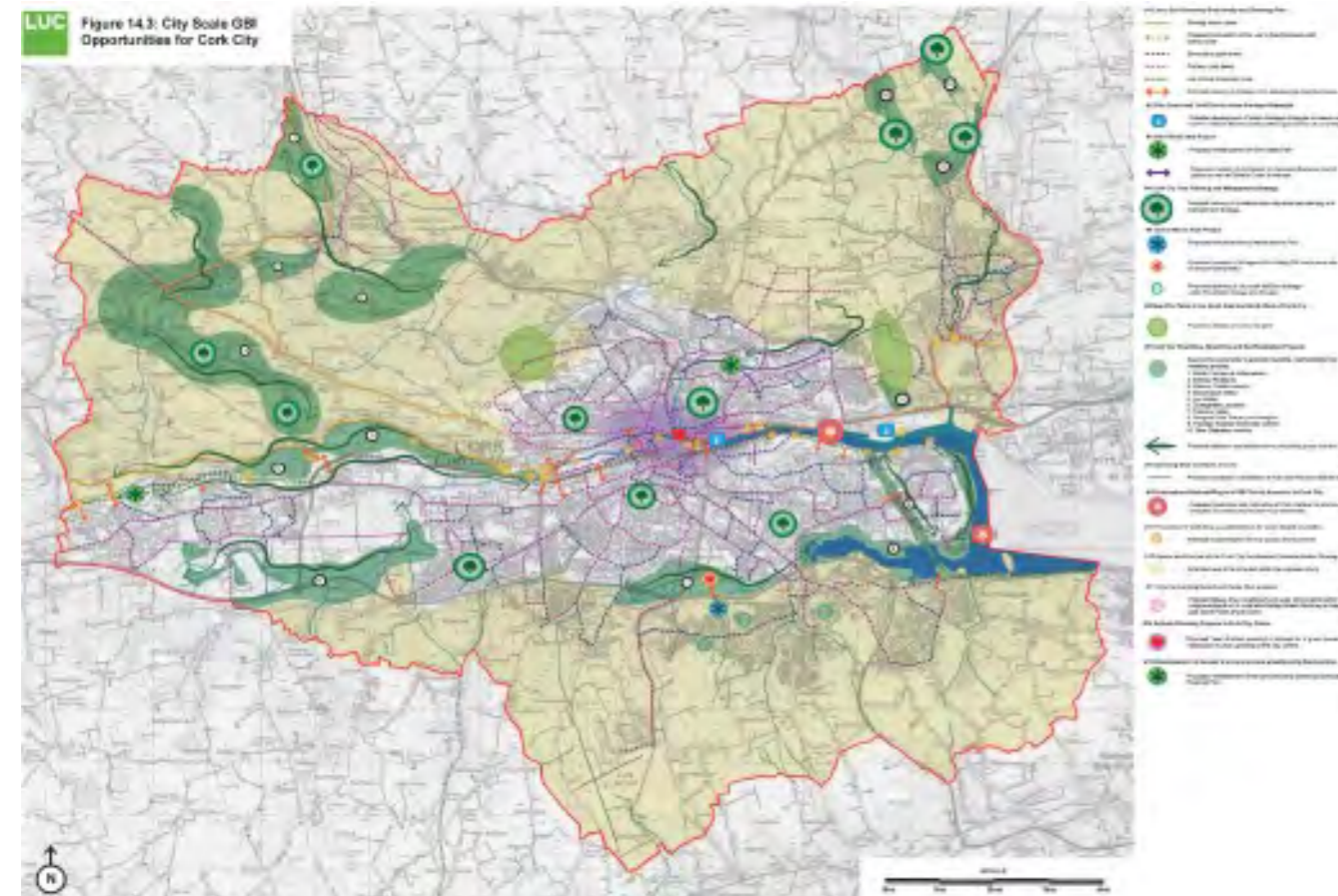
##### Draft Cork City Development Plan 2022-2028 (DCCDP)

The draft development plan for Cork City will come into effect in August 2022. Some landscape designations will change once the new Cork City Development Plan comes into force in June 2022. Therefore, this assessment will consider the draft document within this chapter. The current Cork City Development Plan 2015-2021 at the time of writing this chapter and Cork County Development Plan (for areas not covered by the current CCDP following the extension of the Cork city boundaries in 2019) will also form the planning baseline for this assessment along.

The Landscape Character Assessment has not been updated within the Draft Cork City Development Plan and therefore the Cork City Landscape Study 2008 referenced later in the report is still current.

**Cork City Green and Blue Infrastructure Implementation 2022-2028**

The Cork City Green and Blue Infrastructure Study 2021 identifies emerging opportunities and interventions that have the capacity to deliver a range of GBI outputs within the city. Figure 4.1 illustrates these opportunities and how they can support the establishment of healthy, resilient, wilder and destination spaces across Cork City. The opportunities identified to act as a framework for enhanced delivery of green and blue infrastructure in Cork City.



*Figure 4-1 City Scale GBI Opportunities for Cork City. (Draft Cork City Development Plan 2022-2028)*

There are two city scale GBI opportunities shown on Image 4-1 which refer directly to the Proposed Development site and are listed below:

**Rewilding, Rewetting and Reafforestation Projects**

Support actions and projects that promote and deliver rewilding, rewetting and reafforestation in Cork City to create best practice GBI asset that benefit communities, health and the environment and enhance species richness using ecologically- friendly management.

**Ecology, Biodiversity and Natural Heritage Data Project for Cork City**

Adopt new approaches to overcome gaps in baseline data for ecology, biodiversity and natural heritage at the city level and develop a successful approach for its use at an early stage in development planning.

The plan also contains a number of objectives that relate directly to the protection of the city’s townscape/landscape character. Relevant objectives are listed below:

**S05 – Green and Blue Infrastructure, Open Space and Biodiversity**

Manage and enhance green and blue infrastructure, to protect and promote biodiversity, ecology and habitat connectivity, protect natural areas, enhance landscape character and maritime heritage, and manage access to green and blue spaces that provide recreation, amenity and natural areas.

**S09 – Placemaking & Managing Development**

Develop a compact liveable city based on attractive, diverse and accessible urban spaces and places. Focus on enhancing walkable neighbourhoods that promote healthy living, wellbeing and active lifestyles, where place-making is at the heart. Follow a design-led approach with innovative architecture, landscape and urban design that respects the character of the city and neighbourhood.

**Objective 2.15 – Neighbourhood Design**

The design and siting of development shall create a sense of community and identity, enhance connectivity, incorporate creative approaches to urban design, enhance landscape character and green and blue infrastructure and respect the local context and character of the area.

**Objective 6.9 - Landscape**

- a. To preserve and enhance Cork’s landscape character, key landscape assets and views and prospects of special amenity value.
- b. Landscape will be an important factor in all development proposals, ensuring that a proactive view of development is undertaken while maintaining respect for the environment and heritage generally in line with the principle of sustainability.
- c. To ensure that new development meets the highest standards of placemaking, siting and design.
- d. To protect those prominent open hilltops, valley sides and ridges that define the character of the Cork City Hinterland and those areas which form strategic, largely undeveloped gaps between the main Hinterland settlements from development.
- e. To discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments.
- f. To support, as appropriate, any relevant recommendations contained in the National Landscape Strategy for Ireland 2015-2025.

**Objective 6.10- City Landscape Strategy**

Cork City Council will undertake a City Landscape Strategy during the life of this Plan to ensure that the management of development throughout the City will have regard for the value of the landscape, its character, distinctiveness and sensitivity.

**Objective 6.11 - Landscape and Development**

To ensure that the management of development throughout Cork City will have regard for the value of the landscape, its character, distinctiveness and sensitivity in order to minimize the visual and environmental impact of development, particularly in designated areas of high landscape value where higher development standards (layout, design, landscaping, materials) are required.

**Objective 6.12 - Landscape Preservation Zones**

To ensure that the management of development throughout Cork City will have regard for the value of the landscape, its character, distinctiveness and sensitivity in order to minimize the visual and environmental impact of development, particularly in designated areas of high landscape value where higher development standards (layout, design, landscaping, materials) are required.

**Objective 6.13– Areas of High Landscape Value**

To conserve and enhance the character and visual amenity of Areas of High Landscape Value (AHLV) through the appropriate management of development, in order to retain the existing characteristics of the landscape, and its primary landscape assets. Development will be considered only where it safeguards to the value and sensitivity of the particular landscape. There will be a presumption against development where it causes significant harm or injury to the intrinsic character of the Area of High Landscape Value and its primary landscape assets, the visual amenity of the landscape; protected views; breaks the existing ridge silhouette; the character and setting of buildings, structures and landmarks; and the ecological and habitat value of the landscape.

**Objective 6.14– Cork City View Management Framework**

- a. To protect the strategic panoramic, linear, river prospect or scenic route views identified in this Plan and ensure that development proposals do not have an undue detrimental impact on these views.
- b. Development proposals will be assessed against their impact on the designated view if it falls within the foreground, middle ground or background of that view. New development should not harm, and where possible should make a positive contribution to, the characteristics and composition of the designated views and their landmark elements. It should also preserve or enhance viewers' ability to recognise and to appreciate Strategically Important Landmarks in these views.
- c. Development proposals that could affect a designated view should be accompanied by an assessment that explains, evaluates and justifies any visual impact on the view affected. The scoping process for determining whether a development proposal is likely to affect a designated view should be completed in consultation with Cork City Council. The assessment should demonstrate that the proposal is consistent with the relevant objectives of this Plan. The assessment should form part of a design statement or townscape and visual impact assessment submitted with a planning application.

- d. Development in the foreground and middle ground of a designated view should not be overly intrusive, unsightly or prominent to the detriment of the view. Most designated views are seen in a 120 degree field of view. It is not expected that the view outside of this field of vision should be assessed unless specified by Cork City Council.
- e. Strategic and local landmark buildings will need to be considered in the scoping of views to identify the potential impacts of development proposals.

**Objective 6.15– Development on Scenic Routes**

- a. To protect the character of those views and prospects obtainable from scenic routes identified in this Plan.
- b. To require those seeking to carry out development in the environs of a scenic route to demonstrate that there will be no adverse obstruction or degradation of the views towards and from vulnerable landscape features. In such areas, the appropriateness of the design, site layout, and landscaping of the proposed development must be demonstrated along with mitigation measures to prevent significant alterations to the appearance or character of the area.
- c. To encourage appropriate landscaping and screen planting of developments along scenic routes which provides guidance in relation to landscaping.

**Cork City Development Plan 2015-2021 (CCDP)**

As of May 2022, the Cork City Development plan 2022-2028, remains in draft form. Therefore, the Cork City Development Plan 2015-2021 remains a main strategic planning policy document which guides the future renewal and development of Cork City to 2021 and beyond and will be considered within this assessment. The Proposed Development is located within the jurisdiction of the CCDP. Relevant details on planning policies are described in the Planning Policy Context report included in the planning submission package. The Cork City Development Plan identifies and describes the Landscape Character Areas and Key Landscape Assets of Cork City, as identified in the Cork City Landscape Study 2008. The landscape study was commissioned by Cork City Council to “establish principles and provide the framework for protecting and enhancing the natural environment and positively managing its change, as well as providing the context within which the design of developments can take place in an appropriate manner”.

The Landscape Character Assessment contained within the Cork City Landscape Study 2008, defines 8 Landscape Character Areas within the city as follows:

- Estuarine / Riverine
- Natural harbour
- Historic urban core
- Fine-grained inner-city residential
- Suburban residential
- Urban sylvan character
- Urban industrial / commercial
- Rural agricultural

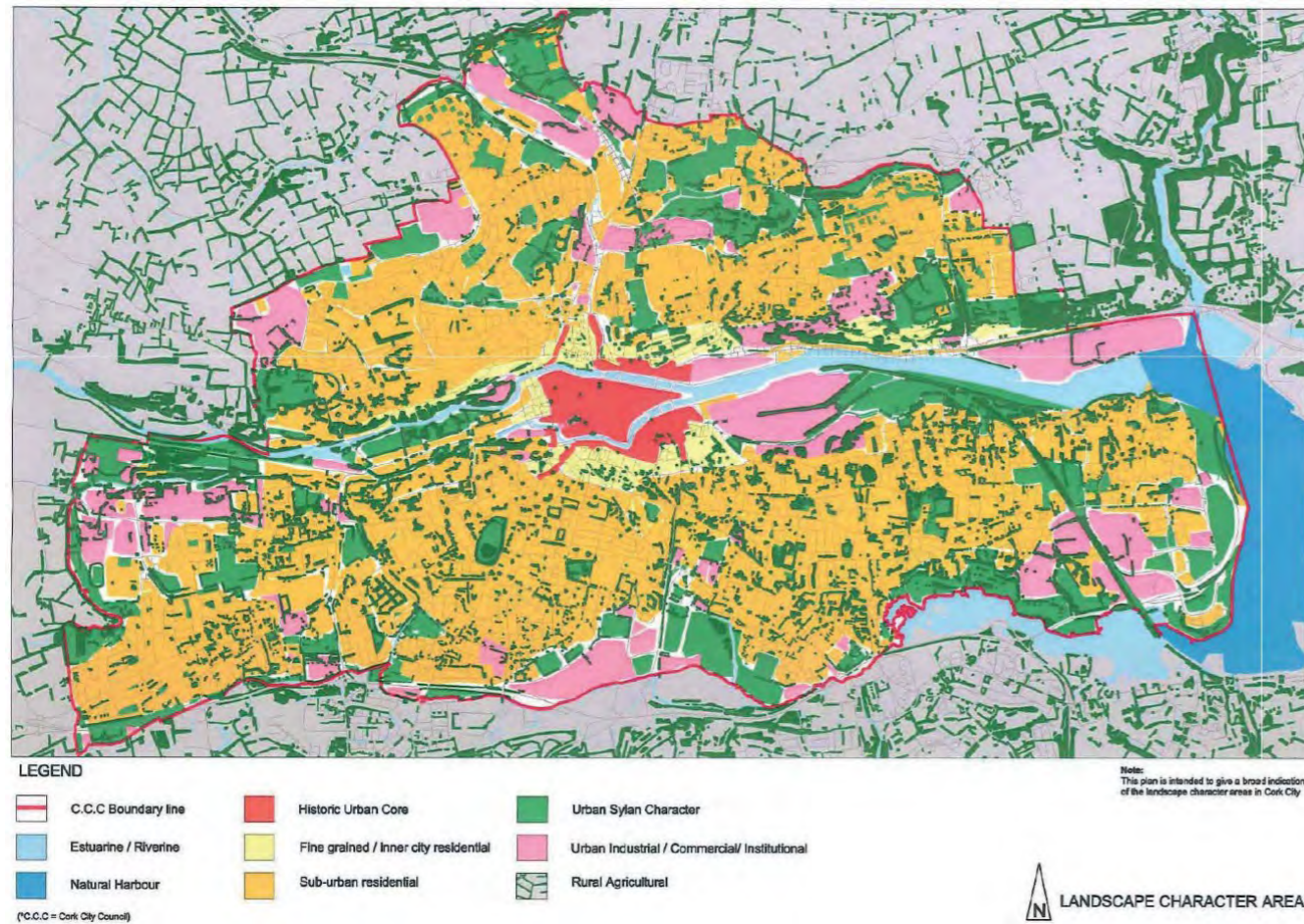


Figure 4-2 Landscape Character Areas (Cork City Landscape Study 2008)

Key Landscape Assets contained within the Cork City Landscape Study 2008 and referenced within the Cork City Development Plan 2015-2021, are identified and categorised in the table on the right:

Key Landscape Assets are illustrated in the CCDP in Figure 10.2 as shown below:

REF	ASSETS CATEGORY
A	TOPOGRAPHY - RIDGES, ESCARPMENTS, SLOPES
B	WATER / RIVER CORRIDORS - RIVERS, ESTUARY, HARBOUR, THE LOUGH, ATLANTIC POND, DOCKLANDS, PORT OF CORK
C	TREE CANOPY - AREAS WITH EXISTING WOODLANDS OR SIGNIFICANT TREE GROUPS, OR AREAS WITH POTENTIAL FOR NEW WOODLANDS
D	ECOLOGY - AREAS WHICH PROVIDE A HABITAT FOR WILD FLORA AND FAUNA
E	VISUALLY IMPORTANT LAND (INCLUDING VIEWS AND PROSPECTS OF SPECIAL AMENITY VALUE, POTENTIAL VANTAGE POINTS AND LOCALLY IMPORTANT VIEWS)
F	HISTORIC CORE / TOWNSCAPES / STREETSAPES
G	LANDMARKS / NATURAL FEATURES / CULTURAL LANDSCAPE - LAND FORMING THE SETTING TO EXISTING LANDMARK BUILDINGS AND/OR PROTAECTED STRUCTURES / BUILDINGS OF SIGNIFICANCE
H	PUBLIC AND PRIVATE OPEN SPACE FOOTPRINT, INCLUDING LAND WITH POTENTIAL FOR PUBLIC OPEN SPACE
I	INSTITUTIONAL OPEN SPACE
J	HISTORIC LANDSCAPE (INCLUDING MONUMENTS/ HISTORIC ROUTES)
K	RURAL CHARACTER / GREEN BELT - PROXIMITY OF RURAL AND AGRICULTURAL LAND USES TO THE CITY
L	BUILT FORM
M	PUBLIC REALM
O	GATEWAYS TO THE CITY
P	BRIDGES
Q	PEDESTRIAN / CYCLE ROUTES IN THE CITY / ACCESS
R	VEHICULAR ACCESS
S	THE RAILWAY IN THE CITY

Table 4-1 Key Landscape Assets



Figure 4-3 Key Landscape Assets Diagram

The CCDP sets out 7 interconnected Strategic Goals, which focus on achieving the vision, set out in the plan. Relevant goals relating to the protection of the city’s landscape character and key landscape assets are quoted below:

**Goal 5: Maintain and Capitalise on Cork’s Unique Form and Character**

“Cork City’s unique character derives from the combination of plan, topography, built fabric and the setting provided by the River Lee valley. The dramatic east west ridges create the visual setting for the city. The goal of the Plan is to protect and capitalise on the unique character of the city, both the character derived from the natural environment and the man-made character created by the built form, while providing opportunities for new development. New development will be required to respect and reflect the dramatic topography as well as the landscape and ecology of the city. It must also respect the built heritage of the city, in particular areas of significant historic character such as the City Centre, the historic north-south spine and the historic villages in the suburbs. There are also opportunities for creation of new character areas in locations such as Docklands, Mahon and Blackpool and at the arrival points or gateways into the city”.

**Goal 7: Protect and Expand the Green Infrastructure of the City**

“The Plan seeks to strengthen the green infrastructure of the city for recreational purposes, to promote biodiversity and to protect the landscape of the city. A diverse range of recreation and open spaces facilities, such as sports pitches, public parks, amenity spaces, indoor sports centres, and walking / cycling routes are vital to the health and wellbeing of Cork’s residents, as well as those working and visiting the city. This green infrastructure also provides a key ingredient for making the city an attractive place to live, visit and do business in. The aim of the Plan is to ensure that people

have access to an appropriate level of provision of the right quality. The Plan also seeks to provide linkages and green corridors between areas of open space to support bio-diversity ...”.

The CCDP also contains a number of objectives that relate directly to the protection of the city’s townscape / landscape character. Relevant objectives are listed below:

**Objective 10.1 Landscape Strategic Objectives**

“To preserve and enhance Cork’s landscape character and key landscape assets”.

“To preserve and enhance Cork’s views and prospects of special amenity value”.

**Objective 10.2 Cork City Landscape**

“To preserve Cork’s unique and distinctive landscape character through appropriate management and enhancement of Key Landscape Assets”.

**Objective 10.3 Cork City Structure Plan**

“To preserve and enhance Cork’s landscape and where appropriate, to increase access to and utilise the landscape for recreational purposes through the implementation of the Landscape Structure Plan”.

**Objective 10.4 Areas of High Landscape Value**

“To conserve and enhance the character and visual amenity of Areas of High Landscape Value (AHLV) through the appropriate management of development, in order to retain the existing characteristics of the landscape, and its primary landscape assets. Development will be considered only where it safeguards to the value and sensitivity of the particular landscape. There will be a presumption against development where it causes significant harm or injury to the intrinsic character of the Area of High Landscape Value and its primary landscape assets, the visual amenity of the landscape; protected views; breaks the existing ridge silhouette; the character and setting of buildings, structures and landmarks; and the ecological and habitat value of the landscape”.

**Objective 10.5 Landscape Preservation Zones**

“To preserve and enhance the character and visual amenity of Landscape Preservation Zones through the control of development. Development will be considered only where it safeguards to the value and sensitivity of the particular landscape and achieves the respective site-specific objectives”.

**Objective 10.6 Views and Prospects**

“To protect and enhance views and prospects of special amenity value or special interest and contribute to the character of the City’s landscape from inappropriate development, in particular those listed in the development plan. There will be a presumption against development that would harm, obstruct or compromise the quality or setting of linear views of landmark buildings, panoramic views, river prospects, townscape and landscape views and approach road views”.

**Objective 10.10 Trees and Urban Woodland**

(d) “To ensure that new development benefits from adequate landscape structure / tree coverage, particularly in areas of the city with inadequate tree coverage”.

**Views and Prospects**

The CCDP states: “Cork City benefits from the prominent ridges which provide a series of striking viewing points of the city. This important resource helps define the character and identity of the city” and that “In general, the city is appreciated by most people along viewpoints such as the River Lee and panoramic views from elevated sites. Amenity views and prospects are defined as those views which significantly contribute to the character and amenity of the city, namely:

- the visual envelope of the city defined by the ridges to the north and south;
- the city skyline;
- the built and natural heritage of the city”.

The CCDP identifies and describes 5 different view types:

- Linear Views of Landmark Buildings – “These occur where a particular landmark / building is the main point of focus. Views tend to be framed within relatively narrow viewing corridors such as laneways and streets. The views of landmark buildings are considered to be of particular importance and special amenity value. The majority of these views are from City Centre or inner-city viewing locations”.
- Panoramic Views – “Panoramas are wide views of the city and suburbs (often from elevated sites) featuring a varying number of city’s landmarks. These panoramic views from specified locations or ‘Panoramic Assessment Points’ are considered to be of particular importance and are important reference points from which large development proposals can be assessed in terms of visual impact”.
- River Prospects – “River prospects are views of landmark buildings from bridges but also riverbanks and quaysides”.
- Townscape and Landscape Features – “These are views of areas that have distinctive / outstanding townscape or landscape features within the city including views of the city ridges”.
- Approach Road Views – “The approach roads into Cork City offer visitors the vital ‘first impression’ of the city and glimpse of the unique topography and character of Cork. Historical routes into the city tend to be from high vantage points, whereas the national primary roads offer wider viewing corridors”.

The Development Management Chapter in the current Cork City Development Plan sets out objectives for future development, which include:

**Objective 16.1 Design Statement**

“All significant planning applications shall submit an accompanying design statement which provides a framework explaining how a Proposed Development is a suitable response to the site and its setting”.

**Objective 16.2 Visual Impact Assessments**

“All significant planning applications shall submit an accompanying visual impact assessment”.

**Objective 16.3 Urban Design**

- “To deliver high quality-built environments through good place making;
- To ensure that development is designed to high qualitative standard and is cognisant of the need for proper consideration of context, connectivity, inclusivity, variety, efficiency, distinctiveness, layout, public realm, adaptability, privacy and amenity, parking and detailed design”.

**Objective 16.4 Skyline and roofscapes**

“The City Council will seek new buildings to be designed to:

- enhance the roofscape in terms of their bulk, massing, materials and aesthetics;
- where appropriate, divide building mass into smaller elements which respect the existing cityscape and the setting and views and prospects of landmark buildings and the other special amenity views;
- Where appropriate locate plant housing for buildings in basements to avoid impact on views of cityscape”.

**Draft Cork City Development Plan 2022-2028 (DCCDP)**

The draft development plan for Cork City is due to come into effect in August 2022. Some landscape designations will change once the new Cork City Development Plan comes into force in 2022.

The Landscape Character Assessment has not been updated within the Draft Cork City Development Plan and therefore the Cork City Landscape Study 2008 referenced later in the report is still current.

**Mahon Local Area Plan**

The ‘Mahon Local Area Plan’ (2014) was prepared as a statutory guide for the area’s development and change over the subsequent six years, this plan has now lapsed, however, it has been included within this chapter to inform the baseline assessment. The development site is located in the southeast corner of the plan’s margins. The LAP objectives for the development site include a ‘Proposed Tall Building’ and the area is illustrated as ‘Development Opportunity’.

In relation to views and visual amenity, the LAP states that “There are a limited number of views of strategic amenity significance protected by the development plan that affect the Mahon Plan Area. These are:

- View of Bessboro House from south (View AR4);
- View across the area from Bloomfield Interchange / N27 to Tivoli Ridge / Docks (view LT14)”

The LAP also states that “In addition to these protected views there are a number of other visual factors that provided a context to the development of the area:

Whilst Mahon has a very shallow gradient, and in general lies on a south-facing slope, it is highly visible from the Rochestown / Douglas Ridge; The area is visible from the Harbour approach to the city and the water bodies surrounding the peninsula. It is Council policy to resist development that threatens to obstruct or compromise the quality or setting of views and prospects of special amenity value. Building heights should respond to the visual context of Mahon in the form of specifically protected views and general views of the area.”

**4.2.1 SCOPE**

**Study Area**

A study area extends beyond a radius of 1.5km has been determined from the boundary of the Proposed Development for the assessment of townscape and visual effects. The extent of the study area is based on initial findings of the desktop study later verified on site during fieldwork survey. It is acknowledged that the Proposed Development may be visible from locations beyond the study area, and as such it is important to note that the 1.5km study area defines the area within which potential effects could be significant, rather than defining the extent of visibility.

Twelve photomontages have been produced to illustrate views from representative viewpoints located within the 1.5km study area radius.

**4.2.2 TEMPORAL SCOPE**

The type and duration of the townscape and visual effects fall within two main stages as follows:

**Construction (temporary and of a short duration)**

Potential physical effects arising from construction of the development on the townscape resource within the development application boundary area;

- Potential effects to townscape character or visual amenity within the wider study area as a result of visibility of construction activities or the development during construction;
- Effects of temporary site infrastructure such as – site traffic; construction compounds, cranes; and
- Potential effects of partially built development in various stages of construction.

**Operational**

- Potential effects of the Proposed Development on townscape resources and townscape character, including the perceptual qualities of the townscape;
- Potential effects of the Proposed Development on views and visual amenity; and
- Potential cumulative effects of the development in combination with other planned and Proposed Developments of a similar type and scale upon the townscape and visual resource of the study area.

### 4.3 METHODOLOGY

This section sets out the methodology for the Townscape and Visual Impact Assessment (TVIA) as a result of the Proposed Development.

#### 4.3.1 GUIDANCE AND OTHER INFORMATION USED IN THE LANDSCAPE AND VISUAL IMPACT ASSESSMENT

The following sources and guidelines were used in the assessment:

- EPA “Guidelines on the information to be contained in Environmental Impact Assessment Reports” 2022
- ‘Guidelines for Landscape and Visual Impact Assessment’ (GLVIA), 3rd Edition, 2013, Landscape Institute (UK) & IEMA;
- ‘Visual Representation of Development Proposals’, Landscape Institute, Technical Guidance Note 06/19, 17 September 2019;
- Cork City Development Plan 2015-2021;
- Cork County Development Plan 2022-2028;
- Draft Cork City Development Plan 2022-2028;
- ‘Urban Development and Building Heights’, Guidelines for Planning Authorities, December 2018
- National Parks and Wildlife Service (NPWS), <http://www.npws.ie/>;
- [http://www. https://www.sportireland.ie/outdoors/find-your-trails](http://www.sportireland.ie/outdoors/find-your-trails); and
- Ordnance Survey Ireland, 1:50,000 Discovery Mapping.

#### 4.3.2 Townscape and Visual Impact Assessment Criteria

This chapter has been prepared based on the Environmental Protection Agency (EPA) Draft guidance document ‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports, 2017, EPA guidance documents. Best practice guidance, such as the “Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3), 2013, Landscape Institute (UK) & IEMA” provide specific guidelines for townscape and visual impact assessments. Therefore, a

combination of the draft EPA guidelines, the Landscape Institute guidelines and professional experience has informed the methodology for the assessment herein. The Landscape Institute guidelines require the assessment to identify, predict and evaluate the significance of potential effects to townscape characteristics and established views. The assessment is based on an evaluation of the sensitivity to change and the magnitude of change for each townscape or visual receptor. For clarity, and in accordance with best practice, the assessment of potential effects on townscape character and visual amenity, although closely related, are undertaken separately.

The assessment acknowledges that townscape and visual effects change over time as the existing townscape external to the Proposed Development evolves and proposed planting establishes and matures.

The significance of an effect or impact is determined by two distinct considerations:

**1. The Nature of the receptor likely to be affected, namely:**

- The value of the receptor or view;
- The susceptibility of the receptor to the type of change arising from the Proposed Developments; and
- The sensitivity to change is related to the value attached to the receptor.

**2. The Magnitude of the effect likely to occur, namely:**

- The size and scale of the townscape and visual effect (for example, whether there is a complete or minor loss of a particular townscape element);
- The geographical extent of the areas that will be affected;
- The duration of the effect and its reversibility; and
- The quality of the effect – whether it is neutral, positive or negative.

The table below provides the definition of the duration of both townscape and visual effects.

DURATION	DESCRIPTION
TEMPORARY	Effects lasting one year or less
SHORT TERM	Effects lasting one to seven years
MEDIUM TERM	Effects lasting seven to fifteen years
LONG TERM	Effects lasting fifteen to sixty years
PERMANENT	Effects lasting over sixty years

Table 4-2 Definition of Duration of Effects

The quality of both townscape and visual effects is defined in the table below.

Table 4-3 Definition of Quality of Effects

QUALITY OF EFFECTS	DESCRIPTION
NEUTRAL	This will neither enhance nor detract from the townscape character or view
POSITIVE (BENEFICIAL)	This will improve or enhance the townscape character or view
NEGATIVE (ADVERSE)	This will reduce the quality of the existing townscape character or view

### 4.3.3 ASSESSMENT PROCESS

The assessment is undertaken based on the following key tasks and structure:

- Establishment of the baseline or receiving environment;
- Appreciation of the Proposed Development; and
- Assessment of effects.

### 4.3.4 ESTABLISHMENT OF THE BASELINE

A baseline study has been undertaken through a combination of desk-based research and site survey in order to establish the existing conditions of the townscape and visual resources of the study area. Desk based research has involved a review of mapping and aerial photography, relevant planning and policy documents, the relevant Landscape / Townscape Character Assessments (if available) and other relevant documents and publications.

### 4.3.5 APPRECIATION OF THE PROPOSED DEVELOPMENT

In order to be able to accurately assess the full extent of likely effects on townscape character and visual amenity it is essential to develop a thorough and detailed knowledge of the Proposed Development. This includes a comprehensive understanding of its location, nature and scale and is achieved through a review of detailed descriptions of the Proposed Development as referenced in Chapter 2 of this report.

The townscape and visual impact assessment has considered all elements of the Proposed Development.

### 4.3.6 ASSESSMENT OF EFFECTS

The townscape and visual impact assessment seeks to identify, predict and evaluate the significance of potential effects to townscape characteristics and established views. The assessments are based on an evaluation of the sensitivity to change and the magnitude of change for each townscape or visual receptor.

The assessment acknowledges that townscape and visual effects change over time as the existing townscape internal and external to the Proposed Development evolves. The assessment therefore reports on potential effects during both construction/operation and completion of the Proposed Development. The prominence of the Proposed Development in the townscape or view will vary according to the existing screening effects of local topography, intervening existing vegetation and building structures.

GLVIA3 requires that a clear distinction is drawn between landscape (which includes the urban townscape) and visual effects:

- Townscape effects relate to the degree of change to characteristics or physical components of an urban area, which together form the character of that townscape, e.g. topography, streets, buildings and open space.
- Visual effects relate to the degree of change to an individual receptor's or a receptor group's view of that townscape, e.g. local residents, users of public open space, footpaths or motorists passing through the area.

As mentioned in the scope above, construction and operational stages of the Proposed Development are assessed separately. Distinctions may be drawn between temporary and permanent effects, with permanent effects typically being of greater importance. Residual effects are those likely to arise from the Proposed Development taking into account all embedded measures.

The assessment forms part of an iterative process where, as potentially significant effects are identified, these inform the design of the Proposed Development. Mitigation of the development has been considered throughout the process, including site selection, consultation and design development. This process and the considerations, which informed it, are described within the Design Statement included in the planning submission package.

When considering the potential effect of changes that a future development may have on the townscape and visual resource it is necessary to identify those key elements of the townscape which make it distinctive. These can be seen as layers which overlay each other and vary in dominance from place to place. These layers mainly comprise of the buildings, structures and spaces which influence the pattern of uses, activity and movement in a place and the experience of those who visit, work and live there.

Cumulative effects arise from changes brought about by one development in conjunction with another of similar character. Cumulative effects are considered where the presence of developments of a similar type or scale, that have planning consent but are not constructed, or that are the subject of undetermined applications may have a combined effect on the perception of townscape character and visual amenity.

### 4.3.7 TOWNSCAPE EFFECTS

Townscape effects describe the impact on the fabric or structure of a townscape or townscape character. The assessment of townscape effects firstly requires the identification of the components of the townscape. The townscape components are also described as townscape receptors and comprise the following:

- Individual townscape elements or features;
- Specific aesthetic or perceptual aspects; and
- Townscape character, or the distinct, recognisable and consistent pattern of elements (natural and man-made) in the townscape that makes one townscape different from another.

The assessment will identify the interaction between these components and the Proposed Development during construction and operational phases. The condition of the townscape and any evidence of current pressures causing change in the townscape will also be documented and described.

#### Townscape Value

Townscape value is frequently addressed by reference to international, national, regional and local designations, determined by statutory and planning agencies. However, absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The quality and condition is also considered in the determination of the value of a townscape. The evaluation of townscape value is undertaken with reference to the definitions stated in the table below.



Table 4-4 Townscape Value

TOWNSCAPE VALUE	CLASSIFICATION CRITERIA
HIGH	Nationally designated or iconic, unspoilt townscape with few, if any, degrading elements.
MEDIUM	Regionally or locally designated townscape, or an undesignated townscape with locally important landmark features and some detracting elements.
LOW	Undesignated townscape with few if any distinct features or with several degrading elements.

**Townscape Susceptibility**

Townscape susceptibility relates to the ability of a particular townscape to accommodate the Proposed Development without undue negative consequences. Townscape susceptibility is appraised through consideration of the baseline characteristics of the townscape, and in particular the scale or complexity of a given townscape.

The evaluation of townscape susceptibility is undertaken with reference to a three-point scale, as outlined in the table below.

Table 4-5 Townscape Susceptibility Criteria

TOWNSCAPE VALUE	CLASSIFICATION CRITERIA
HIGH	Small scale, intimate or complex townscape considered to be intolerant of even minor change.
MEDIUM	Medium scale, more open or less complex townscape considered tolerant to some degree of change.
LOW	Large scale, simple townscape considered tolerant of a large degree of change.

**Townscape Sensitivity**

Townscape sensitivity to change is determined by employing professional judgment to combine and analyse the identified townscape value, quality and susceptibility and is defined with reference to the scale outlined in the table overleaf.

Table 4-6 Townscape Sensitivity to Change Criteria

TOWNSCAPE SENSITIVITY	CLASSIFICATION CRITERIA
HIGH	<ul style="list-style-type: none"> <li>Townscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character.</li> <li>Townscape designated for its international or national townscape value or with highly valued features.</li> <li>Outstanding example in the area of well cared for townscape or set of features that combine to give a particularly distinctive sense of place.</li> <li>Few detracting or incongruous elements.</li> </ul>
MEDIUM-HIGH	<ul style="list-style-type: none"> <li>Townscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character.</li> <li>Townscape designated for regional or county-wide townscape value where the characteristics or qualities that provided the basis for their designation are apparent or a townscape with highly valued features locally.</li> <li>Good example in the area of a well-cared for townscape or set of features that combine to give a clearly defined sense of place.</li> </ul>
MEDIUM	<ul style="list-style-type: none"> <li>Townscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character.</li> <li>Townscape designated for its local townscape value or a regional designated townscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated townscape which may be valued locally – for example an important open space.</li> <li>An example of a townscape or a set of features which is relatively coherent, with a good but not exceptional sense of place - occasional buildings and spaces may lack quality and cohesion.</li> </ul>
MEDIUM-LOW	<ul style="list-style-type: none"> <li>Townscape characteristics or features which are reasonably tolerant of change without detriment to their present character.</li> <li>No designation present or of little local value.</li> <li>An example of an un-stimulating townscape or set of features; with some areas lacking a sense of place and identity.</li> </ul>
LOW	<ul style="list-style-type: none"> <li>Townscape characteristics or features which are tolerant of change without detriment to their present character.</li> <li>An area with a weak sense of place and/or poorly defined character /identity.</li> <li>No designation present or of low local value or in poor condition.</li> <li>An example of monotonous unattractive visually conflicting or degraded townscape or set of features.</li> </ul>

**Townscape Receptors**

The townscape resources within the study area that could be affected by the development include:

- Physical resources such as buildings, open space, trees, watercourses (Canal) etc.;
- Designated, valued or recognised components that contribute to townscape character; and
- Cultural heritage interests that contribute to townscape character.

Townscape receptors are defined as those townscape resources within the study area from which the development may be visible or where potential visibility of the development in one part of the townscape resource affects the experience of another part. Field assessment studies were used to check the potential visibility of the development from the townscape resources within the study area. Within this section specific consideration is also given to changes to townscape elements such as the built fabric, open space or trees.

**Sensitivity of Townscape Receptors**

The sensitivity of a townscape receptor is an expression of its ability to accommodate the Proposed Development as part of its own character. The sensitivity of a townscape varies according to the nature of the existing resource and the nature of the proposed changes as a result of the Proposed Development. The sensitivity of the townscape is based on interpretation of a combination of judgements relating to their susceptibility to the type of change or development proposed and the value attached to the townscape.

**Townscape Character**

Townscape character is a complex mix of physical features and patterns and cultural elements. Buildings, structures and spaces and the resulting layout and urban grain, the density and mix, scale and appearance, human interaction and cultural and historic features combine to create a common 'sense of place' and identity that is experienced as townscape character. Definable units (character areas and character zones) can be used to categorise the townscape and the level of detail and size of unit can be varied to reflect the scale of definition required. It can be applied at national, regional and local levels.

The quality or condition of a townscape character receptor is a reflection of its attributes, such as the condition of the buildings and spaces or vegetative components and the attractiveness and townscape quality of the area as well as its sense of place. A townscape with consistent, intact and well-defined, distinctive attributes is generally considered to be of higher quality and in turn, higher sensitivity, than a townscape where the presence of inappropriate or discordant elements has detracted from its inherent attributes. The higher the quality of a receptor the greater is its sensitivity to the Proposed Development.

**Magnitude of Townscape Change**

Magnitude of change is an expression of the size or scale of change in the townscape, the geographical extent of the area influenced and the duration and reversibility of the resultant effect. The variables involved are described below.

- The extent of existing townscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the townscape;
- The extent to which aesthetic or perceptual aspects of the townscape are altered either by removal of existing components of the townscape or by addition of new ones;
- Whether the effect changes the key characteristics of the townscape, which are integral to its distinctive character;
- The geographic area over which the townscape effects will be felt (within the Proposed Development site itself;

the immediate setting of the Proposed Development site; at the scale of the townscape type or character area; on a larger scale influencing several townscape types or character areas); and

- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

Changes to townscape characteristics can be both direct and indirect. **Direct change** occurs where the Proposed Development will result in a physical change to the townscape within or adjacent to the Proposed Development site. **Indirect changes** are a consequence of the direct changes resulting from the Proposed Development. They can often occur away from the Proposed Development site (for example, off-site construction staff parking) and may be a result of a sequence of interrelationships or a complex pathway (for example, a new road or footpath construction may increase public access and associated problems e.g. littering). They may be separated by distance or in time from the source of the effects. The magnitude of change affecting the baseline townscape resource is based on an interpretation of a combination of the criteria set out in the table below.

*Table 4-7 Magnitude of Townscape Change Criteria (Townscape Effects)*

MAGNITUDE OF TOWNSCAPE CHANGE	CLASSIFICATION CRITERIA
NONE	<ul style="list-style-type: none"> <li>• No change.</li> </ul>
NEGLIGIBLE	<ul style="list-style-type: none"> <li>• Little perceptible change.</li> </ul>
LOW	<ul style="list-style-type: none"> <li>• Minor change, affecting some characteristics and the experience of the townscape to an extent; and</li> <li>• Introduction of elements that is not uncharacteristic.</li> </ul>
MEDIUM	<ul style="list-style-type: none"> <li>• Noticeable change, affecting some key characteristics and the experience of the townscape; and</li> <li>• Introduction of some uncharacteristic elements.</li> </ul>
HIGH	<ul style="list-style-type: none"> <li>• Noticeable change, affecting many key characteristics and the experience of the townscape; and</li> <li>• Introduction of many incongruous developments</li> </ul>
VERY HIGH	<ul style="list-style-type: none"> <li>• Highly noticeable change, affecting most key characteristics and dominating the experience of the townscape; and</li> <li>• Introduction of highly incongruous development.</li> </ul>

**4.3.8 VISUAL EFFECTS**

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e. how a development is seen within the townscape); for example, whether it appears integrated and balanced within the visual composition of a view or whether it creates a focal point.

Negative visual effects may occur through the intrusion of new elements into established views, which are out of keeping with the existing structure, scale and composition of the view. Visual effects may also be beneficial, where an attractive focus is created in a previously unremarkable view or the influence of previously detracting features is reduced. The significance of effects will vary, depending on the nature and degree of change experienced and the perceived value and composition of the existing view.

**Receptors**

For there to be a visual impact, there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e. people, will be affected by changes as a result of the Proposed Development depends on a number of factors, including:

- Receptor activities, such as taking part in leisure, recreational and sporting activities, travelling or working;
- Whether receptors are likely to be stationary or moving and how long they will be exposed to the change at any one time;
- The importance of the location, as reflected by designations, inclusion in guidebooks or other travel literature, or the facilities provided for visitors;
- The extent of the route or area over which the changes will be visible;
- Whether receptors will be exposed to the change daily, frequently, occasionally or rarely;
- The orientation of receptors in relation to the Proposed Development and whether views are open or intermittent;
- Proportion of the developments that will be visible (full, sections or none);
- Viewing direction, distance (i.e. short-, medium- and long-distance views) and elevation;
- Nature of the viewing experience (for example, static views, views from settlements and views from sequential points along routes);
- Accessibility of viewpoint (public or private, ease of access);
- Nature of changes (for example, changes in the existing skyline profile, creation of a new visual focus in the view, introduction of new man-made objects, changes in visual simplicity or complexity, alteration of visual scale, landform and change to the degree of visual enclosure); and
- Nature of visual receptors (type, potential number and sensitivity of viewers who may be affected).

**Value of the View**

Value of the view is an appraisal of the value attached to views and is often informed by the appearance on Ordnance Survey tourist maps and in guidebooks, literature or art. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view is also an indicator. The value of the view is determined with reference to the definitions outlined in the table below.

*Table 4-8 Value of the View*

VALUE	CLASSIFICATION CRITERIA
HIGH	Nationally recognised view of the townscape, with no detracting elements.
MEDIUM	Regionally or locally recognised view, or unrecognised but pleasing and well composed view, with few detracting elements.
LOW	Typical or poorly composed view often with numerous detracting elements.

**Visual Susceptibility**

The GLVIA guidelines identify that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location; and
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the townscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport, where views are not important, or at their place of work, are often considered less susceptible to change. Visual susceptibility is determined with reference to the three-point scale and criteria outlined in the table overleaf.

*Table 4-9 Visual Susceptibility*

SUSCEPTIBILITY	CLASSIFICATION CRITERIA
HIGH	Receptors for which the view is of primary importance and are likely to notice even minor change.
MEDIUM	Receptors for which the view is important but not the primary focus and are tolerant of some change.
LOW	Receptors for which the view is incidental or unimportant and is tolerant of a high degree of change

**Visual Sensitivity**

Sensitivity to change considers the nature of the receptor; for example, a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view.

A judgement is also made on the value attached to the views experienced. This takes account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations;
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art; and
- Possible local value; it is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

The visual sensitivity to change is based on interpretation of a combination of all or some of the criteria outlined in the table below.

VISUAL SENSITIVITY	CLASSIFICATION CRITERIA
HIGH	<ul style="list-style-type: none"> <li>Users of outdoor recreational facilities, on recognised national cycling or walking routes or in nationally designated townscapes.</li> <li>Residential buildings.</li> </ul>
MEDIUM-HIGH	<ul style="list-style-type: none"> <li>Users of outdoor recreational facilities, in highly valued townscapes or locally designated townscapes or on local recreational routes that are well publicised in guide books.</li> <li>Road and rail users in nationally designated townscapes or on recognised scenic routes, likely to be travelling to enjoy the view.</li> </ul>
MEDIUM	<ul style="list-style-type: none"> <li>Users of outdoor recreational facilities including public open space in moderately valued townscapes.</li> <li>Users of primary transport road network, orientated towards the Proposed Development, likely to be travelling for other purposes than just the view.</li> </ul>
MEDIUM-LOW	<ul style="list-style-type: none"> <li>People engaged in active outdoor sports or recreation and less likely to focus on the view.</li> <li>Primary transport road network and rail users likely to be travelling to work with oblique views of the project or users of minor road network.</li> </ul>
LOW	<ul style="list-style-type: none"> <li>People engaged in work activities indoors, with limited opportunity for views of the Proposed Development.</li> </ul>

Table 4-10 Sensitivity to Change Criteria

**Magnitude of Visual Change**

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the Proposed Development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below.

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development;
- The degree of contrast or integration of any new features or changes in the townscape form, scale, mass, line, height, sky lining, back-grounding, visual clues, focal points, colour and texture;
- The nature of the view of the development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses.
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible; and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitude of visual effect resulting from the development at any particular viewpoint or receptor is based on the interpretation of the above range of factors and is set out in the table overleaf.

Table 4-11 Magnitude of Visual Change Criteria (Visual effects)

MAGNITUDE OF VISUAL CHANGE	CLASSIFICATION CRITERIA
NONE	No change in the existing view.
NEGLIGIBLE	The development will cause a barely discernible change in the existing view.
LOW	The development will cause very minor changes to the view over a wide area or minor changes over a limited area.
MEDIUM	The development will cause modest changes to the existing view over a wide area or noticeable change over a limited area.
HIGH	The development will cause a considerable change in the existing view over a wide area or a significant change over a limited area.
VERY HIGH	The development will cause significant changes in the existing view over a wide area or a change which will dominate over a limited area.

4.3.9 SIGNIFICANCE CRITERIA

The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the Proposed Development. The assessment will identify the residual effects likely to arise from the finalised design taking into account mitigation measures and the change over time.

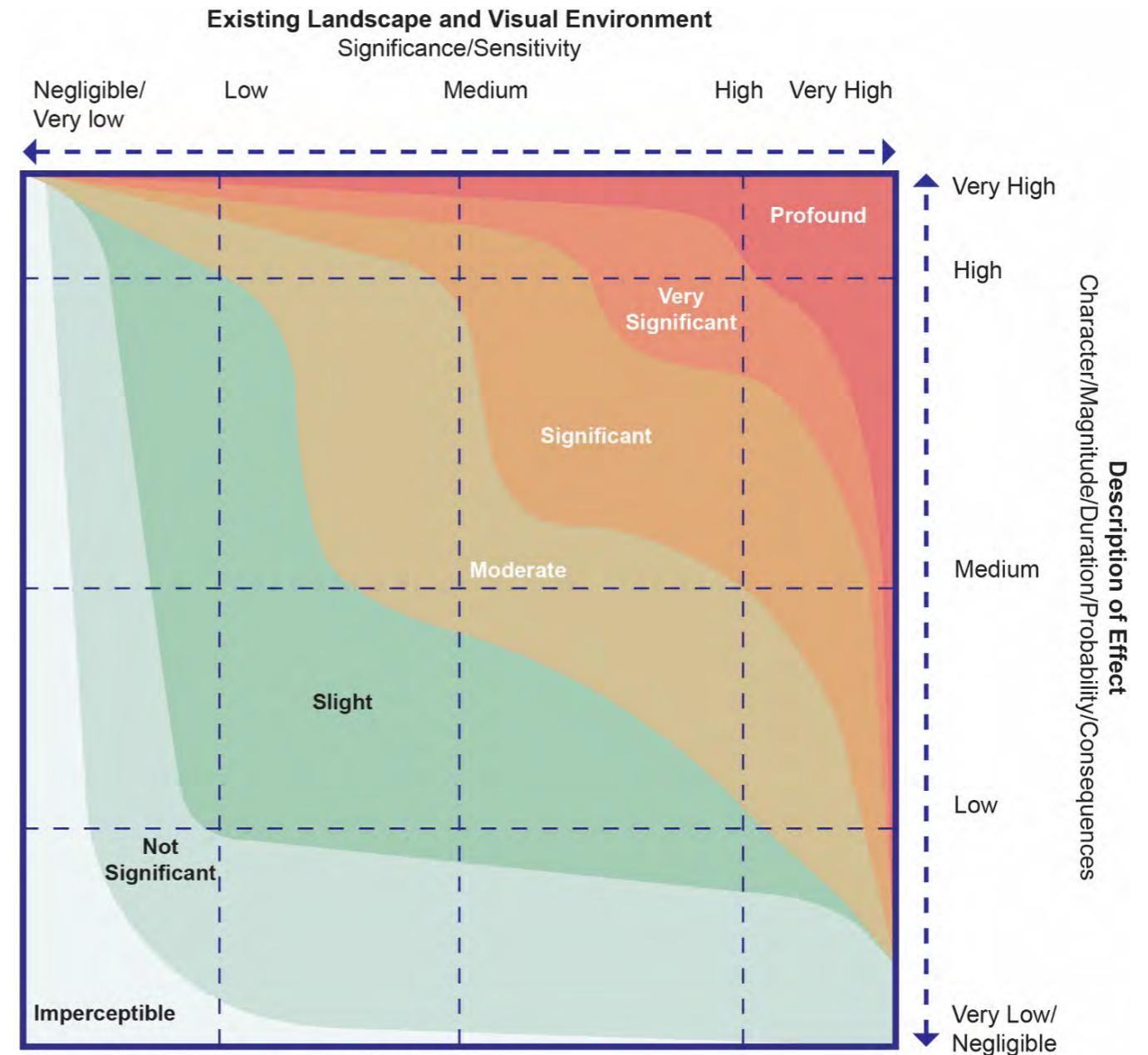
The significance of effects is assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions. In order to provide a level of consistency and transparency to the assessment and allow comparisons to be made between the various townscape and visual receptors subject to assessment, the assessment of significance is informed by pre-defined criteria as outlined in the table below. When assessing significance, individual effects may fall across several different categories of significance and professional judgement is therefore used to determine which category of significance best fits the overall effect to a townscape or visual receptor.

The significance of the effects can be adverse (negative) or beneficial (positive) according to the definitions set out in the table overleaf.

Table 4-12 Categories of Significance of Townscape and Visual Effects

SIGNIFICANCE CATEGORY	DESCRIPTION OF EFFECT
PROFOUND	An effect that obliterates sensitive characteristics within the townscape and/or visual environment.
VERY SIGNIFICANT	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the townscape and/or visual environment.
SIGNIFICANT	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the townscape and/or visual environment.
MODERATE	An effect that alters the townscape in a manner that is consistent with existing and emerging baseline trends.
SLIGHT	An effect which causes noticeable changes in the townscape and/or visual environment without affecting its sensitivities.
NOT SIGNIFICANT	An effect which causes noticeable changes in the townscape and/or visual environment but without significant townscape and/or visual consequences.
IMPERCEPTIBLE	An effect capable of measurement but without significant townscape and/or visual consequences.

The significance of the effect is determined by considering the magnitude of the effect and the quality of the baseline environment affected by the Proposed Development. The basis for consideration of the significance of effects is included below.



Adapted from EPA Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports, August 2017

Figure 4-4 Basis for consideration of significance of effects

Effects will be assessed for all phases of the Proposed Development. Construction effects are considered to be temporary, short term effects which occur during the construction/decommission phase only. Operational/residual effects are those long-term effects, which will occur as a result of the presence or operation of the development.

The quality of each effect is based on the ability of the townscape character or visual receptor to accommodate the Proposed Development, and the impact of the development within the receiving context. Once this is done, the quality of the effect is then assessed as being neutral, beneficial or adverse. A change to the townscape or visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation.

#### 4.3.10 CUMULATIVE EFFECTS

In addition to townscape and visual effects, it is also important to consider potential cumulative effects. The approach used to determine cumulative effects has drawn on guidance on cumulative impact assessment published by the GLVIA3. Cumulative townscape and visual effects may result from additional changes to the baseline townscape or views as a result of the Proposed Development in conjunction with other developments of a similar type and scale.

The cumulative assessment includes developments that are consented but not constructed, that are the subject of undetermined applications or are currently at scoping which are similar in type and scale to the Proposed Development.

A list of cumulative developments has been compiled from known planning applications available on Planning Search of Cork City Council's website and known proposed public sector projects.

##### Magnitude of Cumulative Effects

The principle of magnitude of cumulative effects makes it possible for the proposed scheme to have major effects on a particular receptor, while having only minor cumulative effects in conjunction with other existing developments.

The magnitude of cumulative effects arising from the proposed scheme is assessed as Very High, High, Medium, Low or Negligible, with intermediate categories, based on interpretation of the following parameters:

- The additional extent, direction and distribution of existing and other developments in combination with the Proposed Development;
- The distance between the viewpoint, the Proposed Development and the cumulative developments; and
- The townscape setting, context and degree of visual coalescence of existing and Proposed Development and cumulative developments.

##### Significance of Cumulative Effects

As for the assessment of landscape and visual effects, the significance of any cumulative effects follows a same classification as illustrated in Figure 4-4 - Basis for consideration of significance of effects, in Section 4.3.9, and will be assessed as Profound, Very Significant, Moderate, Slight, Not Significant, Imperceptible.

##### Limitations of Cumulative Effects

The cumulative assessment focuses on potential cumulative effects relating to the main permanent structure of each cumulative development. This is due to the uncertainty of the timing of construction activities for each of the identified developments. As a result, temporary structures and activity relating to construction have not been considered within the cumulative assessment.

#### 4.3.11 FIELD WORK

A site survey of the study area and beyond was carried out in November 2021 identifying the potential visibility of the Proposed Development and key additional viewpoints within the core study area and the wider townscape. Photomontages showing the existing view and the superimposed development on photomontages have been produced from key representative viewpoints, taking into account topography, existing buildings, screening vegetation and other localised factors. The Booklet of Planning Application Photomontages prepared by Pederson Focus contains details on viewpoint locations and Photomontages 1 - 12.

#### 4.3.12 SELECTION OF VIEWPOINTS

Viewpoint selection has been carried out according to the current best practice standards and the following industry guidelines:

- 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA), 3rd Edition, 2013, Landscape Institute (UK) & IEMA;
- 'Visual Representation of Development Proposals', Landscape Institute, Technical Guidance Note 06/19, 17 September 2019

It is not feasible to take photography from every possible viewpoint located in the study area. Photography has been taken from viewpoints, which are representative of the nature of visibility at various distances and in various contexts. Viewpoint photography is used as a tool to come to understand the nature of the potential residual effects. The selection process of viewpoint locations is as follows:

- The location of viewpoints within the study area is informed by desktop and site surveys;
- Identification and selection of representative viewpoints showing typical open or intermittent views within a local area, which will be frequently experienced by a range of viewers; and
- Identification and selection of specific viewpoints from key viewpoints in the townscape such as routes or locations valued for their scenic amenity, main residential areas etc.

#### 4.3.13 PHOTOMONTAGES

Photomontages are photorealistic visualisations produced using specialist software. They illustrate the likely future appearance of the Proposed Development from a specific viewing point. They are useful tools for examining the effects of the development from a number of critical viewpoint positions at publicly accessible locations within the study area.

However, photomontages in themselves can never provide the full picture in terms of potential effects. Photomontages are one source of information and used as a tool to help to understand the nature of potential effects and to assist the determination of the magnitude and significance of residual townscape and visual effects. They can only inform the assessment process by which judgements are made. A visualisation can never show exactly what the Proposed Development will look like in reality due to factors such as; different lighting, weather and seasonal conditions which vary through time and the resolution of the image. As the photomontages are representative of viewing conditions encountered, some of them may show existing buildings or vegetation screening some or all parts of the developments. Such conditions are normal and representative.

The images provided give a reasonable impression of the scale of the development and the distance to the development but can never be 100% accurate. It is recommended that decision-makers and any interested parties or members of the

public should ideally visit the viewpoints on site, where visualisations can be compared to the 'real life' view, and the full impact of the Proposed Development can be understood.

Viewpoints / Photomontages 1 – 12 show the Proposed Development including the following information:

- Existing View, showing the baseline image;
- Photomontage, showing the Proposed Development including all visible components at full height;
- Cumulative Photomontage, showing the Proposed Development in conjunction with other permitted developments at Jacob's Island;
- Cumulative Photomontage, showing the Proposed Development in conjunction with other permitted as well as potential adjacent active application.

Photomontage images have been produced with reference to best practice and the following industry guidelines:

- 'Visual Representation of Development Proposals', Landscape Institute, Technical Guidance Note 06/19, 17 September 2019; and
- Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition, Landscape Institute and Institute of Environmental Management and Assessment, IEMA, 2013.

#### 4.3.14 ZONE OF THEORETICAL VISIBILITY (ZTV)

Mapping the extent of the area from which a development is likely to be visible is commonly referred to as a Zone of Theoretical Visibility (ZTV). ZTV prediction does not take into account the effects of seasons, lighting, weather conditions or visibility over distance. Moreover, a ZTV does not take into account the screening effects of existing vegetation or built structures and can omit topographical variations of up to 10m. Therefore, in reality, ZTV mapping 's principal use is to identify viewing points for further analysis.

Considering the scale, context and overall setting of the Proposed Development, the production of a ZTV would not have been useful in the identification of viewpoints within the study area. The assessment relied therefore on comprehensive site surveys to establish the nature of visibility within the study area and to identify key viewpoint locations.

## 4.4 BASELINE ENVIRONMENT

This section provides a summary of the current (2022) baseline conditions within the study area, as defined in Section 1.2.1 - Study Area and Section 1.3.4 - Establishment of the Baseline.

### 4.4.1 SITE CONTEXT

The Proposed Development site is located at Jacob's Island, which is located in Mahon, a Cork City suburb. Jacob's Island is one of nine sub-zones within Mahon and located in southeast along the shores of Lough Mahon. Jacob's Island is bounded to the north, north-west by the South Ring Road (N40) and is a relatively flat and low-lying area. The subject site encloses the existing 'The Sanctuary' residential buildings to the north and south. The southern site boundary is adjacent to the 'Long Shore' residences.

### 4.4.2 EXISTING LANDSCAPE CONTEXT

#### Cork City Landscape Character Areas (LCA)

Cork City is identified as a landscape character area located within Landscape Character Type 1 (LCT 1) – City Harbour and Estuary as stated in the Cork County Draft Landscape Strategy 2007. The Cork City Landscape Study 2008 subdivides Cork City into 8 smaller character areas. The location of relevant landscape character areas affected by the Proposed Development are described as follows:

#### LCA - Urban Sylvan character

The majority of the proposed site and its immediate environs is designated as 'Urban Sylvan character'. There are tracts of 'Urban Sylvan character' around the site context. The Urban Sylvan Character 'enhances the green rural character of the city landscape'. The visually most important tree groups are located to the south of Jacob's Island, around the former Lakelands House boathouse. The immediate site setting is a residential area with a mix of housing types and densities. The setting is distinguished by the combination of Lough Mahon to the east and south and the influence of the N40 national road to the north.

#### LCA - Sub-urban residential

The existing Long Shore Drive residences are designated 'Sub-urban Residential'. The nearby lands located on the opposite side of the South Ring Road (N40) comprise a mixture of 'Urban Sylvan Character', 'Sub-urban Residential' and 'Urban Industrial / Commercial / Institutional'. 'Sub-urban residential' is the dominant landscape grouping within the city and varies slightly across the city. The key (landscape related) designations pertinent to the development are listed below.

#### Areas of High Landscape Value (AHLV)

Cork City Development Plan 2015-2021 identifies areas of High Landscape Value which are mapped in Appendix 1.1. The lands to the south of the development boundary are designated as 'Areas of High landscape value' (Map 6 – South Eastern Suburbs Objectives, Cork City Development Plan 2015-2021). The site comprises of a portion of this designation, which stretches along the southern and eastern shore of Jacobs Island. Areas of High Landscape Value comprise one or more landscape asset identified in the Cork Landscape Study 2008. Objective 10.4 states the following "To conserve and enhance the character and visual amenity of Areas of High Landscape Value (AHLV) through the appropriate management of development, in order to retain the existing characteristics of the landscape, and its primary landscape assets. Development will be considered only where it safeguards to the value and sensitivity of the particular landscape. There will be a presumption against development where it causes significant harm or injury to the intrinsic character of the Area of High Landscape Value and its primary landscape assets, the visual amenity of the landscape; protected views; breaks the existing ridge silhouette; the character and setting of buildings, structures and landmarks; and the ecological and habitat value of the landscape."

#### Landscape Preservation Zones

There are a number of landscape preservation zones located within the study area. Objective 10.5 of the Cork City Development Plan 2015-2021 states that the character and visual amenity within these zones is to be preserved and enhanced through the control of development. Development can only be considered if the value and sensitivity of a particular landscape can be protected. The majority of the designated sites within the study area are surrounded by:

existing urban built environments or neighbours' land that is zoned for built development. Typically, the landscape character of Landscape Preservation Zones (LPZs) comprises distinctive landscape assets. Landscape Preservation Zone SE5 & SE6 'South Channel', located to the west of the subject site's boundary and includes the landscape assets; Topography, Water/River Corridor, Tree Canopy, Visually Important Land, Landmark and Pedestrian / Cycle Route.

### Cork County Landscape Character Types (LCT)

The landscape character assessment of County Cork is contained in the Cork County Development Plan 2014 and is based on the Cork County Draft Landscape Strategy 2007. It subdivides the County into 16 landscape character types. The assessment evaluated each landscape character type in terms of its landscape value, sensitivity and importance.

The VALUE is defined as *"the environmental or cultural benefits, including services and functions, which are derived from various landscape attributes. Value is evaluated using criteria ranging from Very High to Low."*

The SENSITIVITY is defined as *"the ability to accommodate change or intervention without suffering unacceptable effects to its character and values. Sensitivity is evaluated using criteria ranging from Very High to Low. A highly sensitive landscape is likely to be vulnerable to change whereas a landscape with low sensitivity is likely to be less at risk to change."*

The IMPORTANCE of a landscape character type is rated as Local, County or National.

The landscape character assessment states also that *"Landscape Character Types which have a very high or high landscape value and high or very high landscape sensitivity and are of county or national importance are considered to be our most valuable landscapes and therefore it is proposed to designate them as High Value Landscapes."* The study area covers sections of 'Landscape Character Type 1'.

### LCT 1 – City Harbour and Estuary

This character type contains Cork City and Harbour, which have been grouped into one Landscape Character Area (LCA 19). The key characteristics of the City Harbour and Estuary Character Type are:

- Mouth of the River Lee;
- Extensive natural harbour;
- Urban, industrial and commercial developments;
- Large islands; and
- Estuarine River.

The overall landscape is described as a balance of intensive urban form, rural character and seascape. The landscape value and sensitivity are rated as 'Very High'. The landscape importance is classified as 'National'.

The proposed residential development is located within this landscape character type (LCT 1) and Landscape Character Area LCA 19 - Cork City and Harbour. The landscape character assessment provides a number of recommendations for potential future developments in this character type. The most relevant recommendation is described as follows: *"Protect the north and south ridges and hillsides around the city, to ensure the protection of the visual backdrop to the city. These ridges would be adversely affected by unsympathetic development thus interfering with views of special amenity value to the city and surrounding area."*

### High Value Landscape

Cork County Development Plan 2014 identifies a High Value Landscape Area on Jacob's Island and this forms part of the study area. Landscape character types which have a very high or high landscape value and high or very high landscape sensitivity and are of county or national importance are designated as High Value Landscapes (HVL).

### Scenic Routes

Cork County Development Plan 2014 identifies a selection of scenic routes and there are a portion of two scenic routes within the 1.5km study area. Scenic Route S55 is located closest the Proposed Development site. The route runs along a portion of Monastery Road (L2474), from its junction with Rochestown Road, until it forks near Rochestown. Scenic Route S41 is located to the north of the Proposed Development, the nearest part of the route is the stretch from the junction of N8 and R369 Road. The route runs from Dunkettle to Glanmire and eastwards to Caherlag and Glounthane. The Scenic Routes mentioned are now located within the Cork City boundaries following the extension of the city boundaries into Cork County in 2019.

### Prominent and Strategic Metropolitan Greenbelt Areas

A segment of the Prominent and Strategic Metropolitan Greenbelt Areas runs through the northern and southern parts of the study area. The nearest part of the Greenbelt to the site is located to the south of Rochestown Road (R610).

### 4.4.3 NATIONAL AND INTERNATIONAL DESIGNATIONS, NATURA 2000 SITES

The site does not lie within any internationally or regionally designated landscape or townscape. Within the study area, Douglas River Estuary (part of Mahon Lough) is designated as a Proposed Natural Heritage Area (pNHA) and is located to the east of the development site. A Special Protection area; 'Cork Harbour SPA' is also located in the study area, the nearest parts are along the Mahon Lough shore-side, to the east of the development site. The Great Island Channel SAC (site code 001058) is located approximately 3.5km from the site. While these areas are designated for ecological reasons, they are generally examples of intact landscapes and are therefore considered as potential sensitive receptors.

### Walking and Cycling Routes

The Proposed Development site benefits from the easy and nearby access to the local amenity corridors including cycle lanes and recreational greenways connecting Cork city to Passage West – these quality routes provide opportunities for sustainable travel and Cork City Council continues to introduce and improve cycle infrastructure across the city.

### 4.4.4 LOCAL AND URBAN DESIGN OBJECTIVES

Local policy in relation to urban design objectives for the site is particularly relevant for the assessment of the potential townscape effects, due to the intentions for a tall building and developments on this part of Jacob's Island.

#### 4.4.1.1 Local Area Action Plan

The 'Mahon Local Area Plan' (2014) was prepared as a statutory guide for the area's development and change over the subsequent six years. The development site is located in the southeast corner of the plan's margins. The LAP objectives for the development site include a 'Proposed Tall Building' and the area is illustrated as 'Development Opportunity'. In relation to views and visual amenity, the LAP states that *"There are a limited number of views of strategic amenity significance protected by the development plan that affect the Mahon Plan Area. These are:*



- View of Bessboro House from south (View AR4);
- View across the area from Bloomfield Interchange / N27 to Tivoli Ridge / Docks (view LT14)”

The LAP also states that *“In addition to these protected views there are a number of other visual factors that provided a context to the development of the area: Whilst Mahon has a very shallow gradient, and in general lies on a south-facing slope, it is highly visible from the Rochestown / Douglas Ridge; The area is visible from the Harbour approach to the city and the water bodies surrounding the peninsula. It is Council policy to resist development that threatens to obstruct or compromise the quality or setting of views and prospects of special amenity value. Building heights should respond to the visual context of Mahon in the form of specifically protected views and general views of the area.”*

## 4.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The subject site is located along the N40, on a large site between Mahon Point and existing and permitted residential developments, with excellent access to public transport, cycling network and public amenities.

The proposed development is described in detail in Chapter 2 – Project Description of the EIAR.

## 4.6 POTENTIAL EFFECTS (RESIDUAL EFFECTS)

Considering the nature of the Proposed Development, potential townscape and visual effects identified will also be considered residual. Primary mitigation measures have been included to the architectural design during the planning and design stage. The proposed public realm / landscape architectural design cannot mitigate townscape and visual effects further due to the nature and scale of this Proposed Development.

The following potential visual effects, direct and indirect townscape effects, as well as the duration and nature of effects arising from the Proposed Development, have been identified. Photomontages 1-12 illustrate the Proposed Development from representative viewpoint locations within the study area. A description of each photomontage is included in Section 4.6.4 herein.

### 4.6.1 EFFECTS AT CONSTRUCTION

Townscape and visual effects at construction stage will be experienced locally and from elevated areas to the north and south. Due to the nature of the site, the most notable effects will be from the adjoining road network including the N40 as well as from adjoining areas at Jacob's Island, Mahon to the north and existing suburban developments to the south with views of the development site. The sensitivity of residential receptors is generally considered high. The visual envelope that is likely to be most affected is from the residents along Long Shore Drive to the south and the residential dwellings further south which sit along the shoreline (residences at Harty's Quay). The receptors and activities associated with the Mahon Retail Park and Shopping Centre to the north are considered low.

Construction effects are most likely to be associated with the visibility of construction traffic and to the upper part of the development site where cranes and scaffolding will be visible above existing boundary. Again, it is predicted that these will be most prevalent when viewed in close proximity from the south of the subject site. There will also be mid-distance views of construction works from the nearby road network and long distance view from residences along elevated areas to the south. Those particular views will be panoramic, and the Proposed Development site and associated construction works will be one feature and many in these views.

### Construction impacts will comprise:

- Potential effects to townscape character or visual amenity within the locality or the wider study area as a result of the visibility of construction activities such as the construction of buildings, associated scaffolding, and machinery including cranes.
- Effects of temporary site infrastructure such as site traffic and construction compounds especially those located in areas adjacent to sensitive townscape and visual receptors.
- Potential physical effects arising from construction of the development and in particular on the townscape resource within the site area.

Photomontages 1-12 supplementing this assessment illustrate the townscape and visual effects at operational stage only. The proposed construction works do not allow for a meaningful illustration in photomontages as these can only show one particular snapshot in time, which will not capture the dynamic and complex nature of construction works comprehensively.

Townscape and visual effects and their significance during construction works will be temporary. They will be highest within the immediate vicinity of the site, primarily amongst the residents along Long Shore Drive. Principal views of construction works will likely be experienced within a radius of approximately up to 350m from the site boundary. The magnitude of visual effects is considered medium to high in close distance views. Their significance / quality is considered moderate-significant / adverse.

The visibility of construction works within the wider study area beyond 350m will be limited to the upper sections of the building construction including cranes. It is likely these will be visible from south of the River Douglas/Lough Mahon, as well as from the local road network.

### 4.6.2 EFFECTS AT OPERATION

Operational effects will result in:

- Potential effects of the development on townscape resources and townscape character, including the perceptual qualities of the townscape, and upon designated townscapes where the primary focus of designations or sensitive townscapes is altered;
- Potential effects of the development on views and visual amenity such as the potential for the development to alter (beneficial or adverse) the composition of the view from a viewpoint; and
- Potential cumulative effects of the development in combination with other planned and Proposed Developments of similar type and scale upon the townscape and visual resource of the study area.
- Some of the key townscape and visual operational effects may relate to:
  - The significant opportunity to improve views from within the local and wider landscape/townscape character areas;
  - The extent to which the development has the potential to improve the townscape character by reinforcing and/or enhancing its overall integrity and character, for example the removal of derelict or unused structures;
  - The extent to which the development may intrude into existing views or improve views experienced by residents and day to day users of the area; and
  - The extent to which users of the townscape such as tourists and visitors may be subject to effects (beneficial or adverse).

### 4.6.3 RESIDUAL TOWNSCAPE EFFECTS

Direct or indirect townscape effects on the fabric of the townscape and its receptors are closely related to the nature and extent of visibility. The implementation of all aspects of the proposed residential development will result in permanent, direct changes to the townscape character of the Proposed Development site. The change in townscape character is considered very high. The significance / quality and changes to the townscape character is considered to be Very Significant / Beneficial. The Proposed Development will not introduce elements that are uncharacteristic to the existing townscape character. However, it will intensify the prevailing residential and built-up nature of the existing townscape. It will alter the perception of the townscape character when travelling along the N40. It will further urbanise the overall character of the area, particularly where the subject site is located within Jacobs Island and close to the shoreline.

Cork City is identified as a landscape character area located within Landscape Character Type 1 (LCT 1) – City Harbour and Estuary as stated in the Cork County Draft Landscape Strategy 2007. LCT 1 is an area of very high landscape value and sensitivity with a nationally important landscape. However, the Cork City Landscape Study 2008 subdivides Cork City into 8 smaller character areas. The proposed development will be located within a landscape character area defined as 'Urban Sylvan Character', according to the 'Cork City Landscape Study 2008. However, the Cork City Landscape Study does not rate the landscape sensitivity, value and susceptibility of the landscape to change for each landscape character area. In the absence of this information, the rating is based on the experience and professional judgment of the landscape architect who prepared this chapter. The decision-making has been supported by the site survey. It is concluded that the landscape sensitivity and value of an 'Urban Sylvan Character' area is high-medium. The susceptibility of this part of the landscape to accommodate change is medium due to the existing nature of the character area and its classification.

Outside of the site boundary and within approximately 350m radius from the Proposed Development site, the further urbanisation to the townscape character will be experienced locally from the adjoining 'Sub-Urban Residential' landscape character area as well as from nearby neighbourhoods as well as from elevated locations in the wider study area. These indirect changes will occur outside of the Proposed Development site boundary, where the visibility of the Proposed Development influences the perception of the character of the townscape. The indirect change may be considered greatest from views north from nearby existing residential developments as well as in views from the N40 and Mahon. The magnitude of change in these areas is therefore considered Medium-High. The significance of townscape effects / quality on the landscape character in these areas will be Moderate-Significant / Beneficial during operation. Jacob's Island is currently a mixture of residential developments and brown field sites (in areas north of Jacobs' Island Road and Longshore Avenue). The townscape character is not clearly legible. The Proposed Development will consolidate and define the character of the area as the intensification of built elements will develop a cohesive townscape character.

Indirect change and the magnitude of landscape effects will reduce to Medium, Low and Negligible with increasing distance from the Proposed Development in the wider study area and beyond as the Proposed Development will integrate in the overall townscape character. The intensification of the built-up nature of the townscape will be noticeable but it will not be uncharacteristic. The significance / quality of townscape effects in the wider study area and beyond is therefore considered Slight-Not Significant / Neutral.

A summary of townscape effects of the proposed residential development on key receptors located within the study area is provided in the table below.

4-13 Townscape Character Area

RECEPTOR	MAIN RECEPTOR GROUP	SENSITIVITY	MAGNITUDE (AT OPERATION)	QUALITY OF EFFECTS	SIGNIFICANCE
Within the Proposed Development site	<ul style="list-style-type: none"> <li>Urban Sylvan Character</li> </ul>	High	Very High	Beneficial	Very Significant
Outside of the Proposed Development site and within adjacent townscape environs, up to approx. 350m radius)	<ul style="list-style-type: none"> <li>Urban Sylvan Character</li> <li>Sub-Urban Residential Character</li> <li>Urban Industrial / Urban Institutional Character</li> </ul>	High-Medium	Medium-High	Beneficial	Moderate-Significant
Townscape environs, beyond approx. 350m and up to approx. 1km radius)	<ul style="list-style-type: none"> <li>Urban Sylvan Character</li> <li>Sub-Urban Residential Character</li> <li>Urban Industrial / Urban Institutional Character</li> </ul>	High-Medium	Medium-Low	Beneficial	Moderate - Slight
Townscape environs, beyond approx. 1.5km radius)	<ul style="list-style-type: none"> <li>Urban Sylvan Character</li> <li>Sub-Urban Residential Character</li> <li>Urban Industrial / Urban Institutional Character</li> </ul>	High-Medium	Low-Negligible	Neutral	Not Significant

### 4.6.4 Residual Visual Effects

The Proposed Development is located on a land bank between the N40 and the River Douglas/Lough Mahon within a mixed neighbourhood consisting of commercial, large infrastructural and residential developments. The majority of the Proposed Development will be openly visible in close distance but will quickly reduce with increasing distance due to adjacent built developments and considerable vegetation, which will help to partially screen and integrate the Proposed Development into its setting.

The majority of views will be available from the immediate road network. The residential receptors are considered to have a high visual susceptibility and medium-high sensitivity to change in views. Vehicle travellers along the N40 and recreational walkers will have a medium susceptibility and sensitivity to change in views.

The highest visual effects will be experienced in open and partial views from Jacobs Island Road and adjoining residences facing the Proposed Development site. Open views and partial views will also be experienced from the N40 and the R852 overbridge between Mahon and Jacobs Island. The visual change is considered high, and the resulting significance / quality is moderate-significant / beneficial within a radius of approximately up to 200m-400m depending on the openness of the view and the screening effects of intervening vegetation and other built structures. The proposal will add a new and prominent building block along the N40 and constitute a new edge and entry point in the northern part of Jacob's Island. It will provide structure and introduce a new urban quality to a current brownfield site. Existing and proposed boundary screen planting will obscure views of the lower portions of the Proposed Development and over time the extent of screening will increase as vegetation matures.

Visual effects beyond approximately 400m and up to 1km will reduce quickly and visibility of the Proposed Development will concentrate on the upper sections of the buildings due to intervening screening vegetation and other existing built structures. The Proposed Development will still form a new focus point in available open views, particularly in views west from Hop Island, but it will be one component and several in these views. Visual effects are considered Low-Medium. The visual significance / quality is considered slight-moderate / beneficial. The proposal will begin to integrate into the increasingly built-up environment on Jacob's Island and Mahon.

Long distance views beyond 1km will be available across the River Douglas from sections of the R610 and adjoining areas and experienced by residents, pedestrians, cyclists and vehicular drivers. Elevated locations along the slopes to the south of the River Douglas will also recognise the Proposed Development as new part of the overall Jacob's Island development and as an additional building feature in panoramic views. However, while often clearly recognisable as a new urban element, it will not become a prominent focus point as it will be one feature of many in available views. Visual effects are considered Low. The visual significance / quality is considered slight / neutral.

Twelve photomontages have been produced to illustrate the nature of views from representative viewpoint locations within the study area and are described and assessed below and can be found in Appendix 4.1.

### Viewpoint / Photomontage 1:

View southwest from N40 / South Ring Road. The proposal will tie in with the existing development seen to the left of view and will not stand in contrast to this development due to the similarities in terms of scale and materiality. The proposed development sits below the ridgeline of the existing development within this view; therefore, it will not raise the skyline within the view.

When seen in the cumulative scenario, this proposal ties both the existing and permitted together within this view, creating a linear development line. The indicative adjacent future development will be more prominent in this view as it would extend further along the N40 increasing the built-up nature of this view. It will also screen sections of the Proposed Development.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 1</b> (View from N40/ South Ring Road)	Low	Low	Moderate / Beneficial	Medium / Moderate / Beneficial

### Viewpoint / Photomontage 2:

View southwest from the Mahon Lough shore-side Amenity Route, north of 'The Sanctuary', Jacob's Island. Similarly, to Viewpoint 1, the proposed development will be seen in conjunction with the existing neighbouring development. The Proposed Development will not sit in contrast to the existing development as it is similar in scale, height and materiality as the existing.

When seen in relation to the permitted development of Jacobs Island, the proposed development will not add significant cumulative effects due to the prominence of the tall building dominating this view. The Proposed Development will again be seen as part of the existing neighbouring development from this viewpoint.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 2</b> (View from the Mahon Lough shore-side Amenity Route, north of 'The Sanctuary', Jacob's Island)	MEDIUM-HIGH	MEDIUM-HIGH	MODERATE / NEUTRAL	LOW / SLIGHT / BENEFICIAL

### Viewpoint / Photomontage 3:

View northwest from shore-side Amenity Route, west of 'Long Shore Drive'. The Proposed Development will be partially seen above the existing residential development seen in the foreground. The upper most parts of the Proposed Development will be seen from this view. The addition of which will intensify slightly the prevailing character of modern residential developments within this section of the study area.

When seen in combination with the permitted development as well as the indicative adjacent future development of Jacobs Island, the proposed development will be barely discernible due to the scale and prominence of the adjoining other developments, which will become more visible and prominent than the Proposed Development. The addition of the Proposed Development will not be significant.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 3</b> (View from shore-side Amenity Route, west of 'Long Shore Drive', Jacob's Island)	HIGH	LOW	SLIGHT / NEUTRAL	LOW / NOT SIGNIFICANT / NEUTRAL

### Viewpoint / Photomontage 4:

View west / northwest from Hop Island. The Proposed Development will be a prominent addition in this view when compared to the existing development seen to the right of view. However, there is a similarity in height, scale and materiality when viewed with the existing. The Proposed Development will be perceived as an extension to the existing development which strengthens the prevailing character of modern developments within this view.

When viewed in conjunction with the permitted and indicative adjacent future developments, the Proposed Development will be seen as part of the overall built-up of Jacob's Island. Sections of the proposal will be screened by the permitted development resulting in low cumulative visual effects. The expanse across this view remains the same and the scale and materiality of the individual developments are similar.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 4</b> (View from Hop Island)	HIGH	MEDIUM - HIGH	MODERATE / BENEFICIAL	LOW / SLIGHT / NEUTRAL

### Viewpoint / Photomontage 5:

View north from open space, near the junction of Rochestown Road and Monastery Road. This viewpoint is located on the Lough Mahon cycle path near the junction of Rochestown Road and Monastery Road. The view looks north of Jacob's Island across Lough Mahon. The Proposed Development is visible behind the existing Long Shore Drive residences and shore vegetation. The Proposed Development be a noticeable change in this view increasing the prevalence of built-up townscape in the background. However, there is a similarity in height, scale and materiality when viewed with the existing. The Proposed Development maybe perceived as an extension to the existing development which strengthens the prevailing townscape character of modern developments within this view.

When viewed in conjunction with the permitted development as well as the indicative adjacent future development, the focus turns to the tall building at the end of the island. The Proposed Development will be discernible when viewed with the permitted and indicative developments together and integrates well. The developments together will read as one development, with the permitted and indicative taking precedence over the Proposed Development in terms of height.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 5</b> (View from open space, near the junction of Rochestown Road and Monastery Road)	MEDIUM - HIGH	MEDIUM	MODERATE / NEUTRAL	LOW / SLIGHT / BENEFICIAL

### Viewpoint / Photomontage 6:

View northeast from Mount Oval, east of the N28 on an elevation providing panoramic views to the North. The Proposed Development will be discernible as new built-up cluster to the right of the view, beneath the shoreline on the edge of Jacobs Island. The Proposed Development will form a new town quarter in this view, which is not uncharacteristic when seen in conjunction with the existing development at Mahon. The Proposed Development is sensitive to the shoreline and elevated hillside when viewed from this location.

When viewed in conjunction with the permitted and indicative adjacent future developments, the main focus turns to the taller buildings of the overall quarter. The Proposed Development will be clearly discernible when viewed with the permitted and indicative developments. Together, they will form a substantial new city quarter and read as one development. The Proposed Development will help tying all 3 developments together to form a cohesive townscape character and urban quarter in this view.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 6</b> (View from Mount Oval, east of the N26)	MEDIUM	MEDIUM	MODERATE / BENEFICIAL	MEDIUM / MODERATE / BENEFICIAL

### Viewpoint / Photomontage 7:

This view looks northeast from the 'Black Bridge', a former Passage Railway line bridge and a heritage structure. The Proposed Development can be seen above the vegetation centre of the image. Only the upper parts of the Proposed Development can be seen in this view due to the screening provided by the vegetation along the shoreline. The Proposed Development will add an urban character to this view.

The tall building element comes into view when viewed in combination with the permitted and indicative adjacent future developments intensifying the built-up character in the overall view. The developments will be seen as one development due to the similar materiality of the permitted and indicative schemes.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 7</b> (View from 'Black Bridge')	MEDIUM	MEDIUM	MODERATE / BENEFICIAL	LOW / SLIGHT / NEUTRAL

### Viewpoint / Photomontage 8:

View east from Blackrock / Mahon Greenway N40 bridge. The Proposed Development can be seen prominently forming a new urban quarter in this view. The Proposed Development does not stand in contrast to the existing development seen to the left of the view. The developments are similar in height and massing. The addition of the Proposed Development strengthens the urban character in this view and extends this urbanity south across the N40.

When viewed with the permitted and indicative adjacent future developments, the Proposal reinforces the urban character in this view and strengthens the overall urban component in this view due to the similar scale and massing. Sections of the Proposed Development will be screened by the indicative adjacent future development, which will become the main point of focus in the centre of this view. Overall, all developments will read as one.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 8</b> (Blackrock / Mahon Greenway N40 bridge)	LOW	HIGH	SIGNIFICANT / BENEFICIAL	LOW / MODERATE / BENEFICIAL

### Viewpoint / Photomontage 9:

View east from the N40. The Proposed Development will form a new built-up background in this view behind the vegetation. The Proposed Development will not be overbearing due to only the upper most parts of the proposed development being visible within the view.

The indicative adjacent future development will become a prominent point of focus when seen in combination with the Proposed Development, which will be partially screened by the indicative adjacent future development. All developments will read as one development, with the indicative adjacent future development taking precedence over the proposed in terms of scale and height.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 9</b> (N40)	LOW	LOW	SIGNIFICANT / BENEFICIAL	LOW / SLIGHT / NEUTRAL

### Viewpoint / Photomontage 10:

View south from a pedestrian crossing leading from St Michael's Drive to Mahon Point Shopping Center and Mahon Retail Park. The Proposed Development will be discernible above the vegetation seen to the centre left of this view in the far middle distance. The prevailing character of the industrial units further blends the proposed development with its surrounds.

The permitted and indicative adjacent future development will screen the majority of the proposed development from view when viewed together. Cumulative visual effects are therefore not considered significant.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 10</b> (St Michael's Drive)	LOW	LOW-MEDIUM	MODERATE / BENEFICIAL	NEGLIGIBLE / IMPERCEPTIBLE / NEUTRAL

### Viewpoint / Photomontage 11:

View south from the R852. The Urban Sylvan Character of the area is evident in this view framing the vista south. The Proposed Development will be seen to the centre of the view. Only a small section of the development can be seen within this view due to screening provided by vegetation. While it is the only building seen, it will not break the skyline or become dominant over the carriageway.

The indicative adjacent future development will screen the majority of the Proposed Development from view when seen cumulatively. The indicative adjacent future development will become a prominent point of focus in this view.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 11</b> (R852)	MEDIUM	LOW-MEDIUM	MODERATE-SIGNIFICANT / BENEFICIAL	NEGLIGIBLE / IMPERCEPTIBLE / NEUTRAL

### Viewpoint / Photomontage 12:

View south from the R852 road bridge over the N40. The Proposed Development will be seen as a significant change to the existing view. The Proposed Development will be prominent but not overbearing as the height and mass are at an appropriate proportion when viewed from this viewpoint. The proposal will urbanise this view and provide a new gateway to Jacob's Island. The majority of the middle block will be screened from view by intervening vegetation.

The indicative adjacent future development will screen the majority of the Proposed Development from view when viewed together and takes visual prominence within the view. Cumulative visual effects will not be significant.

VIEWPOINT / PHOTOMONTAGE	VISUAL SENSITIVITY	MAGNITUDE OF VISUAL CHANGE	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
<b>View 12</b> (R852 road bridge over N40)	MEDIUM	MEDIUM	SIGNIFICANT / BENEFICIAL	LOW / SLIGHT / BENEFICIAL

A summary table of visual effects from representative viewpoint locations is enclosed below.

*Table 4-14 Summary of visual effects from representative viewpoint locations*

RECEPTOR/ LOCATION	RECEPTOR GROUP	SUSCEPTIBILITY OF VIEWER TO CHANGE	SENSITIVITY OF VIEWER	MAGNITUDE OF VISUAL EFFECTS (AT OPERATION)	SIGNIFICANCE / QUALITY OF VISUAL EFFECTS	MAGNITUDE / SIGNIFICANCE / QUALITY OF CUMULATIVE EFFECTS
Photomontage 1	Vehicular traffic on the N40	Low	Low	Medium	Moderate / Beneficial	Medium / Moderate / Beneficial
Photomontage 2	Pedestrians, along the amenity path	Medium	Medium-High	Medium-High	Moderate / Neutral	Low / Slight / Neutral
Photomontage 3	Pedestrians, along the amenity path	Medium	High	Low	Slight / Neutral	Low / Not Significant / Neutral
Photomontage 4	Pedestrians, local residents	High	High	Medium-High	Moderate / Beneficial	Low / Slight / Neutral
Photomontage 5	Pedestrians, local residents, vehicular traffic	Medium	Medium-High	Medium	Moderate / Neutral	Low / Slight / Beneficial
Photomontage 6	Pedestrians, local residents	Medium	Medium	Medium	Moderate / Beneficial	Medium / Moderate / Beneficial
Photomontage 7	Pedestrians along the amenity path	Medium/High	Medium	Medium	Moderate / Beneficial	Low / Slight / Neutral
Photomontage 8	Pedestrians along the amenity path	Medium	Low	High	Slight / Beneficial	Low / Moderate / Beneficial
Photomontage 9	Vehicular traffic	Low	Low	Low	Significant / Beneficial	Low / Slight / Neutral
Photomontage 10	Pedestrians	Low	Low	Low-Medium	Moderate / Beneficial	Negligible / Imperceptible / Neutral
Photomontage 11	Pedestrians, vehicular traffic	Low	Medium	Low-Medium	Moderate-Significant / Beneficial	Negligible / Imperceptible / Neutral
Photomontage 12	Pedestrians, vehicular traffic	Low	Medium	Medium	Significant / Beneficial	Low / Slight / Beneficial

#### 4.6.5 CUMULATIVE TOWNSCAPE AND VISUAL EFFECTS

In addition to townscape and visual effects, it is also important to consider potential cumulative effects in combination with adjacent permitted and indicative adjacent future developments. As stated in the methodology, significant cumulative effects may occur where a number of similar developments combine to increase the prevalence of that type of development within a landscape or view to the extent that they become a defining characteristic. The accompanying photomontages depict the cumulative effect of the Proposed Development in combination with the permitted scenario and illustrate indicative adjacent intentions (indicative adjacent future development).

Views 1 – 12 all illustrate the cumulative effects of the proposed residential development when seen in combination with the indicative overall masterplan area of Jacobs Island. The subject site is located within a new mixed-use environment with surrounding residential land uses. Construction on the site will create a localised disturbance, particularly in terms of noise and visual effects. However, the Proposed Development will (a) contribute to the diversity of character in the new urban townscape, and (b) indicate a new place of significance in the townscape improving legibility as it ties together a number of permitted and future developments, allowing the development of a cohesive townscape character. Considering the Proposed Development with the permitted and indicative developments, the proposal will integrate with these developments and create a significant new urban quarter at Jacob’s Island. The visibility of these developments in combination completes the transformation of Jacob’s Island into a new part of the city at the edge of the Douglas River and Lough Mahon. Cumulative townscape and visual effects and their quality will be significant / beneficial. The joint visibility and the strategic location of the new quarter at the N40 with short walking distances to the Mahon shopping areas and recreational facilities along Lough Mahon will justify the scale and massing of the permitted and proposed developments as they will be seen as one consistent development in the majority of views.

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the 2022 Draft Cork City Development Plan, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Cork City Development Plan 2022, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting document Strategic Environmental Objectives (SEOs), Indicators and Targets. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.

SEO L, Material Assets as detailed in Table 5-1 of the Draft Cork City Development Plan 2022 is to:

- To implement the Plan’s framework for identification, assessment, protection, management and planning of landscapes having regard to the European Landscape Convention.

Table 5-1 of the Supporting Document of the Draft Cork City Development Plan 2022 indicates that Scenario 3, the ‘Compact Liveable Growth Scenario’ is determined to likely improve the status of SEOs to a greater degree and potential conflict with status of SEOs – likely to be mitigated to a lesser degree.

#### 4.7 MITIGATION MEASURES

Mitigation is a term used to describe the measures or actions that may be taken to minimise environmental effects. The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant adverse direct and indirect effects on the environment arising from the Proposed Development.

Considering the nature and location of the Proposed Development, the principal mitigation is inherent in the high-quality architecture, design and choice of materials. The architectural design statement prepared by O’Mahony Pike

Architects, which is accompanying the planning application outlines the architectural design and palette of materials used and is summarised in Chapter 2 of this EIAR.

During the construction stage, temporary hoarding will be put in place to the edge of the construction zone.

Landscape proposals have been developed by Doyle + O’Troithigh landscape – architecture. The core principle of the landscape design is permeability in order to connect the Proposed Development to the surrounding built environment and to the wider Lee to Sea pathway and McHugh Park. The design and layout of the public realm is essential in the creation of a built environment for this scheme. The designed landscape amenity areas offer comfort, passive supervision, ease of access, a high amenity value and a safe space for all end users. Second to the core principle established as part of the landscape design approach was the development of a palette of materials for both hard and soft landscaping.

##### Overview of Soft Landscape

The plant material for the Proposed Development has been chosen based on their long-term suitability and aesthetic appeal including the following:

- Suitable for the Irish climate;
- Non-invasive;
- Collectively provide visual interest all year round;
- Enhancement of biodiversity and habitat creation; and
- Be disease resistant;

##### Overview of Hard Landscape

The surface finish throughout the development will work with the proposed building finish to provide a high-end public realm, with a visual consistency across the entire site area, in doing so knitting the external landscape areas together to develop an address for the developed lands.

By approaching the overall landscape design of the scheme at both macro and micro levels, the scheme delivered will provide a landscape of high-level amenity which is workable, aesthetically appealing, and robust to work within the surrounding environment.

#### 4.8 MONITORING

No monitoring is required in relation to potential Landscape & Visual Impacts.

## 4.9 SUMMARY

### 4.9.1 EFFECTS AT CONSTRUCTION

Areas experiencing townscape and visual effects during the construction stage will be experienced locally from the adjacent road network and local residents. The sensitivity of the views is generally considered Low for road users and High for residential receptors. Areas experiencing the most prominent construction effects will be residents of Jacob's Island and the N40/R852 road users where open views of the site will be possible. Beyond the immediate roads, construction effects are most likely to be associated with the visibility of construction traffic and to the upper part of the development site where cranes and scaffolding will be visible. It is considered that there will be some long-distance views of construction activity from high ground.

### 4.9.2 TOWNSCAPE EFFECTS

Direct and permanent change will occur locally where the Proposed Development will be physically located. The scale and materiality of the proposed buildings, fronting the public realm on all sides is a considered response to the existing surrounding permitted development and the opportunities presented by the site's 'place-making' opportunity. The proposal will make a positive contribution to the envisaged local built environment.

Indirect changes will occur at a local level on the surrounding road network, particularly along N40 Road, the R852 Road, and many others within a radius of approximately 200m from the site boundary. The magnitude of indirect change in townscape character is considered to be Medium. The significance is considered to be Moderate and Beneficial. The Proposed Development will consolidate and define the character of the area as the intensification of built elements will develop a cohesive townscape character.

At a city scale, the development contributes to the intensification of land use and introduces a new urban scale to the area. The magnitude of change is considered Medium; the significance of the change in character along the surrounding streets is considered Medium Beneficial.

### 4.9.3 VISUAL EFFECTS

In all views, the development introduces buildings of high design and material quality to the townscape. The buildings (in combination) generate a new urban edge along sections of the N40.

Significant visual effects will be experienced in open and partial views from within up to 200-400m from the development boundary and in particular from Jacobs Island Road and adjoining residences facing the Proposed Development site. Open views and partial views will also be experienced from the N40 and the R852 overbridge between Mahon and Jacobs Island. The proposal will add a new and prominent building quarter and entry point in the northern part of Jacob's Island. It will provide structure and introduce a new urban quality to a current brownfield site. Existing and proposed boundary screen planting will obscure views of the lower portions of the Proposed Development and over time the extent of screening will increase as vegetation matures.

Visual effects beyond approximately 400m and up to 1km will reduce quickly and visibility of the Proposed Development will concentrate on the upper sections of the buildings due to intervening screening vegetation and other existing built structures. The Proposed Development will still form a new focal point in available open views, particularly in views west from Hop Island, but it will be one component and several in these views.

Long-distance views beyond 1km will be available across the Lough Mahon from sections of the R610 and adjoining areas and experienced by residents, pedestrians, cyclists, and vehicular drivers. Elevated locations along the slopes to the south of the Lough Mahon will also recognize the Proposed Development as a new part of the overall Jacob's Island development and as an urban quarter with panoramic views.

### 4.9.4 CUMULATIVE EFFECTS

The Proposed Development will contribute to the diversity of the character in the new urban townscape. Cumulative effects will be significant in available open views as the Proposed Development will improve the legibility of the townscape character. It will tie together a number of permitted and future developments, allowing for the development of a cohesive townscape character.

Considering the Proposed Development with the permitted and indicative adjacent future developments, the proposal will integrate with these developments and create a significant new urban quarter at Jacob's Island. The visibility of these developments in combination completes the transformation of Jacob's Island into a new part of the city at the edge of the Douglas River and Lough Mahon.

### 4.9.5 DIFFICULTIES ENCOUNTERED

No difficulties were encountered in the preparation of this Chapter.

### 4.9.6 REFERENCES

Cork City Development Plan 2015-21;

Cork County Development Plan 2014-2021;

Cork City Landscape Study 2008

Cork City Green and Blue Infrastructure Implementation 2022-2028

Draft County Development Plan 2022-2028;

'Guidelines for Landscape and Visual Impact Assessment' (GLVIA-2013)' by the Landscape Institute; and

'Guidelines on the information to be contained in EIARs' by the Environmental Protection Agency 2022.

### 4.9.7 APPENDICES

4-1 Photomontages





JACOBS ISLAND



CHAPTER FIVE  
Material Assets – Traffic & Transportation

# CHAPTER FIVE

## Contents

5	Material Assets - Traffic & Transportation .....	5
5.1	INTRODUCTION.....	1
5.2	METHODOLOGY .....	1
5.3	EXISTING ENVIRONMENT .....	1
5.4	FUTURE TRANSPORT PROPOSALS .....	20
5.5	PROPOSED DEVELOPMENT.....	26
5.6	TRAFFIC AND TRANSPORTATION ASSESSMENT .....	30
5.7	IMPACT ASSESSMENT .....	40
5.8	MITIGATION MEASURES .....	42
5.9	INTERACTIONS .....	43
5.10	RESIDUAL IMPACTS .....	43
5.11	MONITORING.....	44
5.12	DIFFICULTIES IN COMPILING INFORMATION .....	44
5.13	REFERENCES .....	44
5.14	APPENDICES .....	44

## CHAPTER FIVE

### MATERIAL ASSETS – TRAFFIC & TRANSPORTATION

#### 5.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the likely impacts on the existing transport environment as a result of the Proposed Development. Refer to Chapter 2 for further details of the proposed development. Figure 5.1 illustrates the outline for the proposed development layout.



Figure 5.1: Proposed Development Layout

The chapter describes the methodology used; the existing environment, the characteristics of the Proposed Development, the potential impact which proposals of this kind would be likely to produce; the remedial or reductive measures required to prevent, reduce or offset any significant adverse effects; and any residual impacts that may remain.

#### 5.2 METHODOLOGY

The following methodology has been adopted for the appraisal of the potential impacts of the proposed development on

the existing transport environment:

- Review of relevant available information including, project plans, existing traffic information and other relevant studies;
- Review of 'Traffic and Transport Assessment Guidelines' (May 2014) Transport Infrastructure Ireland (TII);
- Review of Cork City Development Plan 2015-2021, Draft Cork City Development Plan 2022-2028 and Cork Metropolitan Area Transport Strategy (CMATS) 2040;
- Site visits to gain an understanding of the existing traffic and land use conditions;
- A new traffic survey on Jacob's Island to understand the existing trends;
- Review Census trends and long terms counters (consideration to covid impacts); and
- Assessment of the percentage impact of traffic on local roads / junctions, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport.

#### 5.3 EXISTING ENVIRONMENT

##### 5.3.1 SITE LOCATION

The proposed development site is located off the internal road network within Jacob's Island. There will be a number of access points off the spine road in Jacob's Island.

Jacob's Island itself is a peninsula located to the South of the Mahon Interchange off the N40 dual-carriageway, and as such the site effectively a cul-de-sac, with no through route for public transport and traffic. The main access point to the lands for vehicles is via the Mahon Interchange, whereas pedestrian and cyclists have multiple access/egress points to the lands from the Mahon interchange and from the east and west from the River Lee/Lough Mahon Waterfront Greenway.

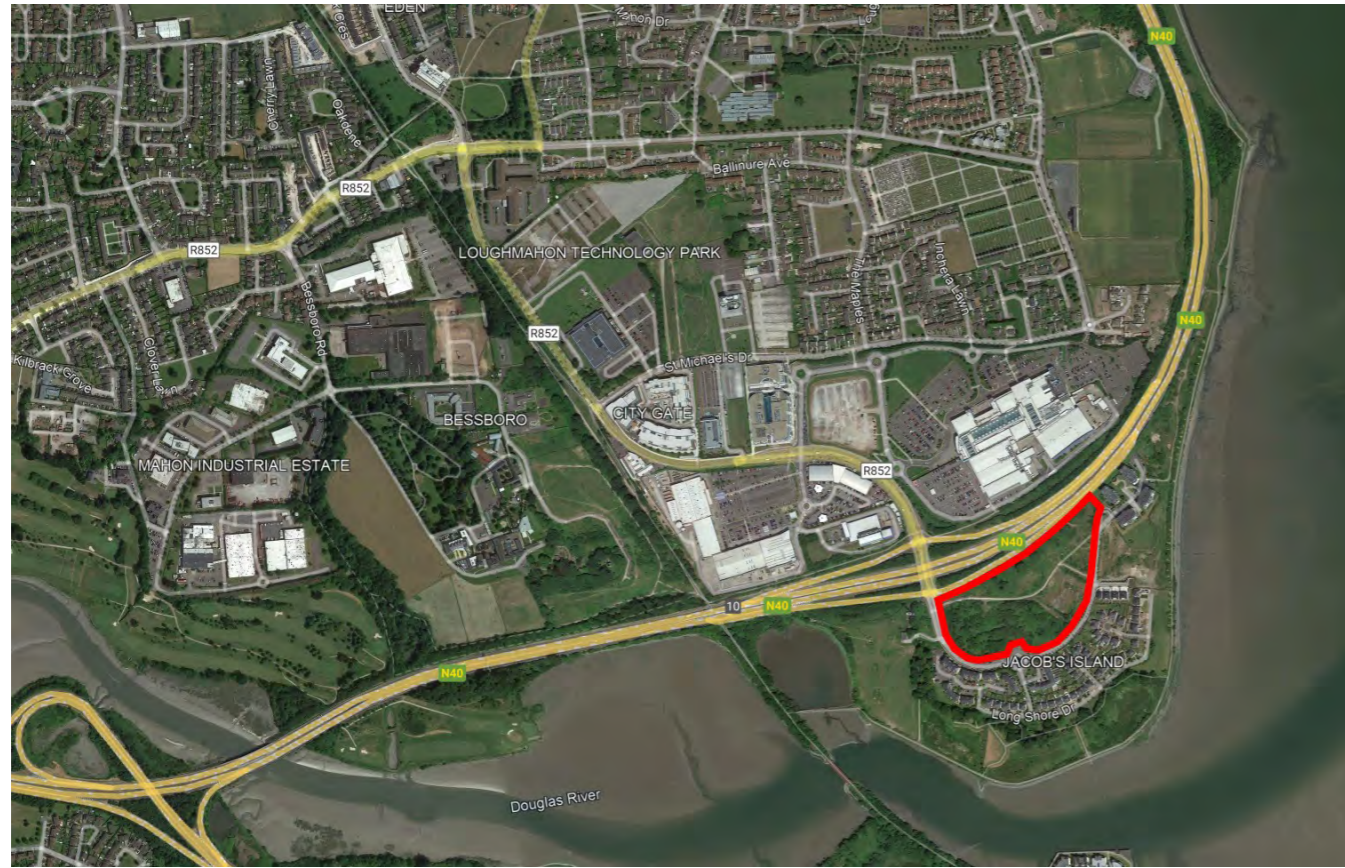


Figure 5.2: Site Location

### 5.3.2 PEDESTRIAN ACCESSIBILITY

#### 5.3.2.1 General Pedestrian Accessibility

The area has excellent connections from the proposed development to the River Lee/Lough Mahon Waterfront Greenway and the Passage West Greenway, there are also existing pedestrian facilities for shorter trips by foot on the internal spine road within Jacob's Island and northwards to Mahon Point Shopping Centre, Mahon Retail Park and general employment centres on Mahon Link Road and Bessboro Business Park. Figure 5.3 below shows pedestrian accessibility between the proposed development and the wider Mahon area, including the locations of pedestrian crossings, off-road walkways and multiple access points to Mahon Point Shopping Centre.

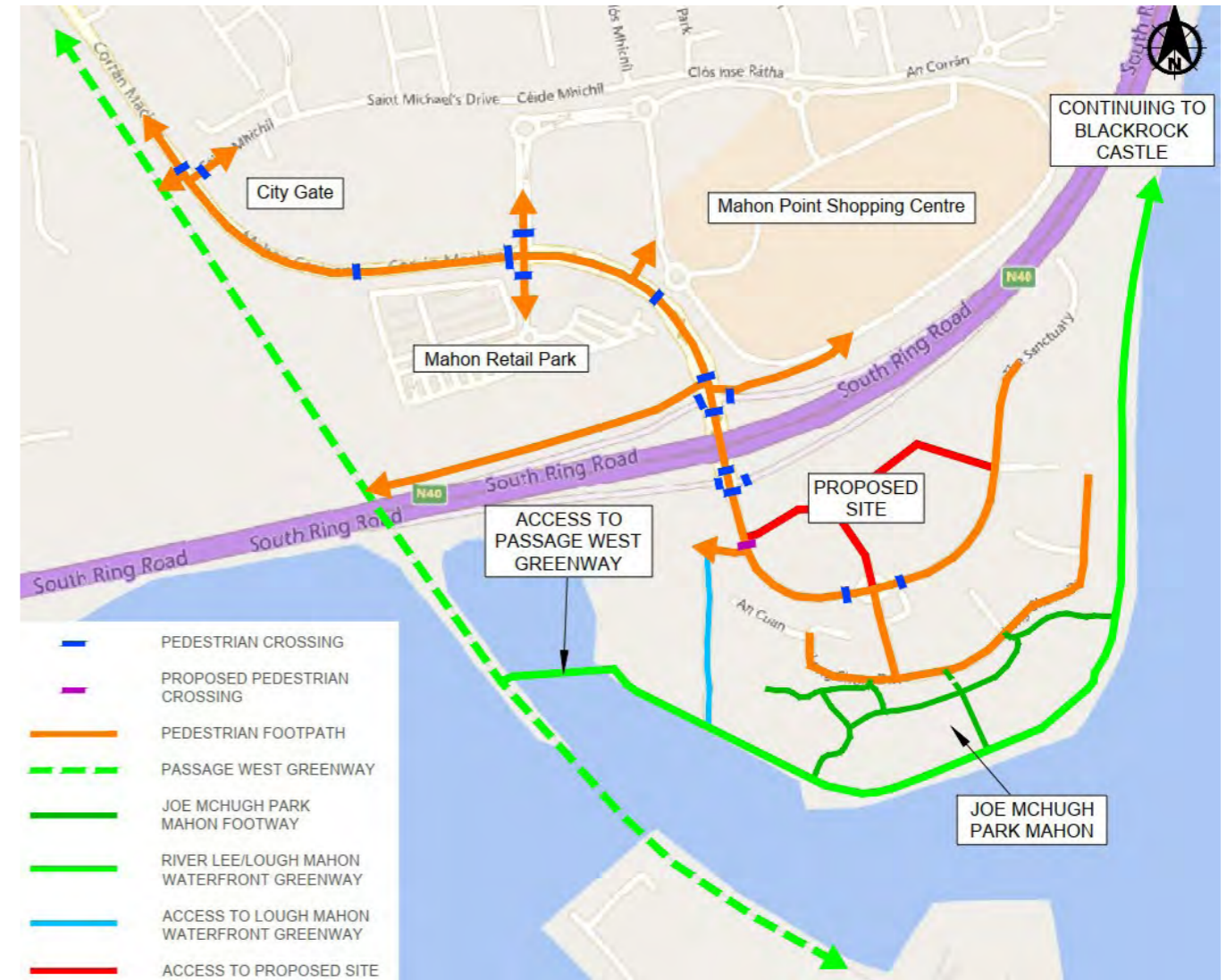


Figure 5.3: Pedestrian Accessibility via Mahon Link Road

Figure 5.3 illustrates the multiple pedestrian connections into Mahon Point Shopping Centre, Mahon Retail Park, City Gate, etc. as follows:

- a walkway along the eastbound merge ramp (as shown in Figure 5.4 below);
- a ramp from the bus stop on the Mahon Link Road (as shown in Figure 5.5 below); and
- pedestrian access to Mahon Retail Park and City Gate at the vehicular entrance junction to Mahon Point Shopping Centre.

The blue connection to the River Lee/Lough Mahon Waterfront Greenway is currently of variable quality.



Figure 5.4: Pedestrian and Cycle Accessibility to Mahon Point Shopping Centre from Mahon Interchange>



Figure 5.5: Pedestrian Accessibility to Mahon Point Shopping Centre from Mahon Link Road

Figure 5.3 also illustrates pedestrian accessibility to Mahon Point Retail Park and to the Passage West Greenway from the Mahon Interchange and from St. Michael's Drive. Signalised pedestrian crossings are in place at the Northern and Southern junctions of the Mahon Interchange, see figure below.

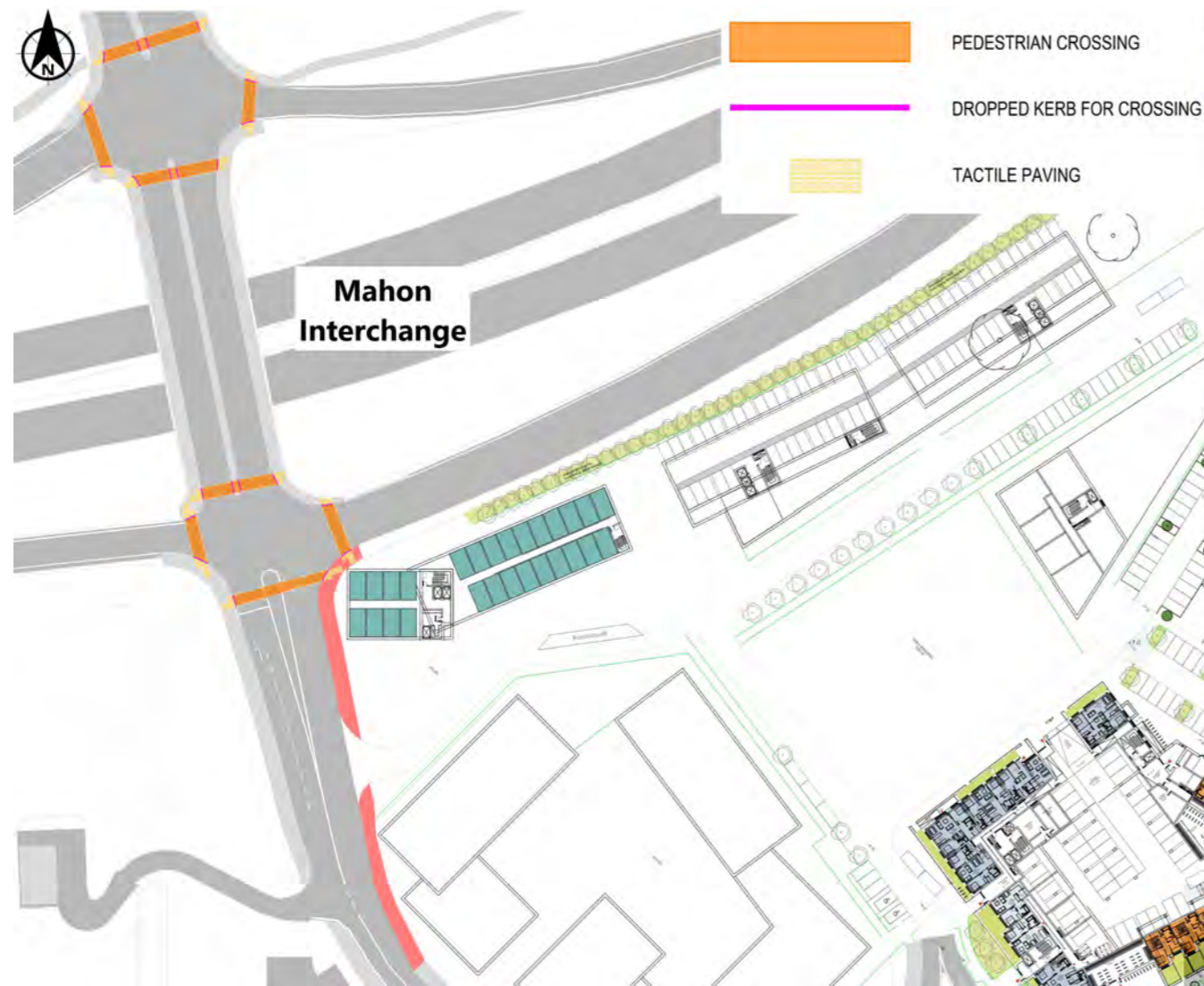


Figure 5.6: Pedestrian crossings at Mahon Interchange

Figure 5.7 and Figure 5.8 illustrate the existing footpath facilities between Jacob's Island and Mahon Link Road, including the existing crossing facilities at the Mahon Interchange, which link Jacob's Island with the Mahon Link Road and beyond to the Mahon Point Shopping Centre, Mahon Retail Park and the Lough Mahon Industrial Park. It is also possible to walk to the terminus of the 202, 202A and 212 bus routes which is located outside the northern entrance to Mahon Point Shopping Centre (this route is highlighted in Figure 5.20).



Figure 5.7: Existing Footpath facilities on Jacob's Island



Figure 5.8: Existing Pedestrian Crossing Signals at southern junction of Mahon Interchange

### 5.3.2.2 Internal facilities within Jacob's Island

Pedestrian footpaths are present on both sides of the internal roadway within Jacob's Island. The roadway leads to a roundabout junction, which is provided with zebra crossings on the major arms (i.e. 2 no. crossings on the main thoroughfare). The footpaths continue as far as the gated entrance to The Sanctuary (i.e. the existing apartment blocks on the eastern side of Jacob's Island). Inside this private entrance, the footpaths continue to the current end of the existing roadway.



Figure 5.9: Roundabout Junction at Jacob's Island

Figure 5.10 to Figure 5.15 illustrate the existing pedestrian facilities at Jacob's Island with the Joe McHugh Park Mahon located to the south and River Lee/Lough Mahon Waterfront Greenway located along the southern and eastern perimeter of Jacob's Island. Due to the popularity of the walkway facility, direct access to and from the walkway exists at multiple locations on Jacob's Island, especially through the Joe McHugh Park Mahon, which its footways have variable quality and poor lighting in some spots. Taking into account the proposed site location, the suggested access to the greenway is located western of the park, as this is closer to the site, see Figure 5.10.



Figure 5.10: Suggested access to the River Lee/Lough Mahon Waterfront Greenway and access to the Passage West Greenway



Figure 5.11: Existing Pedestrian Connectivity at Joe McHugh Park Mahon between the River Lee/Lough Mahon Waterfront Greenway and Jacob's Island



Figure 5.12: Footway at Joe McHugh Park Mahon





Figure 5.13: Footway at Joe McHugh Park Mahon



Figure 5.15: River Lee/Lough Mahon Waterfront Greenway at Jacob's Island



Figure 5.14: River Lee/Lough Mahon Waterfront Greenway at Jacob's Island

A 30-minute walking catchment of Jacob's Island is illustrated in Figure 5.16. It can be seen that Mahon Point Shopping Centre is within a 15-minute walk from the central portion of Jacob's Island, with City Gate within a 20-minute walk and Skehard Road within a 30-minute walk.

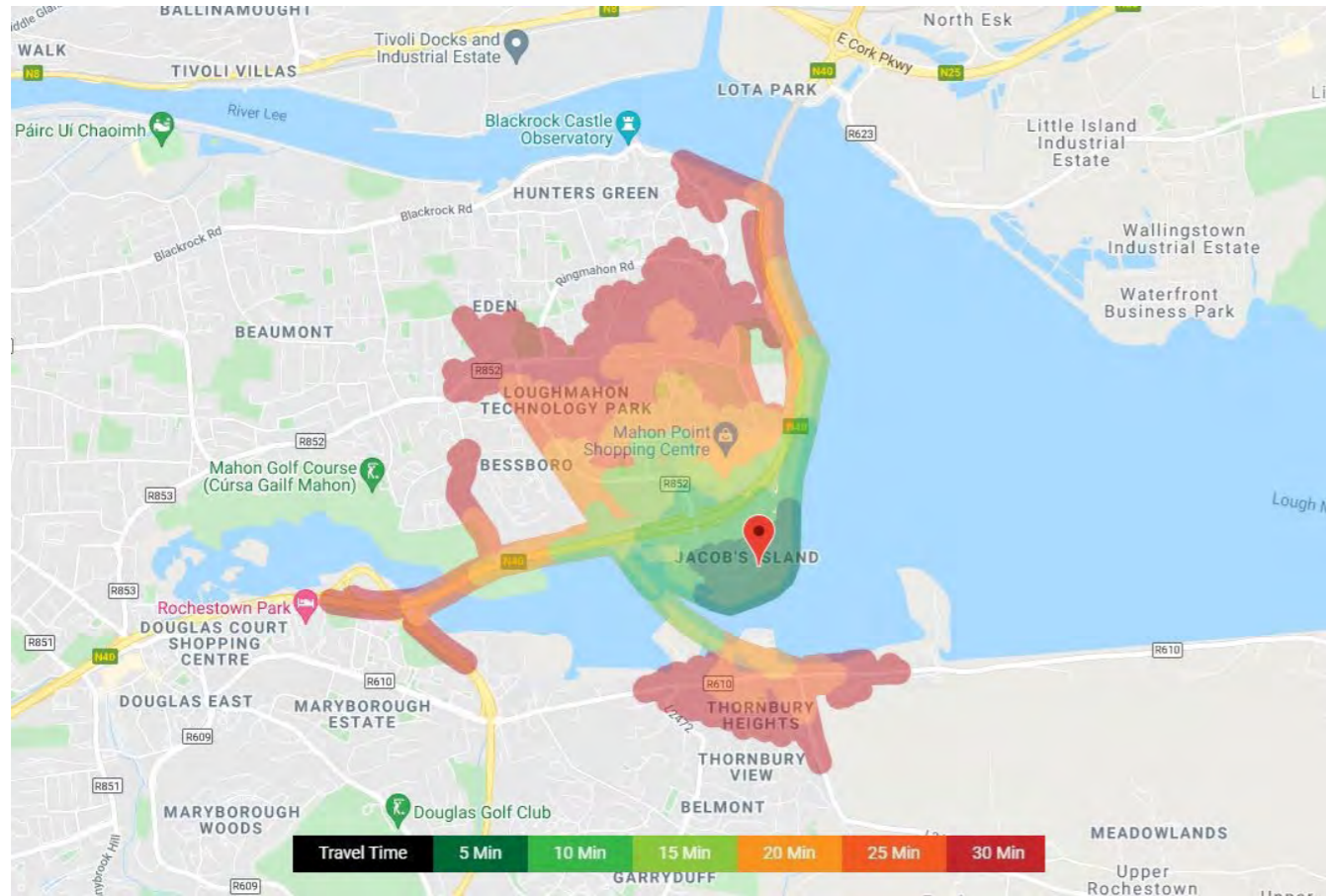


Figure 5.16: Walking catchment to/from Jacob's Island

### 5.3.3 CYCLIST ACCESSIBILITY

#### 5.3.3.1 Existing Accessibility

The River Lee/Lough Mahon Waterfront Greenway forms part of the Jacob's Island site and is easily accessed, with multiple connections. This walkway links to the Passage West Greenway directly to the west, which is an A-rated cycle facility between Cork City and Passage West. Cycle tracks are provided on both sides of the Mahon Link Road from the Skehard Road to the Mahon Interchange, there is also advance cycle stop line on the Mahon Link Road at the vehicular entrance junction to Mahon Point Shopping Centre and Mahon Retail Park.

The existing cycling catchment to and from Jacob's Island is shown in Figure 5.17. It can be seen that Cork City Centre is within a 30-minute cycle from the central portion of Jacob's Island, primarily on a safe and dedicated greenway.

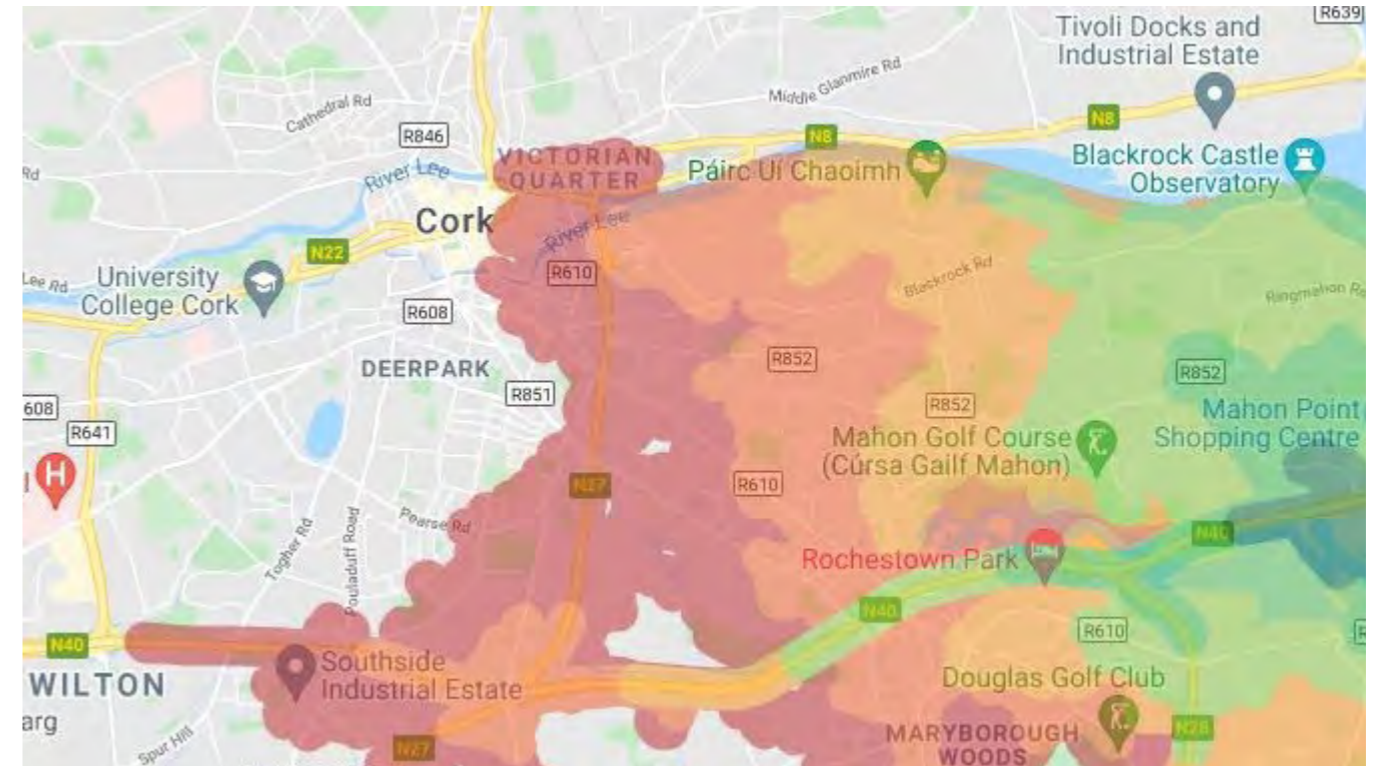


Figure 5.17: Cycling Catchment to/from Jacob's Island

#### 5.3.3.2 Passage West Greenway and River Lee/Lough Mahon Waterfront Greenway

The Passage West Greenway lies to the west of the proposed site. This is a pedestrian and cycle facility implemented on the former Passage Railway line, and is very well-used for both leisure and for commuting to and from Cork City Centre.

The River Lee/Lough Mahon Waterfront Greenway routes along the southern and eastern coastal boundaries of Jacob's Island, connecting to the Passage West Greenway to the west, and continuing to Blackrock Castle to the north.

At present, there are four connections to the River Lee/Lough Mahon Waterfront Greenway from Jacob's Island, which in turn allows the Passage West Greenway line to be accessed easily. There is a ramped connection to the Passage West Greenway from the junction of the Mahon Link Road/St. Michael's Drive, in close proximity of the Mater Hospital. This ramped connection has been upgraded as part of the Passage Railway Greenway Improvement Scheme Phase 1. In addition, the Passage West Greenway is temporarily closed from the Skehard Ramp onto Skehard Road to the Blackrock Ramp at the Blackrock Bridge. This improvement scheme includes the installation of additional ramped connections, upgrade of existing connections and an upgrade proposal for the line itself to include widening, resurfacing, new CCTV, landscaping and incorporation of public lighting.

Figure 5.18 and Figure 5.19 below show this ramped connection. The facility is lit up with public lighting allowing more confidence to commuters wishing to use the facility after dark.



Figure 5.18: New Cycle Ramp access at junction of Mahon Link Road and St. Michael's Drive



Figure 5.19: New Cycle Ramp access at junction of Mahon Link Road and St. Michael's Drive

### 5.3.4 PUBLIC TRANSPORT ACCESSIBILITY

The proposed development site is located to the southeast of Cork City Centre. There are several bus routes which either route directly to the site or near the site, as detailed in Table 5.1. The routing as well as the bus stop locations are presented in Figure 5.20.

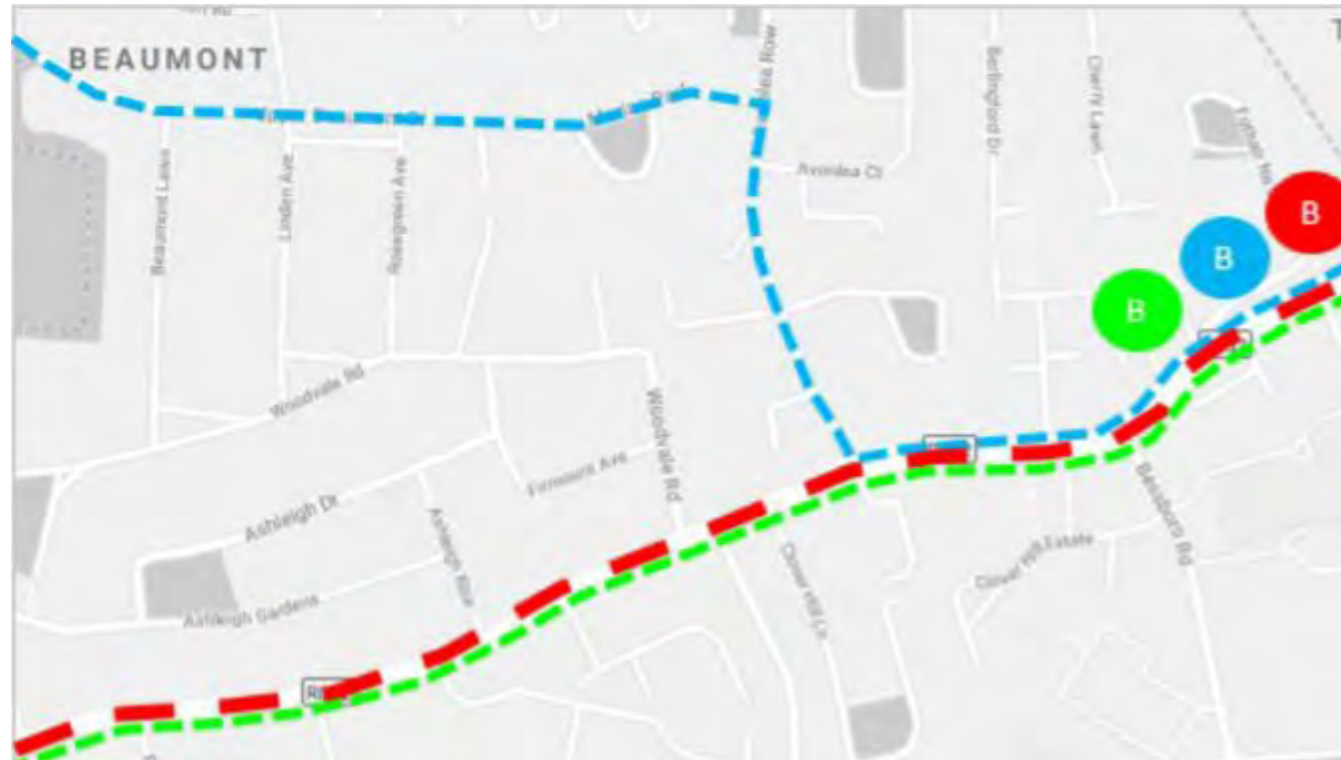


Figure 5.20: Public Transport Provision to the Mahon Area

Table 5.1: Bus Routes in Jacob's Ireland Vicinity

Number	Provider	Route	Frequency
202/202A	Bus Éireann	Apple Campus - Hollyhill - Kilmore Road/Harbour View Road - Merchants Quay - Skehard Road/Ringmahon Road - Mahon Point (Omniplex)	Every 10 mins (Combined)
212	Bus Éireann	Kent Rail Station - Clontarf Street - Centre Park Rd - Blackrock Villa - Mahon Point	Every 1 hour
215	Bus Éireann	Cloghroe - Blarney - Blackpool - St Patrick Street - Ballinlough - Mahon Point - Jacob's Island	Every 30 mins
215A	Bus Éireann	South Mall - Boreenmanna Road - Mahon Point - Jacob's Island	Every 30 mins
219	Bus Éireann	MTU (Southern Orbital) - CUH - Togher - Ballyphehane - Douglas - Mahon (City Gate)	Every 1 hour

It can be seen that the proposed development at Jacob's Island is currently served by the 215 and the 215A services, which currently operate at a 15-minute combined frequency. These services route directly into Jacob's Island and are provided with a dedicated bus turnaround area outside the existing Sanctuary development. This turnaround area acts as the outbound terminus for these services and the bus stop has been upgraded to provide a high-quality, sheltered waiting area for passengers, as shown in Figure 5.21.

Figure 5.22 shows the two existing bus stops on both sides of the Jacob's Island internal spine road, served by the 215 and 215A bus routes, and which will be in close proximity to the proposed Neighbourhood Centre and associated residential units.



Figure 5.21: Existing Bus Terminus and Turnaround Area at The Sanctuary, Jacob's Island



Figure 5.22: Existing Bus Stops on Jacob's Island internal spine road

In addition, the 202/202A route, which currently operates at a 10-minute combined frequency, and the 212 route, which currently operates at a 1 hour frequency have recently been enhanced and extended directly into Mahon Point Shopping Centre, to the northeast of the subject site, which places it at a convenient walking distance from Jacob's Island. The 219 Southern Orbital Route also serves the Mahon area along St. Michael's Drive and operates at a 1 hour frequency. These services as well as the walking route to the 202 terminus are illustrated in Figure 5.20.

The public transport catchment to and from Jacob's Island is illustrated in Figure 5.23 below. This includes travel from the site to the various parts of the city and suburbs. The city centre area is within a 30-minute travel time from Jacob's Island, whilst the major employment areas in Mahon are within a 10-minute travel time.

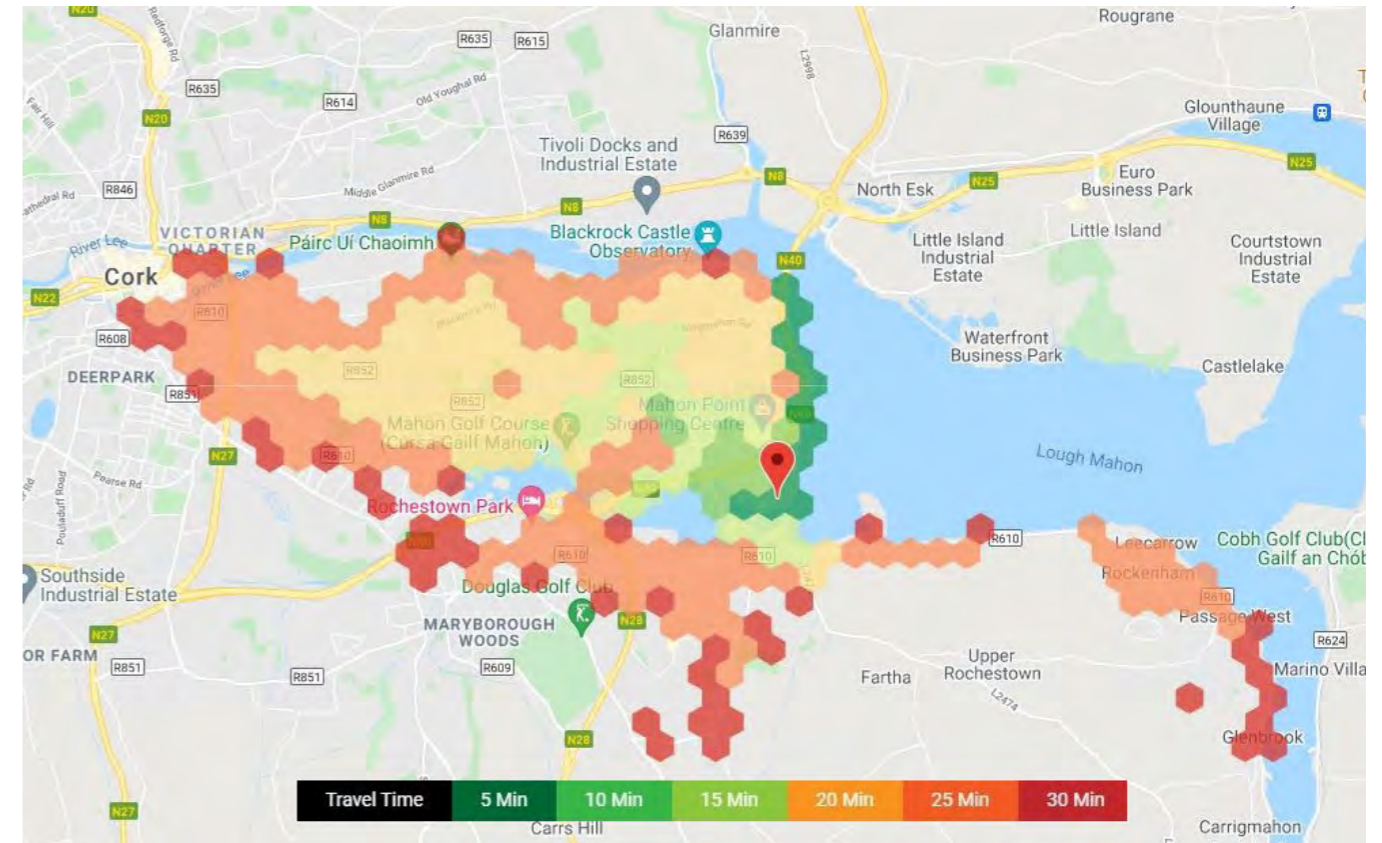


Figure 5.23: Public Transport Catchment to/from Jacob's Island

There are a number of significant improvement schemes in the Cork Metropolitan Area Transport Strategy (CMATS) 2040 that will significantly improve public transport service quality. These are discussed in Section 5.4.1.

### 5.3.5 VEHICULAR ACCESSIBILITY

There are a number of local and national roads close to the site which are presented in Figure 5.24 and described below.

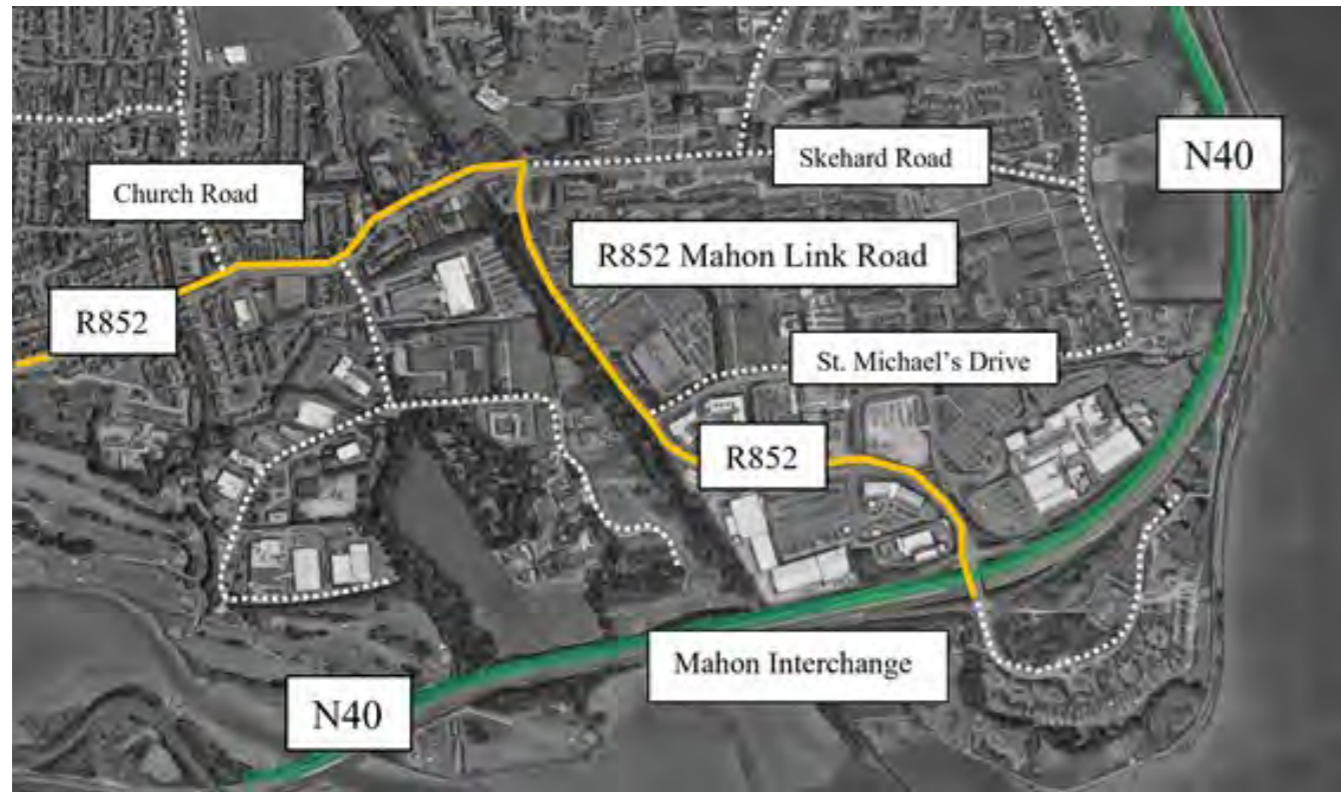


Figure 5.24: Local Road Network

**N40:** The N40 is a national dual carriageway route that connects the N22 from Killarney to the N28 to Carrigaline and the N25 to Waterford. Access and egress from the N40 to the proposed site can be made directly via the Mahon Interchange. The Dunkettle interchange (Refer to Section 5.4.5) is currently undergoing an upgrade and should assist with managing the flows on the N40 and through the Jack Lynch Tunnel.

**R852:** The R852 (Mahon Link Road) connects the N40 at the Mahon Interchange with the Skehard Road, with two lanes in both directions from the interchange to the vehicular entrance junction to Mahon Point Shopping Centre and Mahon Retail Park (widening locally to multiple lanes in both directions on the junctions between the interchange and St. Michael's Drive). This road reduces to a standard single-lane carriageway after the junction with St. Michael's Drive and provides on-road cycle facilities for the majority of the route and pedestrian footpaths.

**Skehard Road:** This is a single-lane carriageway which links Mahon to the city centre via the Boreenmanna Road (with localised widening to provide turning lanes at various junctions). An off-street cycle facility is provided along the southern side of the road. Pedestrian footpaths are provided on both sides of the road. Skehard Road Improvement Scheme Phase 3 has been completed in December 2021, which has upgraded the existing Skehard Road from Church Road to Mahon Link Road, including junction upgrade at Bessborough, refer to Section 5.3.5.1 for further details.

**St. Michael's Drive:** This local road is a single carriageway road that provides access to City Gate and residential developments, and also facilitates public transport access to Mahon Point shopping centre. Pedestrian footpaths are present on both the north and south sides of the road.

**Church Road:** Church Road links the R852 to Blackrock Road and is characterised as providing access to residential properties along its length. Church Road is a single-lane carriageway in each direction with pedestrian footpaths on both sides of the road.

A 30-minute driving catchment to and from the proposed development is illustrated in Figure 5.25. It can be seen that the city centre area is within a 15-minute travel time from Jacob's Island. Surrounding Cork Metropolitan Towns such as Midleton is within 20-minute travel time and Cobh and Blarney are within 25-minute travel time.

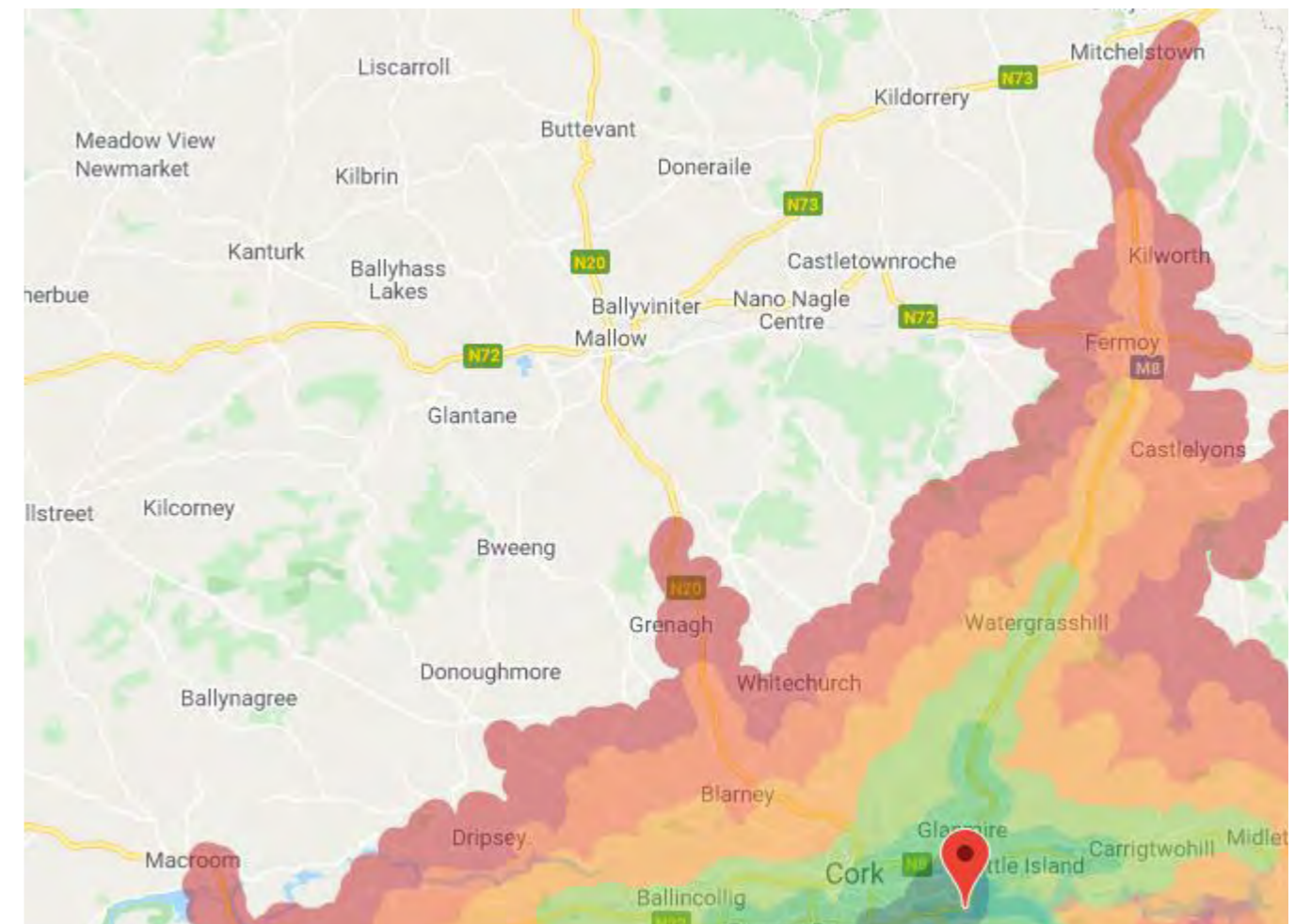


Figure 5.25: Vehicular Catchment

### 5.3.5.1 Skehard Road Improvement Scheme

Phase 1 of the Skehard Road Improvement Scheme (constructed in 2013) included improvements from the Well Road and Churchyard Lane as far as the junction with Park Hill.

Phase 2 (completed in December 2018) of the scheme included further improvements along Skehard Road between Park Hill and the junction with the Mahon Link Road, including improved pedestrian, cyclist and public transport facilities and an upgrade of the junction with Church Road (at Supervalu). In addition, Phase 2 involved the upgrade of the junction of the Skehard Road and Mahon Link Road.

At the Skehard Road/Mahon Link Road junction, the Phase 2 works included localised widening to implement an eastbound bus lane through the junction and to provide two right-turning lanes from Skehard Road to the Mahon Link Road, as well as dedicated bus priority and improved cycle priority on the Mahon Link Road itself, with northbound and southbound bus lanes proposed on the Mahon Link Road in the vicinity of the junction with Skehard Road.

The section of Skehard Road between Church Road and the Mahon Link Road was included as part of Phase 3, construction phase commenced in December 2020 and has been completed in December 2021. An eastbound bus lane and an enhanced westbound cycle lane were proposed as part of the scheme on Skehard Road. Phase 3 also included further improvements to pedestrian, cyclist and public transport facilities from Church Road to the junction with the Mahon Link Road, and upgrades to the junction with Bessboro Road.

As part of Phase 3, the junction of Skehard Road/Bessboro Road has been upgraded to provide a westbound on-road cycle lane, and an eastbound bus lane through the junction, as well as improved pedestrian crossing facilities at the junction itself. See Figure 5.26, Figure 5.27 and Figure 5.28 below for the junction upgrade layouts at the Skehard Road/Church Road, Skehard Road/Bessboro Road and Skehard Road/Mahon Link Road junctions, respectively.



Figure 5.26: Skehard Road/Church Road Proposed Junction Upgrade Layout



Figure 5.27: Skehard Road/Bessboro Road Proposed Junction Upgrade Layout



Figure 5.28: Skehard Road/Mahon Link Road Proposed Junction Upgrade Layout

These improvement works provide enhanced facilities for all road users but with particular benefits for pedestrians, cyclists and public transport users while providing, in as much as possible, for the efficient movement of vehicular traffic. Current bus journey times and reliability are being enhanced by identifying main areas of delay for bus journeys and expanding the existing bus lane infrastructure and the addition of bus priority control measures. Figure 5.29 and Figure 5.30 illustrate the new bus lane on Skehard Road after completion of the works.





Figure 5.29: New bus lane on Skehard Road



Figure 5.30: New bus lane on Skehard Road

### 5.3.6 EXISTING MODE SHARE

Figure 5.31 highlights the Cork City and Suburbs Mode Share, as obtained from the 2016 census. As can be seen in Figure 5.31, car driver and passenger accounts for 63%, with walking accounting for 21%, public transport for 9% and cycling for 3%.

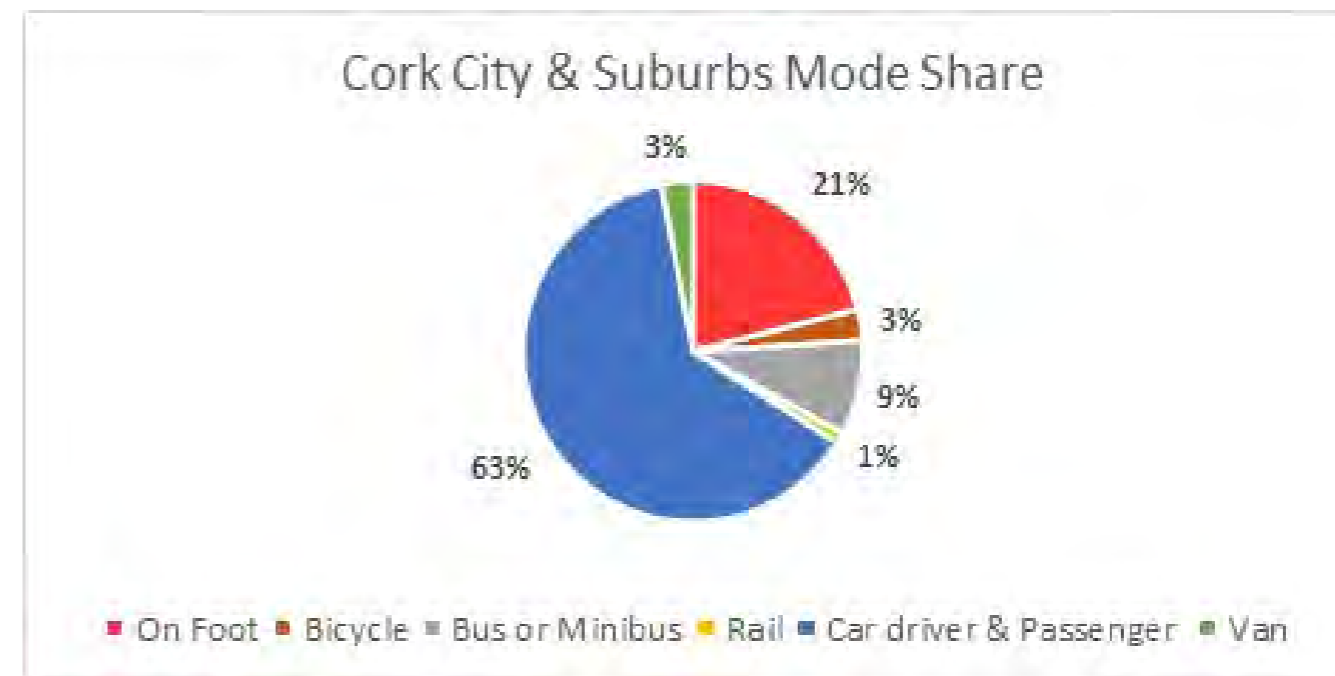


Figure 5.31: Cork City & Suburbs Mode Share

Since 2016 there have been continued improvements in public transport, cycling and walking infrastructure to contribute to a more sustainable modal split.

### 5.3.7 EXISTING TRAFFIC PATTERNS

Previous traffic surveys had been undertaken by an independent traffic survey company IDASO in June 2017. These were discussed with Cork City Council (CCC) during the scoping meeting in July 2021 and deemed to be acceptable for use in assessing the traffic impact for the proposed development. The surveys were undertaken at a number of junctions in the site vicinity, as follows:

- Mahon Interchange (southern junction);
- Mahon Interchange (northern junction);
- Mahon Point Shopping Centre/Mahon Link Road;
- St. Michael's Drive/Mahon Link Road; and
- Mahon Link Road/Skehard Road.

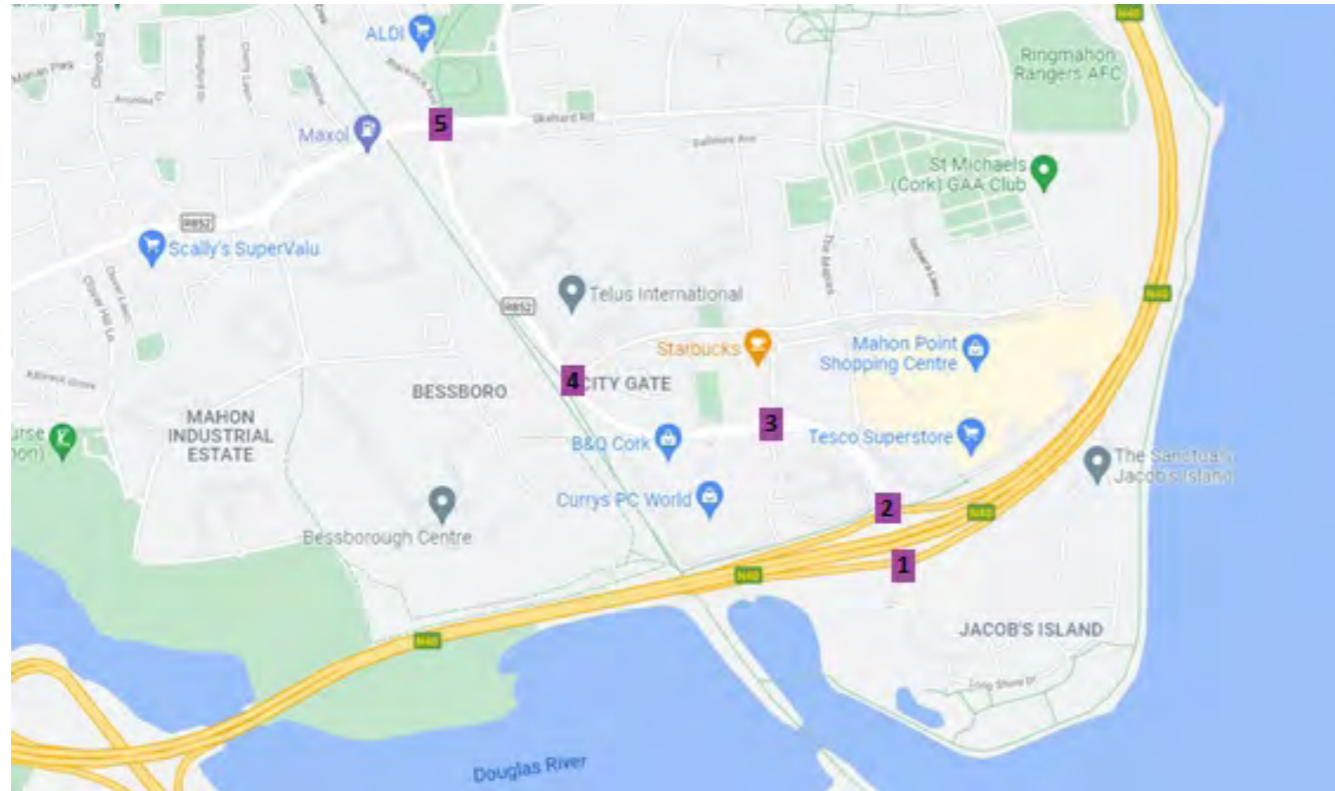


Figure 5.32: Traffic survey locations

### 5.3.7.1 Existing Queue Lengths

The existing queue lengths have been considered the queue lengths identified in the traffic survey from June 2017 on the five junctions listed above. See the maximum queue lengths on the Northern and Southern Mahon Interchange Junctions below.

Table 5.2: Mahon Interchange Queue Lengths

Approach Arm	Queue Length - Morning Peak			Queue Length - Evening Peak		
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3
<b>North Interchange</b>						
Mahon Link Road	6	17	13	8	45	45
EB Slip Road Off N40	27	22	1	15	10	5
Overbridge	17	9	-	9	7	-
EB Slip Road Onto N40	0	0	-	0	0	-
<b>South Interchange</b>						
Overbridge	3	5	-	6	5	-
WB Slip Road Onto N40	0	0	-	0	0	-
Jacob's Island	4	5	-	3	5	-
WB Slip Road Off N40	22	25	-	15	15	-

### 5.3.7.2 TII Long Term Counter

TII have two long term counters on the N40 at either side of the Mahon interchange. These have been reviewed from 2017 to 2021. Traffic flows have dropped in 2020 and 2021 due to the covid pandemic. This has introduced the opportunity for many people to work from home and created a hybrid working solution. The ADT flows can be seen in the tables below. We have also reviewed the average daily flow for September 2021 and these flows are getting closer to the previous levels in 2017 of 61,470 on N40 between Jack Lynch Tunnel and Mahon Jun South Ring Road and 65,770 on N40 west of Mahon Interchange, between Mahon and Bloomfield Interchange.

Table 5.3: N40 between Jack Lynch Tunnel and Mahon Jun South Ring Road

Year	ADT	% HGV
2021	52,560	5.7%
2020	51,710	5.7%
2019	67,640	4.5%
2018	67,010	4.5%
2017	66,690	4.3%

Table 5.4: N40 west of Mahon Interchange, between Mahon and Bloomfield Interchange

	ADT	% HGV
2021	55,750	5.2%
2020	54,930	5.3%
2019	71,700	4.1%
2018	71,080	4.0%
2017	70,940	3.9%

### 5.3.7.3 Jacob's Island Traffic Surveys

Local traffic counters were placed at two locations on Jacobs Island in two different periods of time, from the 3rd Sept to the 30th Sept 2021 and from the 1st Feb 2022 to the 21st Feb 2022. Some covid restrictions were still in place but many people have returned to work with schools and universities fully open. An additional traffic survey has been undertaken between 25<sup>th</sup> April and 15<sup>th</sup> May 2022 in order to obtain a traffic survey with no effects of covid restrictions.

Location 1 (ATC1) is at the entrance to Jacobs Island and location 2 (ATC2) by the Sanctuary apartments. The Sanctuary apartments were chosen as the proposed development is a mix of apartments. These locations can be seen in Figure 5.33.

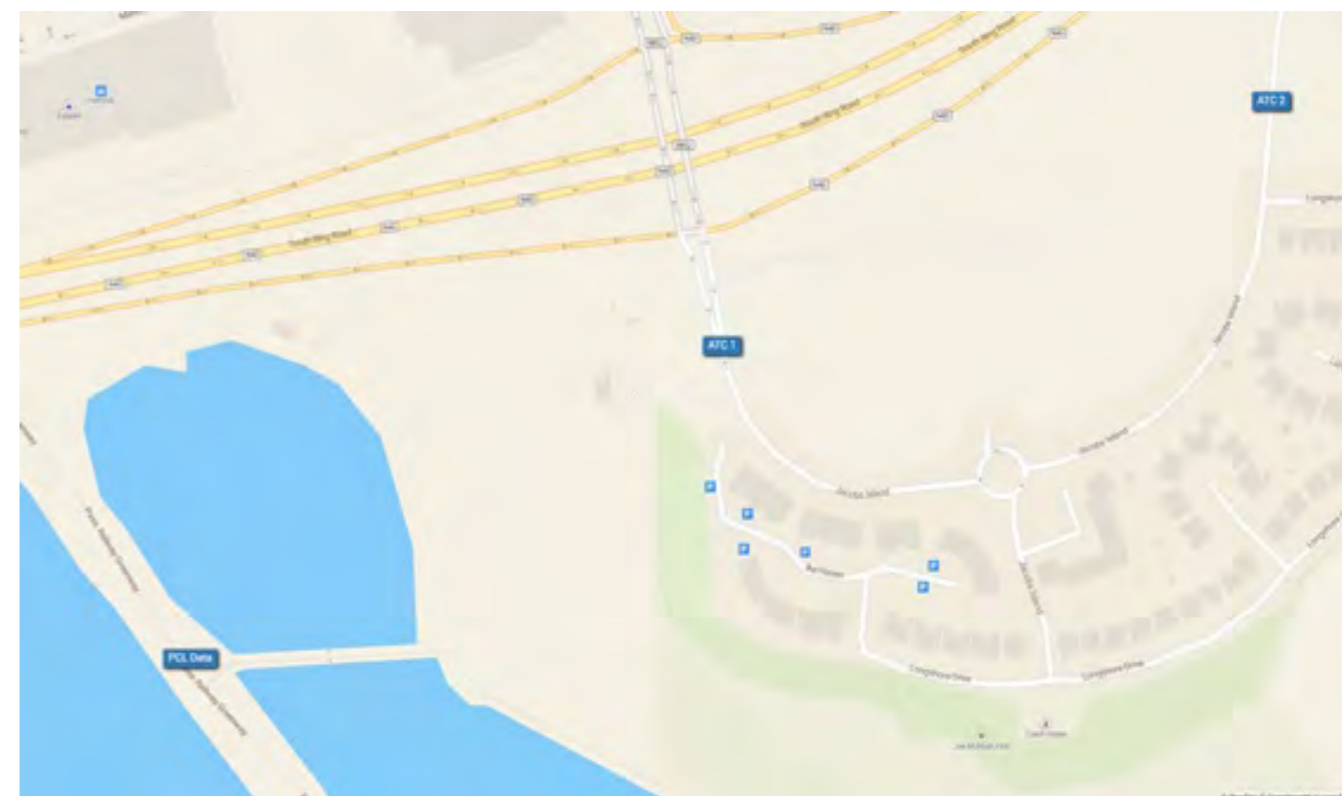


Figure 5.33: Local traffic survey locations

5.3.7.3.1 Traffic Survey – September 2021

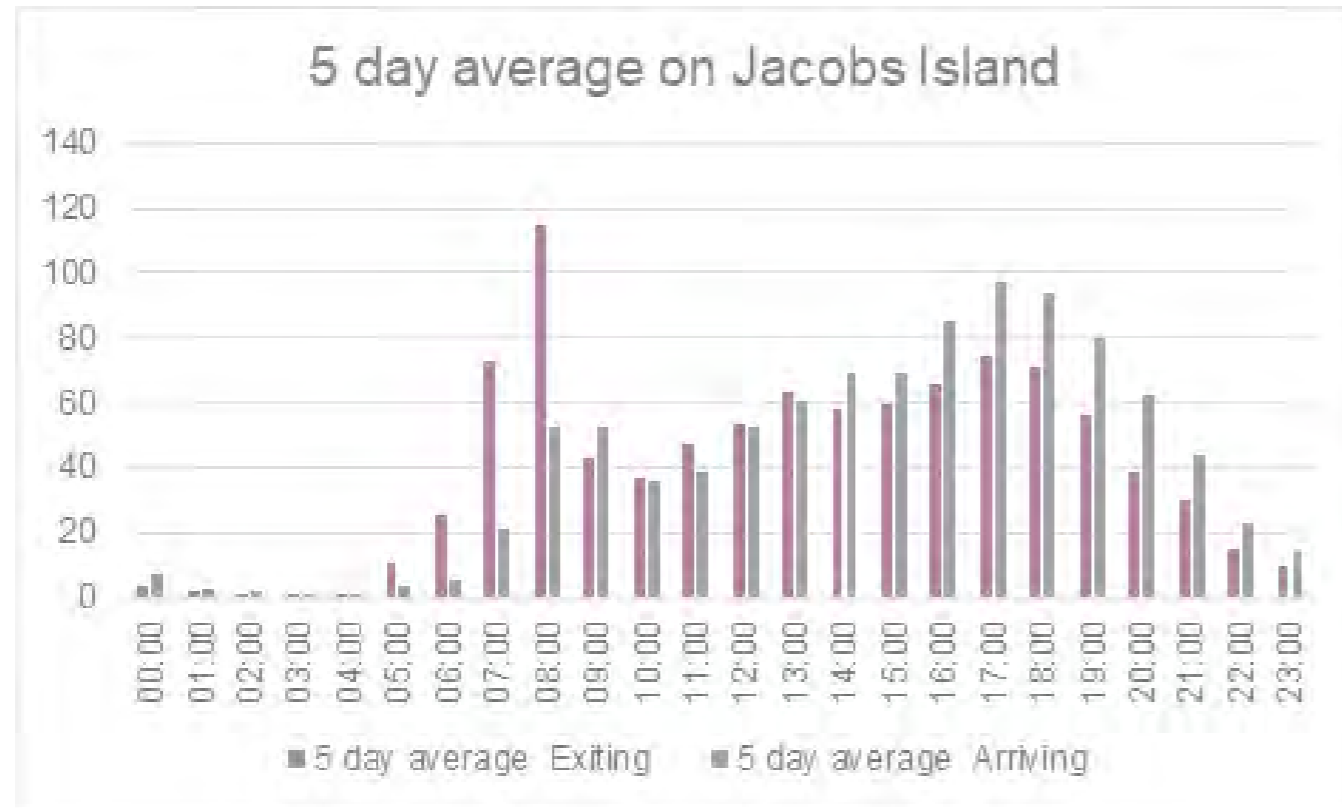


Figure 5.34: Average daily profile exiting and arriving on Jacob's Island (Sep 2021)

The average number of vehicles leaving Jacob's Island in the AM peak is 117 and returning in the PM peak is 97 vehicles. This is a relatively low number of vehicles considering the number of parking spaces available on the Island.

The average no. of vehicles leaving the Sanctuary apartments in the AM peak is 39 vehicles and 42 returning in the PM Peak. The daily profile from Location 2 can be seen in Figure 5.35.

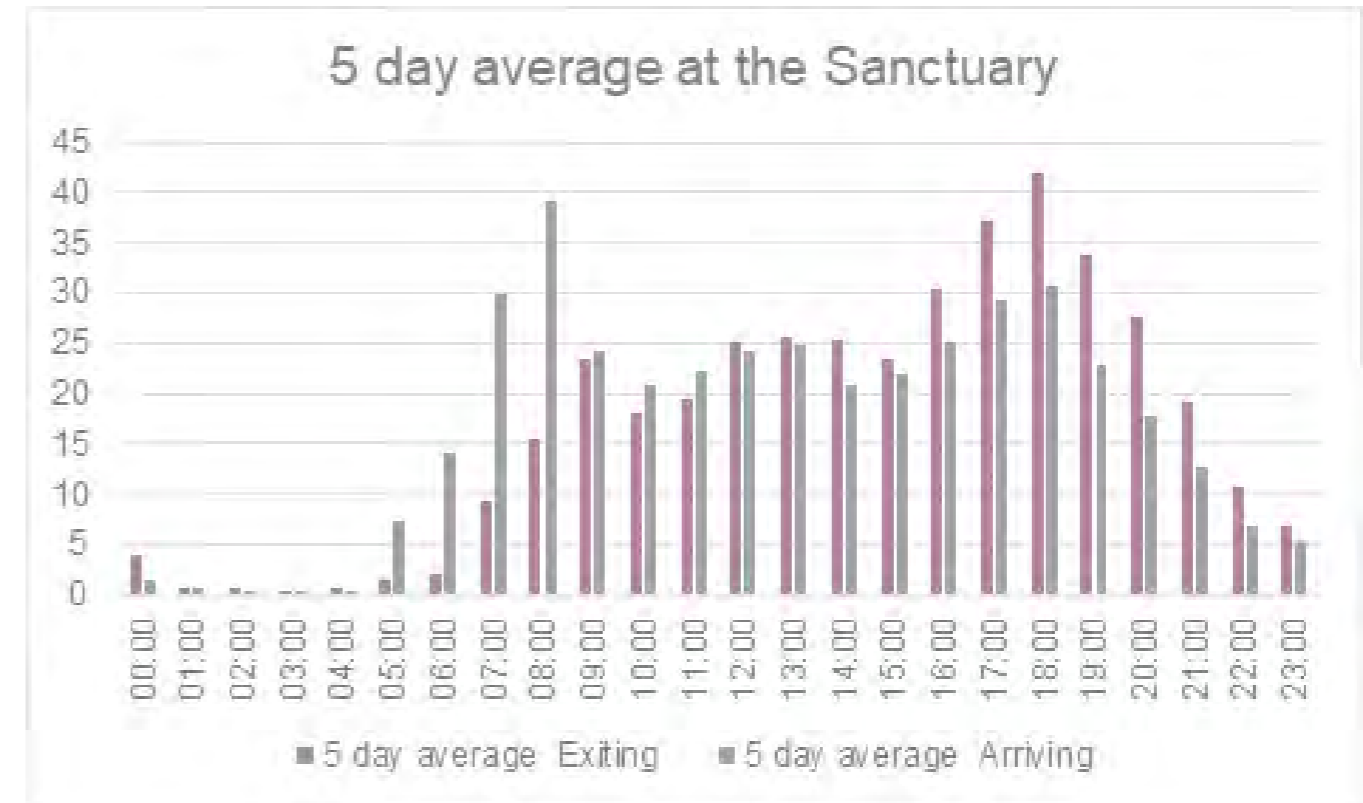


Figure 5.35: Average daily profile exiting and arriving at the Sanctuary (Sep 2021)

5.3.7.3.2 Traffic Survey – February 2022

It is noted that the traffic survey from Feb 2022 obtained results significantly similar to the survey from Sep 2021 as can be seen in the daily profiles from both locations (ATC1 and ATC2) illustrated in Figure 5.36 and Figure 5.37, respectively.

The average number of vehicles leaving Jacob's Island in the AM peak is 111 and returning in the PM peak is 99 vehicles. As mentioned previously, this is a relatively low number of vehicles considering the number of parking spaces available on the island.



Figure 5.36: Average daily profile exiting and arriving on Jacob's Island (Feb 2022)

The average no. of vehicles leaving the Sanctuary apartments in the AM peak is 37 vehicles and 35 returning in the PM Peak. The daily profile from ATC2 is illustrated in Figure 5.37.

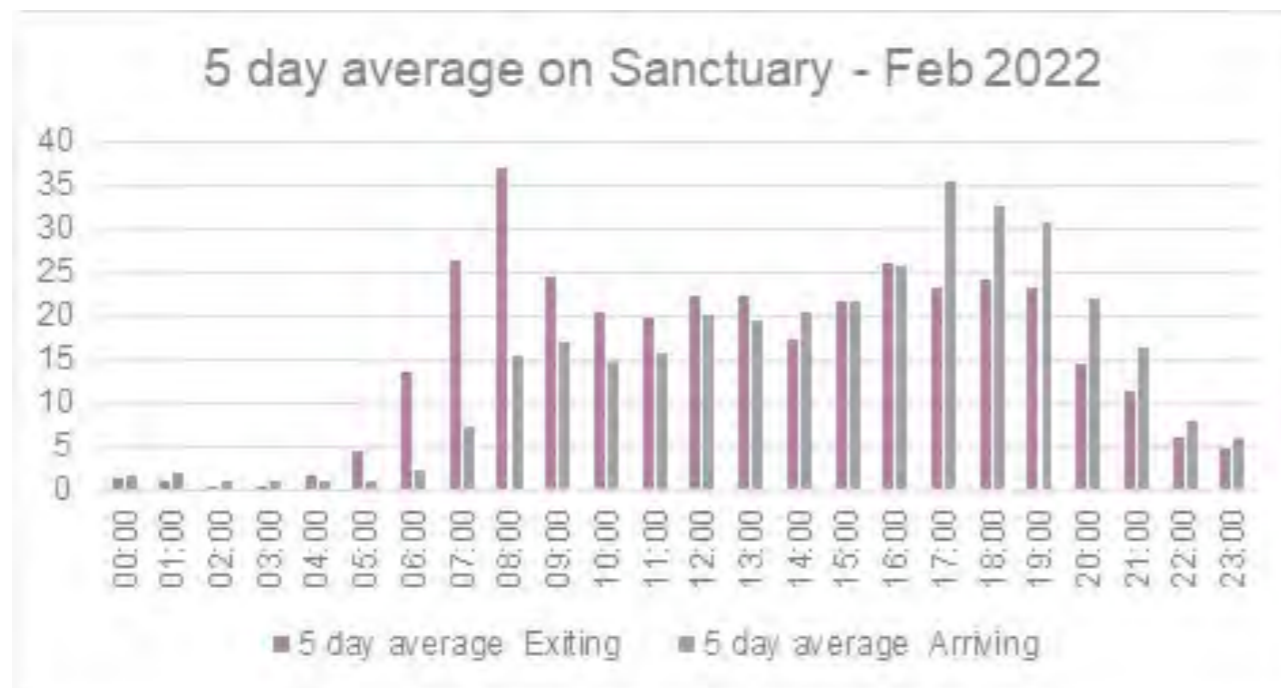


Figure 5.37: Average daily profile exiting and arriving at the Sanctuary (Feb 2022)

5.3.7.3.3 Traffic Survey – April-May 2022

It is noted that the traffic survey undertaken between April and May 2022 acquired results significantly similar to the surveys from Sep 2021 and Feb 2022 as can be seen in the daily profiles from both locations (ATC1 and ATC2) illustrated in Figure 5.38 and Figure 5.39, respectively.

The average number of vehicles leaving Jacob's Island in the AM peak is 119 and returning in the PM peak is 105 vehicles. As mentioned previously, this is a relatively low number of vehicles considering the number of parking spaces available on the island.

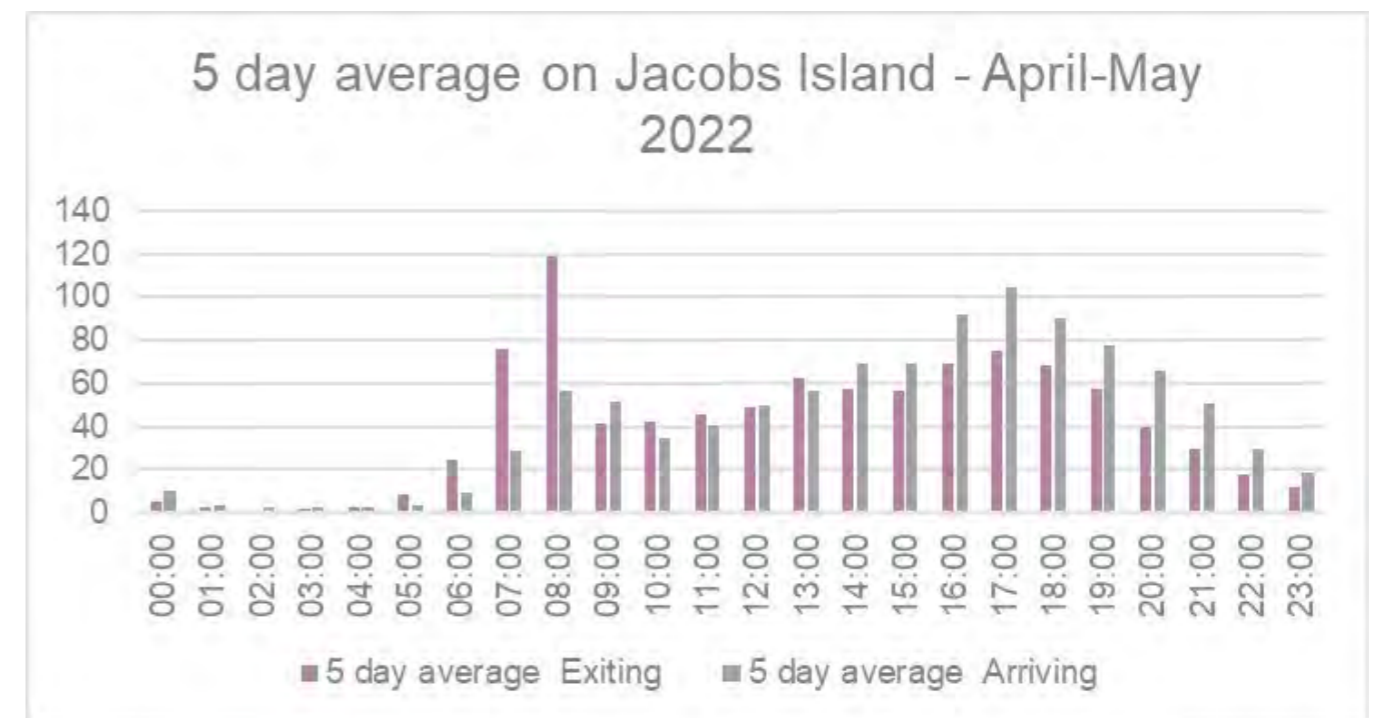


Figure 5.38: Average daily profile exiting and arriving on Jacobs Island (Apr-May 2022)

The average no. of vehicles leaving the Sanctuary apartments in the AM peak is 37 vehicles and 38 returning in the PM Peak. The daily profile from ATC2 is illustrated in Figure 5.39.

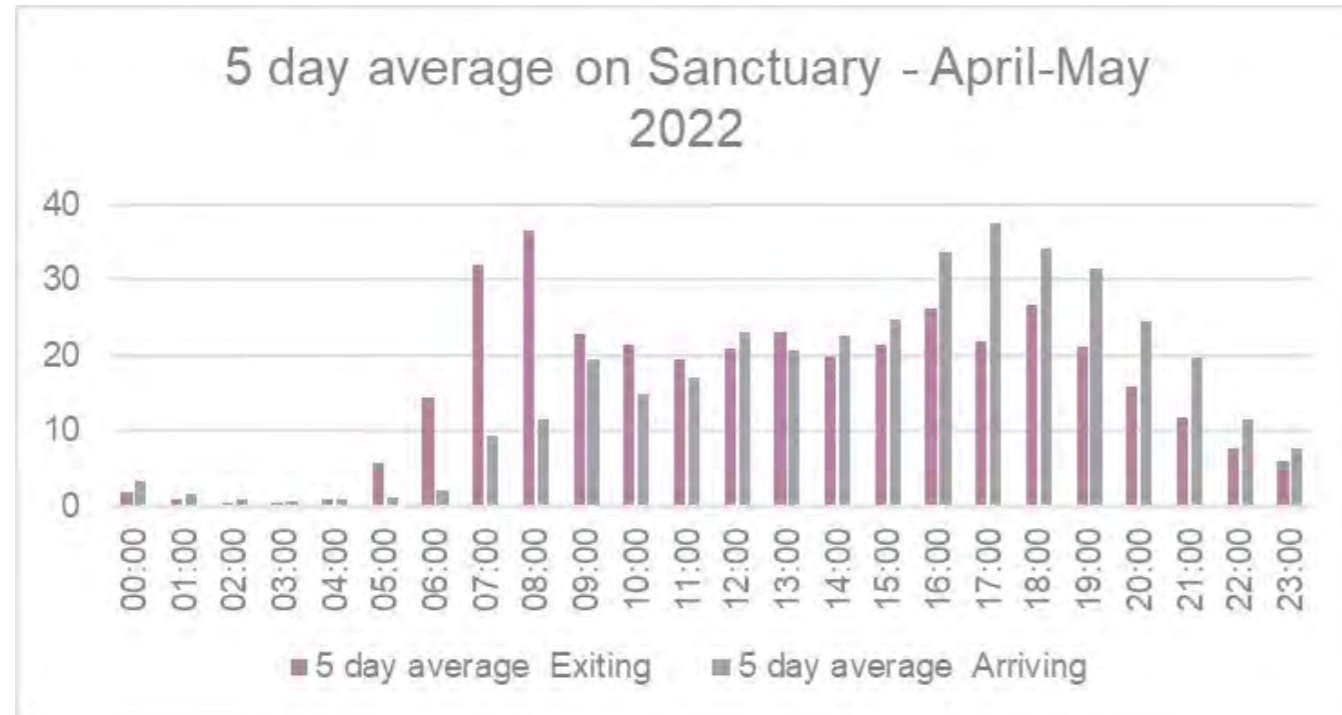


Figure 5.39: Average daily profile exiting and arriving on Sanctuary (Apr-May 2022)

### 5.3.7.4 Existing Car Parking

There are currently a range of residential parking available of Jacob's Island, this can be seen in the table below. The Sanctuary apartments are the only area that is managed by a management company with APCOA managing the car park. This currently operates successfully.

Table 5.5: Existing Residential and Parking Numbers

	No. of residential units	Parking No.
The Sanctuary Jacob's Island	184	241
The Haven	78	116
The Courtyard	18	23
4/5 Bed semis/detached	63	126
TOTAL	343	506

### 5.3.7.5 Existing Modal Split

The local traffic survey data and the existing available parking spaces on site have been assessed to understand the vehicle usage in the AM and PM peak periods. The table below shows that a low % of vehicles move during the peak periods. This may be due to the range of other modes easily available on the island such as bus, cycle and walk with car usage more for leisure and weekend purposes. The numbers outlined in table below have been obtained from the latest traffic survey carried out in Jacob's Island between 25th April and 15th May 2022 as detailed in Section 5.3.7.3.3.

Table 5.6: Current Vehicle Usage During the Peak Periods

	No. of parking spaces	AM Peak departing	PM Peak Arriving	AM Peak % veh of available	PM Peak % veh of available
The Sanctuary Jacobs Island	241	37	38	15%	16%
Total on Jacobs Island	506	119	105	24%	21%

## 5.4 FUTURE TRANSPORT PROPOSALS

### 5.4.1 CORK METROPOLITAN AREA TRANSPORT STRATEGY (CMATS) 2040

The Cork Metropolitan Area Transport Strategy (CMATS) 2040, published in February 2020, has been developed by the National Transport Authority (NTA) in collaboration with Transport Infrastructure Ireland (TII), Cork City Council and Cork County Council.

A key principle for CMATS is to reduce dependency on the private car within the CMA, while increasing the appeal of sustainable transport options. Another fundamental principle of the Strategy is to support the future growth of the CMA through the supply of an efficient transport network. Supporting measures have an important role to play in providing a future transport network that matches up to these principles.

#### 5.4.1.1 Bus Connects

Bus Connects is the National Transport Authority's (NTA) programme to greatly improve bus services in Irish cities. Bus Connects is contained within the Government's National Development Plan 2021-2030 and the Climate Action Plan 2019. The Draft New Bus Network have been published in November 2021 and will assist in realising the ambition of the Cork Metropolitan Area Transport Strategy 2040 to significantly increase public transport use. The Cork Metropolitan Area is growing and the redesign of the bus network – routes, frequencies and timetables – will deliver a better bus system for the current and future needs of the city.

This programme includes nine measures which will transform Cork bus system, illustrated below.

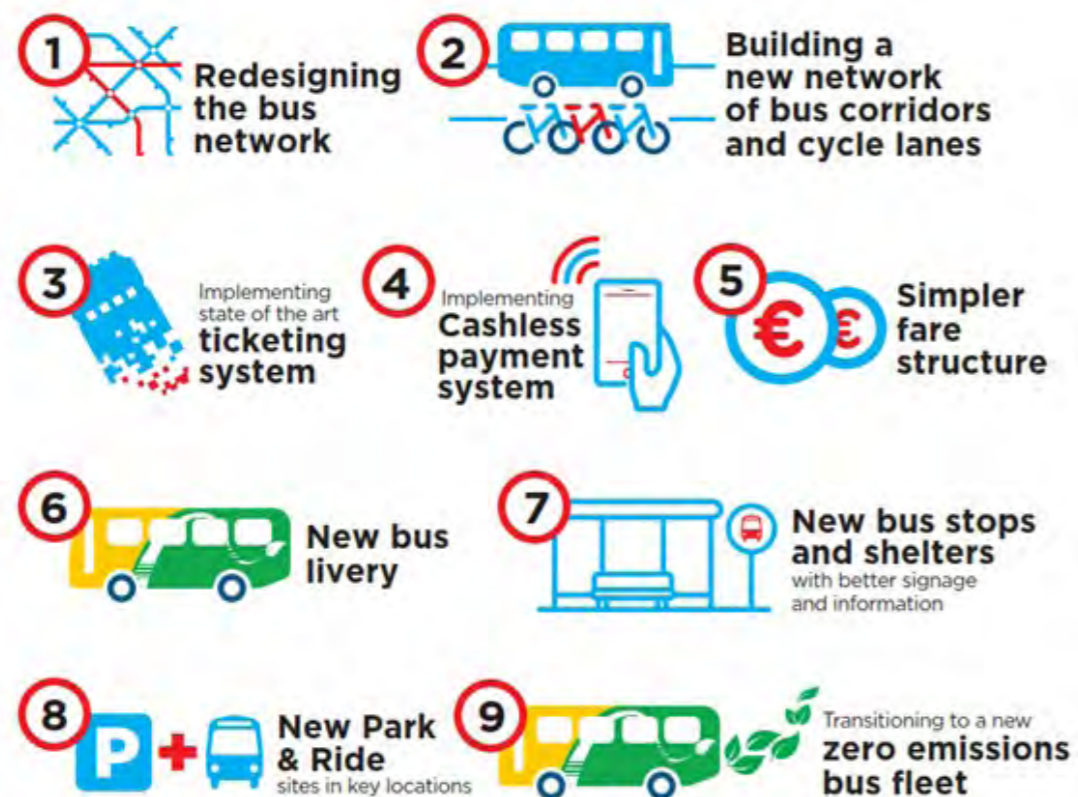


Figure 5.40: Measures to improve the Cork Bus System (Source: Draft New Bus Network)

The Draft New Bus Network is a complete redesign of the Cork bus network. Every route is proposed to change. This programme will provide the following benefits:

- An increase of over one third in bus services in Cork;
- A new frequent network that paves the way for Luas (Light rail system which is a long-term objective for the CMATS);
- Shorter waits and more direct routes for many people;
- Simpler network and schedules;
- Additional services at weekends;
- The average resident will have access to 17% more jobs under the new network;
- Young people’s access to school places will increase by 17% and their access to jobs by 18%, with the revised bus system; and
- More residents of the City and County will be on the public transport network.

Simplified fares will be provided which means that this fare will cover all bus and rail trips started within 90 minutes, there will be no need to pay extra to change between bus to another bus, or from bus to rail, including the future Luas system. The new network will have all new route numbers and will be implemented starting in 2023 and 2024. Jacob’s Island vicinity will be served by the following routes:

Table 5.7: New Bus Routes in Jacob’s Island Vicinity

No.	From	Via	To
1A	Ballincollig, Castle Road	Ballincollig Main Street - Model Farm Road (MTU) - College Road (UCC) - St. Patrick’s Street - City Hall - Boreenmanna Road - Skehard Road	Mahon Point Shopping Centre
1B	Ovens (Dell EMC)	Ballincollig Main Street - Model Farm Road (MTU) - College Road (UCC) - St. Patrick’s Street - City Hall - Boreenmanna Road - Skehard Road	Mahon Point Shopping Centre
9	Jacob’s Island	Mahon Point Shopping Centre - Skehard Road - Beaumont Drive - Centre Park Road - Bus Station	Kent Station
11	Mahon Point Shopping Centre	Ringmahon Road - Saint Luke’s Home - Blackrock - Blackrock Road - Bus Station - Kent Station - MacCurtain Street - Blackpool Shopping Centre - Fairfield Avenue - Upper Fairhill - Parklands Drive	Farranree
14	Cork University Hospital	Summerstown Road - Clashduv Road - Tramore Road - Black Ash Park and Ride - South Ring - Douglas Village Shopping Centre - Well Road - Skehard Road - Mahon Point Shopping Centre	Little Island



Figure 5.41: New Bus Routes in Jacob's Island Vicinity

The proposed development at Jacob's Island will be directly served by bus route 9 operating at a 20-minute frequency. Bus service 11, which will operate at a 30-minute frequency, 1A and 1B, which will operate at a 20-minute frequency each resulting in a 10-minute combined frequency, route directly to Mahon Point Shopping Centre in close proximity of the proposed development. The bus service 14 routes from Mahon Link Road to Little Island through N40 and is in the vicinity of the proposed site, this route will operate at a 30-minute frequency.

The Sustainable Transport Corridors Report published in April 2022 is part of the Bus Connects Cork and highlights that improvements to pedestrian and cycle route facilities for the Mahon area are also included within Bus Connects. This report identifies the corridors that are needed to make the bus system operate efficiently, reliably and punctually, together with the cycling facilities required to enable more people to move out of their cars and onto bicycles. Corridor J, from Mahon to City, is a 7.6km long route that will facilitate walking and cycling in the Mahon and Jacobs Island area. Included within the proposals is a new pedestrian and cycling bridges to be built on either side of the N40 overbridge at Jacob's Island, see the figure below.

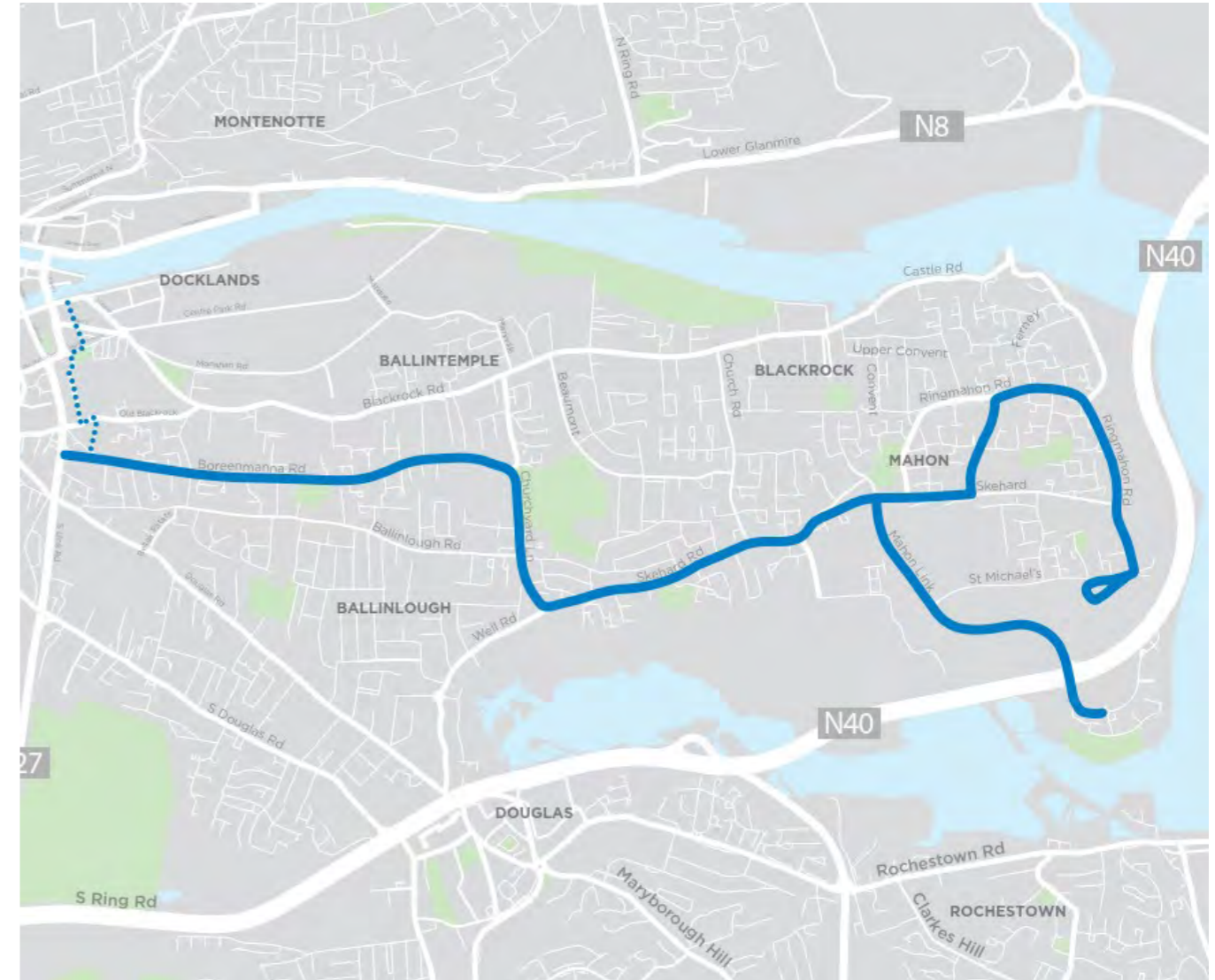


Figure 5.42: Mahon to City Cycle Route and cycle and pedestrian bridges either side of N40 bridge (Source: Sustainable Transport Corridors Report 2022)

### 5.4.1.2 East-West Corridor: Light Rail Transit (LRT)

The development of an East-West Public Transport Corridor, from Mahon in the east to Ballincollig in the west, has been a long-term objective for the CMATS. Following detailed analysis of projected travel demand within the CMA, this Strategy has determined that the East-West Corridor is best served through the provision of a new Light Rail Transit (LRT) tram system. The LRT will be preceded by a high-frequency bus service between Mahon and Ballincollig. This will be delivered in the short-term to underpin higher development densities along the corridor including the regeneration of the Cork City Docks.



The following locations are required to be within the catchment area of the future light-rail system:

- Ballincollig;
- The proposed Cork Science and Innovation Park (CSIP);
- Cork Institute of Technology (CIT) / Current Munster Technological University (MTU);
- Cork University Hospital (CUH);
- University College Cork (UCC);
- Cork City Centre;
- Kent Station / Cork North Docklands;
- Cork South Docklands; and
- Mahon.

Figure 5.43 and Figure 5.44 illustrate the East-West Corridor route and the Public Transport Network presented in the Cork Metropolitan Area Transport Strategy 2040.

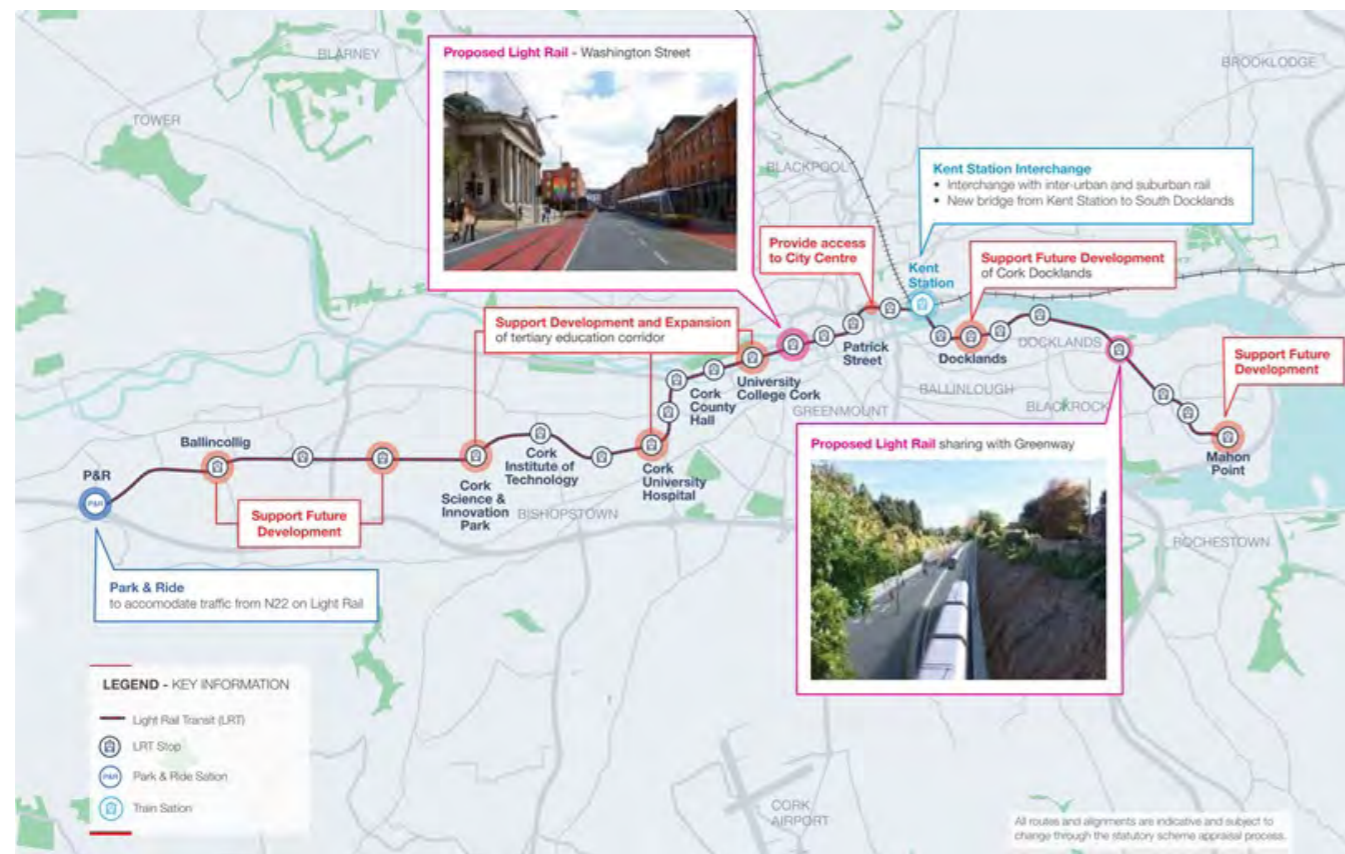


Figure 5.43: East-West Public Transport Corridor Route (Source: CMATS)

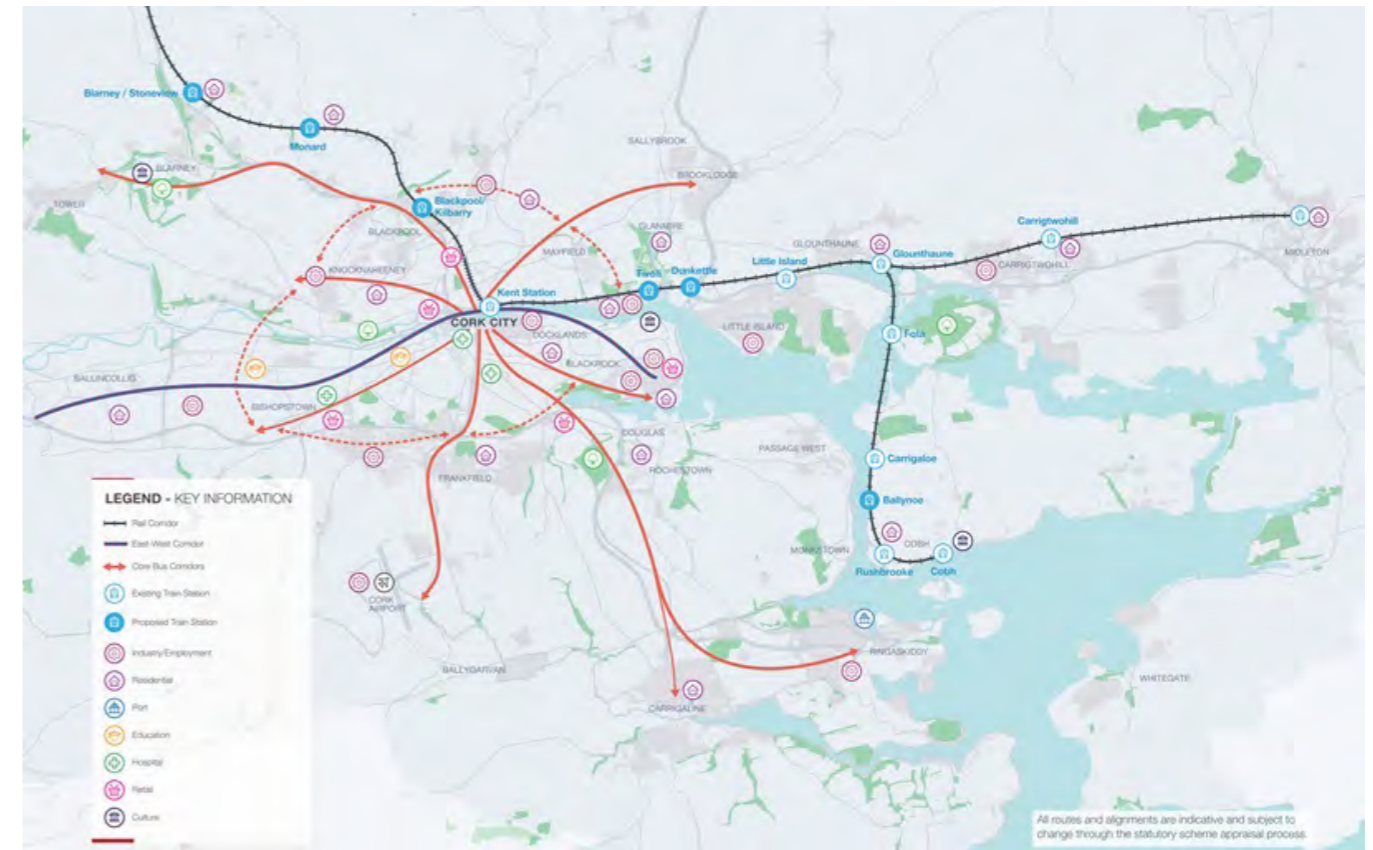


Figure 5.44: Public Transport Network (Source: CMATS)

### 5.4.2 PUBLIC TRANSPORT ON MAHON LINK ROAD

As part of a previous application for apartments adjacent the Sanctuary development (granted in Oct 2018 under An Bord Pleanála Ref. ABP 301991-18), an additional bus lane has been constructed on the Mahon Link Road to aid public transport in the area as seen in Figure 5.45 below.

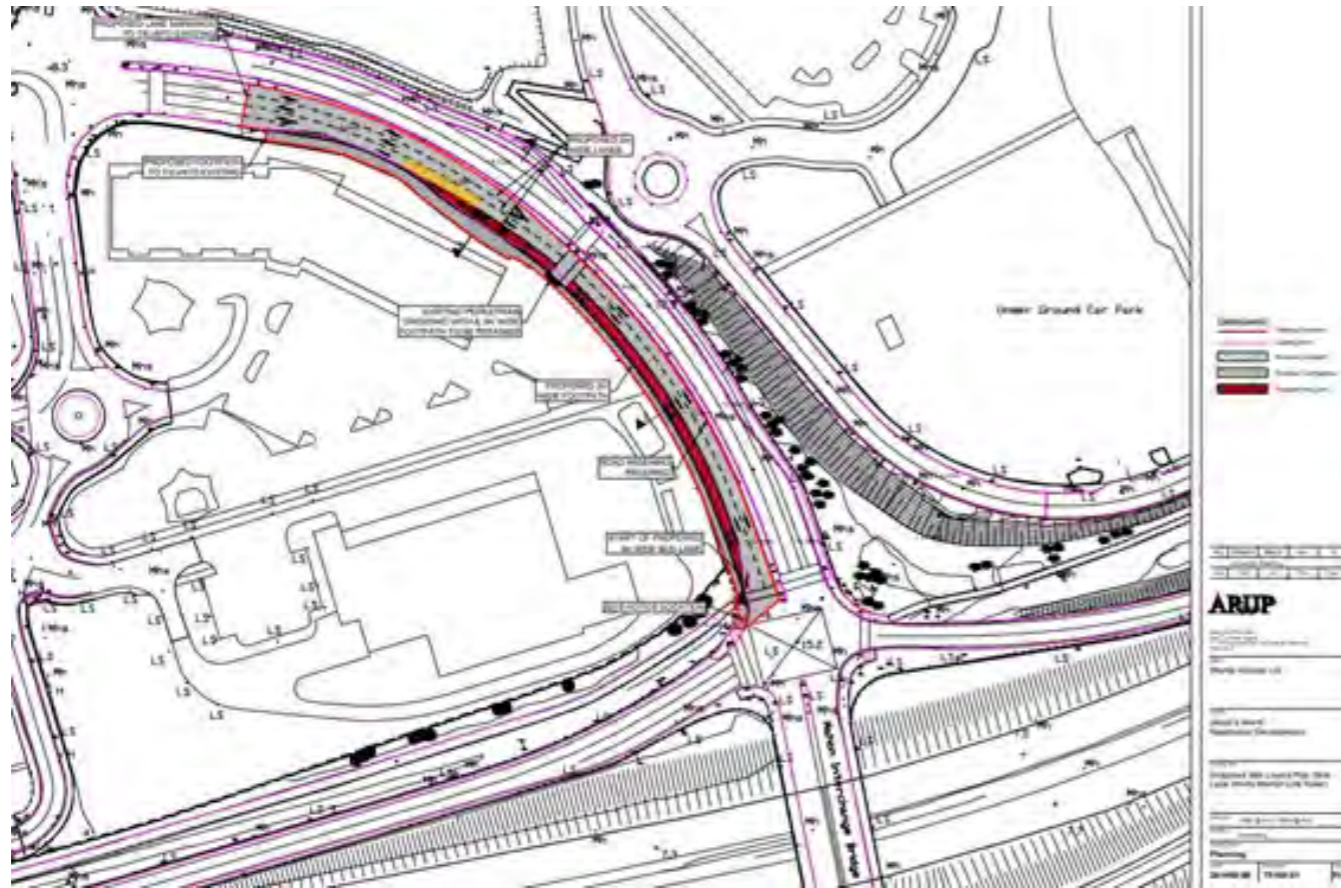


Figure 5.45: Additional bus lane on the Mahon Link Road

In addition, additional 2 way bus lanes have been proposed on the Mahon Link Road by the City Gate Plaza development which consists of 154,000 sq ft of Office & Retail Space. This development is under CCC Ref. 1838036 and is currently under construction. See additional bus lane illustrated in figure below.

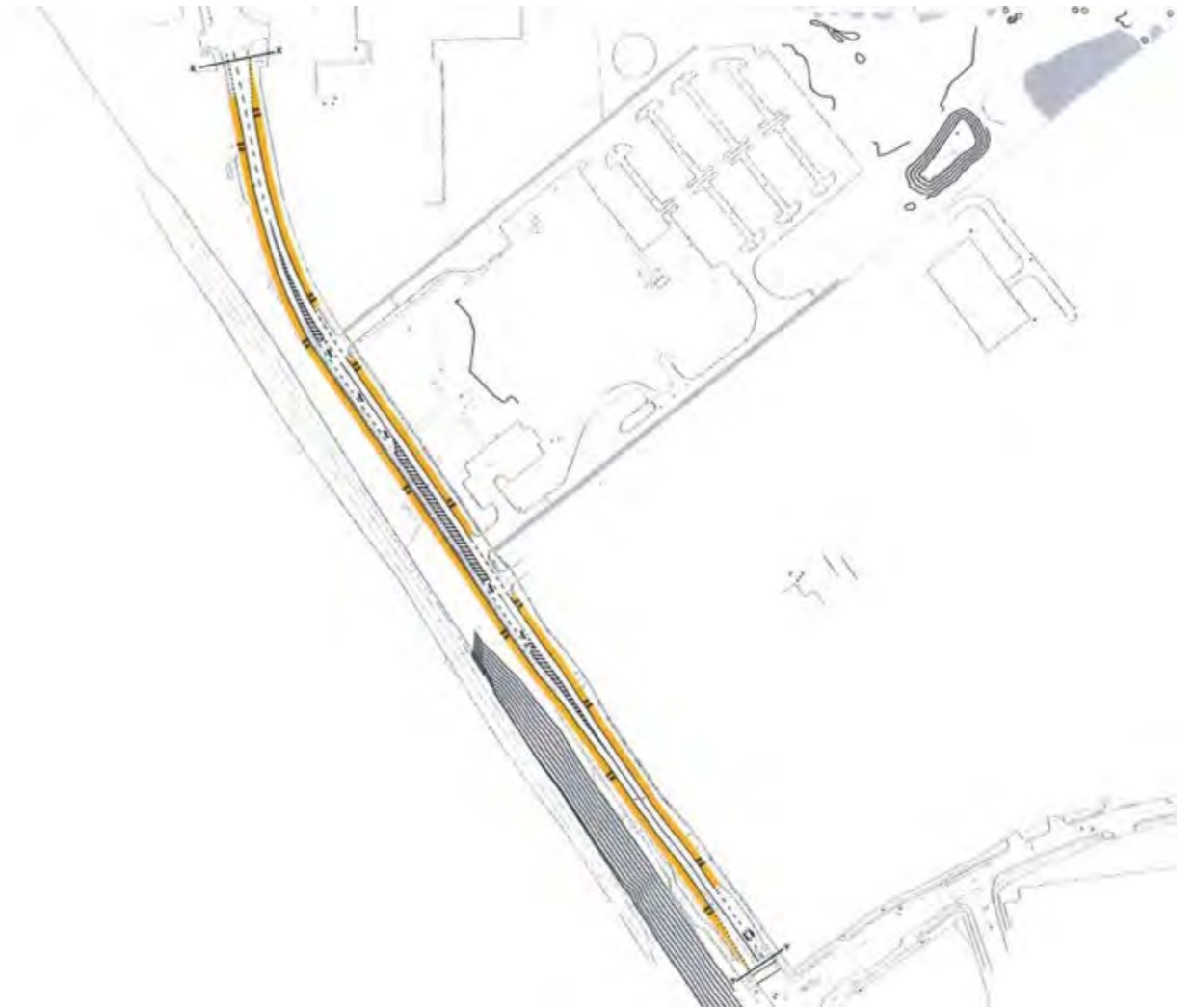


Figure 5.46: Additional 2 way bus lanes on the Mahon Link Road proposed by the City Gate Plaza Development

### 5.4.3 WALKING

Much of the focus areas for improvement identified in the Cork Walking Strategy 2013-2018 remain relevant and have been adapted on the CMATS. The Walking Strategy identified a number of Strategic Routes that coincided where the City's employment and education areas overlap. These routes were linked with public transport services to identify areas where investment in pedestrian infrastructure would deliver most benefits to modal shift.

Two Strategic Routes are located in Mahon. These routes, including their purpose and upgrade proposals, are set out below:

- Ringmahon Road - upgrade the pedestrian loop at Mahon that serves the local community, links to the amenity routes and also to the Skehard Road towards Douglas; and
- Skehard Road - provide a strong east-west link from Mahon to both the City Centre and Douglas via the Boreenmanna Road and Well Road respectively.

## 5.4.4 CYCLING

### 5.4.4.1 Cork Metropolitan Area Transport Strategy (CMATS) 2040

The Cork Metropolitan Cycle Network Plan, finalised and published in January 2017, envisages a network of primary, secondary and greenway cycle routes for the south-eastern portion of Cork City, including the existing Passage West Greenway. The 2017 Metropolitan Cycle Plan is the starting point for the CMATS Cycle Network. The CMATS have largely retained and updated the routes outlined in the 2017 Cycle Network Plan to include new primary routes. The cycling proposals for the site environs are illustrated in Figure 5.47.

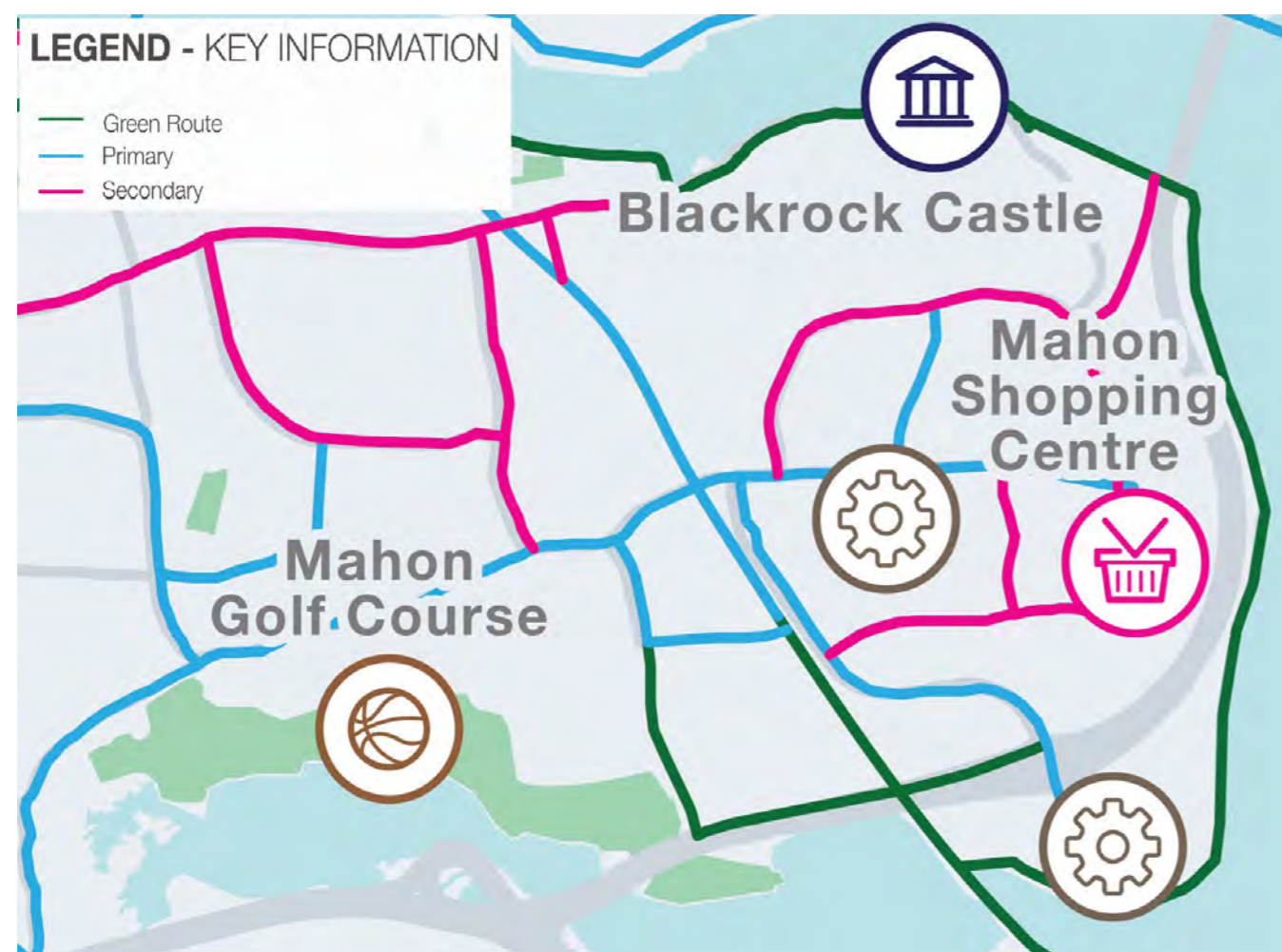


Figure 5.47: Cork Metropolitan Area Cycle Network Map (Source: CMATS)

Primary routes have been designated as such because they experience the highest level of demand. Primary routes are typically direct and provide medium-long radial connections to key destinations across the CMA. These routes are supplemented by secondary and feeder routes which may provide access to residential catchments.

The secondary route network provides connections from residential areas and areas of employment to the primary network. They comprise of a combination of off-road cycle routes, cycle lanes, shared bus and cycle lanes and traffic-

calmed roads. They often run parallel to primary routes, providing an alternative link.

Greenway routes comprise of traffic free or low-trafficked routes and typically comprise of re-purposed derelict railway lines, routes through parks or alongside rivers. Access to greenways can be supported through filtered permeability from residential or other built up areas.

As outlined in the Cycle Network Plan, primary cycle corridors are proposed within Bessboro and along the Skehard Road, ultimately connecting with the Mahon Link Road at the junction with Skehard Road.

The cycle corridors shown along the Mahon Link Road in Figure 5.37 above show that the proposed route is to extend into Jacob's Island itself (via the Mahon Interchange). The River Lee/Lough Mahon Waterfront Greenway and Passage West Greenway line are both greenway networks, except the section of the Passage West Greenway from the ramped connection at the junction of the Mahon Link Road/St. Michael's Drive to Pairc Ui Caoimh.

As indicated in Section 5.3.3.1 above, there are existing on-road cycle facilities on the Mahon Link Road, from the northern arm of the Mahon Interchange, through the junctions at Mahon Point Shopping Centre and St. Michael's Drive and north to the junction with Skehard Road. On Skehard Road, there are existing cycle facilities present along the southern side of the route as it passes the junction with the Mahon Link Road (and a limited length of cycle lane present on the northern side of Skehard Road).

The proposals in the Cork Metropolitan Area Cycle Network Plan will supplement the existing cycle connectivity to the site, and will ensure that cycling access to and from Jacob's Island remains a viable alternative to the private motor car.

### 5.4.4.2 Passage Railway Greenway Improvement Scheme

The Passage Railway Greenway Improvement Scheme has the objective to improve and upgrade the existing Passage West Greenway. Phase 1 of this scheme is currently under construction in order to provide significantly improved facilities for cyclists and pedestrians along the Passage West Greenway from Pairc Uí Chaoimh to Mahon, including the installation of additional ramped connections, upgrade of existing connections and an upgrade proposal for the line itself to include widening, resurfacing, new CCTV, landscaping and incorporation of public lighting.

Phase 2 of this scheme aims to improve and upgrade of the existing Passage West Greenway from Mahon towards Passage West. This comprises the enhancement of safety of the greenway, improvement of access and connectivity with the areas around the greenway including the scope for developing the car parking, lighting, security and public realm facilities at key locations along the route. Planning process is commencing in mid-2022 and construction phase to follow.

### 5.4.4.3 Mahon Cycle Route Scheme

The Mahon Cycle Route Scheme aims to deliver a high quality, safe, coherent, direct and attractive pedestrian and cyclist network along Ringmahon Road, Skehard Road, Avenue de Rennes, Ringmahon Link Road and Castle Road, in addition to providing an off-road link to the adjacent Blackrock - Passage West Greenway at Ballinsheen Road. Detailed design and construction phase are expected to commence in 2022. This scheme is located to the north of Jacob's Island, see below.

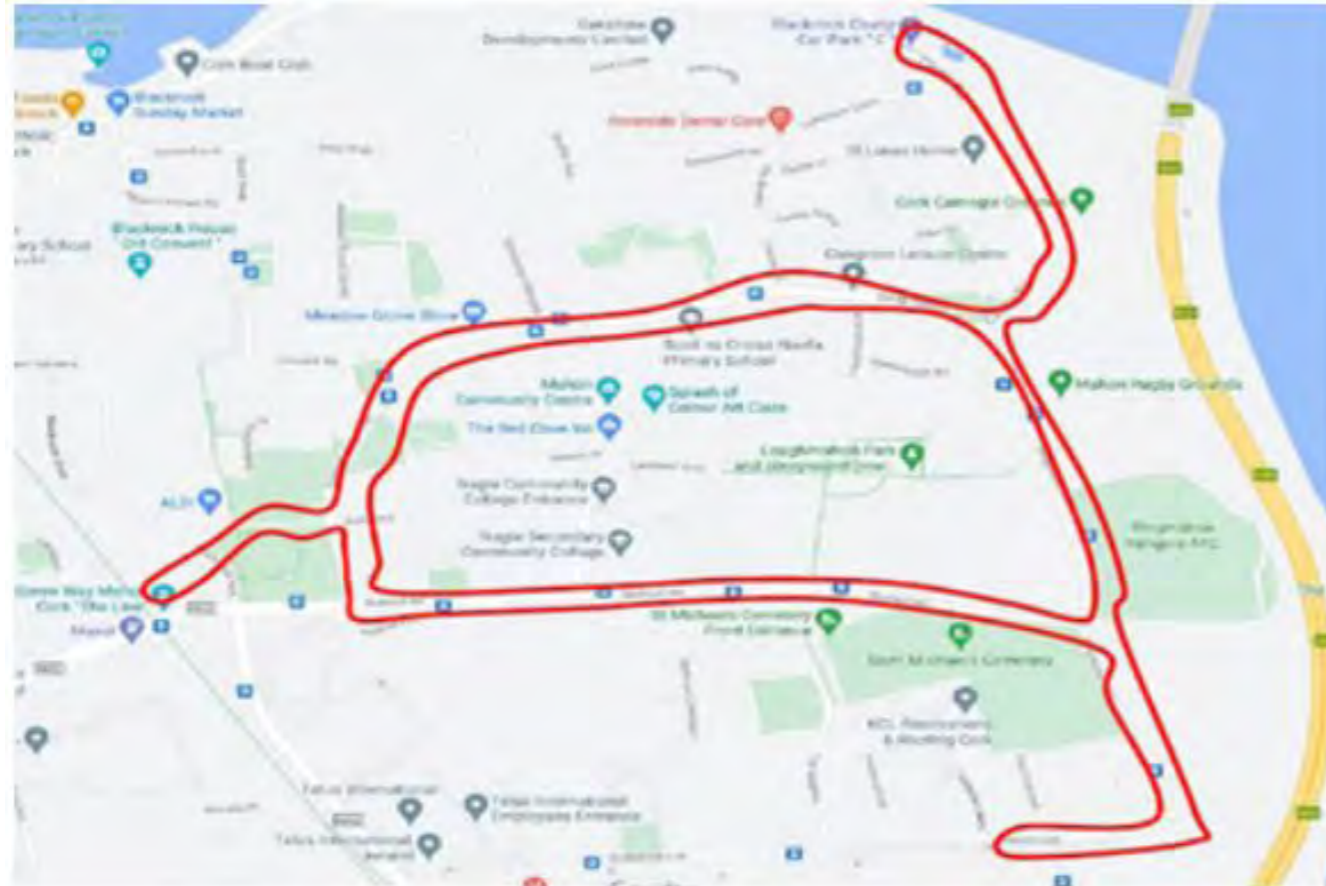


Figure 5.48: Mahon Cycle Route Scheme Location (Source: Cork City Council)

### 5.4.5 DUNKETTLE INTERCHANGE

The Dunkettle Interchange is located approximately 6km to the east of Cork City, north of Jack Lynch Tunnel. TII has proposed a reconfiguration of the existing Dunkettle Interchange to a free flowing interchange, in so far as practicable. That is to say, traffic will not come into conflict with opposing traffic movements either by yielding or stopping at traffic signals, as is the case with the existing interchange.

Dunkettle Interchange is located circa 2.6km to the northeast of the Jacob's Island/ N40 interchange. It is expected that the improvements at the Dunkettle Interchange will reduce congestion and improve journey times along this section of the N40.

## 5.5 PROPOSED DEVELOPMENT

### 5.5.1 SHD DEVELOPMENT PROPOSALS

A detailed description of the proposed development is presented in Chapter 2 – Project Description. The development site is located at Jacob's Island, to the south of Cork City Centre. A site plan was provided by OMP which can be seen in Figure 5.49.

The proposed development consists of the following:

- 489 residential units (block 11, 13, 14 & 15); and
- 4,500m<sup>2</sup> GFA of office units (block 12) including a creche (block 13).



Figure 5.49: Site Plan

The residential units are proposed to be formed by a combination of studio apartments, and 1 or 2 bed apartments.

### 5.5.2 ANTICIPATED FULL MASTERPLAN

The anticipated full masterplan proposals may consist of the following:

- 489 residential units;
- 15,000m<sup>2</sup> GFA of office units;
- 165 bed hotel; and
- Creche.

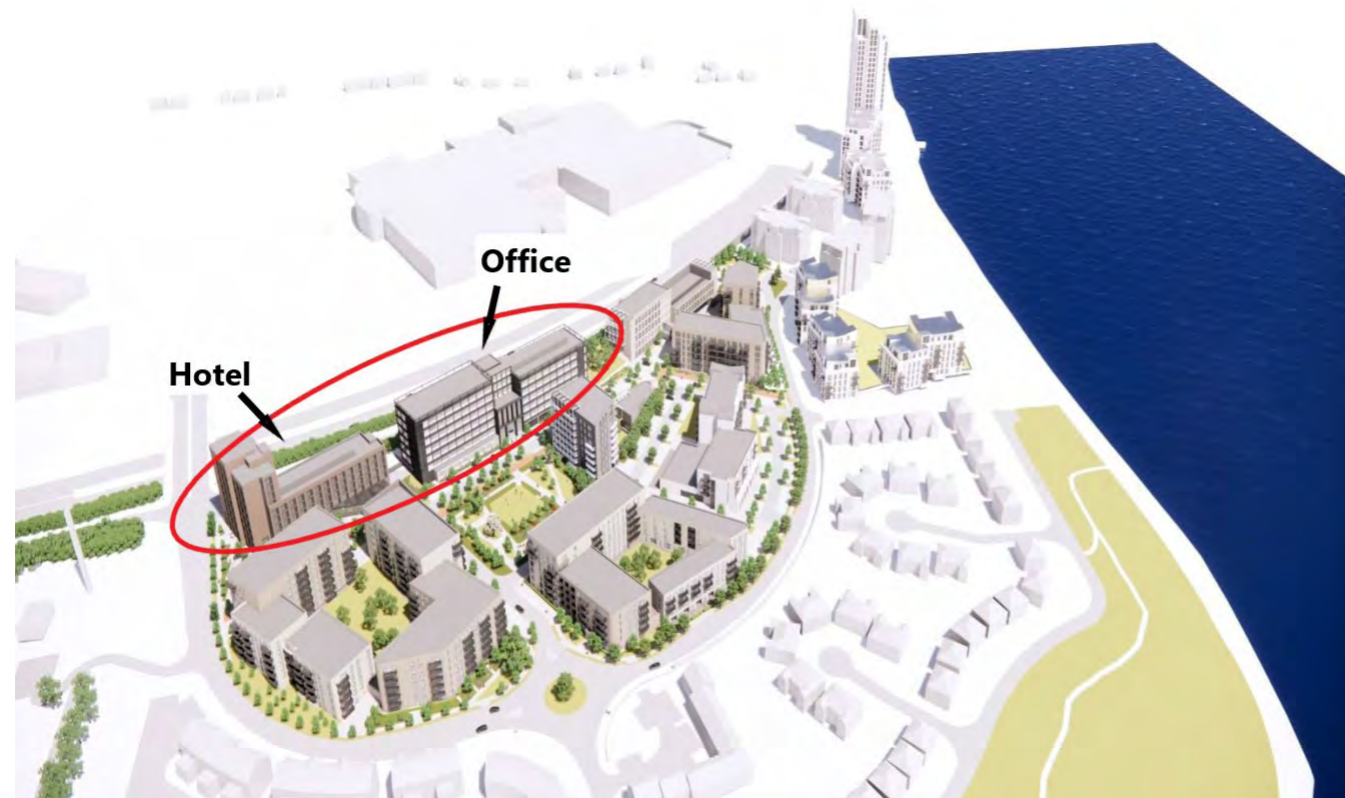


Figure 5.50: Proposed full masterplan with the Hotel and Office section highlighted

This chapter of the EIAR is focused on the SHD application only, however, it provides an indicative insight as to the feasibility and long-term traffic impacts of the full masterplan. Additional planning applications would be required to deliver the anticipated full masterplan proposals and application.

### 5.5.3 PEDESTRIAN AND CYCLE ACCESS

Pedestrian and cycle access to the site is proposed to be taken via the existing Jacob's Island road junction, located to the east of the site. Figure 5.51 highlights the proposed pedestrian and cyclist through routes and desire lines of the site. In line with DMURS there will be separate active travel routes through the site segregated from traffic along the main routes parallel to the liner park with some of the more minor routes having a shared use function.



Figure 5.51: Proposed pedestrian and cyclist accesses

A potential future pedestrian and cycle connection from the proposed development to the River Lee/Lough Mahon Waterfront Greenway is located to the west of the proposed site. This connection is currently of variable quality and could be upgraded with some resurfacing works and cutting back of vegetation to make it a more attract route. A proposed new crossing could be development to facilitate this connection. Discussion with Cork City Council (CCC) would be required.

### 5.5.4 VEHICLE ACCESS

Vehicle access to the site will be taken via the existing Jacob's Island road network. The site can be accessed via the signalised junction with the Mahon Interchange at the N40 to the west of the site. Figure 5.52 below highlights the proposed road hierarchy through routes within the site.



Figure 5.52: Proposed road hierarchy through the site

### 5.5.5 CAR PARKING

#### 5.5.5.1 Car Park Guidelines

The Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022, presents maximum car parking requirements that proposed developments can provide. The development site falls within 'zone 2' of Cork, and the standards outlined are maximum parking requirements.

Table 5.8 below outlines the parking requirements for the various aspects of the site, with Table 5.9 highlighting the proposed parking for the SHD development.

Table 5.8: Draft Cork City Development Plan 2022, car park standards

Draft Cork City Development Plan Parking Standards 2022-2028 (maximum)	
Land Use	Zone 2 Standards
Office	1 space per 150sqm
Hotel	1 space per 2 rooms
Creche	1 space per 6 students
Residential (1-2 bedroom)	1 space per unit
Disabled Parking	5% of total car parking spaces
Motorcycle Parking	1 space per 10 car parking spaces
Electric vehicle parking	1 space per 5 car parking spaces

Table 5.9: Proposed Car Park for SHD

Proposed Development Car Park Spaces SHD			
Land Use	Unit/ sqm	Maximum Parking	Proposed Parking
Office	4,500 sqm	30	69
Creche	1 space per 6 students	8	6
Residential (1-2 bedroom)	489 units	489	246
Car Club Spaces	-	-	6
Total Parking Spaces		527	327
Disabled Parking		27	19
Motorcycle Parking		53	34
Electric vehicle parking		106	54

As can be seen in Table 5.9, the proposed car park spaces for the office facilities are higher than the maximum, however, the proposed car park spaces for the other facilities are considerably lower than the maximum. Therefore, the total proposed car park spaces are also considerably lower than the maximum for the development as outlined by the Development Plan standards. The parking outlined above for the creche is expected to be sufficient as it is expected that the majority of the residential catchment of Jacob's Island will use the creche, and there will be linked trips to the creche and also a high amount of walking and cycling locally. The lower car parking numbers show the developers commitment to a sustainable development.

Table 5.10: Parking numbers for the anticipated full masterplan

Estimated Development Car Park Spaces Full Masterplan			
Land Use	Unit/ sqm	Maximum Parking	Proposed Parking
Office	15,000 sqm	100	172
Hotel	165 rooms	83	98
Creche	1 space per 6 students	8	6
Residential (1-2 bedroom)	489 units	489	246
Car Club Spaces	-	-	6
<b>Total Parking Spaces</b>		<b>680</b>	<b>528</b>
Disabled Parking		34	29
Motorcycle Parking		68	55
Electric vehicle parking		136	76

### 5.5.6 CYCLE PARKING

#### 5.5.6.1 Cycle Park Guidelines

The Draft City Development Plan and the Design Standards for New Apartments (2020) recommend bicycle parking requirements for developments of various land uses. Table 5.11 below outlines the parking requirements for the various aspects of the site, with Table 5.12 highlighting the proposed cycle parking for the development.

Table 5.11: Draft Cork City Development Plan 2022, cycle parking requirements

Draft Cork City Development Plan Cycling Standards 2022-2028	
Land Use	Cycle Parking Requirement
Office	1 space per 150sqm
Hotel (bedrooms)	1 space per 10 rooms
Hotel (restaurant / café / bar)	1 space per 200sqm
Creche	1 space per 25 children
Compliance with Guidelines for New Apartments (2020)	
Residential (1-2 bedroom)	1 space per bedroom
Visitor	1 space per 2 residential units

#### 5.5.6.2 Development Proposals

Table 5.12: Draft cycle parking provision for the SHD development

Draft Cork City Development Plan Cycling Standards 2022-2028		
Land Use	Cycle Parking Requirement	Proposed
Office	28	80
Creche	3	4
Design Standards for New Apartments 2020		
Residential (1-2 bedroom)	819	819
Visitor Spaces	245	245
<b>Total Parking Spaces</b>	<b>1095</b>	<b>1148</b>

Table 5.13: Proposed cycle parking provision for the full masterplan development

Cork City Development Plan Cycling Standards 2015-2021 (maximum)		
Land Use	Zone 3 Standards	Proposed
Office	100	196
Hotel	22	42
Creche	3	4
Design Standards for New Apartments 2020		
Residential (1-2 bedroom)	819	819
Visitor Spaces	245	245
<b>Total Parking Spaces</b>	<b>1189</b>	<b>1305</b>

As can be seen in Table 5.12 and Table 5.13, there is more than adequate cycle parking provision included within the development proposals. In addition, 245 cycle parking spaces are proposed for visitor parking set out around the site.

The cycle parking is proposed to be secure and sheltered, and located within close proximity of the residential blocks and be well lit.

## 5.6 TRAFFIC AND TRANSPORTATION ASSESSMENT

The Traffic and Transportation Assessment report is provided at Appendix 5.1 and the Impact Assessment in Section 5.7.

### 5.6.1 INTRODUCTION

This section describes the methodology used to assess the impact of the traffic generated by the development at Jacob's Island on the local road network. Based on the guidance within Transport Infrastructure Ireland's (TII) Traffic and Transport Assessment Guidelines (2014).

The Traffic Impact Assessment (TIA) methodology and technical parameters were discussed with the Council during scoping. The following section outlines the traffic assessment associated with the SHD in the first instance, and then the full masterplan.

All traffic flow diagrams associated with the tested scenarios are provided in the Traffic and Transportation Assessment

report at Appendix 5.1.

As discussed with Cork City Council (CCC) during scoping in July 2021, the following junctions were considered in the initial scope of the assessment:

- Blackrock Avenue/ Mahon Link Road / Skehard Road;
- Mahon Link Road/ St Michael's Drive;
- Mahon Link Road/ Shopping Centre Access;
- Mahon Interchange (North and South); and
- Jacob's Island Access.

### 5.6.2 MODELLING SCENARIOS

Through discussions held with Cork City Council during scoping, the following scenarios have been agreed to be included within the modelling:

- Opening year – 2024;
- Opening year + 5 years – 2029; and
- Opening year +15 years – 2039.

The opening year 2024 and 2029 is tested with the SHD development. For the scenario year of 2039, this will be tested with the anticipated vehicular traffic associated with the full masterplan proposals (correct as of October 2021). Any modelling is indicative as the full masterplan may be subject to change. The modelling results and assumptions for the estimated full masterplan are preliminary and final counts will be confirmed at the application stage.

### 5.6.3 BASE TRAFFIC FLOWS

The base traffic flows detailed in Section 5.4.2 include classified traffic surveys undertaken in June 2017 over a three hour morning period (07:00-10:00) and three hour evening period (16:00-19:00), by IDASO, at a number of junctions in the vicinity of the site. These were discussed with Cork City Council (CCC) during the scoping meeting in July 2021 and deemed to be acceptable for use in assessing the traffic impact for the proposed development. The junctions assessed are as follows:

- Mahon Interchange (southern junction);
- Mahon Interchange (northern junction);
- Mahon Point Shopping Centre/Mahon Link Road;
- St. Michael's Drive/ Mahon Link Road; and
- Mahon Link Road/ Skehard Road.

These locations are shown in Figure 5.27 in Section 5.3.7.

Table 5.14 below outlines the AM and PM peak hour two-way traffic flows extracted from the base 2017 data. The flows are presented in PCUs (Passenger Car Units).



Table 5.14: 2017 base link flows on the local road network

Road	AM Peak (08:00-09:00)	PM Peak (16:30-17:30)
Mahon Interchange – Westbound off-ramp	714	457
Mahon Interchange – Eastbound on-ramp	297	870
Mahon Interchange – Eastbound off-ramp	1,147	683
Mahon Interchange – Westbound on-ramp	359	1,202
Jacob’s Island Access Road	179	163
Mahon Link Road – east of Shopping Centre	2,526	3,124
Mahon Link Road – west of Shopping Centre	1,913	1,933
Mahon Link Road – south of St Michael’s Drive	1,847	1,912
Mahon Link Road –north of St Michael’s Drive	1,492	1,442
Skehard Road – east of Mahon Link Road	759	789
Skehard Road – west of Mahon Link Road	1,556	1,451

Table 5.14 outlines that the highest link flows in the AM and PM peak hours is on the Mahon Link Road, east of the shopping centre. The table highlights the tidal nature between the morning and evening peak at the Mahon Interchange from the N40 with a difference of 433 PCU’s arriving in the morning via the eastbound off-ramp in comparison to the westbound off-ramp (1,147-714).

### 5.6.4 TRAFFIC GENERATION

In order to establish the level of traffic likely to be generated by the development, trip rates from the TRICS database were used. The people trip rates and corresponding trip generation are shown in Table 5.15 and Table 5.16 respectively.

People trip rates have been used for the residential and office aspects of the development, with reference to vehicle trip rates for the hotel. The creche is to service the people of Jacob’s Island so will be passby trips. As the available surveys on the TRICS database were filtered to accurately reflect the site, there was limited people trip rate information available for the hotel, therefore vehicle trip rates have been used instead. All trip rates have been compared against other Irish sites available, and against comparable cities within Ireland and the UK. The traffic counters that were put in place on Jacob’s Island during Sept 2021, Feb 2022 and April/May 2022 also showed low levels of vehicle movements in the peak hour (Section 5.3.7.3).

### 5.6.4.1 Trip Rates

Table 5.15: People and vehicle trip rates

Land Use	Unit	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)	
		Arrivals	Depart	Arrivals	Depart
Residential – flats privately owned (People trip rate)	Per Dwelling	0.105	0.362	0.41	0.248
Office (People trip rate)	Per 100sqm	1.628	0.14	0.093	1.419
Hotel (veh trip rates)	Per 1 Bedroom	0.131	0.181	0.154	0.143

It should be noted that the peak time for hotel trips doesn’t align with the residential and office peak times, however, the hotel trips have been included within the commuter peak time. There are no trip rates or trip generation associated with the creche, as it is expected that all vehicle trips to it will be linked to other aspects of the site. This could consist of vehicles arriving to employment on site i.e. hotel or office, or internal movements from residents on Jacob’s Island walking and cycling.

### 5.6.4.2 SHD Traffic Generation

Table 5.16: People Trip Generation for the SHD

Land Use	Unit	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)	
		Arrivals	Depart	Arrivals	Depart
People Trip Generation					
Residential – flats privately owned	Per Dwelling – 489 units	53	181	205	124
Office	Per 100sqm – 4,500 sqm	73	6	4	64

5.6.4.3 Anticipated Full Masterplan Traffic Generation

Table 5.17 below outlines the people and vehicle trip generation using the trip rates outlined in Table 5.16.

Table 5.17: People and vehicle trip generation

Land Use	Unit	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)	
		Arrivals	Depart	Arrivals	Depart
People Trip Generation					
Residential – flats privately owned	Per Dwelling – 489 units	53	181	205	124
Office	Per 100sqm – 15,000 sqm	244	21	14	213
Vehicle Trip Generation					
Hotel	Per 1 Bedroom – 165 bed	26	36	31	29

5.6.4.4 Mode Share

Figure 5.53 highlights the proposed mode share for the Jacob's Island development. In comparison to the existing Cork City and suburbs mode share outlined in Section 5.3, car driver and passenger has been reduced by 5%, and active and sustainable travel including on foot, by bike and public transport has increased from 33% to 39%. This is also supported by the low number of vehicles currently leaving Jacob's Island as set out in Section 5.3.7.

The proposed modal split is applied to the people trip rates to get the vehicle numbers. The vehicle numbers are also limited by the low levels of parking available at the proposed site.

Jacob's Island Mode Share

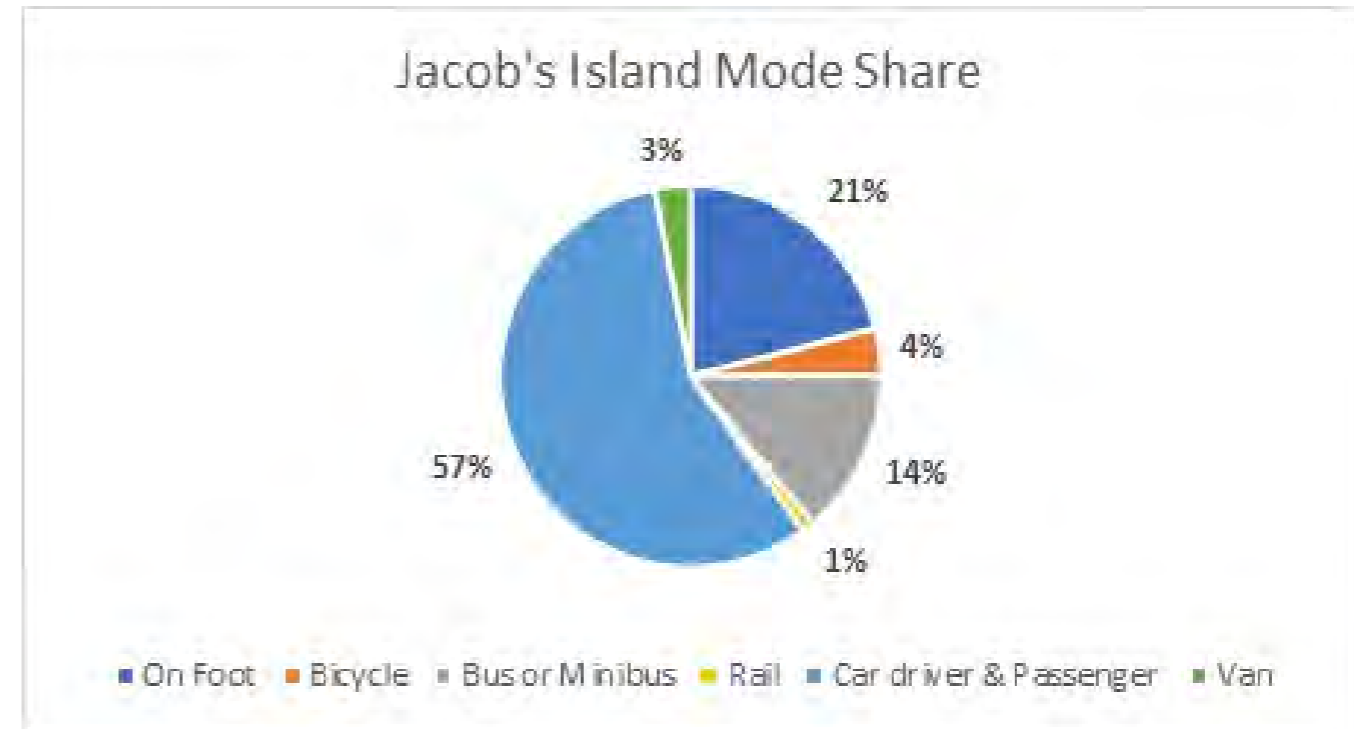


Figure 5.53: Proposed Development Mode Share

Table 5.18: People and vehicle trip generation for SHD Development (Note: minor discrepancies due to rounding)

Mode	Mode Share (%)	Morning Peak		Evening Peak	
		Arr	Dep	Arr	Dep
Car Driver & Passenger	57%	72	107	178	119
On Foot	21%	26	39	66	44
Bus or Minibus	14%	18	26	44	29
Bicycle	4%	5	7	13	8
Van	3%	4	6	9	6
Rail	1%	1	2	3	2
<b>Total Trips</b>	<b>100%</b>	<b>126</b>	<b>187</b>	<b>313</b>	<b>209</b>

Table 5.19 below highlights the total vehicle trip generation expected for the SHD application.

Table 5.19: SHD Vehicle Trip Generation (Note: minor discrepancies due to rounding)

Total Vehicle Trips	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)	
	Arrivals	Departures	Arrivals	Departures
	75	112	188	126

Table 5.19 outlines that there is expected to be 188 two-way vehicle trips in the morning peak and 313 two-way vehicle trips in the evening peak associated with the SHD development.

Table 5.20 below highlights the total vehicle trip generation expected for the anticipated full masterplan application.

Table 5.20: Anticipated Masterplan vehicle trip generation

Total Vehicle Trips	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)	
	Arrivals	Departures	Arrivals	Departures
	205	159	164	233

Table 5.20 outlines that there is expected to be 364 two-way vehicle trips in the morning peak and 397 two-way vehicle trips in the evening peak associated with the full masterplan development.

### 5.6.5. TRAFFIC DISTRIBUTION

The generated traffic has been distributed onto the surrounding road network based on the origin/destination to work data obtained from 2016 Census POWSCAR data. Figure 5.54 outlines the distribution of traffic on the surrounding road network.

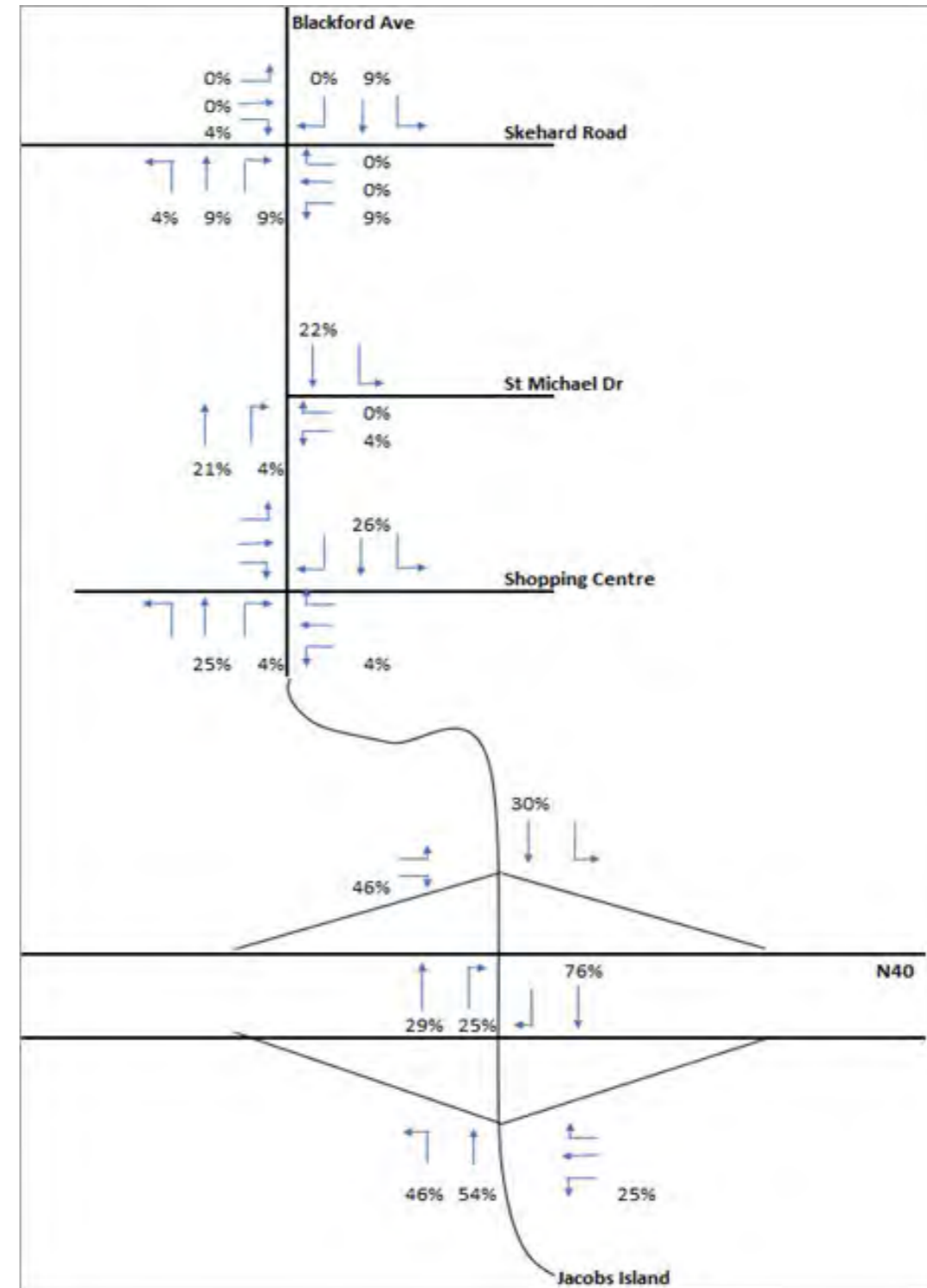


Figure 5.54: Development traffic distribution

Figure 5.54 highlights the traffic distribution for the AM and PM peak period.

### 5.6.6 TRAFFIC GROWTH

For all years the base + committed and base + committed + development will be included within the junction modelling. Medium traffic growth has been assigned to the 2017 base traffic for the future scenarios using the TII Project Appraisal Guidelines (PAG) for link based traffic growth forecasting for the Cork City area. Table 5.21 outlines the growth rates that have been used in the junction assessment.

Table 5.21: TII Annual Growth Rate

Region	Medium Growth			
	2013-2030		2030-2050	
Vehicle Category	Light Vehicle (LV)	Heavy Vehicle (HV)	Light Vehicle (LV)	Heavy Vehicle (HV)
Cork City	1.0102	1.023	1.0012	1.0176

### 5.6.7 COMMITTED DEVELOPMENT

As a result of scoping discussions with the Transportation Department of Cork City Council, a number of developments in the Mahon area that have planning permission in place (that has not yet expired) have been incorporated into the Transport Assessment undertaken in this EIAR as 'committed' developments. The committed development applications are outlined below.

- Former Motorola Site (TP 09/33673 – by O'Flynn Construction) 4 storey office building – Ref. 09/33673 not built according to google earth (expired 25/04/2019). Note CCC Ref. 19/38875 scheme which includes the 09/33673 site.
- Residential Development at Eden, Blackrock, Cork (TP 16/37233 & PL 28.249400 by Piers Developments) of 141 units.
- Residential Development at Bessboro, Mahon, Cork (TP 17/37349 by Murphy Transport Ltd.) 35 units – Outline permission granted will need a subsequent application before it can be constructed.
- Jacob's Island 413 apartments and neighbourhood centre (granted in Oct 2018), permitted under An Bord Pleanála Ref. ABP 301991-18 (by Montip Horizon Ltd), also note amendment (granted in Feb 2022) for an increase in apartments from 413 to 437 no. under An Bord Pleanála Ref. ABP 310378-21.
- Bessboro warehouse holdings – 135 residential units (granted Feb 2019) - (permitted under CCC Ref. 1837820, ABP Ref 302784-18).

### 5.6.8 THRESHOLD ANALYSIS

A threshold analysis was undertaken on all junctions across the study area. This analysis compares the base + committed traffic flows against the base + proposed development traffic flows. It is normal practice that any junction with a predicted 5% increase due to a proposed development would be modelled and tested. The threshold assessment is outlined in Table 5.22 for the 2024 SHD development and Table 5.23 for the 2039 anticipated full masterplan development threshold assessment.

#### 5.6.8.1 2024 Threshold Analysis

Table 5.22: 2024 SHD Threshold Analysis

Road	2024 Base		Development			
	AM	PM	AM	% Change	PM	% Change
Skehard Road/ BlackRock Ave/ Mahon Link Road	2076	2093	77	4%	80	4%
St Michael Drive/ Mahon Link Road	2141	2190	55	3%	87	4%
Shopping Centre/ Mahon Link Road	2958	3886	70	2%	103	3%
Northern N40 Interchange	2933	3637	151	5%	243	7%
Southern N40 Interchange	1227	1985	98	8%	215	11%
Jacob's Island Access	295	152	142	48%	149	98%

#### 5.6.8.2 2039 Threshold Analysis

Table 5.23: 2039 Masterplan Threshold Analysis

Road	2039 Base		Development			
	AM	PM	AM	% Change	PM	% Change
Skehard Road/ BlackRock Ave/ Mahon Link Road	2229	2248	77	3%	84	4%
St Michael Drive/ Mahon Link Road	2300	2178	90	4%	97	4%
Shopping Centre/ Mahon Link Road	3178	4174	102	3%	115	3%
Northern N40 Interchange	3154	3887	233	7%	241	6%
Southern N40 Interchange	1318	2127	202	15%	158	7%
Jacob's Island Access	306	158	151	49%	226	143%

The threshold analysis results outlined in Table 5.22 and Table 5.23 for the 2024 and 2039 scenarios, respectively, highlight that only the North and South Mahon Interchange junctions and the Jacob's Island Access require to be included within the junction assessment.

### 5.6.9 JUNCTION ASSESSMENT

Analysis of the performance of the junctions were undertaken using the JCT Consultancy Ltd software LinSig v.3, with the results of the analysis presented in terms of percentage degree of saturation (DoS%) with the corresponding predicted mean maximum queue (MMQ). The Practical Reserve Capacity (PRC) is presented within the results. The PRC is calculated from the maximum degree of saturation on a link and is a measure of how much additional traffic could pass through the junction while maintaining a maximum degree of saturation of 90% on all links.

#### 5.6.10 SCENARIO RESULTS

Table 5.24 to Table 5.29 outlines the junction modelling results for the 2024, 2029 and 2039 scenarios for the morning and evening peaks.

#### 5.6.10.1 2024 Base + Committed

Table 5.24: 2024 Base + committed morning and evening results

Approach Arm	Morning Peak			Evening Peak		
	MMQ	Queue length (m)	Deg Sat %	MMQ	Queue length (m)	Deg Sat %
North Interchange						
Mahon Link - Inside	4.5	27	44.3%	35.2	211	88.8%
Mahon Link - Outside	5.8	35	22.6%	32.2	193	75.2%
EB Off Slip - Inside	20.7	124	64.1%	14.7	88	51.7%
EB Off Slip - Outside	23.1	139	68.0%	7.3	44	51.7%
Interchange - Inside	7.6	46	64.9%	13.6	82	87.5%
Interchange - Outside	7.5	45	67.5%	14.5	87	88.6%
PRC	32.4%			1.4%		
South Interchange						
Interchange - Inside	3.9	23	37.9%	7.8	47	69.8%
Interchange - Outside	4.2	25	37.8%	7.7	46	69.6%
WB Off Slip - Inside	14.6	88	55.2%	12.1	73	66.5%
WB Off Slip - Outside	14.5	87	55.2%	11.9	71	65.7%
Jacob's Island - LT	3.9	23	30.0%	2.8	17	41.5%
Jacob's Island - Ahead	7.7	46	55.0%	4.8	29	64.7%
PRC	63.1%			29%		

5.6.10.1 2024 Base + Committed + SHD Development (based on isolated junction modelling)

Table 5.25: 2024 Base + committed + SHD development morning and evening results

Approach Arm	Morning Peak			Evening Peak		
	MMQ	Queue length (m)	Deg Sat %	MMQ	Queue length (m)	Deg Sat %
North Interchange						
Mahon Link - Inside	7.0	42	27.2%	43.5	258	89.8%
Mahon Link - Outside	6.7	42	49%	43.9	264	95.4%
EB Off Slip - Inside	21.4	126	66.7%	15.6	96	52.4%
EB Off Slip - Outside	23.7	144	66.9%	15.4	90	52.4%
Interchange - Inside	8.8	54	68.2%	18.4	108	95.2%
Interchange - Outside	8.3	48	70.3%	19.3	114	95.8%
PRC	28.1%			-6.4%		
South Interchange						
Interchange - Inside	4.3	24	48.6%	19.2	114	81.0%
Interchange - Outside	4.3	24	50.0%	22.6	138	80.9%
WB Off Slip - Inside	15.2	90	57.9%	13.3	78	75.5%
WB Off Slip - Outside	15.4	90	58.1%	13.3	78	75.5%
Jacob's Island - LT	7	42	43.1%	9.1	54	60.0%
Jacob's Island - Ahead	10.6	66	61.6%	5.9	36	81.1%
PRC	47.2%			11%		



As can be seen in Table 5.25 and Figure 5.55 there is a minimal increase in queuing on the eastbound and westbound off-slip in both the morning in evening peaks as a result of the additional vehicle trips associated with the SHD development traffic.

**5.6.10.3 2029 Base + Committed**
*Table 5.26: 2029 Base + committed morning and evening results*

Approach Arm	Morning Peak			Evening Peak		
	MMQ	Queue length (m)	Deg Sat %	MMQ	Queue length (m)	Deg Sat %
North Interchange						
Mahon Link - Inside	5.2	31	46.8%	42.3	254	92.0%
Mahon Link - Outside	6.9	41	26.3%	41.4	248	84.5%
EB Off Slip - Inside	21.9	131	67.1%	16.8	101	56.1%
EB Off Slip - Outside	24.5	147	69.8%	7.8	47	56.1%
Interchange - Inside	7.8	47	68.4%	14.4	86	89.3%
Interchange - Outside	7.6	46	69.2%	15.8	95	91.3%
PRC	28.9%			-2.3%		
South Interchange						
Interchange - Inside	3.4	20	39.5%	8.2	49	74.1%
Interchange - Outside	3.6	22	40.0%	8.7	52	74.3%
WB Off Slip - Inside	14.8	89	58.1%	13.6	82	71.0%
WB Off Slip - Outside	14.7	88	58.0%	13.6	82	71.0%
Jacob's Island - LT	4.9	29	36.1%	3.1	19	44.9%
Jacob's Island - Ahead	8.1	49	56.7%	5.4	32	70.7%
PRC	55%			21.1%		

5.6.10.4 2029 Base + Committed + SHD Development (based on isolated junction modelling)

Table 5.27: 2029 Base + committed + SHD development morning and evening results

Approach Arm	Morning Peak			Evening Peak		
	MMQ	Queue length (m)	Deg Sat %	MMQ	Queue length (m)	Deg Sat %
North Interchange						
Mahon Link - Inside	7.8	48	29.2%	59	360	98%
Mahon Link - Outside	7.8	48	51.4%	64.6	390	99.8%
EB Off Slip - Inside	23.5	144	70.3%	16	96	56.6%
EB Off Slip - Outside	25.8	156	73%	15	90	97.2%
Interchange - Inside	9.1	54	71.4%	26.2	156	99.2%
Interchange - Outside	9.8	60	73.4%	27.6	162	99.7%
PRC	22.7%			-10.9%		
South Interchange						
Interchange - Inside	4.8	30	50.7%	25.4	150	85.2%
Interchange - Outside	5.7	36	51.4%	28	168	86.1%
WB Off Slip - Inside	16.3	96	59.8%	15.1	90	81%
WB Off Slip - Outside	16.5	96	59.9%	14.8	90	80.2%
Jacob's Island - LT	7.3	42	46.9%	9.8	60	62.8%
Jacob's Island - Ahead	11.3	66	66.9%	6	36	85.5%
PRC	34.5%			4.5%		



Figure 5.56: Mahon Interchange Model 2029

As can be seen in Table 5.27 and Figure 5.56 there is a minimal increase in queuing on the eastbound and westbound off-slip in both the morning in evening peaks as a result of the additional vehicle trips associated with the SHD development traffic.



**5.6.10.5 2039 Base + Committed**
*Table 5.28: 2039 Base + committed morning and evening results*

Approach Arm	Morning Peak			Evening Peak		
	MMQ	Queue length (m)	Deg Sat %	MMQ	Queue length (m)	Deg Sat %
North Interchange						
Mahon Link - Inside	5.3	32	48.2%	40.4	242	91.3%
Mahon Link - Outside	6.7	40	26.0%	42	252	84.9%
EB Off Slip - Inside	22.5	135	69.3%	16.4	98	56.1%
EB Off Slip - Outside	25	150	70.9%	7.9	47	56.1%
Interchange - Inside	7.9	47	68.9%	14.6	88	90.4%
Interchange - Outside	7.7	46	71.0%	15.5	93	90.8%
PRC	26.8%			-1.5%		
South Interchange						
Interchange - Inside	3.4	20	40.5%	9.5	57	74.0%
Interchange - Outside	3.5	21	40.7%	8	48	75.2%
WB Off Slip - Inside	15.5	93	57.4%	13.7	82	70.1%
WB Off Slip - Outside	15.4	92	57.3%	13.5	81	69.6%
Jacob's Island - LT	4.9	29	37.6%	3	18	44.9%
Jacob's Island - Ahead	8.3	50	59.0%	5.4	32	70.7%
PRC	52.5%			19.7%		

As can be seen in Table 5.28 there is a minimal increase in queuing on the eastbound and westbound off-slip in both the morning in evening peaks as a result of the additional vehicle trips associated with the SHD development traffic.

5.6.10.6 2039 Base + Committed + Estimated Full Masterplan Development

Table 5.29: 2039 Base + committed + estimated full masterplan morning and evening results

Approach Arm	Morning Peak			Evening Peak		
	MMQ	Queue length (m)	Deg Sat %	MMQ	Queue length (m)	Deg Sat %
North Interchange						
Mahon Link - Inside	8.5	51	56.1%	65.1	391	99.6%
Mahon Link - Outside	8.7	52	34.3%	62.1	373	98.1%
EB Off Slip - Inside	24.7	148	72.0%	17.5	105	56.9%
EB Off Slip - Outside	27.9	167	76.4%	17.5	105	56.9%
Interchange - Inside	10.2	61	74.7%	23.2	139	98.2%
Interchange - Outside	8.7	52	76.4%	24.2	145	98.5%
PRC	17.7%			-10.6%		
South Interchange						
Interchange - Inside	6.5	39	57.9%	24.8	149	58.7%
Interchange - Outside	5.7	34	54.8%	24	144	58.1%
WB Off Slip - Inside	18.1	109	66.9%	14.7	88	81.5%
WB Off Slip - Outside	18.1	109	66.9%	14.8	89	81.8%
Jacob's Island - LT	7.7	46	46.4%	6.1	37	62.8%
Jacob's Island - Ahead	11.6	70	65.5%	9.9	59	85.3%
PRC	34.6%			5.1%		



Figure 5.57: Mahon Interchange Model 2039

As can be seen in Table 5.29 and Figure 5.57 there is a minimal increase in queuing on the eastbound and westbound off bound slip in both the morning in evening peaks as a result of the additional vehicle trips associated with the estimated full masterplan development traffic.

## 5.7 IMPACT ASSESSMENT

### 5.7.1 DO NOTHING

The 'Do Nothing' scenario incorporates the impact of committed developments on the surrounding road network with no introduction of the proposed development. Therefore, the 'Do Nothing' scenario is considered the base + committed scenario throughout this traffic and transportation assessment. The results of this scenario can be seen in Table 5.24, Table 5.26 and Table 5.28 above.

The 'Do-Nothing' scenario would mean that the N40 Mahon Interchange and the surrounding infrastructure would remain in its current state and background traffic would grow over time. Given the location of the site and its close proximity to major commercial and industrial hubs such as Mahon Point Shopping Centre, Mahon Point Retail Park and City Gate. It is reasonable to assume that a development, potentially with an equal or more intensive requirement for vehicular trips, would be established on this site at some stage in the future.

Further discussions on the 'Do Nothing' scenario are presented in Section 5.7.3.

### 5.7.2 CONSTRUCTION PHASE

The projected opening year for the Proposed SHD Development is 2024 and construction on the site will involve two phases:

- Earthworks: including activities such as site clearance, stock piling of material, excavation and construction of foundations, hardstanding areas – build up for car parks, trench excavations for drainage, dewatering of excavations, new access roads, site entrances, construction compound, haul route, storage of fuels and oils.
- Construction: including activities such as access road construction, the surfacing of car parks and construction of residential and office buildings including a creche facility.

Heavy goods vehicle truck movements into and out of the site are estimated in approximately 30 no. trips daily on average across the construction programme. These trips expected to peak during the semi-basement and lower ground excavation works and large concrete pours, estimated as 50 no. HGV movements daily. Note that the excavated material will be relocated internal within the site and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period.

People movement (in and out) and associated car trips during each construction stage will be circa 20no. during basement excavation stage and rising to circa 50 no. during construction with an increase to 60no. as the frame is being progressed. The numbers on site will maintain at this level during the façade construction but will increase to between 60-70 during internal M&E installation.

Generally, the trips to and from the site will be by private car and vans accommodating 1-2 workers. Some sub-contractors will use minibus transport when in larger crews, such as concrete contractors, M&E, and facades. Public transportation will also be availed of by individual workers. Typically, construction workers will remain on site from between morning start to evening time as the hours of work will be from 7:30 am to 6 pm Monday to Friday, 7.30 am to 4 pm on Saturdays, or as directed by Cork City Council. It is proposed that hours of work outside of these times will be by agreement with the local authority.

The construction impact is 'likely' and will have a 'Negative' effect in the 'medium-term' as construction period will be approximately 10 years. This likely medium-term effect during the construction stage is predicted to be 'Not Significant' as appropriate mitigation measures will be put in place to minimise the impact of construction vehicles on the surrounding road network.

### 5.7.3 OPERATIONAL PHASE

The traffic assessment carried out for the base + committed scenario is considered the 'Do Nothing' scenario. The 'Do Something' scenario includes the proposed SHD development to the assessment, therefore this is the base + committed + proposed development.

The N40 Mahon Interchange operates with reserve capacity available in the 'Do Nothing' and 'Do Something' scenario. Predicted queuing does not impact the N40 itself and can be accommodated within the slip lane lengths available for both the eastbound and westbound off-slips.

The percentage increase in traffic is sub-threshold at three of the five junctions that have been assessed as part of the traffic assessment as per TII's Transport Assessment Guidelines. The maximum increase at the junctions to the north of the Mahon Interchange is noted on the Skehard Road/ Mahon Road/ Blackrock Avenue junction and St Michael/ Mahon Road junction, of 4% in the 2024 scenario.

For 2024, the proposed SHD development results in an additional 8 PCU's on the eastbound off-slip (North Interchange) during the evening peak and no significant increase in queuing in the morning peak. There is a significant increase in queue length on the Mahon Link for all years in the evening peak, as can be seen from Table 5.24 to Table 5.29 and Figures 5, the most notable increases are of 11 PCU's in 2024, 23 PCU's in 2029 and 25 PCU's in 2039.

A summary of the 'Do Nothing' and 'Do Something' junction operational performance considering the worst case scenario are presented in Table 5.30. The subject assessment incorporates a 15-year Design Year from the projected 2024 Opening Year. The probability of the predicted impacts occurring during this timeframe can be described as 'likely' and the impacts are predicted to be 'Permanent'.

Table 5.30: Description of effects

Peak Hour	Design Year	Do Nothing		Do Something		Quality of Effects	Significance
		MMQ	Deg Sat %	MMQ	Deg Sat %		
North Interchange							
AM	2024	23.1	68.0%	23.7	68.2%	Negative	Imperceptible
	2029	24.5	69.8%	25.8	73.4%	Negative	Imperceptible
	2039	25.0	71.0%	27.9	76.4%	Negative	Slight
PM	2024	35.2	88.8%	43.9	95.8%	Negative	Significant
	2029	42.3	92.0%	64.6	99.8%	Negative	Very Significant
	2039	42.0	91.3%	65.1	99.6%	Negative	Very Significant
South Interchange							
AM	2024	14.6	55.2%	15.4	61.6%	Negative	Slight
	2029	14.8	58.1%	16.5	66.9%	Negative	Slight
	2039	15.5	59.0%	18.1	66.9%	Negative	Slight
PM	2024	12.1	69.8%	22.6	81.1%	Negative	Moderate
	2029	13.6	74.3%	28.0	86.1%	Negative	Significant
	2039	13.7	75.2%	24.8	85.3%	Negative	Significant

5.7.4 CUMULATIVE

The Jacob's Island 413 apartments and neighbourhood centre (granted in Oct 2018), permitted under An Bord Pleanála Ref. ABP 301991-18, including its amendment granted in Feb 2022 for an increase in apartments from 413 to 437 no. is a permitted development located in the immediate vicinity of the proposed development site. This and other developments (refer to Section 5.6.7) in the Mahon area that have planning permission in place have been incorporated into the analysis detailed above and are referred to as 'committed' developments. In addition, for the scenario year of 2039, the anticipated vehicular traffic associated with the full masterplan proposals have been incorporated to the traffic and transportation assessment.

Therefore, the cumulative impact of the proposed development (including the anticipated full masterplan) in addition to the committed developments have already been assessed in Sections 5.7.2 and 5.7.3.

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Plan, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting Strategic Environmental Assessment (SEA) Statement contained in Appendix 2(A) of the Draft Plan. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.

SEO Material Assets objectives as detailed in Table 5-1 and 7-1 of the Draft Plan are to:

- Make best use of the material assets of the county and promote the sustainable development of new infrastructure to provide for the current and future needs of the population.

Table 7-5 of the SEA indicates that Scenario 3, the 'Compact Liveable Growth Scenario', identified as the preferred scenario, is determined likely to improve the status of SEOs to a greater degree and have potential to conflict with the status of SEOs – likely to be mitigated to a lesser degree.

5.7.4.1 Construction Phase

The construction phase of these developments may coincide with the development of the proposed development, potential cumulative impacts are not expected once similar mitigation measures (Refer to Section 5.8) are implemented. The probability of the cumulative impacts on the construction phase occurring can be described as 'likely' and will have a 'Negative' effect in the 'medium-term', it is also predicted to be 'Not Significant' as appropriate mitigation measures will be put in place to minimise the impact of construction vehicles on the surrounding road network.

5.7.4.2 Operational Phase

The probability of the cumulative impacts on the operational phase occurring can be described as 'likely' and the impacts are predicted to be 'permanent'. Any potential cumulative operational impacts will be 'Negative' and range from 'Slight' to 'Very Significant' as can be seen in the scenario year of 2039 in Table 5.30.

5.8 MITIGATION MEASURES

Mitigation Measures for the site for the Proposed SHD Development include best practice mitigation measures for construction and standard maintenance practice measures during the operation and maintenance phase. The particular mitigation measures that should be met at a minimum are outlined in section below.

It should be noted that the projected opening year for the development in 2024, by which point several mitigations measures close to the site will have been provided including the north-bound bus lane which will have been provided as part of the adjacent permitted scheme (ABP 301991-18) being delivered by the previous Montip Horizon Ltd developer. A more up-to-date census will have been undertaken, and it is expected that the mode share for private car for Jacob's Island will be a reduction in comparison to the 2016 census as a result of the impact of COVID-19 and working from home, as well as the outlined mitigation measures.

### 5.8.1 CONSTRUCTION PHASE

In order to ensure satisfactory operation of the construction stage the following mitigation measures are proposed:

- Signage will be erected in advance to warn other pedestrian and road users of a construction site ahead. These signs will be checked and cleaned regularly so that they are maintained in a good condition;
- Inside the site boundary a clear pedestrian access will be provided to the areas of work and appropriate signage placed. Pedestrian boundary will be delineated with pedestrian barriers. Whether inside the site boundary or on the public road all plant will give way to pedestrians and will be carefully controlled by operatives and site banksman;
- Any works completed outside site boundary will be fully barriered with such work covered by a method statement and agreed in advance with the local authority. All plant driving on the public roads will be accompanied by a vehicle banksman. For works outside the boundary which may impede the traffic/pedestrians on the public road a separate traffic management plan will be completed;
- Provision of sufficient on-site parking during the construction phase to ensure no potential overflow onto the local network. The site construction compound will be able to accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas;
- An automatic wheel-washing unit shall be installed and maintained at the entrance to the site. This will be available for use at all times. Maintenance will include for cleaning out of the equipment and disposal of any material gathered within. At the end of the construction phase, the wheel washing facilities shall be removed from site;
- The roads will be monitored throughout the works and a road sweeper will be employed when required for the duration should the roads become dirty;
- All deliveries must be notified to the site in advance so that the site will be organised, for the offloading and dictate which crane will be unloading. This is to ensure that delivery trucks, on entering the site, cannot block any of the public roads adjacent to the site. A banksman will be assigned to control all deliveries
- Construction traffic will be minimised during peak hours;
- Monitoring and control of construction traffic will be ongoing during construction works; and
- Any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.

### 5.8.2 OPERATIONAL PHASE

With the objective of mitigating the potential impact of the proposed development during its operational stage, the following initiatives have been identified and subsequently form an integral part of the subject development proposals.

It is recommended to undertake discussions with the Council in advance of the full masterplan development to perform a review of the signal operations of the Mahon Interchange and Retail Park signalised junctions. It is likely that the increase in queue length on the Mahon Link highlighted in Section 5.7.3 could be reduced by linking the 2 signalised junctions, or by improving the stages or run time.

The design of the proposed development has sought to maximise the ability to provide attractive connections to the surrounding pedestrian and cycling network. Internally, dedicated pedestrian and cycling infrastructures will be provided and will connect with the existing / future pedestrian and cycling facilities in the local public road network thereby facilitating excellent pedestrian permeability.

Cycle parking has been provided at a higher rate to that proposed within the development management standards.

Accordingly, this provision of cycle parking will help ensure cycling is a viable alternative mode of transport to private car travel thereby helping minimise private car trips generated by future residents.

A Mobility Management Plan (MMP) is to be compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development.

## 5.9 INTERACTIONS

Traffic and Transport has a number of interactions with other topics. The most significant interactions are between 'Climate and Climate Change' (Chapter 11) and 'Noise and Vibrations' (Chapter 10).

During the construction phase, the following aspects would interact with traffic and transport and in the absence of mitigation may give rise to likely significant effects.

- Noise and Vibration: Construction traffic may increase localised noise and vibration effects.
- Climate and Climate Change: Emissions from construction traffic may impact local air quality and climate with respect to increased emissions of greenhouse gases from vehicles.

During the operational phase the potential interactions are:

- Climate and Climate Change: Emissions from traffic associated with future occupants may affect local air quality and climate in regard to increased emissions of greenhouse gases from vehicles.

The potential significant impacts of material assets of traffic and transport have been considered within the relevant discipline and mitigation measures (Section 5.8) outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

## 5.10 RESIDUAL IMPACTS

### 5.10.1 CONSTRUCTION PHASE

Provided the above mitigation measures and management procedures are incorporated during the construction phase, the residual impact on the local existing environment will be 'medium-term' in nature and 'Negative' in terms of quality of effects. The potential residual impact of construction stage activities is predicted to be 'Slight' as there will be a small increase in HGV's on the surrounding road network due to excavation plant and dumper trucks involved in site development works and material delivery vehicles.

### 5.10.2 OPERATIONAL PHASE

The implementation of the mitigation measures outlined above, including the MMP, will ensure that the residual effect on the local existing environment is both managed and minimised. Accordingly, the potential residual impact can be described as 'Negative' but 'Slight' and will be 'Permanent'.

## 5.11 MONITORING

### 5.11.1 CONSTRUCTION PHASE

During the construction stage, the following monitoring exercises are proposed:

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and External road conditions; and
- Timings of construction activities in terms of start / finish times.

### 5.11.2 OPERATIONAL PHASE

As part of the Mobility Management Plan (MMP) process, it is proposed that further transport surveys be undertaken on Jacobs Island to continue to understand how the island is operating. An initial evaluation of the operation of the plan will take place once the proposed development is approximately 50% occupancy and then annually into its operation. The plan will be appropriately adjusted at that stage based on the results. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.

## 5.12 DIFFICULTIES IN COMPILING INFORMATION

- Traffic surveys on Jacob's Island were undertaken in September 2021 and February 2022. During both sets of surveys there were still some restrictions in place that effect travel movements and patterns.
- Difficulties regarding assessing the long-term impact of COVID-19 on travel patterns. Low growth has been applied to the traffic for the future scenario years, however, some shift in the mode share has been allowed for.
- An additional traffic survey has been undertaken between 25th April and 15th May 2022 in order to obtain a traffic survey with no effects of covid restrictions. This is detailed in Section 5.3.7.3.

## 5.13 REFERENCES

- Environmental Protection Agency (EPA) guidance documents 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022'
- TII (NRA) Traffic & Transportation Assessment Guidelines; (May 2014)
- Cork City Development Plan 2015-2021;
- Cork City and Suburbs Census Data, 2016;
- Draft Cork City Development Plan 2022-2028;
- Cork Metropolitan Area Transport Strategy (CMATS) 2040;
- Cork Metropolitan Cycle Network Plan; (Jan 2017);
- Cork Bus Network Redesign Volume II: Draft New Network; (Nov 2021);
- Sustainable Transport Corridors Report (April 2022);

- Transport for Ireland; <http://www.transportforireland.ie>
- Transport Infrastructure Ireland; <http://www.tii.ie>

## 5.14 APPENDICES

Appendix 5.1 - Traffic and Transportation Assessment Report



JACOBS ISLAND



CHAPTER SIX  
Material Assets – Services, Infrastructure  
& Utilities

# CHAPTER SIX

## Contents

6	Material Assets - Services, Infrastructure & Utilities.....	6
6.1	INTRODUCTION .....	1
6.2	DESCRIPTION OF THE EXISTING BASELINE ENVIRONMENT.....	1
6.3	PROPOSED DEVELOPMENT .....	3
6.4	PREDICTED IMPACTS.....	5
6.5	MITIGATION MEASURES .....	8
6.6	RESIDUAL IMPACTS .....	9
6.7	INTERACTIONS .....	9
6.8	APPENDICES .....	9



## CHAPTER SIX

### MATERIAL ASSETS - SERVICES, INFRASTRUCTURES & UTILITIES

#### 6.1 INTRODUCTION

This evaluation has been done in consultation with Irish Water and following the relevant Standards and Guidelines, including but not limited to:

- IS EN 752-4: 1997 – Drain and Sewer Systems Outside Buildings, Part 4: Hydraulic Design and Environmental Considerations
- Irish Water Standard Details and Specifications
- Irish Water Code of Practice for Wastewater Infrastructure
- Irish Water Code of Practice for Water Infrastructure
- Cork City Minimum Engineering Requirements
- Greater Dublin Strategic Drainage Study (GDSDS) Volume 2 – New Developments
- EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

##### 6.1.1 RELEVANT GUIDELINES

This evaluation has been done in consultation with Irish Water and following the relevant Standards and Guidelines, including but not limited to:

- IS EN 752-4: 1997 – Drain and Sewer Systems Outside Buildings, Part 4: Hydraulic Design and Environmental Considerations
- Irish Water Standard Details and Specifications
- Irish Water Code of Practice for Wastewater Infrastructure
- Irish Water Code of Practice for Water Infrastructure
- Cork City Minimum Engineering Requirements
- Greater Dublin Strategic Drainage Study (GDSDS) Volume 2 – New Developments
- EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

#### 6.1.2 METHODOLOGY

This study envisages to

- i. identify the existing services around the site based on record maps, provided by Irish Water and Cork City Council, and site visits;
- ii. describe the proposed services plan;
- iii. analyse the impacts of the proposed development, both during construction and operational phases, proposing remedial or reductive measures.

#### 6.1.3 DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION

There were no difficulties encountered in compiling information for the existing environment.

### 6.2 DESCRIPTION OF THE EXISTING BASELINE ENVIRONMENT

#### 6.2.1. SURFACE WATER

As part of the works for the original development that was completed under planning reference 00/24609, the surface water network for Jacobs Island has been completed for the entire development. The infrastructure that was completed at the time was designed for all future development (i.e., all development envisaged under the 00/24609 planning application).

The installed surface water drainage network varies from 225 - 600 mm diameter. The surface water sewer outfalls directly into the Lough Mahon Estuary via a non-return valve. The outfalls are sized at 750 mm and 900 mm diameter.

#### 6.2.2 FOUL WATER

As is similar with the surface water network, the wastewater sewer network for the entire Jacobs Island development was completed as part of the original works and this infrastructure catered for the development works that are proposed under this application. This wastewater sewer network is completely separate to the surface water network throughout the site.

In 2013 a taking in charge process was undertaken in conjunction with Cork City Council and during this process the constructed sewage network was signed off by Cork City Council following the process of CCTV surveys and visual inspections. In addition, a report that reviewed the design and future capacity of the existing sewers was undertaken and provided to Cork City Council by MMOS. A connection spur to this network is provided to the proposed Development Lands. The wastewater infrastructure is now in the charge of Irish Water.

### 6.2.3 WATER SUPPLY

The trunk water main is 200mm diameter ductile iron and is laid within the main Jacobs Island spine road. This trunk main is looped back across the over bridge and also under the carriageway onto the north side of the South Link Road (N40). A full network of water supply services has been completed throughout the Jacobs Island development and has been taken in charge by the local authority. A connection spur to this watermain is provided to the proposed Development Lands. The water infrastructure is now in the charge of Irish Water.

### 6.2.4 ELECTRICITY

Based on the ESB utilities map of the area, the existing site is currently fed via underground cables which are rated at 10kv/20kv/400V/230V.

There is currently an ESB substation located in the middle of the proposed SHD development and the existing underground network travels across the proposed SHD development to serve existing residential units.

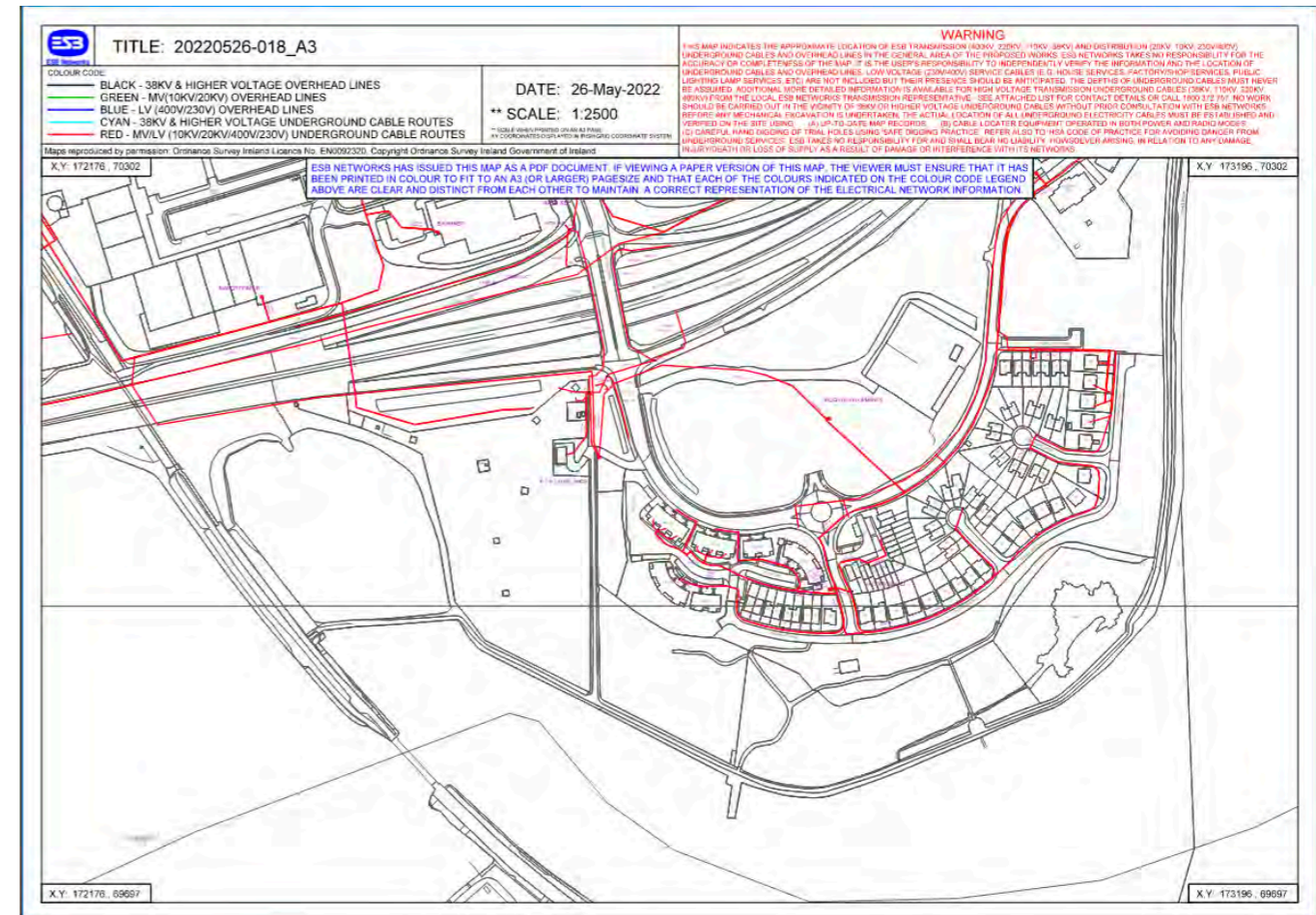


Figure 6.1 ESB Utilities Map

### 6.2.5 TELECOMS

#### EIR

The existing site is currently fed from the EIR network. The EIR network enters the site via the northwest by the Mahon Interchange Bridge. It currently serves the existing residential units of Jacobs Island, and a ring extends up to the proposed SHD site.



Figure 6.2 EIR Utilities Map

**Virgin Media**

According to Virgin Media records/website there is currently no Virgin Media services in the area. Having engaged with Virgin Media they expressed their willingness to extend their network to the proposed SHD

**6.2.6 NATURAL GAS**

Based on the GNI utilities map, there is an existing medium pressure (4 bar) distribution gas underground pipework around the site. The pipework has been brought to the site boundaries in form of:

- 125 PE-X 4 bar distribution pipe at the northwest site boundary, terminating with an isolation valve and an end cap
- 125 PE-X 4 bar distribution pipe and 90 PE-X 4 bar distribution pipe, both at the east site boundary, terminating with the isolation valves and the end caps.

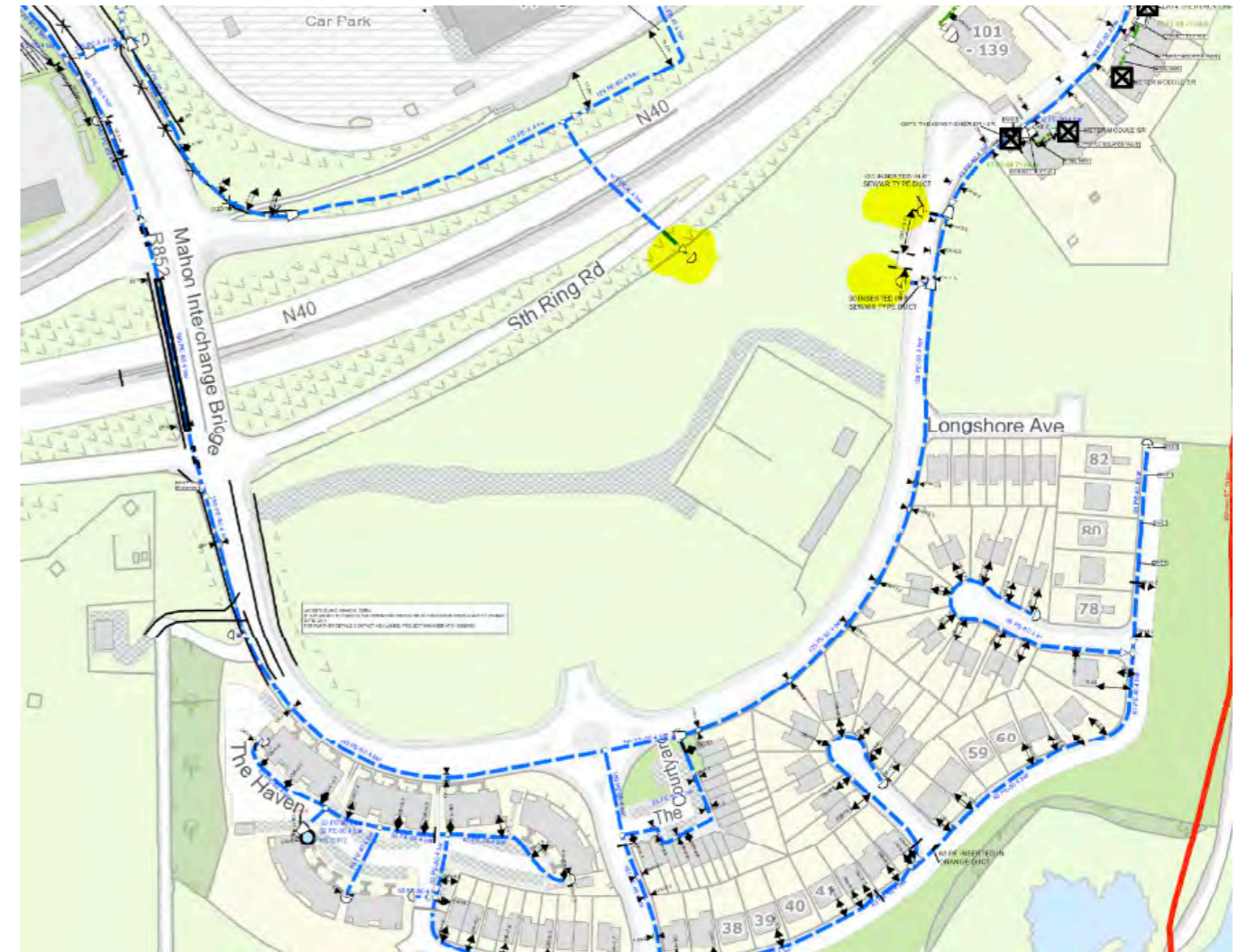


Figure 6.3 GNI Utilities Map

**6.3 PROPOSED DEVELOPMENT**

Chapter 2 of this EIAR describes in detail the elements of the proposed development. In relation to the proposed services and utilities to serve the proposed development, they are described in the sections below.

**6.3.1 SURFACE WATER**

The development site is currently an un-developed site. The proposed site development will change the ground covering from wild grass/weed covering to building and hard standing with landscaped area.

It is proposed that the new developments' roof and hardstanding areas surface water runoff will discharge by gravity to the below ground gravity surface water sewer network. This piped surface water sewer system will outfall by gravity to the existing surface water sewer that discharges into the Lough Mahon. It is noted that the point of outfall of the sewer is directly into the Lough Mahon and as recognized in the Greater Dublin Strategic Drainage Study (GSDS) attenuation is not required in such circumstance where the point of outfall is into an estuary, as specifically advised in section 6.3.3.4., as follows.

“Where there is little downstream to be concerned about with respect to flooding (discharging to the estuary or sea), criteria on flow rates and volumes of discharge are of little relevance. Water quality is the only issue needing to be addressed (primarily sedimentation)”

Attenuation is therefore not proposed for the current application; however, hydrocarbon interceptors and SUDs will be provided for all discharge generated off the newly added carparking area and traffic routes.

### 6.3.2 FOUL WATER

The foul drainage for the proposed development has been designed as a completely separated system to the storm. All foul drainage for the above ground units will be drained and gathered in stacks at basement/undercroft floor level. The foul is to be collected beneath the ground floor slab and directed to the proposed new foul network onsite, which is proposed to discharge to the existing manholes in the Jacobs Island residential access road. It is proposed two separated outfalls to the public foul sewer, as indicated in Figure 6.4. It is noted that a portion of the foul sewer before the proposed foul connection to FS31 is permitted under ABP-301991-18 SHD and consent has been secured from the landowner for the proposed connection.

A Design Acceptance has been issued by Irish Water confirming the feasibility of the new connections to the public sewer, and also verifying that the proposed foul sewer network within the development is according to the Irish Water standards. The Irish Water Design Acceptance is provided at Appendix Design 6.1.

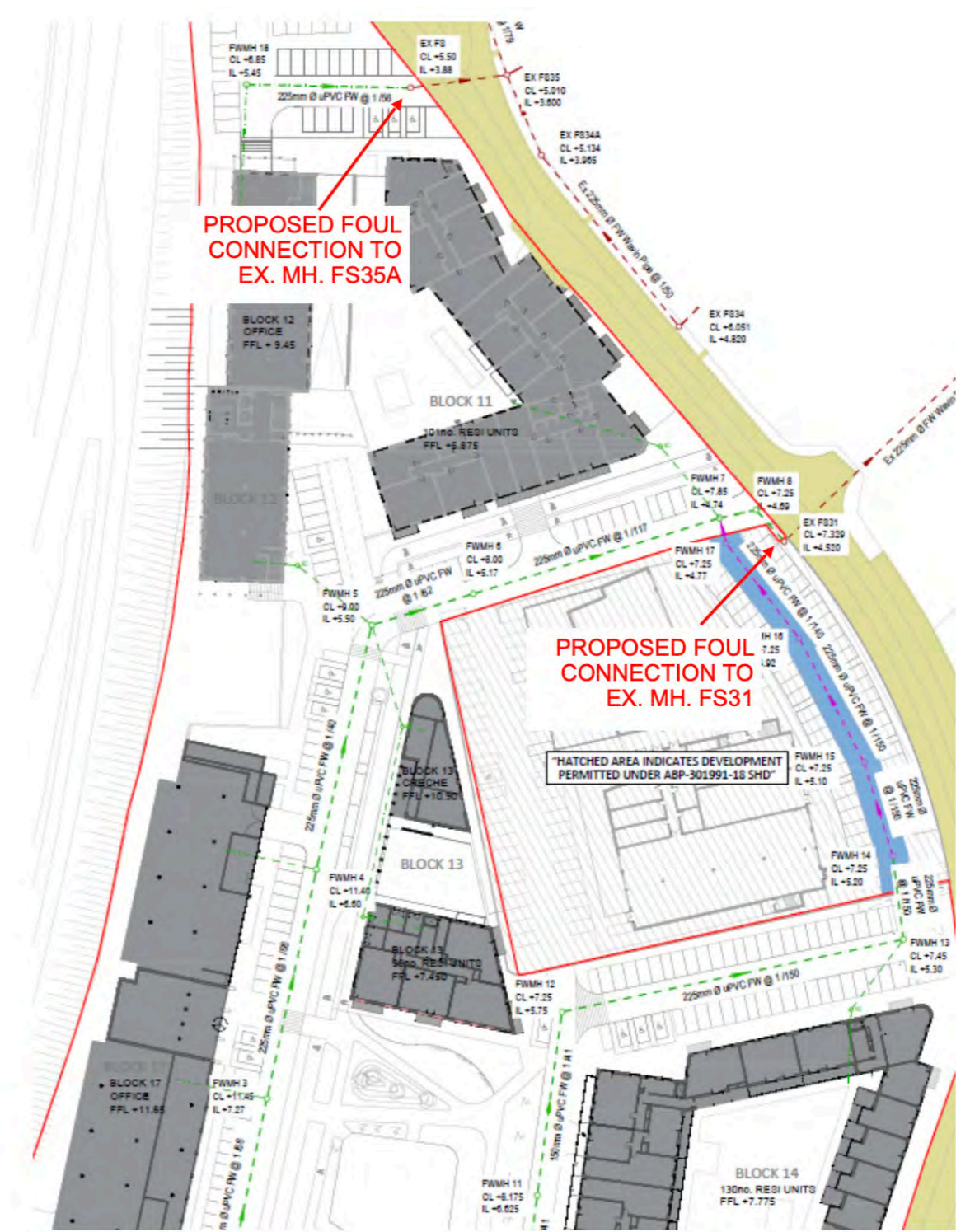


Figure 6.4 Proposed Foul Outfalls

Estimation of foul sewage outfall/overall water usage is based on the Irish Water Code of Practice. The predicted sewage outfall is calculated on a pro-rata basis in relation to the number of units and the gross commercial areas for the proposed development. The proposed development calculated discharge in each connection is summarised below:

**Connection to FS31:**

Average flow = 2.10 l/s

Peak flow = 11.90 l/s

**Connection to FS35:**

Average flow = 1.08 l/s

Peak flow = 5.65 l/s

### 6.3.3 WATER SUPPLY

The proposals for the water supply will involve taking a feed from the existing watermain located outside the site running along the spine road. Sluice valves will be provided at appropriate locations to facilitate isolation and purging of the system. Appropriately located 24-hour water storage will be provided within the new scheme, as required. Firefighting supply hydrants and sprinkler systems within the site will be fully detailed in accordance with the requirements of the Fire Safety Certificate.

The predicted water demand is also calculated on a pro-rata basis in relation to the number of units and the gross commercial areas for the proposed development, and it is estimated to 3.50 l/s for the average demand, and 17.40 l/s for peak demand.

A Pre-Connection Enquiry was submitted to Irish Water, the response to which confirmed that the proposed development can be serviced by the existing water infrastructure network in the area. A copy of the confirmation is included in Appendix 6-1.

A Design Acceptance has been issued by Irish Water confirming the feasibility of the new connections to the public watermains, and also verifying that the proposed network within the development is according to the Irish Water standards. A copy of the Design Acceptance is included in Appendix 6-2.

### 6.3.4 ELECTRICITY

The new SHD development will require diversion works as the existing network travels across the site. These modifications to the existing network could be done alongside works required to allow for the new permanent infrastructure for the SHD. The substations requirement for each block has been assessed and allowed for within architectural layouts.

### 6.3.5 TELECOMS

**EIR**

The proposed SHD development will consist of one incoming comms room per block. Each apartment block/commercial unit will have their own individual comms room to facilitate telecommunications. The new development will consist of separate underground networks connecting to all new apartment blocks and commercial units.

**Virgin Media**

According to Virgin Media records/website there is currently no Virgin Media services in the area. Having engaged with Virgin Media they expressed their willingness to extend their network to the proposed SHD

### 6.3.6 NATURAL GAS

The SDH development will be mainly relying on renewable energy sources for heat energy, so the gas will most likely be used as a peak / backup energy source for commercial buildings and spaces (TBC in the detailed design stage).

Where provided, the underground gas service pipes will tap into the existing distribution pipes (already brought to the site boundary) and distribute to individual buildings via GNI skids or gas meters

## 6.4 PREDICTED IMPACTS

The potential impacts are described according to the EPA document Guidelines for Information to be Contained in EIAR (2022). The impacts can be described as below, in terms of their quality, significance, duration, and type.

- Quality: Positive, Neutral, or Negative
- Significance: Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, or Profound
- Duration: Momentary (seconds to minutes), Brief (less than 1 day), Temporary (less than 1 year), Short-term (approximately 1 to 7 years), Medium Term (approximately 7 to 15 years), Long Term (approximately 15 to 60 years), or Permanent (more than 60 years).
- Type: Direct, Indirect, Cumulative, or Residual.

### 6.4.1 'DO NOTHING' SCENARIO

Under a 'Do Nothing' scenario, there would be no change in land use and consequently the impacts to the environment would stay the same.

### 6.4.2 CONSTRUCTION PHASE

In general, the excavation and removal of soil will result in a change to the site hydrology owing to the necessity to remove excessive rainwater ponding from the construction site and the potential disturbance to the surrounding road from construction spillage. However, the impact will be moderate provided the mitigation measures recommended are employed.

The impacts are described below for each individual underground element. Chapter 10 of this EIAR has also assessed the impacts of below ground services related to Noise and Vibration.

#### 6.4.2.1 Surface Water

The proposed development entails the construction of below ground services involving the laying of pipework in trenches which will involve digging and relocating excavated material on site. Excavations, if unrestricted, may result in localized ground pollution by spillage of hydrocarbons, fuels, or pollution from hazardous materials used in the construction process, which may cause a temporary moderate negative impact if the mitigation measures are not followed.

#### 6.4.2.2 Foul Water

Also, like the surface water network, the construction of below ground services will involve digging and relocating excavated material on site. Excavations, if unrestricted, may result in localized ground pollution by spillage of hydrocarbons, fuels, or pollution from hazardous materials used in the construction process, which may cause a temporary moderate negative impact if the mitigation measures are not followed.

#### 6.4.2.3 Water Supply

As other impacts at construction phase, the potential effects of installing new watermain connections taking the feed from the live watermain, may cause temporary moderate impacts, such as disruption to other services and users.

#### 6.4.2.4 Electricity

ESB to confirm all required ducting/infrastructure post planning.

The impact is likely to be neutral, imperceptible, and temporary.

#### 6.4.2.5 Telecoms

##### EIR

All EIR ducting will be laid in trenches in footpath/roads and will also require access chambers located at various points around the development (to be confirmed by EIR during detailed design stage after application has been made).

The impact is likely to be neutral, imperceptible, and temporary.

##### Virgin Media

According to Virgin Media records/website there is currently no Virgin Media services in the area. Having engaged with Virgin Media they expressed their willingness to extend their network to the proposed SHD

#### 6.4.2.6 Natural Gas

The construction of below ground services will involve digging and relocating excavated material on site. Excavations, if unrestricted, may result in localized ground pollution by spillage of hydrocarbons, fuels, or pollution from hazardous materials used in the construction process, which may cause a temporary moderate negative impact if the mitigation measures are not followed.

### 6.4.3 OPERATIONAL PHASE

#### 6.4.3.1 Surface Water

The proposed development will change the land-use from a non-developed site to a residential/commercial development. On completion, the majority of the site will then be covered by buildings or paved, resulting in a reduction in the amount of rainfall that infiltrates to the soil zone as rainfall will be diverted to storm water runoff from the site. This could have a permanent impact on this existing surface water sewers due to increasing the watercourse flow volume/discharge during heavy rainfall and may increase the flooding risk.

However, as mentioned in Section 6.2.1, the existing large diameter surface water sewers have sufficient capacity to service this development as the surface water strategy for the entire Jacobs Island has been designed and implemented as permitted by TP 00/24609. The proposed scheme is consistent with this design.

### 6.4.3.2 Foul Water

The new development will increase foul outfalls to the surrounding sewer network as detailed above in this chapter. From previous consultation with Cork City Council and the confirmation of design acceptance from Irish Water it is understood that the existing sewer network has sufficient reserve capacity to cater for these flows.

### 6.4.3.3 Water Supply

In general, new developments can cause difficulties for existing water supply and reduce the water pressure to other users. The volume of water required for the development is within the capacity of the existing water supply. The firefighting provisions will have no extra significance over and above another development of its kind.

### 6.4.3.4 Electricity

The impact of the proposed SHD development on the electricity supply is likely to be an increase in demand on the existing supply.

### 6.4.3.5 Telecoms

#### EIR

The existing EIR network is to be extended along proposed roadways/footpaths to serve the SHD. The potential impact of the development on the EIR network is likely to be neutral.

#### Virgin Media

According to Virgin Media records/website there is currently no Virgin Media services in the area. Having engaged with Virgin Media they expressed their willingness to extend their network to the proposed SHD

### 6.4.3.6 Natural Gas

The existing gas distribution pipework provided for the development seems to be adequately sized for 100% gas usage for the whole development. Given that the actual (if any) use of the gas will be used just for cover peak / backup up heat outputs, there is no risk of starving other consumers or distribution pipework of gas supply.

### 6.4.4 'WORST CASE' SCENARIO

Detrimental construction methods can lead to issues with the performance of the system. Increased volumes outfall/demand and local blockages can lead to overloading/ undersupply of the system.

### 6.4.5 CUMULATIVE IMPACT

Without a coordinated engineering design approach, there is potential for a clash of below ground surface water, foul water and watermain networks as well as proposed mechanical and electrical underground services.

The cumulative residual and operational impacts of the proposed development and the following projects have been assessed:

- Construction of an office and hotel development at Jacob's Island, Ballinure, Mahon, Cork (22/40809)
- Construction of 413 no. apartments, neighbourhood centre, creche, road improvement works including upgrades to the Mahon Link Road (R852) to the North of the N40 interchange to incorporate a dedicated bus lane and all site development works at Jacob's Island, Ballinure, Mahon, Cork (TA.301991)

The water distribution and drainage scheme for the proposed development need to take into consideration the demand / incoming flow to the proposed network, which includes the discharge from the Hotel & Office Scheme. Based on the areas and occupancy rates, the average daily water demand for the overall development becomes approximately 500 m<sup>3</sup>/day. The foul discharge in terms of peak flow (6 x DWF) is calculated as 28.70 l/s on completion of the future works.

It is noted that the Irish Water design acceptance was issued for the proposed development including the future works under Planning Ref. 22/40809.

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Plan, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting Strategic Environmental Assessment (SEA) Statement contained in Appendix 2(A) of the Draft Plan. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.

SEO MA objectives, Material Assets as detailed in Table 5-1 and 7-1 of the Draft Plan are to:

- Optimise existing infrastructure and provide new infrastructure to match population distribution proposals
- Ensure access to affordable, reliable, sustainable and modern energy for all which encourages a broad energy generation mix to ensure security of supply – wind, solar, hydro, biomass, energy from waste and traditional fossil fuels
- Promote the circular economy, reduce waste, and increase energy efficiencies
- Ensure there is adequate sewerage and drainage infrastructure in place to support new development.
- Reduce the energy demand from the transport sector and support moves to electrification of road and rail transport modes
- Encourage the transition to a zero-carbon economy by facilitating the development of a grid infrastructure to support renewables and international connectivity. Reduce the average energy consumption per capita including promoting energy efficient buildings, retrofitting, smart- buildings, towns and grids.

Table 7-5 of the SEA indicates that Scenario 3, the ‘Compact Liveable Growth Scenario’, identified as the preferred scenario, is determined likely to improve the status of SEOs to a greater degree and have potential to conflict with the status of SEOs – likely to be mitigated to a lesser degree.

## 6.5 MITIGATION MEASURES

The mitigation measures are designed to protect the existing utilities and ensure minimum to no disruption to the existing services. The mitigations are described below for the construction and operational phases.

### 6.5.1 CONSTRUCTION PHASE

In order to prevent the release of hazardous materials (fuels, paints, cleaning agents, etc) during construction site activity, all hazardous materials should be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks should be used on the site during the construction phase of the project. Safe material handling of all potentially hazardous materials should be emphasized to all construction personnel. The roads surrounding the site shall undergo regular cleaning to remove any spoil spilt during excavation and removal off-site.

### 6.5.2 OPERATIONAL PHASE

#### 6.5.2.1 Surface Water

The surface water drainage system for the entire site was installed and taken in charge of by Cork City Council in 2013. From the surface water modelling exercise undertaken at the time it was confirmed that the main network was more than adequate to cater for full storm discharge from the Jacobs Island present development.

In accordance with the current Storm Water Management Guidelines & following consultation with Greater Dublin Strategic Drainage Study (GSDS) Vol. 2 Section E2.1, it is intended to design this new development for SuDS. Therefore, the following measures will be considered.

- Open green areas and podium landscaping which will provide interception storage for between 5-10mm of rainfall and provide treatment by filtration through the planter soils. These planted areas will also provide a medium for removal of pollutants and will improve the quality of surface run-off discharging into the surface water drainage system.
- Petrol and Oil (Hydrocarbon) interceptors will be provided at all surface water discharge points of the development to the existing surface water drain. This is intended to prevent any deterioration of water quality in downstream watercourses. These interceptors will also include silt collection and storage capacity to prevent silt discharge from the development to the receiving environment.
- Non-return valves will be provided prior to the connection to the existing drainage network.
- In addition, tree pits, swales, soakaways, and another SuDS measure will be considered following an onsite infiltration test.

No other amelioration, remedial or reductive measures are considered necessary, apart from good practice in the hydraulics and engineering design of the surface water drainage system.

#### 6.5.2.2 Foul Water

No other ameliorative, remedial or reductive measures are considered necessary, apart from good practice in the hydraulics and engineering design of the foul water drainage system.

Given the use of appropriate secondary containment for the storage of fuel oils, paints and other potentially hazardous materials on the site during the construction phase, the risk of accidental release of these compounds to the environment will be greatly reduced.

#### 6.5.2.3 Water Supply

From previous discussion with Irish Water, it is considered that the current infrastructure should be sufficient to meet the development demands.

#### 6.5.2.4 Electricity

Provision of electrical supply will be carried out in accordance with the recommendations of ESB and Cork City Council (for public lighting).



## 6.5.2.5 Telecoms

### EIR

Provision of telecommunications supply will be carried out in accordance with the recommendations/specification of EIR.

### Virgin Media

According to Virgin Media records/website there is currently no Virgin Media services in the area. Having engaged with Virgin Media they expressed their willingness to extend their network to the proposed SHD.

## 6.5.2.6 Natural Gas

The existing gas distribution pipework provided for the development seems to be adequately sized for 100% gas usage for the whole development. Given that the actual (if any) use of the gas will be used just for cover peak / backup up heat outputs, there is no risk of starving other consumers or distribution pipework of gas supply.

## 6.5.3 MONITORING

### 6.5.3.1 Construction Phase

An environmental consultant should be retained on the project team to conduct periodic inspections of the construction site to ensure that any hazardous materials stored on the construction site are stored within appropriate secondary containment and that any surface water discharged off site during the construction is free from excessive sediment. The monitoring and maintaining cleanliness of exits from site and adjacent roads should also be conducted.

### 6.5.3.2 Operational Phase

Periodic inspections, emptying and maintenance of the hydrocarbon interceptors and foul network by a licensed waste disposal contractor will be undertaken. Smart water meters will be installed to monitor consumption within the development.

## 6.6 RESIDUAL IMPACTS

### Foul Water Drainage

No significant residual impacts from either the construction or operational phases of the development are likely, as a consequence of the connection to the foul water drainage network.

### Potable Water

No significant residual impacts from either the construction or operational phases of the development are likely, as a consequence of the connection to the potable water network.

### Power, Gas and Telecommunications

No significant residual impacts from either the construction or operational phases of the development are likely, as a consequence of the connection to the Power, Gas and Telecommunications networks.

## 6.7 INTERACTIONS

There is an interaction during construction between the various disciplines involved in the building process ranging through initial excavation and laying of underground services. There is also required interaction with the local authority and Irish Water at both design and construction stage in agreeing the design and construction details to their satisfaction.

## 6.8 APPENDICES

6-1 Irish Water Pre-Connection Enquiry

6-2 Irish Water Design Acceptance



JACOBS ISLAND



CHAPTER SEVEN  
Land, Soils & Geology

# CHAPTER SEVEN

## Contents

7	LAND, SOILS & GEOLOGY .....	7
7.1	INTRODUCTION .....	1
7.2	DESCRIPTION OF THE EXISTING BASELINE ENVIRONMENT.....	1
7.3	PROPOSED DEVELOPMENT.....	4
7.4	PREDICTED IMPACTS .....	5
7.5	MITIGATION MEASURES.....	6
7.6	RESIDUAL IMPACTS.....	7
7.7	APPENDICES .....	8

# CHAPTER SEVEN

## LAND, SOILS & GEOLOGY

### 7.1 INTRODUCTION

This chapter describes the type of land, soil, and geology likely to be encountered around the general area of the proposed development. It also assesses and evaluates the likely significant impacts of the proposed development on the existing environment and identifies mitigation measures to minimise any impacts.

#### 7.1.1 RELEVANT GUIDELINES

This chapter has been prepared in accordance with the overarching Environmental Impact Assessment Report guidance and in accordance with, but not limited to, the following relevant guidelines:

- Department of Housing, Planning and Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022); and
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report;
- The EU Water Framework Directive (WFD), 2000/60/EC;
- The Groundwater Directive, 2006/118/EC;
- European Communities (Water Policy) Regulations 2014 (S.I. No. 350 of 2014);
- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010), as amended by the European Communities Environmental Objectives (Groundwater) (Amendment) Regulations 2011 (S.I. No. 389 of 2011) and the European Communities Environmental Objectives (Groundwater) (Amendment) Regulations 2012 (S.I. No. 149 of 2012) and the European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016 (S.I. NO. 366 of 2016);

#### 7.1.2 METHODOLOGY

This impact assessment has been undertaken in accordance with the EU Commission Guidance on the preparation of an Environmental Impact Assessment Report (EIAR), Department of Housing, Planning and Local Government (DHPLG) guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, and the Environmental Protection Agency (EPA) guidelines on the preparation of an EIAR, along with the Institute of Geologies of Ireland (IGI) guidance. The IGI guidelines outline a 13-step methodology that is divided across four distinct elements:

- Element 1: Initial Assessment (Steps 1 to 5)
- Element 2: Direct and Indirect Site Investigation and Studies (Steps 6 to 9)
- Element 3: Mitigation Measures, Residual Impacts and Final Impact Assessment (Steps 10 to 12)

- Element 4: Completion of the Soils, Geological & Hydrogeological Sections of the EIS (Step 13)

The existing soils and geology have been interpreted from desktop information and project specific ground investigations. The current baseline represents the do-nothing scenario. The subsequent section within this chapter considers the effects that construction and operational practices will have on the surrounding environment.

#### 7.1.3 DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION

There were no difficulties encountered in compiling information for the existing environment.

### 7.2 DESCRIPTION OF THE EXISTING BASELINE ENVIRONMENT

The site is located within in Jacobs Island, Mahon which is located to the east of Cork City and within the city environs. The site is located to the south of the N40 (south Link Road) and to the north and to the east, north and west of the Jacobs Island Spine Road. Reference site location below.

#### 7.2.1 EXISTING SITE

The existing site comprises undeveloped lands within the overall Jacobs Island development.

The existing site levels slope from the north boundary of the site along the N40 South Link Road where levels are around +12.40 and +13.10, to the south/eastern boundary along the residential access road, where levels fall from +8.10 to +5.20.

#### 7.2.2 SITE HISTORY

The detailed site history is outlined in chapter 2 of the EIAR. The key features of the site development are as follows.

- The site is represented as Agricultural Lands associated with Lakeland House on the OSI Historic 25" map (1888-1913)
- After this time, it is understood that the lands were used locally as Allotments.
- The Southern Ring Road (N40) was constructed in the late 1990's and this formed the current Northern boundary of the development Site.
- The main access spine road to the Jacobs Island development was constructed in 2006, thus forming the southern boundary.
- During the construction of the Jacobs Island Development a construction access to the site compound was provided through the lands.

### 7.2.3 REGIONAL TOPOGRAPHY

As noted above the site levels vary from North to South. The lands to the south continue to slope towards the Lough Mahon Estuary. The road levels on Lough Mahon Drive are at approximately 5.0 m OD. The lands slope further to approximately 3.0 m OD at the foreshore to the estuary.

### 7.2.4 REGIONAL BEDROCK

During the Carboniferous Period (circa 300 million years ago), limestone was deposited in what were then the shallow tropical seas of the north Munster shelf. This limestone was laid down on Devonian old red sandstone. At the end of the Carboniferous Period, the rocks of the south Cork region were uplifted, folded and faulted by Variscan orogeny (mountain building period). This gave rise to a series of steep-flanked and sometimes overturned anticlines and synclines, extending from Waterford to Kerry. The anticlinal ridges have brought the old red sandstone to the surface, with the Carboniferous limestone having been eroded from the ridge crests.

As a result, the geomorphology of the south Cork and Cork harbour region is characterised by elongate east-northeast to west-southwest valleys separated by intervening ridges. Devonian old red sandstones generally form the high ground, and Carboniferous limestones are generally exposed in valleys. The geology of the site and surrounding area is shown in Figure 2 below.

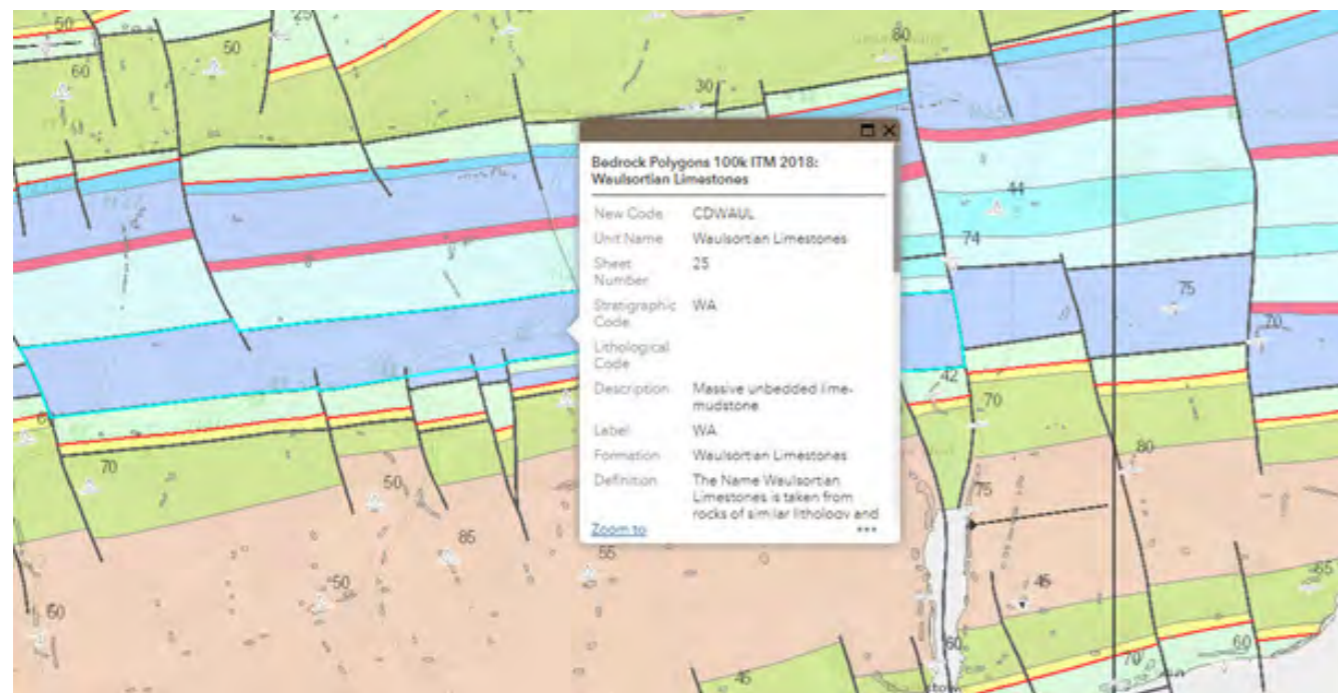


Figure 7.1 - Bedrock Geology 100k extract from GSI maps

The bedrock geology Sheet 25 prepared by the Geological Survey of Ireland (GSI), with the supporting document “Geology of South Cork”, indicate that the site is underlain by Carboniferous limestone. Three separate formations have been identified in Ballinure and the site is proximate to all three.

### 7.2.5 REGIONAL SOILS

The Quaternary Period, which extends from the beginning of the last Ice Age (1.6 million years ago) to the present, is the

last period of the geological timescale. Sediment composition for this period varies depending on the type of substrate that the ice flowed over. Most of the surface deposits in the south Cork area were deposited during the Quaternary Period, largely during the Ice Age itself. They were deposited directly from the glacier ice or the melt water flowing from it. In the former case it became boulder till or boulder clay (mixture of sediments ranging in size from clay to boulders), and in the latter case it was sorted and deposited separately as gravel, sand, silt or clay. Postglacial deposits generally take the form of river alluvium along the valleys of main rivers.

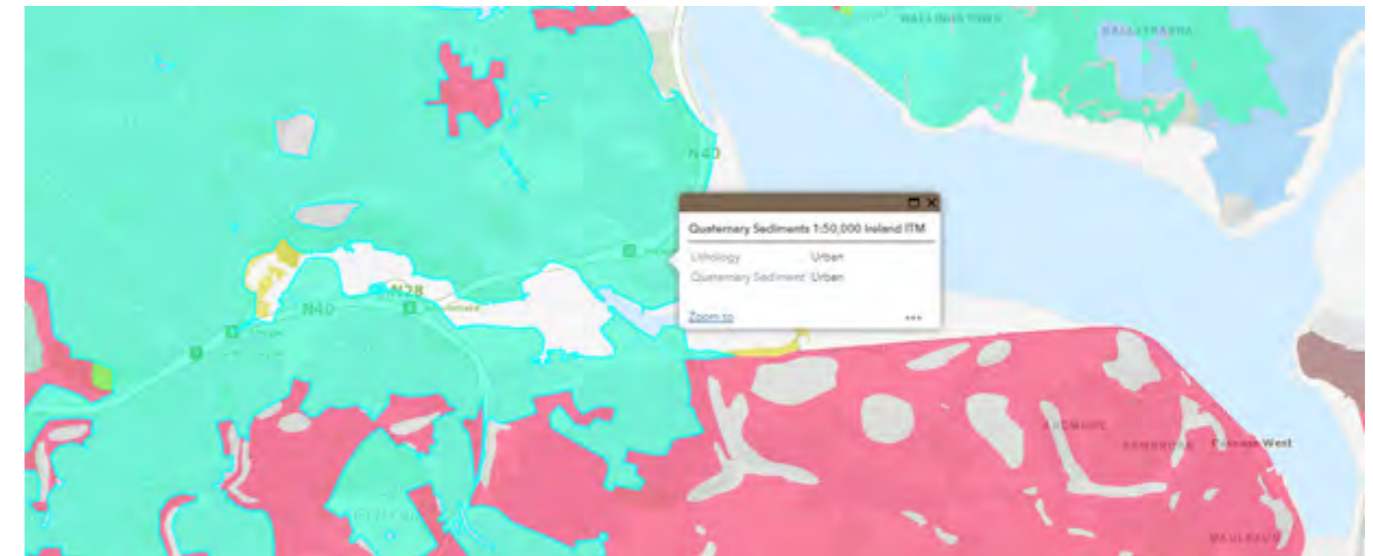


Figure 7.2 - Quaternary Sediments extract from GSI maps

### 7.2.6 REGIONAL HYDROLOGY

We have consulted the Geological Survey of Ireland groundwater resources aquifer map, and this identifies a regionally important aquifer beneath the site. The aquifer is orientated in an east-west orientation.

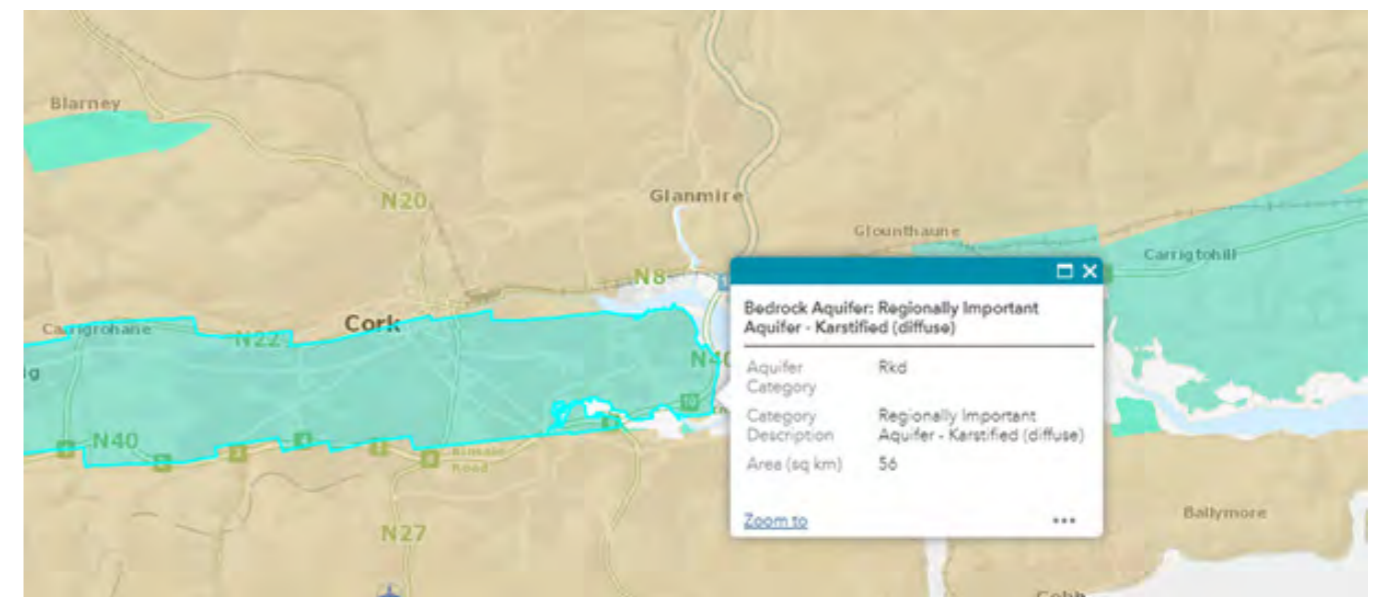


Figure 7.3 - Bedrock Aquifer extract from GSI maps

Groundwater recharge mapping indicates an average recharge of 140 mm/year.

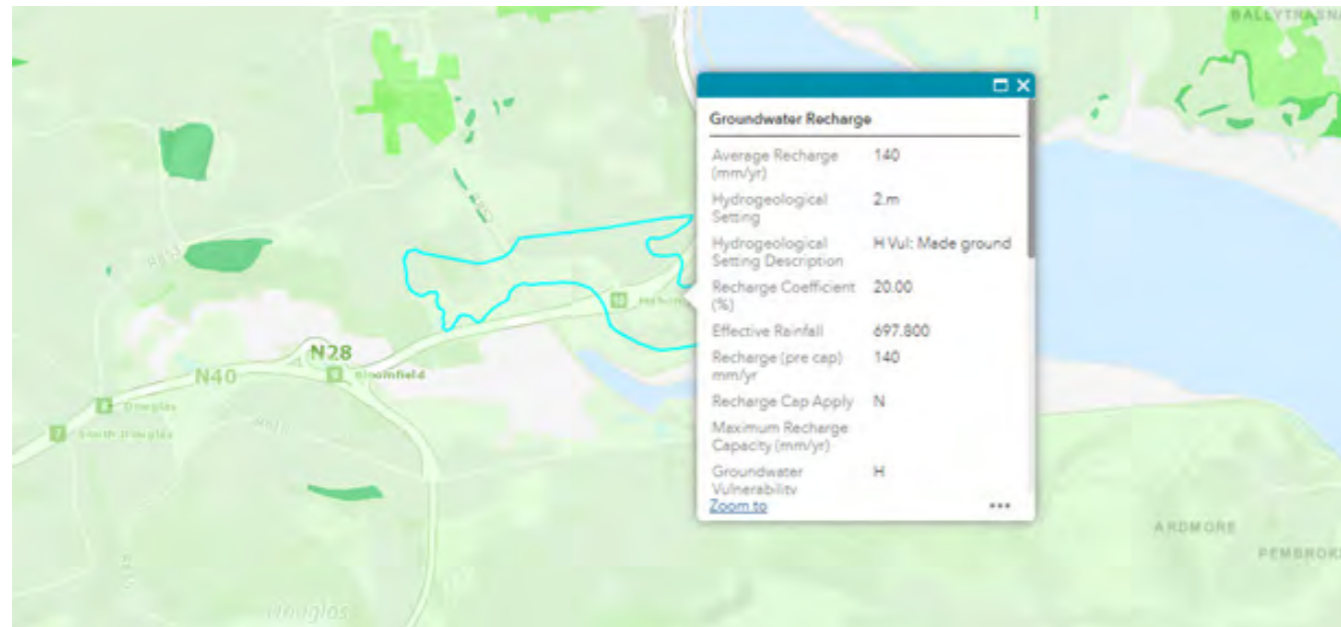


Figure 7.4 - Groundwater recharge extract from GSI maps

The bedrock aquifer is unlikely to receive any direct discharge from the site, given its depth, as the more likely discharge is to the adjacent Lough Mahon Estuary.

The GSI mapping give detail on the aquifer vulnerability. According to this mapping the aquifer vulnerability is noted as High.

1. Hydrology

The catchment for the site is the adjacent Lough Mahon Estuary which outfalls to Cork Harbour. The adjacent estuary is tidal. The hydrology of the site and surrounding areas is described in detail in the Chapter 8 of this EIAR.

The bedrock aquifer is unlikely to receive any direct discharge from the site, given its depth, as the more likely discharge is to the adjacent Lough Mahon Estuary.

The GSI mapping give detail on the aquifer vulnerability. According to this mapping the aquifer vulnerability is noted as High.

7.2.7 HYDROLOGY

The catchment for the site is the adjacent Lough Mahon Estuary which outfalls to Cork Harbour. The adjacent estuary is tidal. The hydrology of the site and surrounding areas is described in detail in the Chapter 8 of this EIAR. 2.

7.2.8 LOCAL GEOLOGY

The following Site Investigations have been carried out at the site and vicinity as follows.

- Priority Geotechnical Block 10, Jacob’s Island Interpretative report. - June 2021
- Priority Geotechnical Block 10, Jacob’s Island - Geophysical Survey Report - June 2021
- Geotech – Mahon Point Site Investigation Report – 1999.

Site investigations carried out at the site demonstrate that the site has a relatively consistent geological make up.

- Made Ground: Made ground was discovered at only one exploratory hole position (BH A6), comprising a thin (0.4m) layer of topsoil and hardcore adjacent to a roadway.
- Alluvial Deposits: There were no alluvial deposits observed within the proposed development site.
- Glacial Deposits: Glacial deposits comprising of sandy and gravelly clay, sandy gravel, and gravelly sand were encountered underlying the topsoil. The maximum observed depth of the deposits was 20.1m below ground level (8.8m below O.D.) at BH A8. Generally, gravelly cohesive deposits were observed to depths of between 2m and 7m below ground level (0.1m to 5.4m below O.D.), overlying more granular deposits.
- Bedrock: Bedrock was proved by open hole rotary drilling at several locations. The top of the bedrock was observed at depths of between 12.5m in Borehole A13 (5m below O.D.) and 20.1m in Borehole A8 (8.8m below O.D.).
- Evidence of groundwater has been recorded during the site investigations carried out to date. Groundwater was observed within borehole BH A46 at a depth of 8.5m and within Borehole BH A3 at a depth of 7.50m (-1.84m O.D.).
- No artesian groundwater pressure was recorded within the bedrock. Gas monitoring of the standpipes indicated low levels of methane, carbon dioxide, and hydrogen sulphide, and moderate levels of oxygen.

A summary of rock head levels for six no. boreholes are given in the Table 1 below. A site investigation plan for these borehole locations is attached at appendix 7.1.

Borehole Ref.	Top of Limestone Bedrock	
BH A3	13m BGL	-7.34m O.D.
BH A5	18.2m BGL	-10.00m O.D.
BH A8	20.1m BGL	-8.85m O.D.
BH A11	14.4m BGL	-6.85m O.D.
BH A13	12.5m BGL	-5.06m O.D.
	19.5m BGL	-12.06m O.D.
BH A46	13.3m BGL	-5.55m O.D.

Table 7.1 Borehole Logs – Rock Head Levels

The material encountered in all boreholes was similar and in general consisted of Made Ground, which overlies Cohesive Glacial Deposits that rests on Granular Glacial Deposits that overlies the Limestone Bedrock. The bedrock is Lower Carboniferous age Waulsortian, Little Island & Lough Mahon formations, comprising steeply dipping limestone that extends from 12.5m BGL to 20.1m (max recorded) BGL.

The above description represents the order of occurrence of the soil strata below the ground surface. However, at specific locations one or more strata may be absent or the order of occurrence may vary.

An Independent Laboratory tested samples recovered during the site investigation for contaminants. As there are no Irish soil screening values for human health screening, the EPA 'recommends the use of Generic Assessment Criteria (GAC), based on the UK EA Contaminated Land Exposure Assessment (CLEA) model, either produced by the UK Environment Agency (EA) itself (known as Soil Guideline Values/SGVs) or values generated using the CLEA model by reputable third-party organisations such as Land Quality Management (LQM) or Contaminated Land: Applications in Real Environments (CL:AIRE). Where GAC have not been published or if practitioners don't use human health GAC publications, values should be generated by appropriately qualified and experienced professionals using the CLEA model to ensure consistency with the EPA approach'.

The samples in all cases were discovered to be uncontaminated. A further assessment using the CLEA model will be undertaken to confirm this prior to the commencement of the works.

Waste acceptance criteria leachate 10:1 mg/kg levels were assessed. All determinants were within inert limits for the samples assessed.

### 7.2.9 LOCAL HYDROGEOLOGY

During the 1999 and the 2021 site investigations ground water was only observed in some of the boreholes at between 7.5 m and 6.0 m below ground level.

### 7.2.10 EPA LICENSED FACILITIES

It is noted that, according to the EPA map data viewer, there are no EPA licenced facilities within the vicinity of the site.

## 7.3 PROPOSED DEVELOPMENT

Chapter 2 of this EIAR describes in detail the elements of the proposed development. This section describes the possible changes to the land, soil and geology caused by the ground works required to allow for the construction of the development.

During the excavation works cutting and filling will occur on site with re-profiling of the site to accommodate development areas. The proposal will allow for an approximate cut volume of 18,500m<sup>3</sup> to allow for the excavation to formation levels and construction of the basement car park. Excavated material will consist of topsoil and suitable engineered and non-engineered fill material and this will be retained onsite for future use.

Due to site topography, many areas will require fill material to reach the proposed levels, the amount of fill estimated for leveling the ground is around 19,000m<sup>3</sup>, likely re-utilizing all excavated ground. Nevertheless, should it become necessary, any material to be exported off site will be transported to a suitably licensed facility. All material is anticipated to be classified as Inert.

The main works to be carried out below existing ground levels include, but are not limit to, the following:

- Developing basement car park.
- Accessing existing services.
- Stripping and excavating of existing subsoil and fill materials.
- Foundation works to high-rise structures.
- Drainage works.

All buildings structures will be supported on piled foundations, subject to further detailed design. Formation levels across the site will vary and they are anticipated to the various areas as 5.65m OD (Block 11), 7.0m OD (Block 12), 6.85m OD (Block 13), 6.8m OD (Block 14), 7.5m OD (Block 15).

It is proposed to use reinforced concrete or secant piles retaining wall along the perimeter of the basement's car park, with suspended RC slabs at podium deck levels. Temporary retaining works are also likely to be required for the support of embankments during excavation and construction works.

After the buildings' foundations and basements car parks, the underground services will be the next major aspect of the development.

Trenches shall be dug to make the connection to existing services and lay the new pipework for drainage and water distributions, as well as for gas tubulations, and telecommunications cables. No service diversion is appointed on records to be completed before building the proposed scheme.

During the temporary works, any surface water that accumulates on the excavation base will be gathered locally and discharged to the local sewer, after passing through silt traps and oil interceptors, if deemed necessary, within the construction site.

The final developed site will then consist of buildings, hard standing and public open spaces. Any areas that are developed as public open space will be completed as necessary with imported and site won clean soil. Any building area in confined space with limited ventilation will be built with suitable protection against ground gas and vapours, subject to a detailed risk assessment.

It is noted that the site finished floor level will be above the typical ground water level in the glacial deposits and made ground.

## 7.4 PREDICTED IMPACTS

The potential impacts are described according to the EPA document Guidelines for Information to be Contained in EIAR (2022). The impacts can be described as below, in terms of their quality, significance, duration, and type.

- Quality: Positive, Neutral, or Negative
- Significance: Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, or Profound
- Duration: Momentary (seconds to minutes), Brief (less than 1 day), Temporary (less than 1 year), Short-term (approximately 1 to 7 years), Medium Term (approximately 7 to 15 years), Long Term (approximately 15 to 60 years), or Permanent (more than 60 years).
- Type: Direct, Indirect, Cumulative, or Residual.

### 7.4.1 DO-NOTHING SCENARIO

According to previous SI Reports, the site is found to be stable and un-contaminated. Based on this information, there is no short, medium or long-term adverse negligible effect to site users.

### 7.4.2 CONSTRUCTION PHASE

The works within the proposed development that may have an impact on the existing geological and soil environment are as follows.

- Removal of the existing topsoil from the site – with stockpile storage for re-use.
- Soil for future re-use on site and for export of the surplus soil material off site.
- Groundwater and risk of flooding during excavation

#### 7.4.2.1 Stockpiled material

Excavation works will require the on-site stock piling of both topsoil material for re-use as well as for suitable excavated material be reused for as engineered fill material for buried structures suitable backfill as well as non-engineered fill material for other uses.

The material, if kept in an unprotected storage, could be a source of dust pollution to the construction workers and local residents, creating a temporary significant negative impact to the surroundings.

#### 7.4.2.2 Material to be transported off site

All material to be transported off the site will be subject to an appropriate licencing. It is anticipated that all material will be classified as Inert. Appropriate environmental measures will need to be employed to ensure that the material does not become a source of pollution.

#### 7.4.2.3 Groundwater on excavation works

The site investigation report noted groundwater in deep levels in a few boreholes across the site. Even though the water strike levels were noted deeper than the proposed excavation levels, there could be a minimal possibility of reaching groundwater during excavation works. In this unlikely event, the water could increase a risk of local flooding in the site area, therefore having a brief negative impact in the environment.

#### 7.4.2.4 Soil contamination during ground works

The traffic movement in and out of site during construction, such as deliver vehicles, HGV and concrete trucks, could have a negative impact on the local geology if no good measures are employed. These vehicles and trucks could spill fuel, concrete, and any other carried material that could contaminate the ground, causing a long-term impact to the environment.

### 7.4.3 OPERATIONAL PHASE

As the development will be constructed well above the local aquifer, with no foundations penetrating it, it is not anticipated that there will be any operational impacts on the aquifer. There also will be no impacts on the geology or the site users during the operational phase.

### 7.4.4 CUMULATIVE IMPACTS

The cumulative residual and operational impacts of the proposed development and the following projects have been assessed:

- Construction of an office and hotel development at Jacob's Island, Ballinure, Mahon, Cork (22/40809)
- Construction of 413 no. apartments, neighbourhood centre, creche, road improvement works including upgrades to the Mahon Link Road (R852) to the North of the N40 interchange to incorporate a dedicated bus lane and all site development works at Jacob's Island, Ballinure, Mahon, Cork (TA.301991)

Following good construction practice and the mitigation measures proposed in the following section 7.5, the potential cumulative impacts of the proposed development can be considered as a slight and neutral impact on the surround environment.

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Plan, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting Strategic Environmental Assessment (SEA) Statement contained in Appendix 2(A) of the Draft Plan. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.



SEOs objectives as detailed in Table 5-1 and 7-1 of the Draft Plan are to:

- Protect soils against pollution, and prevent degradation of the soil resource;
- Promote the sustainable use of infill and brownfield sites over the use of greenfield sites; and
- Safeguard areas of prime agricultural land and designated geological sites.

Table 7-5 of the SEA indicates that Scenario 3, the 'Compact Liveable Growth Scenario', identified as the preferred scenario, is determined likely to improve the status of SEOs to a greater degree and have potential to conflict with the status of SEOs – likely to be mitigated to a lesser degree.

## 7.5 MITIGATION MEASURES

The mitigation measures are designed to protect the existing environment and ensure minimum to no impact to the local geology. The mitigations are described below for the construction and operational phases.

### 7.5.1 CONSTRUCTION PHASE

The excavation works generate a great volume of material to be kept on site for future use. This material will require to be stockpiled locally on site, in a protected area, to avoid this material to become a source of dust pollution.

As highlighted in section 7.4.2.3, during the excavation works, there is a slight possibility to reach groundwater in localised areas. In order to control any possible groundwater in the areas being excavated, the contractor will require to isolate the area by digging trenches to the perimeter of the foundation area with suitable falls and sumps. The perimeter drain in an open excavation such as a basement, should include French drains as per the following extract from CIRIA C532.

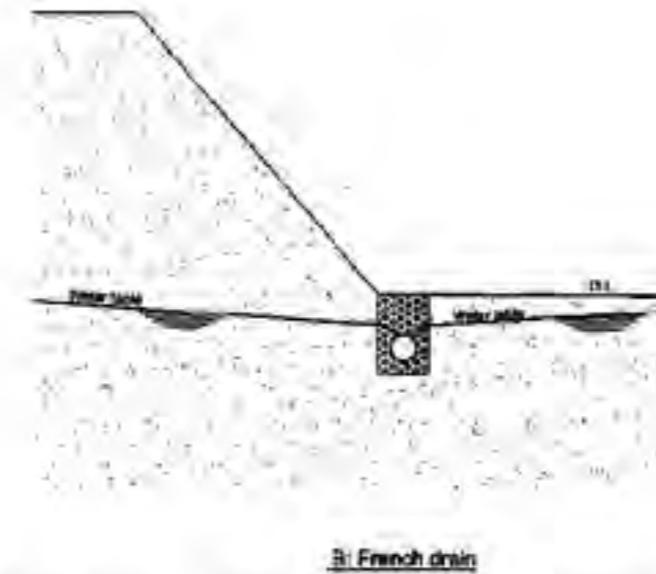


Figure 6.42 Schematic section showing water control methods

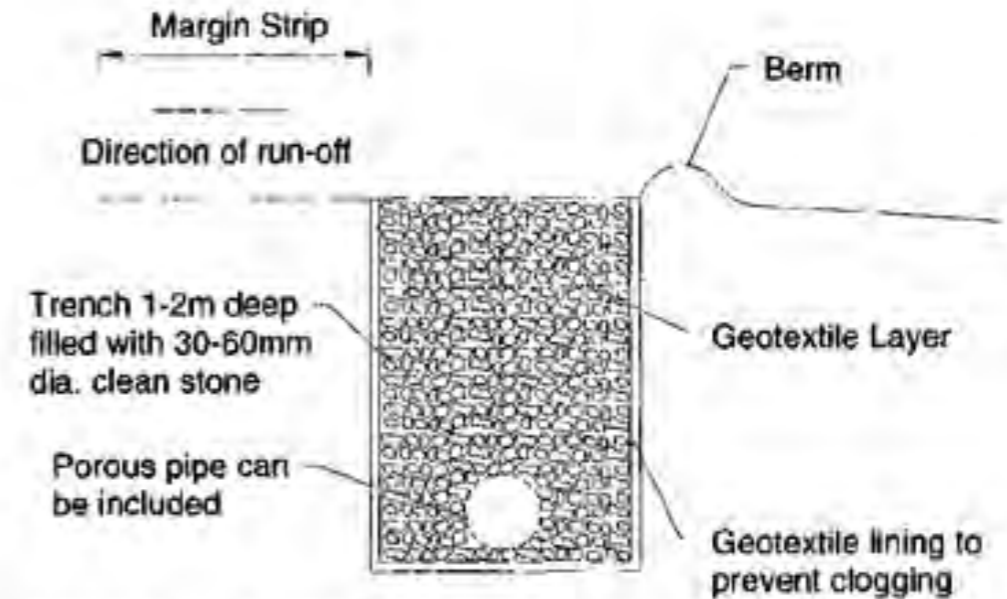


Figure 6.43 Typical filter drain detail

Figure 7.5 – Typical Filter Drain Detail (CIRIA C532 Control of water pollution from construction Sites)

Discharge of ground water should be via silting ponds where suspended solids can be removed, and the water quality can be monitored. The following extract from CIRIA C532 provides a cross section through a typical silting pond.

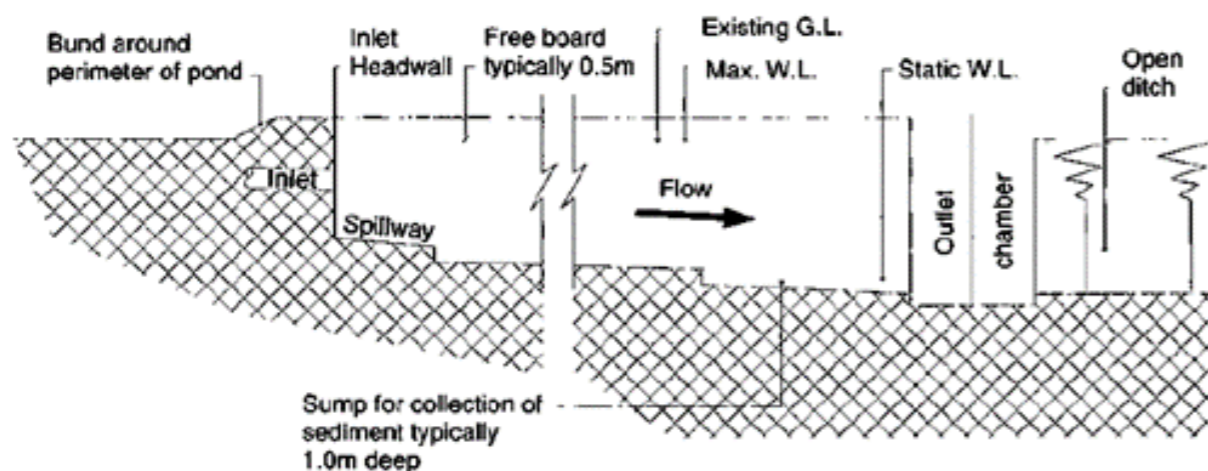


Figure 7.6 – Typical Silting Pond Detail (CIRIA C532 Control of water pollution from construction Sites)

At the delivery and wash down point it is important that good measures are employed to prevent spillages from concrete delivery trucks contaminating the ground.

A designated fuel transfer area should be provided on site, and this is typical good practice on well managed construction sites. The contractor will be required to install an impermeable paved and bunded area that is capable of handling and intercepting a fuel spillage. All tanks should be fully bunded and placed on a firm and secure foundation as per the following sketch from CIRIA C532.

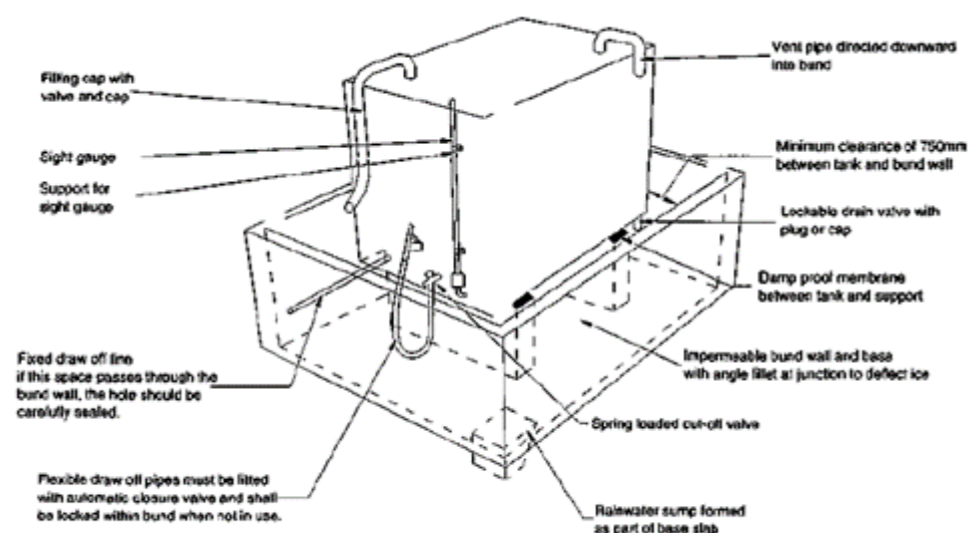


Figure 7.7 – Typical Fuel Bunding area (CIRIA C532 Control of water pollution from construction Sites)

Concrete should always be placed in a controlled method to prevent spillages as is good construction practice. Where possible concrete should be placed using a concrete pump. As noted above it is important that the machinery is well maintained.

If the mitigation measures are put in place and a risk assessment is carried out in advance of and during the works, the significance of these impacts will reduce to imperceptible.

### 7.5.2 OPERATIONAL PHASE

No significant effects are highlighted during the operational phase.

### 7.5.3 MONITORING

A Resident Engineering Consultant will be retained on the site to monitor the construction. If the suggested mitigation and control measures are put in place and a risk assessment is carried out in advance of and during the works, the significance of the noted impacts will reduce to imperceptible.

## 7.6 RESIDUAL IMPACTS

There is an interaction during construction between the various disciplines involved in the building process ranging through excavation and ground works, storage/relocating materials on/off site, and hydrology regarding water quality.

The soil and geology impacts described in this chapter could interact with the hydrology impacts, as some sources of water pollution could arise in the construction site during excavation and ground works, such as the following.

- **Suspended Solids;** The contractor is to employ measures to ensure that water pollution does not arise as a result of suspended solid pollution. Sources of suspended solid pollution include, excavation, earth stockpiles, plant and wheel washing, build-up of mud on site roads. Good practice construction measures are proposed in the following sections that the contractor will be required to employ to ensure that suspended sediments from the above potential sources do not enter the watercourse.
- **Oils and Hydrocarbons;** Oils are a potential source of pollutants on a construction site. Diesel, lubricating oil, fuel, petrol, and hydraulic fluids are used quite readily on construction sites for various types of machinery and refuelling and maintenance are required regularly on sites. The contractor will need to employ good practice measures to prevent these potential pollutants entering the water course. These measures will include bunded areas for the storage of fuels, regular maintenance of machinery to ensure that no leakages occur, measures to protect the site from vandalism and the provision of a designated refuelling area on site or refuelling off site.
- **Concrete and Cement Products;** It is important the cement products are carefully stored to withstand various weather conditions such as heavy rainfall and high winds to prevent run off and dust pollution. Concrete products can cause contamination during wash down of the trucks which can cause a large volume of uncontrolled runoff. Good practice measures can be employed on site to prevent such uncontrolled runoff by the use of a special impermeable bunded slab with a collection point and siltation for such operations

With the implementation of the mitigation measures proposed during construction, the potential adverse effects on human health, controlled waters and vegetation will be either not significant or imperceptible significance. No residual effects are anticipated from the operational phase.

## 7.7 APPENDICES

### 7.1 Site Investigation Plan



JACOBS ISLAND



## CHAPTER EIGHT

Water (Hydrology & Hydrogeology)

# CHAPTER EIGHT

## Contents

8	WATER (HYDROLOGY & HYDROGEOLOGY).....	8
8.1	INTRODUCTION .....	1
8.2	PROPOSED SHD DEVELOPMENT .....	1
8.3	METHODOLOGY.....	1
8.4	DESCRIPTION OF EXISTING BASELINE ENVIRONMENT .....	3
8.5	PROPOSED DEVELOPMENT .....	5
8.6	FLOOD RISK IDENTIFICATION .....	6
8.7	IMPACT ASSESSMENT .....	11
8.8	MITIGATION MEASURES .....	12
8.9	INTERACTIONS .....	13
8.10	RESIDUAL IMPACTS .....	13
8.11	WORST CASE SCENARIO .....	13
8.12	CONSTRAINTS ENCOUNTERED .....	13
8.13	MONITORING.....	13
8.14	SUMMARY OF IMPACTS .....	13
8.15	REFERENCES .....	13

# CHAPTER EIGHT

## HYDROLOGY & HYDROGEOLOGY

### 8.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential impact of the proposed development on the surrounding surface water, groundwater and hydrological and hydrogeological environments, additionally identifying proposed mitigation measures to minimise any impacts.

The assessment must consider the potential for non-conformance with the EU Water Framework Directive (WFD) (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for the Community action in the field of water policy) objectives and ensure that:

- The need for the avoidance and reduction of impacts on the water environment is taken fully into account in the environmental evaluation; and
- The selection of appropriate means of preventing any significant predicted impact is made through mitigation or modification of the design where necessary, with the objective of designing-out potential adverse environmental impacts.

### 8.2 PROPOSED SHD DEVELOPMENT

Refer to Chapter 2 (Project Description) for further details on the proposed development.

### 8.3 METHODOLOGY

This assessment complies with the requirements for an EIAR and has been prepared in accordance with the Environmental Protection Agency (EPA) guidance documents ‘Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022’.

A description of the impact i.e. the “quality” of the effects (i.e. whether it is adverse or beneficial), the “significance” of the effects (i.e. the magnitude of the effect in terms of the environment), the “probability” of the event occurring, the “duration” of the effects (i.e. whether it is short-term, long-term, etc.) and the significance/sensitivity of the existing environment have been considered in the appraisal methodology as required by the EPA EIAR guidance.

The appraisal of the potential impacts of the proposed development on the surrounding surface water and hydrological environments included the following:

- Review of the proposed SHD development layout and proposed drainage.
- Review of existing topographic survey information (available survey undertaken in 2004 and LiDAR data).
- Review of site investigation in 1999 and 2021.
- Review of information available on relevant water features in the Environmental Protection Agency (EPA)

online mapping service [www.catchments.ie](http://www.catchments.ie).

- Review of information available on the Geological Survey of Ireland (GSI) online mapping service.
- Review of Environmentally Protected Areas proximate to the site in the National Park and Wildlife Service website [www.npws.ie](http://www.npws.ie).
- Review of Office of Public Works (OPW) National Flood Hazard Mapping and Catchment Flood Risk Assessment and Management Studies (CFRAM Studies) and the Irish Coastal Wave and Water Level Modelling Study (ICWWS) Phase 1, in order to identify potential for flood risk.
- Review of Cork City Development Plan 2015-2021 and Draft Cork City Development Plan 2022-2028.
- Review of Planning Applications in the area using Cork City Council (CCC) Online Planning Applications Service.
- Review of utility records at the site.

#### 8.3.1 IMPACT ASSESSMENT METHODOLOGY

An assessment of the predicted impacts of the proposed development on hydrology and hydrogeology during and after the construction phase, as per Annex IV of Directive 2014/52/EU and EPA Guidance notes (2017) is presented in the following section.

- The following considerations have been used for the impact assessment:
- Quality of an Impact: Described as being Positive, Neutral or Negative.
- Significance of an Impact: The significance of each impact was considered as having either an Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant or Profound impact.
- Duration of Impacts: The duration of each impact was considered to be either momentary, brief, temporary, short-term, medium-term, long-term, permanent or a reversible impact. Momentary impacts are impacts lasting from seconds to minutes. Brief impacts are considered to last less than a day. Temporary impacts last less than a year. Short-term impacts are seen as impacts lasting one to seven years. Medium-term impacts are impacts lasting 7 to 15 years. Long-term impacts are impacts lasting 15 to 60 years. Permanent impacts are impacts lasting over 60 years and Reversible impacts are impacts that can be undone, for example through remediation or restoration.

#### 8.3.2 DATA SOURCES

The following online resources were used to inform the impact assessment for Hydrology and Hydrogeology:

- Environmental Protection Agency (EPA) Online Mapping Service: <https://gis.epa.ie/EPAMaps/Water> and [www.catchments.ie](http://www.catchments.ie)
- GSI Open Topographic Data Viewer for extracting LiDAR data: <https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b7c4b0e763964070ad69bf8c1572c9f5>
- Geological Survey of Ireland (GSI) Public Data Viewer <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>
- National Parks and Wildlife Services (NPWS) GIS dataset: [www.npws.ie](http://www.npws.ie)
- Office of Public Works (OPW): [www.floodinfo.ie](http://www.floodinfo.ie)

#### 8.3.3 CONSULTATION

Inland Fisheries Ireland (IFI) and Irish Water were consulted to understand their concerns for the proposed development. The concerns expressed relating to Water are outlined in the following paragraphs.

IFI requested confirmation of sufficient capacity in the existing drainage network and treatment facilities to take the discharges from the proposed development. They expressed the need to complete an impact assessment if any new structures or disturbance was planned for any watercourses. The IFI also expressed a concern for the escape of pollutants such as suspended solids to waters.

Irish Water requested consideration of the potential negative impacts on water sources and that mitigation measures should ensure a zero risk to such water sources. Irish Water directed that the appropriate documentation is required to be completed to connect to the public water supply or sewage collection system and the location of assets for such connections should be pre-determined. Irish Water recommended the separation of surface water from foul water networks to minimise surface water contributions to combined sewers. Any relocation of Irish Water assets or discharge points to be considered in the EIAR. Any impact on the catchment of a water source or potential impacts on water quality or on sensitive areas to be considered.

### 8.3.4 EXISTING MAPPING AND SURVEYS

Discovery series mapping and Topographical Survey (LiDAR) mapping were examined to identify water features at or near the site and to provide information on the hydrological regime for the existing site. A topographic survey taken on the site in 2004 was also examined.

#### 8.3.4.1 Discovery Series mapping

An extract from Discovery series mapping can be seen in Figure 8.1. The mapping indicates a lake/marshy area feature located to the south of the proposed development on the shore at Lough Mahon. The lake feature is to the east of Joe McHugh Park. A similar feature exists to the west of the Loughmahon Peninsula at Crawfords Quay. Both of these features are approximately 125 m to the south of the site boundary for the Proposed SHD Development.

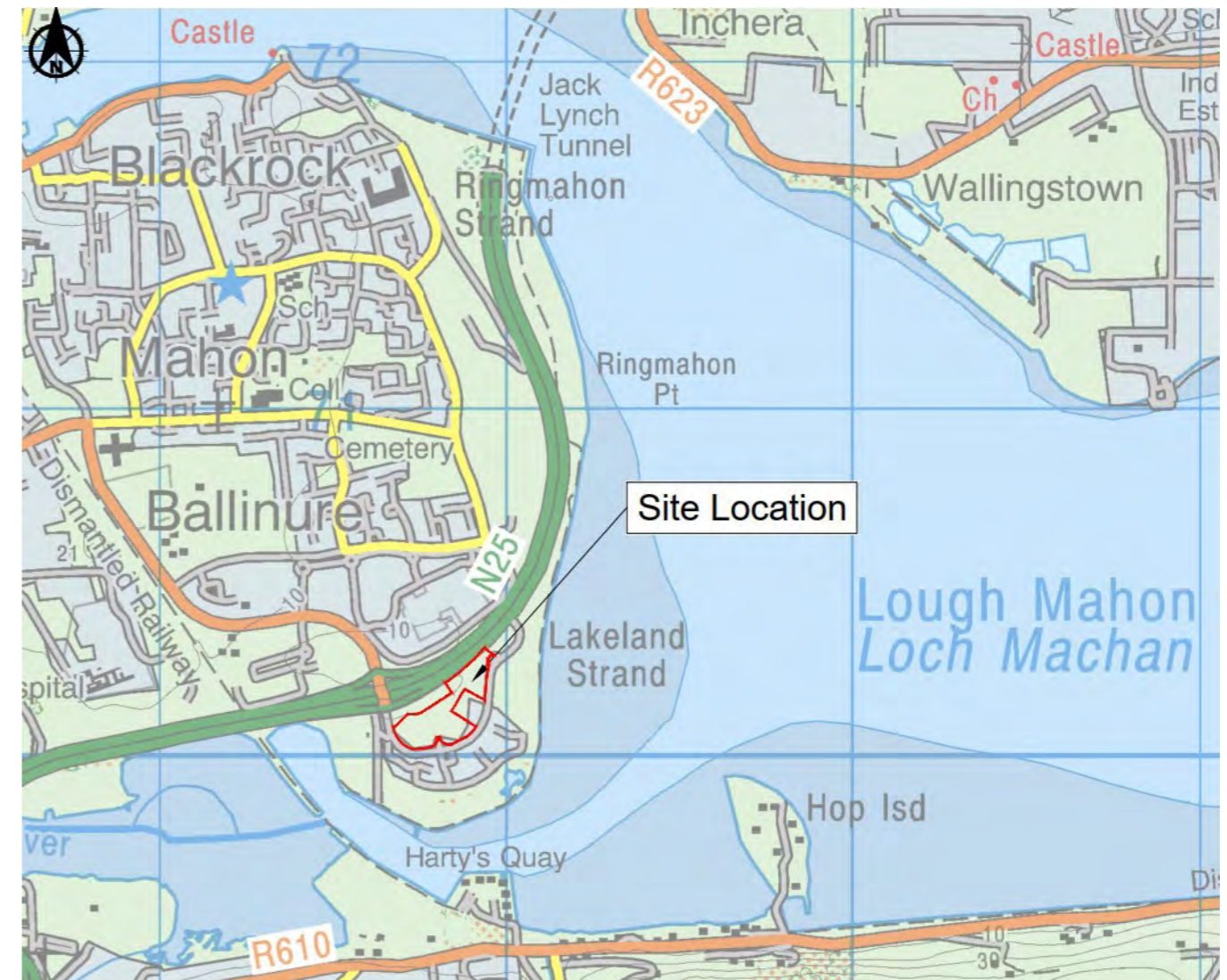


Figure 8.1: Discovery Mapping

#### 8.3.4.2 Topographical Survey from LiDAR

The GSI Open Topographic Data Viewer provides access to processed LiDAR data in raster format, the data available for this development was captured between May 2010 and May 2011. The data has been downloaded and mapped as illustrated in Figure 8.2. As can be seen from LiDAR data, levels on site vary from 6m (local low spots on the site) to 14m. The existing site drains southwards in a radial fashion draining to the southeast and to the southwest. It can be seen in the LiDAR survey that the existing circulatory road to the south of the Proposed SHD development provides some natural defence to the site.



Figure 8.2: Topographic Data from LiDAR (GSI Open Topographic Data)

### 8.3.4.3 Topographic Survey 2004

A topographic survey of the site undertaken in 2004 was available for review and this concurred largely with the LiDAR data (Dated 2010/2011). The low points at the site, circa 5.2 m to 6 m OD coincide mainly with proposed open areas and car parks, refer to Section 8.6 for further assessment on site levels.

## 8.4 DESCRIPTION OF EXISTING BASELINE ENVIRONMENT

### 8.4.1 EXISTING HYDROLOGICAL ENVIRONMENT

The site for the proposed development is adjacent to Lough Mahon and is within Hydrometric Area 19 in the catchment

of the Lee, Cork Harbour and Youghal Bay, which includes the area drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy Battery, Co. Cork, draining a total area of 2,153 km<sup>2</sup>. This site is also within the Water Framework Directive (WFD) Sub-catchment known as Glasheen (Corkcity)\_SC\_010. There are no watercourses running through the site for the Proposed SHD Development.

#### 8.4.1.1 Coastal Environment - Lough Mahon

The nearest water features to the site are the Tramore River, located to the south, and Lough Mahon which is located to the east of the site for the Proposed SHD Development at Jacob's Island. These water features can be seen in Figure 8.3.



Figure 8.3: Extract from EPA Online Mapping Service

#### 8.4.1.2 Existing site drainage

Based on the topographic survey from LiDAR data as shown in Figure 8.2 and from the topographic survey undertaken in 2004, the northern part of the site slopes to the southwest and southeast towards the Tramore River and Lough Mahon. In addition, there are some local low spots within the site.



### 8.4.2 EXISTING WATER QUALITY ENVIRONMENT

The site for the Proposed SHD Development drains to transitional waters in Lough Mahon. The water quality of this body of water can be found in EPA mapping.

The dataset provided by EPA shows results for water quality monitoring and assessments of Trophic Status carried out on Irish Transitional Waters for the Reporting period 2018-2020. This transitional water body is classed as Eutrophic (rich in nutrients and so supporting a dense plant population, the decomposition of which kills animal life by depriving it of oxygen). The status of this waterbody is 'At Risk' of deteriorating or being at less than 'Good' status in the future.

### 8.4.3 EXISTING SITE HYDROGEOLOGY AND GEOLOGY

The Geological Survey Ireland (GSI) website provides information on their public online mapping service on aquifer vulnerability and subsoils. These aspects are discussed in the following sections.

#### 8.4.3.1 Aquifer Vulnerability

Groundwater Vulnerability is a term used to represent the natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. GSI classifies the vulnerability of the aquifer as 'high' at the location of the site as illustrated in Figure 8.4. GSI identified the aquifer as a regionally important aquifer beneath the site.



Figure 8.4: Groundwater Vulnerability at the site (Source: www.GSI.ie)

Site investigation on a neighbouring site (April/May 2021) indicates that groundwater at the site may be between 5.52 m bgl and 9.0 m bgl but this is subject to seasonal variation.

A site investigation was undertaken at the site in June 2021 and boreholes recorded groundwater at depths of 7.50m (-1.84m OD) and 8.5m.

#### 8.4.3.2 Subsoils

GSI classifies the subsoil of the entire site as "Made ground" as illustrated in Figure 8.5. There is no record of estuarine silts in this location on the mapping which might indicate past flooding. Further detail on flood history and flood predictions can be seen in Section 8.7 on Flood Risk Identification.

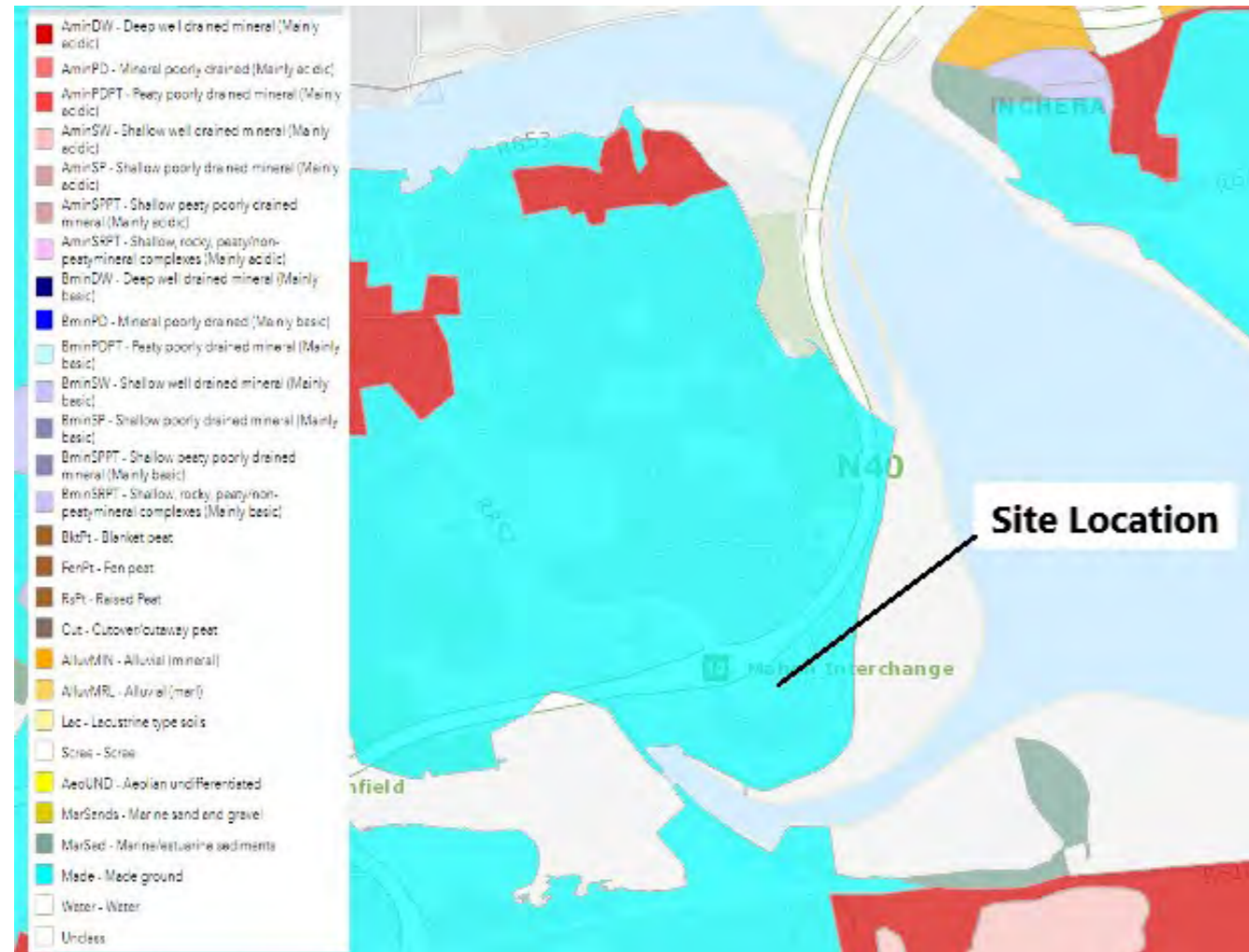


Figure 8.5: Subsoils at the site (Source www.GSI.ie)

A site investigation undertaken in 1999 observed made ground at only one bore hole within the SHD development site, comprising a thin (0.4m) layer of topsoil and is described as turf over firm brown sandy clay topsoil with subangular to rounded medium to coarse gravel of sandstone and bricks. Elsewhere on the site, the bore holes indicate stiff clay and/or very dense stiff clay below the layer of topsoil. On this basis, it is assumed that there is negligible contaminated ground on the site.

Site investigation on a neighbouring site (April/May 2021) indicates that made ground is present up to a depth of 1.4 m bgl with mixed glacial and alluvial silt deposits below this.

#### 8.4.4 EXISTING PROTECTED AREAS

Information on existing Environmentally Protected Areas is available on the National Parks & Wildlife Service website. The Douglas Estuary Proposed Natural Heritage Area (pNHA) and Cork Harbour Special Protection Area (SPA) meet the shoreline of the Loughmahon Peninsula, at approximately 200m from the site at the nearest point, in the vicinity of the

site as illustrated in Figure 8.6. These Environmentally Protected Areas are considered to be sensitive aquatic receptors for any surface water drainage running off the site.

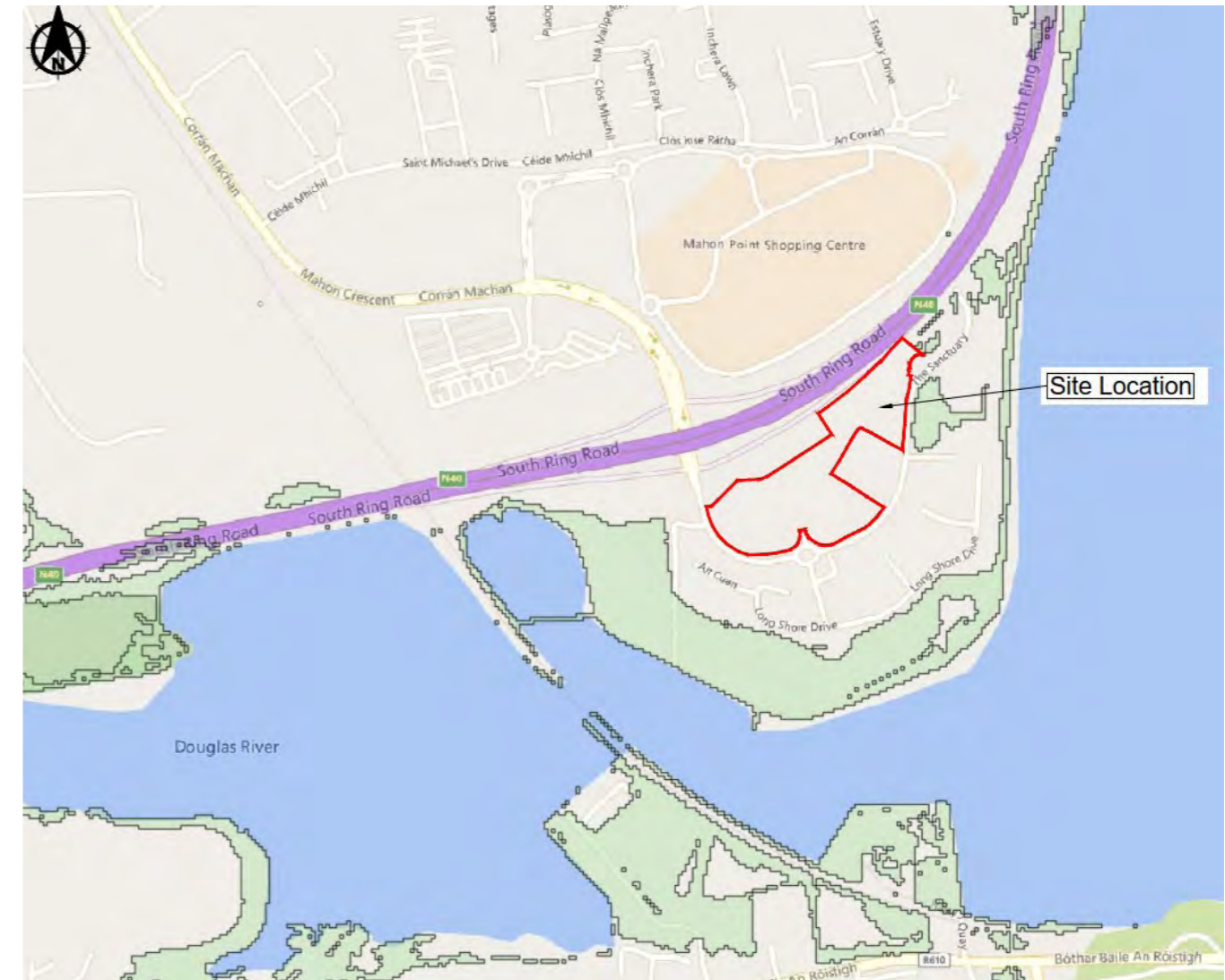


Figure 8.6: Existing Environmentally Protected Areas

## 8.5 PROPOSED DEVELOPMENT

The layout of the proposed development is described in Chapter 2 (Project Description) of this report. The strategy relating to drainage and the management of run-off at the site is described in the following section.

### 8.5.1 SURFACE WATER MANAGEMENT STRATEGY

The overall lands at this location were developed in the early 2000's with the drainage infrastructure being constructed

in the mid 2000's as part of the development which was constructed at the time. The drainage infrastructure downstream was constructed to cater for the surface water run-off from the site for the Proposed SHD Development at the time and the design and future capacity of the existing sewers was subsequently reviewed and confirmed to be satisfactory. The network downstream therefore has sufficient capacity to drain the entire site by gravity sewers to the outfall in the estuary. Internal drainage at the site will be designed to connect to the existing system.

The existing surface water drainage network includes 600 mm diameter and 900 diameter surface water sewers adjacent to the foreshore leading to an outfall located to the north of the site. The surface water sewer outfalls directly into the Lough Mahon Estuary via a non-return valve. It is noted that the point of outfall of the sewer is directly into the Lough Mahon and as recognised in the Greater Dublin Strategic Drainage Study (GDSDS) attenuation is not required in such circumstance where the point of outfall is into an estuary. For this reason, attenuation is not proposed for the current application. Hydrocarbon interceptors will be provided for all discharge points generated off the newly added carparking area and traffic routes.

The lower elevations on site are approximately between 5.2m and 6m, as highlighted in Section 8.4.4. Low lying levels are associated with the following blocks of the proposed SHD development in particular:

- Public open space east of Block 12 proposed for offices – existing levels of 5.2m to 6.5m.
- Centrally in the proposed green area at Block 15 – existing level of 5.7 m to 5.8 m.
- West of Block 14 and car park adjacent – existing level of 6.15 m.

It is expected that the ground will be levelled out and raised at these low spots as part of design and landscaping of the proposed development. This will allow for the drainage infrastructure to be installed at a suitable level to connect into the existing drainage system without risk of back up causing flooding on the site due to high water levels at the outfall coincident with a rainfall event.

Levels are highest, in the order of 14 m at Block 12 (offices). The road leading into the site from Mahon starts with at an elevation of 13.5 m OD at the Mahon Interchange and falls to an elevation of 4.88 m OD at the turning head to the south east of the site. The circulatory road to the south from the Mahon Interchange forms a natural containment of the site up to this point. The turning head coincides with a car park and green area which are proposed for the site for the Proposed SHD Development.

The development is proposed to be drained by a system of surface water sewers. Connections will be made into the existing drainage system that has already been taken in charge and inspected by Cork City Council (2013).

The site levels around the buildings/road are all above the extreme predicted tidal flood level of 5.31 m OD as identified in Section 8.7.3.2. Finished floor levels are also above this level. Storm water discharges will be by gravity to gulleys and drainage channels and on into a below ground gravity pipe network leading into the existing sewer networks. In addition, it can be seen in Figure 8.14<sup>Error! Reference source not found.</sup> that no pluvial flood risk areas are indicated for the site for the Proposed SHD Development.

It is assumed that all internal manholes and manholes at the connection points that have a cover level lower than 5.31 m OD will be sealed and lockable. This is necessary to avoid inward seepage and 'popping' of sewers in an extreme tidal event causing local flooding at the site or adjacent to the site.

### 8.5.2 FOUL WATER MANAGEMENT STRATEGY

As for the surface water system, the foul water system for the overall lands at this location was developed in the early

2000's with the infrastructure being constructed in the mid 2000's as part of the development which was constructed at the time and the design and future capacity of the existing sewers was subsequently reviewed. This wastewater sewer network is completely separated from the surface water network throughout the site. The existing foul sewer drains by gravity to the north of the development to an existing manhole and from this point the sewer continues west to the Cork City pumping station at Mahon Point Shopping Centre.

The infrastructure downstream of the site was constructed to cater for the foul water flows from the site for the Proposed SHD Development at the time. The network downstream therefore has sufficient capacity to convey foul flows by gravity sewers to an existing foul sewer network that has already been taken in charge and inspected by Cork City Council (2013). Internal drainage at the site will be designed to connect to the existing system.

It is assumed that all internal manholes and manholes at the connection points that have a cover level lower than 5.31 m OD will be sealed and lockable. This is necessary to avoid inward seepage and 'popping' of sewers in an extreme tidal event causing the flooding of contaminated wastewater onto the site or adjacent to the site.

## 8.6 FLOOD RISK IDENTIFICATION

The Planning System and Flood Risk Management: Guidelines for Planning Authorities, published in November 2009, have been used to identify any flood risk at the site.

Flood zones are a key tool in flood risk management, these zones are geographical areas within which the likelihood of flooding is in a particular range. There are three types or levels of flood zones defined for the purposes of these Guidelines:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B."

The Office of Public Works (OPW) have produced indicative flood mapping to assist in flood risk identification, this information is available on their website. The mapping included on this website was produced from a number of sources and was used, in conjunction with the Guidelines, to examine the risks in the sections below.

### 8.6.1 EXISTING FLOOD HISTORY

A summary report of the existing flood history for the location of the site was generated from the OPW website and this can be seen in Figure 8.7. It can be seen from this report that there is no record of historical flooding at Mahon and in and adjacent to Jacob's Island. The nearest flood event is located to southeast of the site at Rochestown Road, Rochestown, Co. Cork and occurred on 3rd to 4th February 2014, it is indicated in the map below as Flood ID 12086. This flooding was caused by a combination of south-easterly winds and high tides, flood water encroached onto the Rochestown Road from a lagoon on the northern side of the road and the R610 was flooded to depths of 80m to 100m.

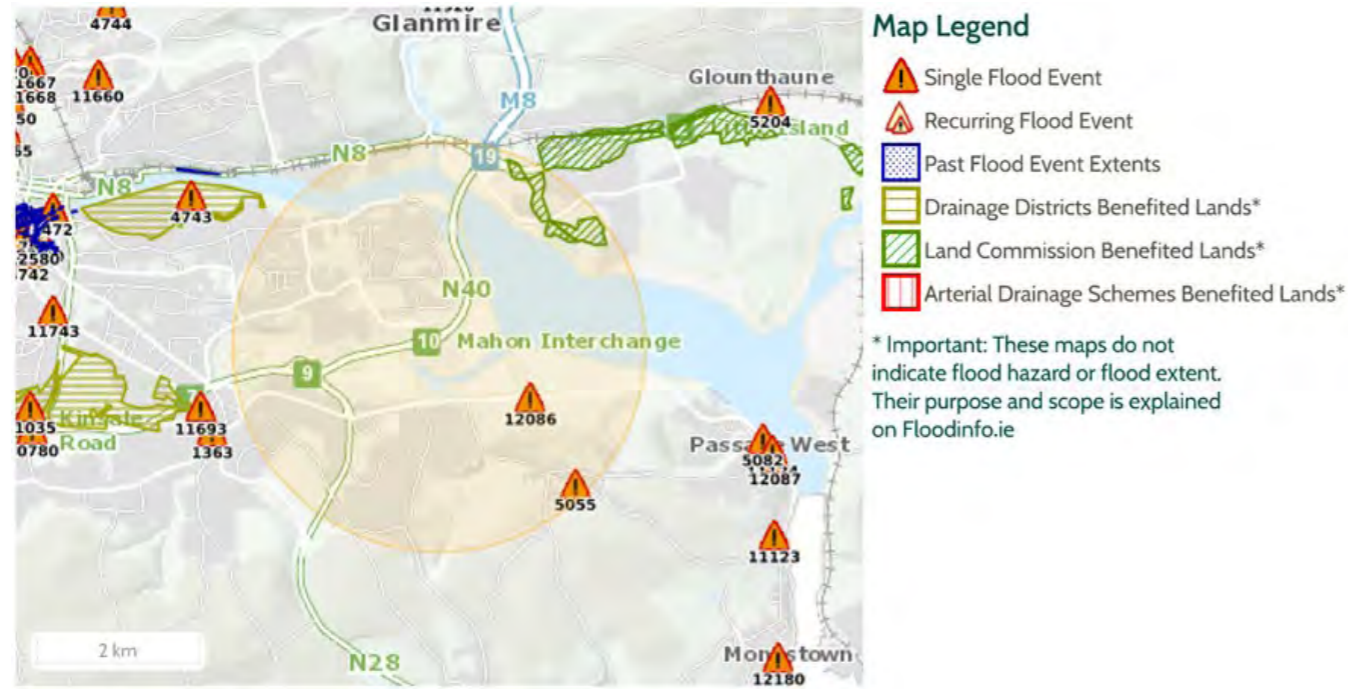


Figure 8.7: OPW Flood Map Report for flood incidents within 2.5 km of the development (Source www.floodmaps.ie)

### 8.6.2 OPW ARTERIAL DRAINAGE

The OPW carried out a number of arterial drainage schemes on catchments under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. Flood protection in the benefiting lands was increased as a result of the Arterial Drainage Schemes.

Drainage Districts were carried out by the Commissioners of Public Works under a number of drainage and navigation acts from 1842 to the 1930s to improve land for agriculture and to mitigate flooding.

The Land Commission took over a number of embankments as part of its work. These embankments were created by landowners to reclaim land from rivers or the sea, typically in the 19th century. The purpose of the schemes was to create land for agriculture. In some cases, embankments were created and the area behind was allowed to flood and flush out a number of times to reduce the salt content of the soil.

As illustrated in OPW Flood Map Report (Figure 8.7). There are no Arterial Drainage Schemes with Benefitting Lands, Drainage Districts, Land Commission areas or flood defences in the vicinity of the location of the site.

### 8.6.3 OPW PREDICTIVE MAPPING

The OPW predictive flood mapping for the location of the site is shown in Figures 8.8 and 8.9 for the 1 in 200 (Flood Zone A) and the 1 in 1000 (Flood Zone B) year return periods respectively. These maps were sourced from the National Coastal Flood Hazard Mapping 2021 Flood Mapping Project and they are available in the OPW Online Flood Maps Service at www.floodmaps.ie. These maps illustrate predicted tidal flooding in the Mid-Range Future Scenario (MRFS)

which includes a 0.5m increase in sea level (to allow for Climate Change). There is no fluvial flood risk identified for the site or in the vicinity of the site.

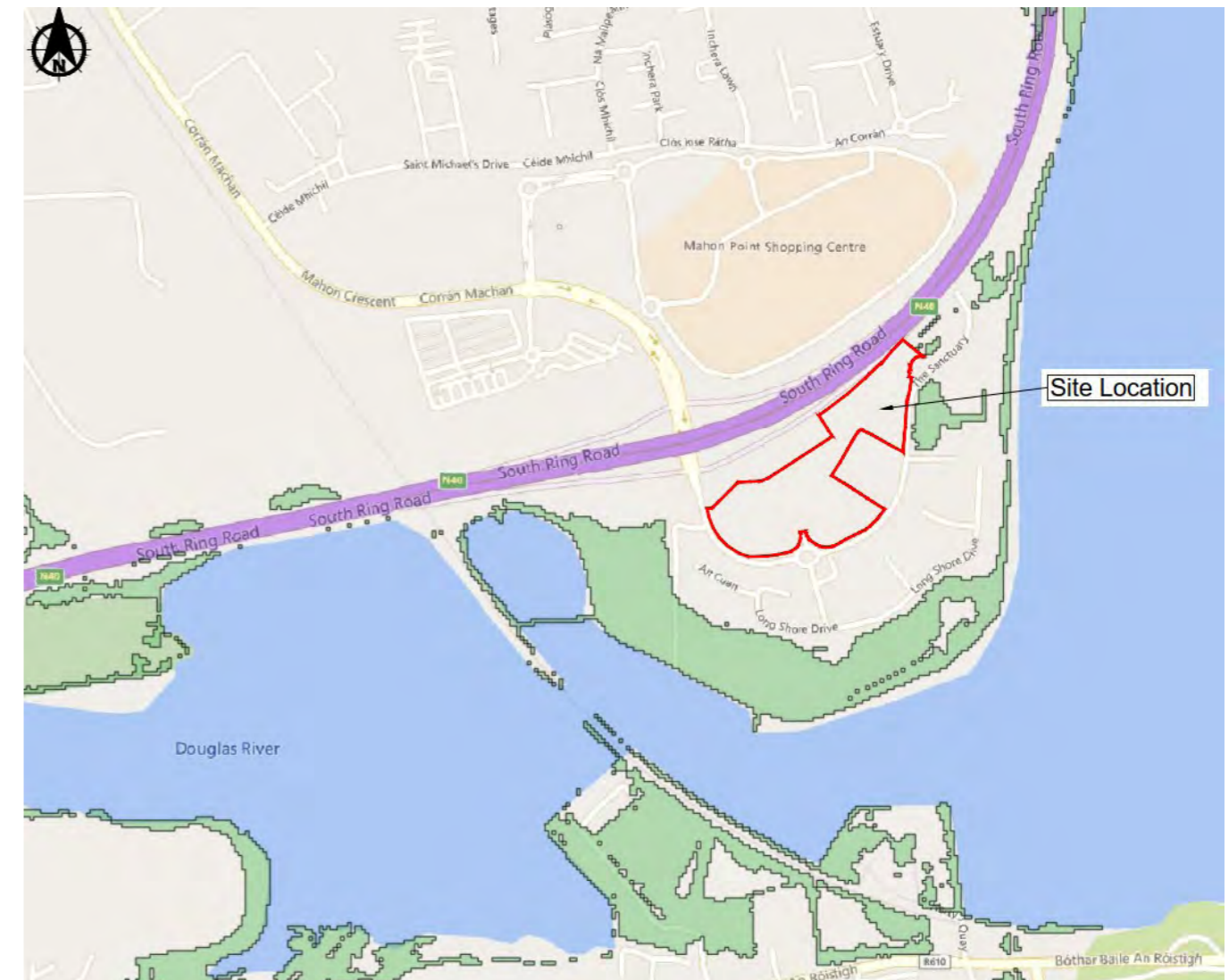


Figure 8.8: Predictive tidal flooding identified for 1 in 200 year return period MRFS (Source www.floodinfo.ie)



Figure 8.9: Predictive tidal flooding identified for 1 in 1000 year return period MRFS (Source [www.floodinfo.ie](http://www.floodinfo.ie))

The extent of flooding is similar for both of these events in the vicinity of the site at Mahon and the Jacob's Island area. The proposed development site is located adjacent to Lough Mahon and is not indicated to be in a predictive tidal flood risk area. Although there are predictive tidal flood risk areas close to the site located to the east and the predictive tidal flood risk area covers a large area of the coastal perimeter of Jacob's Island, including the Joe McHugh Park Mahon and Lough Mahon Walkway, none of these areas present a risk of preventing full access and egress from the site in an emergency.

### 8.6.3.1 Tidal Flooding

Tidal flooding is caused by higher than normal sea levels, largely as a result of storm surges, resulting in the sea overflowing onto the land. Coastal flooding is influenced by the following factors:

- High tide level;

- Low barometer pressure combined with high winds; and
- Wave action dependent on wind speeds, direction, local topography and exposure.

As can be seen in Figures 8.8 and 8.9 the site is within a Flood Zone C – where the probability of flooding from rivers and the sea is low.

### 8.6.3.2 Existing Flood Risk Studies

The Irish Coastal Wave and Water Level Modelling Study (ICWWS) Phase 1 was undertaken in 2018. Phase 1 is an update of the extreme water level estimation undertaken as part of the Irish Coastal Protection Strategy Study (ICPSS) between 2004 and 2013, which provided estimated water levels for a range of Annual Exceedance Probability (AEP) events at a series of estimation points around the Coast of Ireland.

The complete suite of ICWWS 2018 Phase 1 estimated extreme water level results for the Present Day sea levels as well as the Mid-Range Future Scenario (MRFS), High End Future Scenario (HEFS), High+ End Future Scenario (H+EFS) and High++ End Future Scenario (H++EFS) which represent a 0.5m, 1.0m, 1.5m and 2.0m increase in sea level, respectively.

The results of the predicted water levels from the ICWWS Phase 1 study can be seen in the OPW website [www.floodinfo.ie](http://www.floodinfo.ie) for the nearest node 'South Point C3' in Figure 8.10.

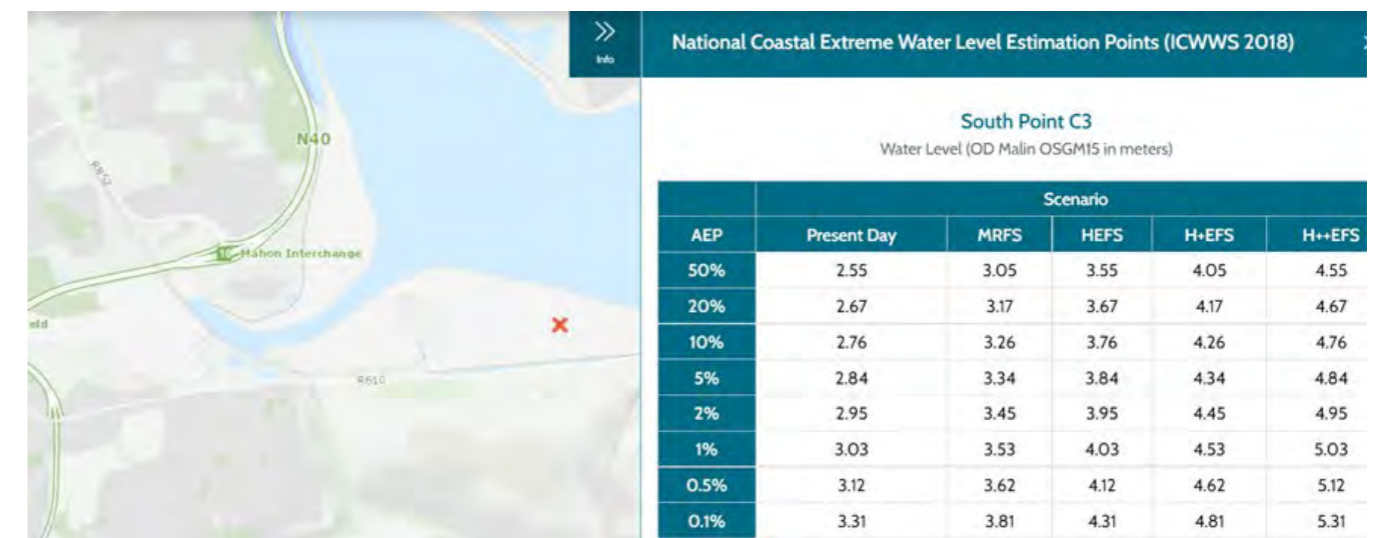


Figure 8.10: Predictive water levels at South Point C3 from the ICWWS 2018 study (Source: [www.floodinfo.ie](http://www.floodinfo.ie))

As discussed in Section 8.4.4, the lowest levels at the site are of the order of 5.2 m and these are very localised at the site. Otherwise, levels at the site vary from 6 m to 14 m which are far above the highest predicted tidal flood levels for the site (the 1 in 1000 year return period tidal flood event together with a 2 m increase in sea level is predicted to reach a level of 5.31 m).

The proposed finished floor levels and the proposed levels for the surrounding hard standing and green areas at the site for the Proposed SHD Development will be greater than the extreme predicted tidal flood level of 5.31 m OD. There are

no proposed residential units at basement level included in this development. The proposed ESB sub-stations for the site and access to these which would be considered as 'Critical Infrastructure' in accordance with The Planning System and Flood Risk Management: Guidelines are also above the predicted extreme flood level.

The indications from the predicted water levels from the ICWWS Phase 1 study are that this site would not be suitable for certain types of drainage e.g. infiltration systems such as soakaways or septic tanks for foul sewage for example. A residual risk of back up through made ground from tidal flooding in extreme events would render these types of drainage methods unsuitable at this site. The proposed drainage at the site is discussed in Section 8.6.

### 8.6.3.3 Fluvial Flooding

Fluvial Flooding as a result of overtopping of rivers is not relevant to this location, given its position adjacent to Lough Mahon Estuary as discussed in Section 8.7.3.

### 8.6.3.4 Pluvial Flooding

Pluvial or surface water flooding is the result of rainfall generated flows that arise before runoff can enter a watercourse or sewer. In undeveloped land overland flow occurs when the amount of rainfall exceeds the infiltration capacity of the ground to absorb it. This excess water flows overland forming ponds in natural hollows. It is important to note that the overall lands at this location were developed in the early 2000's with sufficient capacity within the drainage system provided to drain the entire Site by gravity sewers with an outfall to the estuary.

Generally, in order for a site to be considered at risk from overland flooding, it would require steep gradients within or surrounding the site and a reasonably large catchment area. In this case the surrounding areas are relatively flat and the site is defended from the north by the N40 South Link Road.

It is anticipated that local low points on the site as discussed in Section 8.4.4 will be levelled out and raised as part of the design for the site.

Figure 8.11 illustrates the pluvial flooding at Mahon and Jacob's Island area, note that pluvial flooding is highlighted in orange colour. It can be seen in Figure 8.14 that no pluvial flood risk areas are indicated for the site for the Proposed SHD Development.

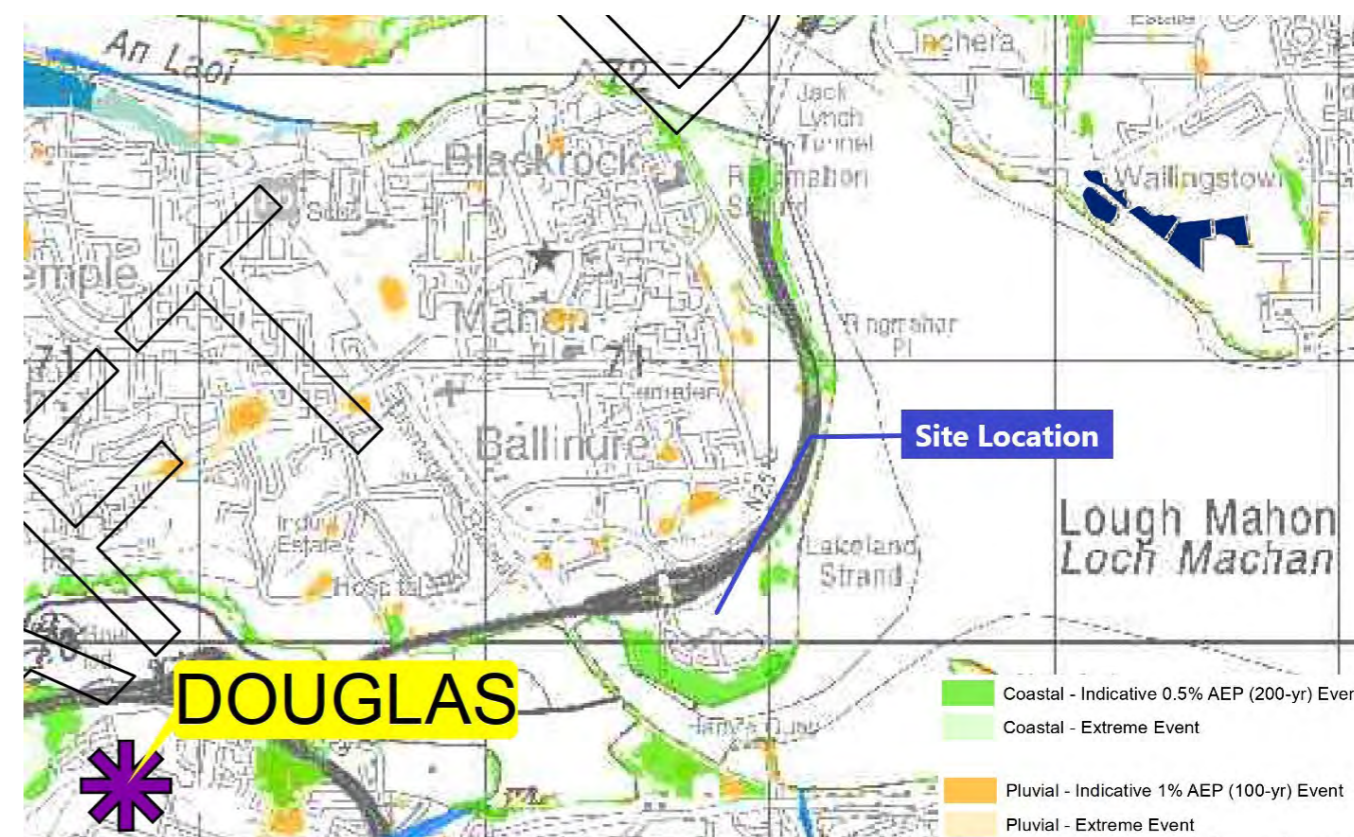


Figure 8.11: Pluvial Flooding

### 8.6.4 GSI FLOOD MAPPING

Groundwater flooding occurs when the level of water stored in the ground rises, as a result of prolonged rainfall, to meet the ground surface and flows out over it. Groundwater flooding tends to be very local and result from site specific factors such as tidal variations.

The site is not vulnerable to groundwater flooding and the risk can be considered low.

#### 8.6.4.1 GSI Historic surface water flooding 2015/2016

The Geological Survey Ireland (GSI) website provides information on their public online mapping service on groundwater flooding. It is indicated that there is Winter 2015/2016 Surface Water Flooding area located to the south of the site, surrounding the coastal perimeter of Jacob's Island, as can be seen in Figure 8.12. The Winter 2015/2016 Surface Water Flooding map shows fluvial (rivers) and pluvial (rain) floods, excluding urban areas, during the winter 2015/2016 flood event, and was developed as a by-product of the historic groundwater flood map.



Figure 8.12: Winter 2015-2016 Surface Water Flooding

#### 8.6.4.2 GSI Predictive groundwater flooding

There is no predicted groundwater flooding identified for the site.

#### 8.6.4.3 GSI Historic groundwater flooding 2015/2016

There are no records of historic groundwater flooding at the site.

#### 8.6.5 FLOODING FROM ARTIFICIAL DRAINAGE SYSTEMS

Flooding resulting when the flow entering a drainage system exceeds its' discharge capacity and the system becomes blocked and/or cannot discharge due to a high water level in the receiving watercourse or outfall.

The existing surface water drainage network around the site was originally designed to drain the entirety of the development lands when constructed. The lands are currently drained to the Lough Mahon estuary where a non-return

valve has been provided. There is therefore capacity in the existing drainage system and the site is permitted to drain unattenuated into Lough Mahon.

The risk of flooding of the proposed site from the drainage system is considered low.

#### 8.6.6 FLOODING FROM UPLAND OVERLAND FLOWS

The N40 South Ring Road forms a natural barrier from upland flows from higher ground north of the Ring Road draining towards the site. These flows have been managed as part of the drainage of the Ring Road.

##### 8.6.6.1 N40 South Ring Road

The drainage on the N40 South Ring Road is maintained by a maintenance company and this is regularly monitored for blockages etc. The South Ring Road is on a major strategic route and it is expected that this road will be well maintained at all times.

#### 8.6.7 EXISTING FLOOD RELIEF SCHEMES AND DEFENCES

Although the Lower Lee Flood Relief scheme did consider a Tidal Barrage in a Supplementary report produced for that scheme at various locations in Cork Harbour and Lough Mahon, these were not included in the final flood relief scheme proposal and there are no further flood relief schemes currently proposed for Jacob's Island.

##### 8.6.7.1 Interaction with adjacent development

Most of the adjacent development including this Proposed SHD Development collectively forms part of an original masterplan for the area. As such the drainage for the proposed site has already been taken into account in the drainage system in place for the surrounding sites that formed part of the Masterplan. The proposed site would therefore not have any impact or interaction for hydrology and hydrogeology on the adjacent lands.

#### 8.6.8 FLOOD ZONE MAPPING

As there is no risk of flooding recorded or predicted for this site it is considered sufficient to refer to Figure 8.9 with the site outline and the baseline flood mapping shown on this as representing a Flood Zone C – where the probability of flooding from rivers and the sea is low. The vulnerability of the occupants of the site for flood risk is therefore considered to be low. The mobilisation of potential pollutants to a sensitive aquatic receptor is also unlikely to occur as a result of flooding.

#### 8.6.9 CONCLUSION ON FLOOD RISK

From the flood risk identification in the preceding paragraphs, it can be concluded that flood risk to the Proposed SHD Development or flood risk from the Proposed SHD Development is considered to be low.

## 8.7 IMPACT ASSESSMENT

The review of the baseline scenario and proposed layout at the site for the Proposed SHD development has informed the impact assessment for hydrology and hydrogeology. The baseline can be summarised as follows:

- There are no watercourses running through the site.
- On site attenuation of surface water is not required in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS) as the point of outfall is into an estuary.
- The site is made up of made ground from unknown sources, but no evidence of contaminated ground from ground investigation (1999).
- There is no flood risk to the Proposed SHD Development or no flood risk from the Proposed SHD Development.
- Emergency access is available to and from the site.
- Hydrocarbon interceptors will be provided for all discharge points generated off the newly added carparking area and traffic routes.
- The existing circulatory road to the south of the Proposed SHD development provides some natural defence to the mobilisation of sediments and other potentially polluting particles during a rainfall event running off the site.
- The N40 South Ring Road forms a natural barrier from overland flows running onto the south from the north.
- There are two Environmentally Designated Protected Areas within 200 m of the site and these are sensitive aquatic receptors. All potential impacts on hydrology and hydrogeology are therefore examined in the following section.

### 8.7.1 DO NOTHING SCENARIO

The existing site is currently overgrown with no particular negative or positive impacts for hydrology and hydrogeology in its existing state. The 'Do Nothing Scenario' would be considered to have a neutral impact.

### 8.7.2 POTENTIAL CONSTRUCTION STAGE IMPACTS

Construction on the site for the Proposed SHD Development will involve two phases: 1) Earthworks and 2) Construction.

The activities relating to Earthworks include: Site clearance, stock piling of material, excavation and construction of foundations, hardstanding areas – build up for car parks, trench excavations for drainage, dewatering of excavations, new access roads, site entrances, construction compound, haul route, storage of fuels and oils.

The potential impacts from the earthworks phase of construction could result in suspended solids and other pollutants mixing with the surface water running off the site and reaching the shoreline. There is a pNHA and an SPA to the south of the site at a distance of approx. 200 m at its nearest point.

Excavations will include the excavation of made ground as indicated in Section 8.5.3 and this may include unknown sources of material, but no evidence of contaminated ground from ground investigation (1999).

Construction phase activities include: access road construction, construction of housing units, offices and the surfacing of car parks.

The potential impacts from the construction phase could result in the mobilisation of potentially polluting fine particles from materials stored or spillages and leaks of fuels and oils from stored areas or from machinery.

Potential sources of sediment laden water and other pollutants include:

- Drainage and seepage water resulting from excavations;
- Stockpiled excavated material providing a point source of exposed sediment;
- Construction of the drainage trenches trench resulting in entrainment of sediment from the excavations during construction;
- Cleaning of concrete mixers and storage of concrete products used in construction can result in the pollution of surface water running off the site;
- Abandoned broken down vehicles with the risk of fuel and oil seepage;
- Silt carried on the wheels of vehicles leaving the site being deposited onto the public road and conveyed into existing drainage systems;
- Fuel and oil spills infiltrating through the ground or conveyed elsewhere by surface water flows during a rainfall event.

The above activities can result in the release of suspended solids and other pollutants to water bodies. The consequences could lead to an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies and have a negative impact. However, there are limited pathways from this site to the sensitive aquatic receptor downstream as there are no watercourses on the site. The potential impacts on the Environmentally Protected Areas downstream of the site is described in Chapter 9 Biodiversity.

Potential effects are rated as negative for water quality, with a slight significance if not mitigated against. Any impact would be considered to be of temporary duration.

### 8.7.3 POTENTIAL OPERATIONAL AND MAINTENANCE PHASE IMPACTS

There are no proposed infiltration systems such as soakaways or septic tanks for foul sewage for example. The surface water drainage will be collected and connected into an existing drainage system which has capacity and leads to an existing outfall. The new foul sewer network will connect up to an existing foul sewer network with sufficient capacity which leads to an existing pumping station. The connections downstream of both systems have been inspected and taken in charge and the capacity has been reviewed and confirmed as being satisfactory for the conveyance of flows from the Proposed SHD Development.

As the proposed development on site includes residential and office development only, it is not expected that significant quantities of hazardous material will be brought on site.

The manholes in the internal drainage system and at the adjacent connection points in the existing system are sealed with lockable covers where these are below the level of 5.31 m OD.

Potential effects are rated as neutral for quality, with imperceptible significance if not mitigated against. Any impact would be considered to be of brief duration.



### 8.7.4 POTENTIAL RISKS TO HUMAN HEALTH

The potential risks to human health in terms of hydrology and hydrogeology are expected to be of low significance. Any potential risks outlined above during construction and operation relate to sea water quality and fish stocks and the significance is expected to be slight and of temporary duration.

### 8.7.5 CUMULATIVE IMPACTS

Where construction is proposed to occur at adjacent locations concurrent with the works for the Proposed SHD Development, cumulative risks of a release of suspended solids and spillages into public storm sewer systems resulting from trafficking on public roads from exposed sites could occur and compound the risk. Concurrent construction works cannot be anticipated at this stage.

In terms of the volume of expected run-off from the site together with adjacent sites, the existing drainage system has capacity to take the flows from the Proposed SHD Development and this will drain to a licenced foreshore discharge point, therefore no cumulative impact for surface water discharges is anticipated with adjacent properties.

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Plan, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting Strategic Environmental Assessment (SEA) Statement contained in Appendix 2(A) of the Draft Plan. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.

SEO W objectives as detailed in Table 5-1 and 7-1 of the Draft Plan are to:

- Ensure that the status of water bodies is protected, maintained and improved in line with the requirements of the Water Framework Directive
- Ensure water resources are sustainably managed to deliver proposed regional and City growth targets in the context of existing and projected water supply and wastewater capacity constraints ensuring the protection of receiving environments
- Avoid inappropriate development in areas at risk of flooding and areas that are vulnerable to current and future erosion
- Integrate sustainable water management solutions (such as SuDS, porous surfacing and green roofs) into development proposals

Table 7-5 of the SEA indicates that Scenario 3, the 'Compact Liveable Growth Scenario', identified as the preferred scenario, is determined likely to improve the status of SEOs to a greater degree and have potential to conflict with the status of SEOs – likely to be mitigated to a lesser degree.

## 8.8 MITIGATION MEASURES

Mitigation Measures for the site for the Proposed SHD Development include best practice mitigation measures for construction and standard maintenance practice measures during the operation and maintenance phase. The particular mitigation measures that should be met at a minimum are outlined below.

### 8.8.1 CONSTRUCTION PHASE

This site is unique in that the existing circulatory access road to the south of the Proposed SHD Development forms a natural barrier for the surface water running off the site and will also allow the deposition of sediment. This will prevent the mobilising of any pollutants reaching the environmentally protected areas downslope of the site. The breach points in this natural defence will be the haul routes into the site, new entrances into the site and the turning head on the existing road to the southeast of the site. The Construction and Environmental Management Plan (CEMP) sets out the proposed mitigation measures for the construction of this development. Best practice mitigation is proposed on site during construction, implementing the following as a minimum:

- A wheel wash will be provided at all entrances and exits from the site.
- Drainage trenches will be constructed in short lengths and backfilled as the construction progresses to ensure that the drainage trenches do not become a conveyance route for silt laden run-off.
- Materials brought on site will be suitably covered where there is a risk of wind-blown sediments escaping from imported or exported material.
- Parking of vehicles will be kept to a designated area.
- Any fuels or oils stored on site will be banded.
- Portaloo or holding tanks will be used for foul drainage from the site facilities during construction. These will be emptied on a regular basis by a licenced contractor. As discussed in Section 8.4.4 and Section 8.7.3.2 the site is not suitable for a septic tank.
- De-watering of excavations will be undertaken into lined lagoons, where the water will be allowed to settle before controlled discharge from the site.
- Any stock piled material will be covered and surrounded with silt fencing.
- All works areas will be surrounded with silt fencing and potential surface water pathways to low-lying areas banked up. The silt fencing will be monitored and replaced where this is found to be sagging or clogged with material.
- The condition of haul routes will be managed. Public roads at the entrance to the site will be maintained where any material has been deposited from vehicles entering or leaving the site. The haul routes and trafficked access routes will be monitored to ensure that there are no potholes developing that would collect rainwater and new stone will be applied to haul routes where this is observed to be breaking down from trafficking and encouraging the accumulation of silt.
- Vehicles that have broken down on site will not be left on site for long periods. They will be removed to avoid any seepage of fuels or oils from the vehicle infiltrating the ground.
- Only concrete chutes will be permitted to be cleaned on site in designated lined wash out areas. The residue will be later removed from the site.
- All construction materials such as concrete blocks will be stored on purpose built hardcore areas above the existing ground to avoid surface water run-off from rainfall mobilising the fine particles from these products into the ground.

With the above mitigation the potential impact during the construction phase for hydrology and hydrogeology is reduced to neutral for quality, not significant and of brief duration.

### 8.8.2 OPERATIONAL PHASE

It is expected that the management of the site for the Proposed SHD Development will be managed by a dedicated management company and that the drainage may be taken in charge by Cork City Council. On that basis it is expected that the drainage system will be monitored for blockages, leakages and repaired in a timely fashion.

With the above mitigation the potential impact during the operational phase for hydrology and hydrogeology is reduced to neutral for quality, with imperceptible significance and of momentary duration.

## 8.9 INTERACTIONS

Water has a number of interactions with other topics. The most significant interactions are between 'Biodiversity', 'Land and Soil' and 'Climate'. Uncontrolled and polluted surface water run-off has the potential to impact on the environment and the depth to groundwater and ground conditions can facilitate pathways for potential pollutants to impact on the environment. The uncertainty of Climate Change impacts could contribute to the level of impact on the environment from increased rainfall and coastal flooding. The flood risk assessment in Section 8.7 and the mitigation measures proposed in Section 8.9 take account of these interactions and it is considered that the potential impacts of interactions can be reduced to short-term and local as described in Section 8.11 Residual Impacts.

## 8.10 RESIDUAL IMPACTS

Although the site for the Proposed SHD Development is within 200 m at its nearest point of Environmentally Protected Areas downslope of the site, there is a considerable riparian zone in the form of Joe McHugh Park and adjacent green belt to the east and west of this on the shores of the Lough Mahon peninsula. This riparian zone protects the pNHA and SPA habitats from the built environment. The residual risk from the site would therefore be to the habitat in the riparian zone itself. The risk may occur from an accidental spillage of materials being imported or exported from the site. The spillage is expected to be managed locally adjacent to existing roads and unlikely to impact on the riparian zone downslope of this. The concerns of the Consultees: IFI and Irish Water have been considered in this chapter. There are no watercourses on the site for the proposed SHD Development, the wastewater sewer network is completely separated from the surface water network throughout the site, there is sufficient capacity in the existing drainage network to cater for discharges from the proposed development and mitigation measures are considered appropriate to address the remaining concerns.

## 8.11 WORST CASE SCENARIO

The worst-case scenario has already been discussed in Section 8.7.3.2 in considering the most extreme flood condition at the site from the predictive ICWWS study undertaken in 2018 and it was found that the risk to the site is very low. In this scenario the occupants of the site could be reached in an emergency as all roads into the site are above predicted flood levels.

In the event of a pile up of traffic due to flooding or congestion elsewhere in the roads network as occurred in October 2019 causing a grid lock in Cork City, the position of the site allows for emergency access if required into and out of the Lough Mahon peninsula by boat.

It is not anticipated that a worst-case scenario would impact on the water quality in the receiving aquatic environment as a result of the construction or operation of the Proposed SHD Development site. Quantities of pollutants are expected to be low and managed in accordance with best practice during construction and operation as detailed in the Impact Assessment in Section 8.8 and the Mitigation Measures in Section 8.9.

## 8.12 CONSTRAINTS ENCOUNTERED

There were no particular constraints encountered for the appraisal of this site for effects on Hydrology and Hydrogeology.

## 8.13 MONITORING

The water quality will be monitored for the duration of the construction of the site at pre-agreed locations on the shoreline with Cork City Council. Baseline samples will be taken in advance of the works on the site. It is expected that standard management company/Cork City Council (when drainage is taken in charge) monitoring for leaks in storm and foul sewers will be undertaken and repairs carried out in a timely manner.

## 8.14 SUMMARY OF IMPACTS

The potential impacts for hydrology and hydrogeology for the Proposed SHD Development are of low significance when normal best practice mitigation is applied during the construction and operation of the proposed development. Flood risk to the Proposed SHD Development or flood risk from the Proposed SHD Development is considered to be low.

## 8.15 REFERENCES

- Environmental Protection Agency (EPA) guidance documents 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022' at <https://www.epa.ie/our-services/monitoring-assessment/assessment/environmental-impact-assessment/>
- Office of Public Works (OPW) National Flood Hazard Mapping and Catchment Flood Risk Assessment and Management Studies (CFRAM Studies) and the Irish Coastal Wave and Water Level Modelling Study (ICWWS) Phase 1 at <https://www.floodinfo.ie/>
- Cork City Development Plan 2015-2021 at <https://www.corkcity.ie/en/cork-city-development-plan/> and Proposed Cork City Development Plan 2022-2028 at <https://www.corkcity.ie/corkcityco/en/proposed-cork-city-development-plan-2022-2028/>
- Annex IV of Directive 2014/52/EU at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN>
- EPA mapping for quality of transitional waters at <https://www.epa.ie/our-services/monitoring-assessment/freshwater-marine/estuaries-and-coastal/>



JACOBS ISLAND



CHAPTER NINE

Biodiversity

# CHAPTER NINE

## Contents

9	BIODIVERSITY .....	9
9.1	INTRODUCTION .....	1
9.2	METHODOLOGY .....	1
9.3	DESCRIPTION OF EXISTING BASELINE ENVIRONMENT.....	4
9.4	FIELD SURVEY RESULTS .....	10
9.5	IMPACT ASSESSMENT.....	19
9.6	MITIGATION MEASURES .....	23
9.7	RESIDUAL IMPACTS.....	29
9.8	CUMULATIVE EFFECTS .....	29
9.9	DIFFICULTIES IN COMPILING INFORMATION.....	31
9.10	REFERENCES.....	31
9.11	APPENDICES .....	34

# CHAPTER NINE

## BIODIVERSITY

### 9.1 INTRODUCTION

The project is described in full in Chapter 2.0 of the EIAR. Information in relation to potential impacts on European sites is set out in detail in the Natura Impact Statement [NIS] submitted with the planning application. The existing biodiversity of the site and connectivity with the surroundings was assessed through a desktop study and site surveys including an ecological walkover, habitat survey, mammal survey and bat survey.

### 9.2 METHODOLOGY

#### 9.2.1 DESK STUDY

A desk study was carried out to collate ecological data collect from either the site at Jacobs Island or in the immediate environs of the proposed project. These areas were viewed using Google Earth, Google maps<sup>1</sup> and Bing maps<sup>2</sup> (last accessed on 24/05/2022).

Locations and boundaries of all European sites within 15km of the proposed project were identified and reviewed using the NPWS online map viewer. Boundary shapefiles were also downloaded from this site to facilitate the preparation of project graphics. The Environmental Protection Agency (EPA) mapping<sup>3</sup> system was used to identify any hydrological connection between the proposed development and European sites.

Desktop information on relevant European sites were reviewed on the NPWS website, including the site synopsis for each SAC/SPA, the conservation objectives, the site boundaries as shown on the NPWS online map viewer, the standard Natura 2000 Data Form for the SAC/SPA which details conditions and threats of the sites, and published information and unpublished reports on the relevant European sites.

The National Biodiversity Data Centre (NBDC) was accessed for information on protected habitats and species known from the 2 km grid square W57S within which the site is located (last accessed 3<sup>rd</sup> September 2021). Bat records within 4km of the survey area were also reviewed using the NBDC website.

The conservation status of mammals within Ireland and Europe is evaluated using one or more of the following; Wildlife Acts, the Red List of Terrestrial Mammals (Marnell et al., 2009; 2019) and the EU Habitats Directive 92/43/EEC.

Birds of Conservation Concern in Ireland, No. 4 (BoCCI), published by BirdWatch Ireland and the RSPB NI, is a list of priority bird species for conservation action on the island of Ireland (Gilbert et al., 2021) The BoCCI lists birds which breed and/or winter in Ireland and classifies them into three separate lists; Red, Amber and Green; based on

<sup>1</sup> <https://www.google.ie/maps>

<sup>2</sup> <http://www.bing.com/maps/>

<sup>3</sup> <https://gis.epa.ie/EPAMaps/>

the conservation status of the bird and hence their conservation priority. Birds on the Red List are those of highest conservation concern, Amber List are of medium conservation concern and Green List are not considered threatened (see Table 9.1).

The site has been subject to a number of ecology surveys. It was surveyed in 2000 by Roger Goodwillie as part of the proposal to develop housing on Jacobs Island (Goodwillie, 2000 in McCarthy Developments (2000).

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

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

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

- Surface water
- Groundwater
- Land & Air

#### 9.2.2 SITE SURVEYS

The proposed development site was first visited on 25<sup>th</sup> August 2021. A full ecological walkover survey of the site was conducted by John Deasy on the 21<sup>st</sup> September 2021 on behalf of Atkins. The purpose of the survey was to characterise and record the habitats and sensitive ecological receptors within the proposed development site and wider lands on Jacobs Island as shown on Figure 9.3.. The site was visited again on 11<sup>th</sup> January 2022; this survey focused on the adjoining River Lee/Lough Mahon Waterfront Greenway.

A Phase 1 habitat survey was undertaken in line with published practice (Smith et al., 2011), with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000). Dominant plant species in each habitat type were recorded. Plant nomenclature follows the Botanical Society of Britain and Ireland's List of Accepted Plant Names (Botanical Society of Britain and Ireland, 2007). Habitats were later mapped using MapInfo v16 GIS software.

Incidental sightings and signs of birds, mammals, invertebrates and amphibians were noted during the walkover survey to further evaluate the importance of the site to flora and fauna (in line with the approach set out in the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017). The landscape value for bats was also considered (after e.g. Entwistle et al., 2001; etc.). Trees or structures suitable for bat roosts within the development site and potential suitable bat foraging habitat were also noted during the daytime walkover of the Site.

During the ecological survey the presence of invasive plant species such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*) were also recorded.

Aerial photos and site maps assisted the ecological walkover survey. The location of the proposed project and the surrounding areas were viewed using Google Earth, Google maps and Bing maps. The EPA online mapviewer OSI Discovery series maps were used to locate watercourse networks.

9.2.2.1 Bats

**Daylight Inspections**

On 15<sup>th</sup> September 2021, a walkover survey of the site was conducted By Dr. Caroline Shiel (on behalf of Atkins) during daylight hours to investigate roosting and foraging potential for bats.

**Bat Detector Surveys**

Prior to sunset on 15<sup>th</sup> September 2021, two Songmeter 4 remote bat detectors were deployed on site to monitor bat activity overnight (see Figure 9.1). They were set to record bats from 20 minutes before sunset on 15<sup>th</sup> September 2021 (sunset = 19:48) to 20 mins after sunrise on 16<sup>th</sup> September 2021 (sunrise = 07:10).

Songmeter A was mounted on a branch of an alder situated beside the central path running through the site. This recording position was at the western side of the site (GPS 72745 70121).

Songmeter B was mounted on a young oak tree beside a fenced-off area towards the eastern side of the site. It was positioned on a side track running in a south easterly direction from the main track (GPS 72903 71089).

A bat survey was also conducted by walking transects of the site using hand held bat detectors. This survey was commenced at sunset and ran for approximately 2 hours. Equipment used included a Pettersson D240X time-expansion detector and an Echometer Touch plugged into an ipad.



Figure 9.1 Aerial view of area surveyed for bats at Jacob's Island. The positions of the two remote bat detectors are indicated with red stars.

**Survey Constraints**

There were no constraints associated with this survey. Weather was favourable for the duration of the survey.

9.2.2.2 Terrestrial mammals - Otter

Walkover otter surveys of Lough Mahon, inclusive of the outer Douglas River Estuary were completed on 16<sup>th</sup> January 2022. Surveys were undertaken by Ross Macklin, Triturus on behalf of Atkins. The surveys were completed between the Pouldougheric River at Rochestown to the Cork Boat Club west of the Blackrock Castle observatory. The survey covered c.5.1km of coastal habitat, which was predominantly open mudflat and intertidal habitat with scrub, treelines, upper saltmarsh, tidal lagoons and patches of mixed broadleaved woodland.

The survey was completed during dry, mild, bright and settled conditions, which ensured that a good representation of habitat marked by otter could be recorded in the field, including territorial marking or marking of feeding areas. The survey also deliberately coincided with prolonged dry periods to not minimise rain washout of otter signs (spraint, smears etc.).

Each otter sign was logged by type, location (handheld GPS), condition and approximate age for later interpretation to distinguish differences in habitat use and activity. Spraints were subjectively assessed as either fresh (very recent), mixed-age (recent and older spraints typically indicative of a regular sprainting site) or old (spraint breaking down and not recently deposited). Furthermore, indicative counts of spraint (i.e. number of individual spraints) and the number of sprainting sites (often separate clusters in one area) were noted. This helped indicate the frequency of otter marking, which can clarify levels of activity in particular areas of river channel or other aquatic habitats.

#### **Total corridor otter survey (TCOS) methodology**

The survey broadly followed the best practice survey methodology for otter as recommended by Lenton et al. (1980), Chanin (2003) and Bailey & Rochford (2006). However, methodology differed in that the entire waterline was surveyed rather than the standard 500-600m sections from accessible points (e.g. bridges). The novel survey technique, known as a total corridor otter survey (TCOS) (Macklin et al., 2019), encompassed the entire coastal zone was surveyed adjoining the study area.

Total corridor survey methodology typically involves the use of two (or more) surveyors working independently (in tandem) along each respective bank of an individual watercourse (where practical). This also facilitates one to work from a more elevated position (e.g. bank top) with one surveying (with appropriate PPE such as a dry suit or chest waders) from within the channel, thus greatly increasing the likelihood of otter sign detection. This is especially true of more cryptic signs such as holts, which can be located in undercut banks, under tree root systems etc. out of the view of traditional surveys. Surveyors can alternate between the river channel and each bank depending on surveyor knowledge and experience of preferential areas of habitat likely to be used by otter.

#### **Legislative Protection**

The Eurasian otter (*Lutra lutra*) is a species of conservation concern and high priority having suffered major declines in its range and population throughout Europe since the 1950s. It is classified as 'near threatened' by the IUCN Red List with a decreasing population trend and, as such, is listed in Appendix I of CITES, Appendix II of the Bern Convention (Council of Europe, 1979) and Annexes II and IV of the EC Habitats Directive (92/43/EEC).

Otters, along with their breeding and resting places, are also protected under provisions of the Irish Wildlife Acts 1976-2021. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive 92/43/EEC, which is transposed into Irish law by the European Union (Birds and Natural Habitats) Regulations 2011-2021.

The protection of otters is outlined in Article 51(1) and (2): -

Protection of fauna referred to in the First Schedule;

**51.(1)** The Minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the species referred to in Part 1 of the First Schedule.

**51.(2)** Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a license granted by the Minister under Regulation 54, a person who in respect of the species referred to in Part 1 of the First Schedule (listed below). Items (b) and (d) may be considered most relevant to developments.

- a. deliberately captures or kills any specimen of these species in the wild,

- b. deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,
- c. deliberately takes or destroys eggs of those species from the wild,
- d. damages or destroys a breeding site or resting place of such an animal, or
- e. keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive, shall be guilty of an offence.

In an Irish context, according to the most recent Article 17 reporting (NPWS, 2019), otter conservation status has improved, with the species now evaluated as being of 'Favourable' conservation status. Otters were considered to be previously 'Near Threatened' (Marnell, 2009) based on a 20-25% decline between 1980 and 2005 (Bailey & Rochford, 2006). However, the current conservation status is now of 'Least Concern' (Marnell et al., 2019).

#### **9.2.2.3 Terrestrial mammals - Badger**

##### **Site Walkover Survey & Sett definition**

The initial site walkover surveys were conducted on the 16<sup>th</sup> January 2022 during dry bright weather. Surveys were undertaken by Ross Macklin, Triturus on behalf of Atkins. This site walkover aimed to establish the location of badger setts and signs (latrines, snuffle holes, trails & setts) in the proposed development area and the contiguous semi-natural habitats of the coastal fringe. These habitats outside of the scrub dominated development lands were considered to offer the only potential to support the species, albeit low overall. This was considered due to the relatively high disturbance in the Jacob's Island area due to high population density and the relatively poor connectivity with habitats containing a high level of naturalness and or low relative disturbance. The site surveys were conducted by walking through habitats in the development lands at Jacob's Island and along the coastal boundaries where contiguous semi-natural habitat was present outside of built land. This included grassland, scrub, treelines and mixed broadleaved woodland fringes. Winter is a good time to find setts as vegetation has died back.

Given the inherent difficulty in defining sett types (Byrne et al., 2012), setts if encountered would be divided into two categories in the current survey i.e. 'main setts' and 'non-main setts'. They would also be categorized using the sub-classes of Thornton (1988), e.g. main, annex, subsidiary, outlier etc.

Main setts were identified following the definition of Smal (1995); 'Usually have a large number of entrances (used and disused) with conspicuous soil heaps. The setts look well used, with paths between entrances and to and from the sett being obvious and well-worn. Main setts are breeding setts and are normally in continuous use'.

Non-main setts were defined by the current co-author (Ross Macklin) as follows; 'setts within the catchment of the main sett and thus most probably utilized by the social group from the main sett, characteristically having a smaller number of entrances and showing clear signs of badger activity recent or historical'.

#### **9.2.3 EVALUATION OF ECOLOGICAL RECEPTORS**

The evaluation and impact assessment within this report has been undertaken with reference to relevant parts of the 2018 Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland. Terrestrial, Freshwater, Coastal and Marine - developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018). Consideration was also given to Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment published by the European Union in 2013. Consideration was also given to the newly published Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022 (EPA, 2022).

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known / published accounts of distribution and rarity where available, and professional experience: -

- International (European).
- National (Ireland).
- Regional (Munster).
- County (Cork)
- Townland (Ballinure).
- Local (intermediate between the Site and Townland).

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and / or species rarity; the extent to which such habitats and / or species are threatened throughout their range, or to their rate of decline.

## 9.3 DESCRIPTION OF EXISTING BASELINE ENVIRONMENT

### 9.3.1 BACKGROUND INFORMATION ON THE PROPOSED SITE

The proposed site is located at Jacobs Island in Mahon, Cork City. The Strategic Housing Development site is bound to the north by the N40, to the south and west by an internal access road and to the east by the Sanctuary, an existing residential apartment scheme. The Sanctuary comprises 4 no. blocks ranging in height from 6 to 8 no. storeys and the terminus for the 215 bus service is located at its entrance. The lands to the south of Jacob's Island, a peninsula on Lough Mahon, principally comprise two and three storey dwellings units and public open space known as the Joe McHugh Public Park. The Mahon Point District Centre is located directly to the north of the N40 and includes Mahon Point Shopping Centre, Mahon Retail Park and City Gate Business park. The proposed site is accessed south of the N40 via the R852 flyover (refer to Chapter 2.0).

To the south of the site, separated by a housing development, is the confluence between the Douglas River Estuary and Cork Harbour, which is encompassed by Cork Harbour Special Protection Area (004030).

The site at Jacobs Island does not lie within a Natural Heritage Area. Natural Heritage Areas (NHAs) are nationally designated sites, which are considered important for the habitat, species or geological heritage. NHAs are legally protected under the Wildlife Amendment Act 2000. However, ca. 150-200m to the south the shoreline adjoins Douglas Estuary pNHA (001046); the pNHA is notable for wintering waterbirds as well as areas of saltmarsh habitat.

Douglas Estuary is also listed as a Wildfowl Sanctuary (Site code - WFS-67) (see - <https://www.npws.ie/protected-sites/wildfowl-sanctuaries>).

There are no freshwater features within the proposed site. The River Douglas enters the Douglas River Estuary to the west of the proposed site, and Cork Harbour south of the proposed site. Thus, the proposed site is surrounded to the west, south and east by transitional waters. This area known as Lough Mahon is classed as being eutrophic by the EPA and being of Moderate status under the Water Framework Directive. A small area of marshland is located to the southeast – between the existing residential development and the River Lee/Lough Mahon Waterfront Greenway.

The NBDC mapviewer does not record any invasive plant species listed on the 3<sup>rd</sup> Schedule of the Natural Habitats Regulations, 2011.

As noted Jacobs Island adjoins Lough Mahon (Cork Harbour). Lough Mahon has a surface area of approximately 12.23km<sup>2</sup> stretching from Mahon to Passage West (CRFB, 2008), with its volume changing over the tidal cycle. The harbour is classified as transitional waters (Inner Harbour) and coastal waters (Outer Harbour).

ERU (1989) found that “many of the environmental parameters measured in the harbour show a gradient extending from the upper harbour and estuarine areas, through the lower Harbour to the Harbour mouth. Thus, going in this direction, BOD loadings, phosphate, nitrate, and ammonia levels, bacteria levels, and levels of contaminants in the water, sediments and biota all show a general decrease in values as the Harbour mouth is reached. Dissolved oxygen levels, on the other hand, show an increase along the same gradient” (from T.J. O'Connor & Associates (2009). This pattern of water quality change has also been found in more recent studies (see e.g. Hartnett and Nash, 2015; see also McGovern et al. (2020) which provides a detailed summary of background water quality within different sections of Cork Harbour; much of it derived from Costello et al., 2001, prior to the commissioning of Carrigrennan WWTP).

Currently, the harbour's Water Framework Directive ecological status is defined as Moderate, with its chemical status categorised as Good (2013-2018; source: EPA Maps). Between 2008 and 2018, dissolved inorganic nitrogen (as N); orthophosphate (P) and chlorophyll trends were all downwards, indicating gradual improvements to water quality (source: EPA Maps). This may to some extent reflect the developments being undertaken under the Cork Main Drainage Project which was largely completed in 2004 and achieved the cessation of the discharges of untreated sewage into the Lee Estuary and Lough Mahon (as was predicted in modelling by O'Kane and Barry, 2007 as quoted in Mott McDonald (2008). However, recent EPA data (source: EPA Maps) categorise water quality in much of the harbour and lower River Lee as being of Intermediate status (2018-2020); in contrast areas such as Lough Mahon and Douglas Estuary are categorised as Eutrophic. Recent work on the Lower Harbour, however, should fuel further improvements to water quality in the Lower Harbour in coming years. The proposed development seeks to intercept and control surface waters during both construction and operation at site (refer to Mitigation Measures).

The proposed site at Jacobs Island is not located within any European sites. The proposed site is hydrologically connected via surface water outfalls to Lough Mahon within Cork Harbour, within which is located Cork Harbour SPA (004030) and Great Island Channel SAC (001058). Cork Harbour SPA, the closer of the two sites, is located 17.65km downstream of the proposed site.

A data request was also submitted to NPWS for information on rare and protected plant and animal species within the 10km grid square within which the site is located (W76 & W77); a response was received in November 2021. The NBDC database was also searched for records of any species noted from these grid squares by NPWS. There are no notable records noted from Jacobs Island.

Desktop research highlighted no published records on the NBDC database for invasive plant species such as Japanese knotweed (*Fallopia japonica*) from within Jacobs Island. The nearest record of Japanese knotweed is from the R852 at top of exit to join the N40 South Link Road (eastwards) from Mahon, Cork (W726702; 2014). There were no records of Himalayan balsam (*Impatiens glandulifera*) or Giant Hogweed (*Heracleum mantegazzianum*) within the site, or in the vicinity of the site; or of other forms of knotweed. (However, note discussion of records of invasive species from within the site set out below).

#### 9.3.1.1 Results of Previous Field Surveys undertaken on site

The wider lands on Jacobs Island have been subject to a number of ecology surveys. They were surveyed on 2000



by Roger Goodwillie as part of the proposal to develop housing on Jacobs Island (Goodwillie, 2000 in McCarthy Developments (2000). Surveys undertaken at the time included the area where housing has now been built as well as lands between the housing and the estuary. These lands were surveyed in November 1998 and May 2000. However, apart from the creation of a small park and retention of areas of brackish lagoon south of the houses, the areas discussed in this report have been largely developed.

This wider lands on Jacobs Island used to host a large badger sett in the south-eastern corner overlooking the brackish marsh.

The wider lands were again surveyed in 2007 by Scott Cawley. Scott Cawley's 2007 survey identified two species of interest - White Melilot (*Melilotus albus*) and Ribbed Melilot (*Melilotus officinalis*). White Melilot flowers from June – August; while Ribbed Melilot flowers from June to September.

However, the 2007 survey undertaken by Scott Cawley noted the presence of Japanese knotweed within the site.

As would be expected due to the character of lands on Jacobs Island other invasive / garden species were noted: - winter heliotrope (*Petasites pyrenaicus*), butterfly-bush (*Buddleja davidii*), traveller's-joy (*Clematis vitalba*) and Himalayan honeysuckle (*Leycesteria formosa*). Scott Cawley also noted the presence of Evening primrose (*Oenothera biennis*), a garden escape which has naturalised on many sites such as this in Cork.

### 9.3.2 STATUTORY CONSERVATION SITES

#### 9.3.2.1 European Designated Sites

The developer has also submitted a Natura Impact Statement (Atkins, 2022; refer to Appendix 9.1) to the Board in respect of the proposed development, which should be read in relation to potential impacts to European sites.

European designated sites comprise Special Areas of Conservation (SAC) and Special Areas of Protection (SPAs). This network of European designated sites is referred to as the Natura 2000 network. SACs are designated for their biodiversity value based on the presence of Annex I habitats and Annex II species listed under the EU Habitats Directive (92/43/EEC). SPAs are designated for the protection of bird species listed on Annex I of the Bird Directive (2009/147/EC).

The proposed site is not located within any European sites. The lands on Jacobs Island adjoins Cork Harbour SPA (004030). The proposed development site is screened by existing residential developments and a public park from Cork Harbour SPA. Figure 9.2 displays the location of the SPA in relation to the proposed development site.

Cork Harbour SPA is designated for the following species, in addition to the wetlands that support them:

- Little Grebe (*Tachybaptus ruficollis*)
- Great Crested Grebe (*Podiceps cristatus*)
- Cormorant (*Phalacrocorax carbo*)
- Grey Heron (*Ardea cinerea*)
- Shelduck (*Tadorna tadorna*)
- Wigeon (*Anas penelope*)
- Teal (*Anas crecca*)

- Pintail (*Anas acuta*)
- Shoveler (*Anas clypeata*)
- Red-breasted Merganser (*Mergus serrator*)
- Oystercatcher (*Haematopus ostralegus*)
- Golden Plover (*Pluvialis apricaria*)
- Grey Plover (*Pluvialis squatarola*)
- Lapwing (*Vanellus vanellus*)
- Dunlin (*Calidris alpina*)
- Black-tailed Godwit (*Limosa limosa*)
- Bar-tailed Godwit (*Limosa lapponica*)
- Curlew (*Numenius arquata*)
- Redshank (*Tringa totanus*)
- Black-headed Gull (*Chroicocephalus ridibundus*)
- Common Gull (*Larus canus*)
- Lesser Black-backed Gull (*Larus fuscus*)
- Common Tern (*Sterna hirundo*)

Great Island Channel SAC (001058) is located within Cork Harbour to the east of the proposed development site. Great Island Channel SAC is designated for the following habitats: -

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) [1330]

The potential for impacts to European (Natura 2000) sites is fully considered in the accompanying Natura Impact Statement (Atkins, 2022; refer to Appendix 9.1).

*Table 9.1 Natura 2000 sites within 15km from the site.*

Site	Number	Distance
Special Protection Area for birds		
Cork Harbour SPA	004030	within 200m
Special Areas of Conservation		
Great Island Channel SAC	001058	3.8km East

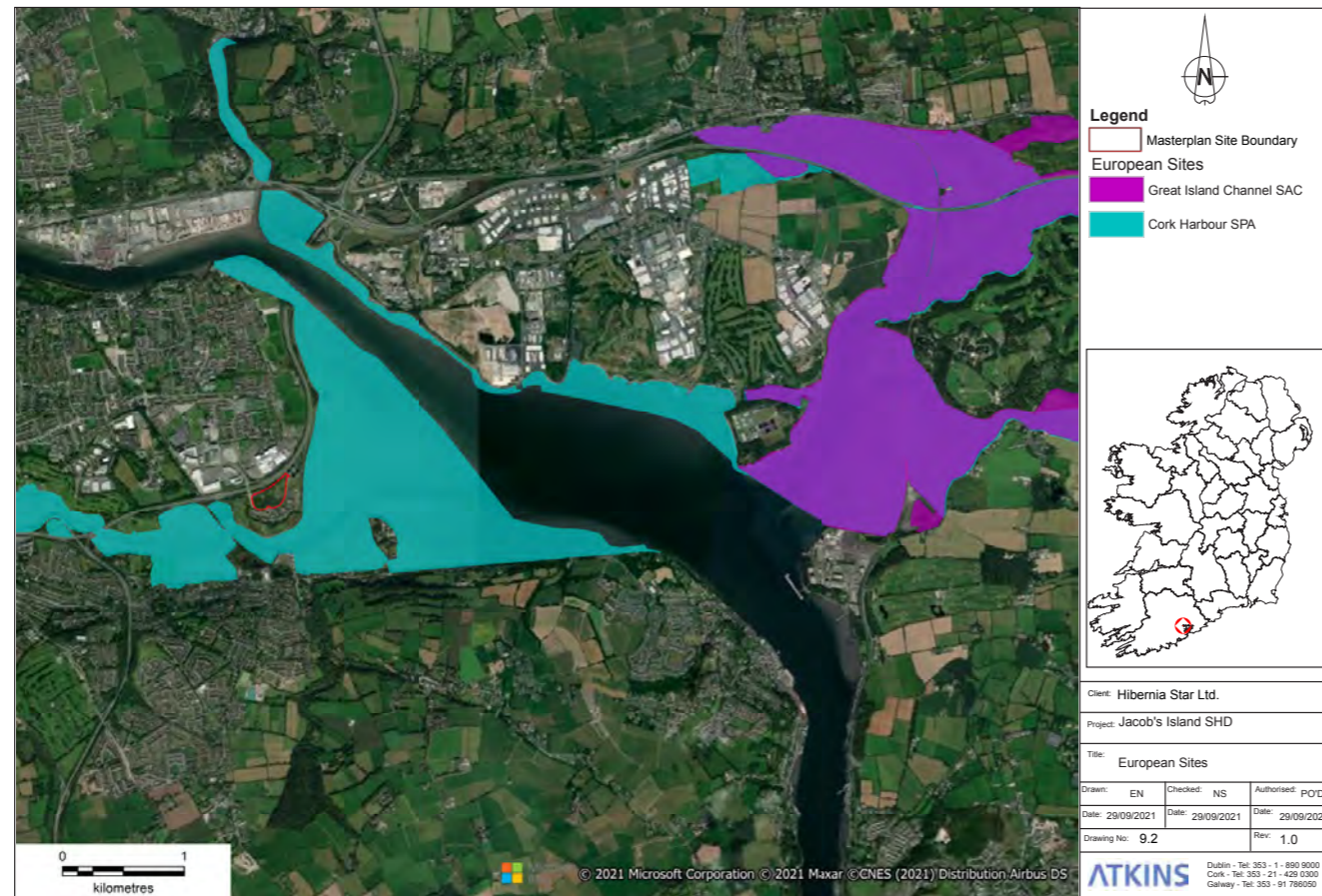


Figure 9.2 European Sites.

### 9.3.2.2 Nationally Important Sites

Natural Heritage Areas (NHAs) are nationally designated sites, which are considered important for the habitat, species or geological heritage. NHAs are legally protected under the Wildlife Amendment Act 2000. Proposed Natural Heritage Areas (pNHAs) are sites that are of significance for wildlife and habitats, but which have not as yet been statutorily designated; however, their ecological value is recognised by Planning and Licencing Authorities.

There are five pNHAs located within 5km of the proposed site as outlined in Table 9.2.

Table 9.2 Proposed Natural Heritage Areas close to the Site.

Site	Number	Distance
Douglas River Estuary	001046	200m straight-line distance
Glanmire Wood	001054	2.9km straight-line distance
Great Island Channel	001058	3.7km straight-line distance
Rockfarm Quarry, Little Island	001074	2.7km straight-line distance
Dunkettle Shore	001082	1.8km straight-line distance

**Douglas River Estuary pNHA (001046)** is located approximately 200m to the south and west of the proposed development site. This is a large area that includes the Douglas River Estuary together with the western intertidal area of Lough Mahon as far as Blackrock Castle. This site consists of extensive mudflats, formed from fine silts, bisected by the Douglas River. Damp grassland occurs on part of the southern side, extending to some low islands which are inundated in extreme tides. An area of pasture adds to the value of the site since it provides an important roost for many wading birds, including Black-tailed Godwit; as well as a feeding area for a large flock of Wigeon. In addition to intertidal mudflats the designated area contains several habitats that are rare and important on a local and national level. These include reed and large sedge swamp and saltmarsh. These habitats all support a diversity of birds, mammals and invertebrates. For example, the protected and rare moth Twin-spotted Wainscot is found in a reedbed at the western / inner end of Douglas Estuary. The estuary is an integral part of Cork Harbour and of particular significance for wintering birds (NPWS, n.a.<sup>4</sup>).

**Glanmire Wood pNHA (001054)** is located 2.69km to the north of the site boundary. The NPWS site synopsis describes the site as follows (NPWS, 2009<sup>5</sup>): -

“Glanmire Wood occurs on the east bank of the Glashaboy River, immediately south of Glanmire village in East Cork. The following description of the site is largely based on the 1986 An Foras Forbartha County Report.

The main habitat of interest is mixed broad-leaved woodlands dominated by oak (*Quercus* spp.), Beech (*Fagus sylvatica*) and Sycamore (*Acer pseudoplatanus*) with a few conifers, especially European Silver-fir (*Abies alba*). The ground flora is particularly rich and includes two grasses, Wood Fescue (*Festuca altissima*) and Wood Millet (*Milium effusum*), which are thought to indicate ancient woodland. More commonly occurring species include Primrose (*Primula vulgaris*), violets (*Viola riviniana*, *V. reichenbachiana*), Wood Anemone (*Anemone nemorosa*) and Lords-and-ladies (*Arum maculatum*).

The tidal river below the wood adds to the diversity of the site with patches of saltmarsh. The recent NHA survey indicates that no damaging activities occur within the wood at present. However, in the past the wood has been much modified by planting and felling. This site is of interest because this type of woodland is rare in east Cork.”

4 NPWS (n.a). Site Synopsis. Douglas Estuary pNHA (001046).

5 NPWS (2009). Site Synopsis. Glanmire Wood pNHA (001054).

**Great Island Channel pNHA** (001058) is located 3.7km to the east of the site boundary, on the opposite side of the harbour. This pNHA is designated for the same features as the SAC, as outlined above – the mudflats and sandflats not covered by seawater at low tide, and Atlantic salt meadows.

**Rockfarm Quarry, Little Island pNHA** (001074) is located 2.7km to the east of the site boundary, on the opposite side of the harbour. The NPWS site synopsis describes the site as follows (NPWS, 2009<sup>6</sup>):

“Rock Farm Quarry is located c. 9km west of Cork City on the southern shore of Little Island in the River Lee estuary. It is situated on limestone which is of Carboniferous age and was formed of a shell reef. There are a range of rock types in the area including fine-grained crinodal limestone, pseudobreccia, reef limestone and a conglomerate - the Cork marble. Formerly, the area was quarried for its limestone, but it is now no longer actively quarried and a golf course occupies much of the site. This site’s southern boundary is along the top edge of the quarries’ rock cliffs.

The habitats within the site include unimproved lowland dry grassland, amenity grassland (the improved tees and greens of the golf course), scrub woodland and the exposed rock and spoil of the quarries.

On the floor of the quarries and around their edges, a rich calcareous flora has developed and within this small area (30ha) there is a considerable diversity of species. The calcareous grassland species include grasses such as Red Fescue (*Festuca rubra*), Quaking-grass (*Briza media*), Downy Oat-grass (*Helictotrichon pubescens*) and a small annual species, Fern-grass (*Desmazeria rigida*). Crested Dog’s-tail (*Cynosurus cristatus*) is also frequently encountered. Some of the herbs present include Kidney Vetch (*Anthyllus vulneraria*), Common Knapweed (*Centaurea nigra*), Field Scabious (*Knautia arvensis*), Oxeye Daisy (*Leucanthemum vulgare*), Fairy Flax (*Linum catharticum*), Common Bird’s-foot-trefoil (*Lotus corniculatus*) and Bulbous Buttercup (*Ranunculus bulbosus*). The rock from the quarries also supports the growth of a distinct flora including species such as Round-leaved Crane’s-bill (*Geranium rotundifolium*), Weld (*Reseda luteola*), Dwarf Spurge (*Euphorbia exigua*) and Great Mullein (*Verbascum thapsus*). Ferns noted in the area are Maidenhair Spleenwort (*Asplenium trichomanes*) and Rustyback (*Ceterach officinarum*).

There are small areas of scrub woodland, mainly of Ash (*Fraxinus excelsior*) with Traveller’s-joy (*Clematis vitalba*) and the exotic and invasive species Japanese Knotweed (*Reynoutria japonica*). The proximity of the site to the sea also gives a maritime influence to the site and the presence of White Campion (*Silene alba*), Wild Madder (*Rubia peregrina*) and Portland Spurge (*Euphorbia portlandica*) are noted. Many orchids are found in the site including the Early-purple Orchid (*Orchis mascula*), Bee Orchid (*Ophrys apifera*) and Dense-flowered Orchid (*Neotinea maculata*), a species usually only found occasionally in the west and centre of Ireland. Also, of note is a parasitic plant on Ivy, the Ivy Broomrape (*Orobanche hederæ*).

Although the present land use within the site would appear to maintain the sites interest, alteration or extension of the golfing activities may be potentially damaging to the site. It is suggested that no new areas of ‘rough’ should be taken into the golf course, heavy fertiliser application should be avoided, as should the dumping of mown grass on the dry calcareous grassland areas; extensive reseeding or top seeding of greens and trees with rye-grass mixtures would also be detrimental to the areas species composition and diversity.

The area is of considerable interest botanically because of its species diversity and the presence of ‘rarities’ for the region, such as Dense-flowered Orchid and Portland Spurge. The area could also be

used as an educational resource for local schools – for example, projects such as comparing the species composition and phenology of the cut and uncut areas of the golf course, species composition changes with scrub invasion, invertebrate sampling and fossil identification.”

**Dunkettle Shore pNHA** (001082) is located 8km to the east of the site boundary, on the opposite side of the harbour. The site is of value because its mudflats provide an important feeding ground for waterfowl and it acts as a significant roost for birds in the upper harbour. Furthermore, it is an integral part of Cork harbour which is an internationally important wetland, regularly holding flocks of over 20,000 waterfowl.

### 9.3.2.3 Nature Reserves

No nature reserves are located within the 5km of the proposed project.

### 9.3.2.4 Other non-statutory designated sites of ecological value

The NPWS site synopsis for Douglas Estuary lists the estuary as a Wildfowl Sanctuary, it is listed as site WFS-67) (see - <https://www.npws.ie/protected-sites/wildfowl-sanctuaries>). The Lough is listed as WFS-12 (just over 6km to the west).

There are no other non-statutory designated sites of ecological value in the vicinity of the proposed site.

## 9.3.3 FLORA & FAUNA

### 9.3.3.1 Rare and Protected Flora and Fauna

The NBDC database was searched for records within the 2 km grid squares W77F and W77J within which the Site is located. The records of flora, birds, mammals and invertebrates returned are presented in Table 9.3 below. A data request for rare and protected species and habitats data was submitted to NPWS in October 2021.

While there are records of badger and red squirrel in the vicinity of the proposed site, it is unlikely that these species would occur on the site as it is isolated from other terrestrial habitat and corridors by the N40 to the north and the harbour to the south, east and west. It is possible that otter commuting along the estuary shoreline; however, given the distance between the site and the shore and the buildings and roads present between the two areas, it is unlikely that otter would be recorded on the proposed site.

Wetlands birds are known to utilise the shore along Jacob’s Island at low tide. However, the site does not provide suitable habitat for foraging or roosting waterbirds.

6 NPWS (2009). Site Synopsis. Rockfarm Quarry, Little Island pNHA (001074).

Table 9.3 NBDC Rare and Protected Flora and Fauna.

Species	Grid square	Date of latest record	Protected Status	Source
Common Frog ( <i>Rana temporaria</i> )	W77F; W76J	18/01/2020	EU Habitats Directive - Annex V; Wildlife Acts	Irish National Frog Database
Barn Swallow ( <i>Hirundo rustica</i> )	W76J	31/12/2011	Wildlife Acts; Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Bar-tailed Godwit ( <i>Limosa lapponica</i> )	W77F; W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex I; Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011
Black-headed Gull ( <i>Larus ridibundus</i> )	W77F; W76J	02/12/2017	Wildlife Acts; Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Brent Goose ( <i>Branta bernicla</i> )	W76J	19/11/2016	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Common Goldeneye ( <i>Bucephala clangula</i> )	W76J	31/12/2011	Wildlife Acts; EU Birds Directive - Annex II; Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011
Common Greenshank ( <i>Tringa nebularia</i> )	W76J	02/12/2017	Wildlife Acts	Birds of Ireland
Common Kestrel ( <i>Falco tinnunculus</i> )	W77F; W76J	27/05/2015	Wildlife Acts; Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011
Common Kingfisher ( <i>Alcedo atthis</i> )	W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex I; Birds of Conservation Concern - Amber List	Birds of Ireland
Common Linnet ( <i>Carduelis cannabina</i> )	W76J	31/12/2011	Wildlife Acts; Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Common Pheasant ( <i>Phasianus colchicus</i> )	W76J	31/12/2011	Wildlife Acts; EU Birds Directive - Annex II & III	Bird Atlas 2007 - 2011
Common Redshank ( <i>Tringa totanus</i> )	W76J	02/12/2017	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Common Sandpiper ( <i>Actitis hypoleucos</i> )	W76J	31/12/2011	Wildlife Acts; Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Common Shelduck ( <i>Tadorna tadorna</i> )	W76J	02/12/2017	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Common Snipe ( <i>Gallinago gallinago</i> )	W76J	31/12/2011	Wildlife Acts; EU Birds Directive - Annex II & III; Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011
Common Starling ( <i>Sturnus vulgaris</i> )	W76J	19/11/2016	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Common Swift ( <i>Apus apus</i> )	W76J	31/12/2011	Wildlife Acts; Birds of Conservation Concern - Red List	Bird Atlas 2007 - 2011
Common Tern ( <i>Sterna hirundo</i> )	W77F	23/06/2017	Wildlife Acts; EU Birds Directive - Annex I; Birds of Conservation Concern - Amber List	Birds of Ireland

Species	Grid square	Date of latest record	Protected Status	Source
Common Wood Pigeon ( <i>Columba palumbus</i> )	W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex II & III	Birds of Ireland
Dunlin ( <i>Calidris alpina</i> )	W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex I; Birds of Conservation Concern - Red List	Birds of Ireland
Eurasian Curlew ( <i>Numenius arquata</i> )	W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex II; Birds of Conservation Concern - Red List	Birds of Ireland
Eurasian Oystercatcher ( <i>Haematopus ostralegus</i> )	W77F; W76J	02/12/2017	Wildlife Acts; Birds of Conservation Concern - Red List	Birds of Ireland
Eurasian Teal ( <i>Anas crecca</i> )	W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex II & III; Birds of Conservation Concern - Amber List	Birds of Ireland
Eurasian Wigeon ( <i>Anas penelope</i> )	W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex II & III; Birds of Conservation Concern - Amber List	Birds of Ireland
European Golden Plover ( <i>Pluvialis apricaria</i> )	W76J	19/11/2016	Wildlife Acts; EU Birds Directive - Annex II & III; Birds of Conservation Concern - Red List	Birds of Ireland
Great Black-backed Gull ( <i>Larus marinus</i> )	W76J	19/11/2016	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Great Cormorant ( <i>Phalacrocorax carbo</i> )	W76J	19/11/2016	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Great Crested Grebe ( <i>Podiceps cristatus</i> )	W76J	02/12/2017	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Herring Gull ( <i>Larus argentatus</i> )	W76J	02/12/2017	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
House Martin ( <i>Delichon urbicum</i> )	W77F; W76J	04/08/2016	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
House Sparrow ( <i>Passer domesticus</i> )	W76J	31/12/2011	Wildlife Acts; Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Lesser Black-backed Gull ( <i>Larus fuscus</i> )	W76J	19/11/2016	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Little Egret ( <i>Egretta garzetta</i> )	W77F; W76J	23/06/2017	Wildlife Acts; EU Birds Directive - Annex I	Birds of Ireland
Little Grebe ( <i>Tachybaptus ruficollis</i> )	W77F; W76J	02/12/2017	Wildlife Acts	Birds of Ireland
Mallard ( <i>Anas platyrhynchos</i> )	W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex II & III	Birds of Ireland

Species	Grid square	Date of latest record	Protected Status	Source
Mew Gull ( <i>Larus canus</i> )	W76J	02/12/2017	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Mute Swan ( <i>Cygnus olor</i> )	W76J	21/09/2016	Wildlife Acts; Birds of Conservation Concern - Amber List	Birds of Ireland
Northern Lapwing ( <i>Vanellus vanellus</i> )	W77F; W76J	02/12/2017	Wildlife Acts; EU Birds Directive - Annex II; Birds of Conservation Concern - Red List	Birds of Ireland
Red-breasted Merganser ( <i>Mergus serrator</i> )	W77F	02/12/2017	Wildlife Acts; EU Birds Directive - Annex II; Birds of Conservation Concern - Amber List	Birds of Ireland
Red Knot ( <i>Calidris canutus</i> )	W76J	19/11/2016	Wildlife Acts; Birds of Conservation Concern - Red List	Birds of Ireland
Rock Pigeon ( <i>Columba livia</i> )	W76J	31/12/2011	Wildlife Acts; EU Birds Directive - Annex II	Bird Atlas 2007 - 2011
Tufted Duck ( <i>Aythya fuligula</i> )	W77F; W76J	31/12/2011	Wildlife Acts; EU Birds Directive - Annex II & III; Birds of Conservation Concern - Amber List	Bird Atlas 2007 - 2011
Large Red-Tailed Bumble Bee ( <i>Bombus (Melanobombus) lapidarius</i> )	W77F; W76J	06/06/2019	Near threatened	Bees of Ireland
Common Dolphin ( <i>Delphinus delphis</i> )	W77F; W76J	10/09/2018	EU Habitats Directive - Annex IV Wildlife Acts	IWDG Cetacean Strandings Database
Grey Seal ( <i>Halichoerus grypus</i> )	W76J	27/12/2015	EU Habitats Directive - Annex II & V Wildlife Acts	Atlas of Mammals in Ireland 2010-2015
Eurasian Badger ( <i>Meles meles</i> )	W77F; W76J	10/05/2015	Wildlife Acts	Atlas of Mammals in Ireland 2010-2015
Eurasian Red Squirrel ( <i>Sciurus vulgaris</i> )	W77F; W76J	31/12/2007	Wildlife Acts	The Irish Squirrel Survey 2007
European Otter ( <i>Lutra lutra</i> )	W76J	29/02/2012	EU Habitats Directive - Annex II & IV Wildlife Acts	Atlas of Mammals in Ireland 2010-2015

The absence of recent records of species from the NBDC database or NPWS records does not necessarily mean that it does not occur within the area rather it has not formally been recorded as present.

Bat suitability mapping accessed via the NBDC (Lundy et al., 2011)<sup>7</sup> shows that the environs of the proposed site, is classed as being of medium bat suitability. The site is of highest suitability for soprano pipistrelle (*Pipistrellus*

*pygmaeus*), Brown long-eared bat (*Plecotus auritus*), Common pipistrelle (*Pipistrellus pipistrellus*) and Leisler's bat/ lesser noctule (*Nyctalus leisleri*).

### 9.3.3.2 Invasive Species

While non-native invasive species are not an ecological feature of value, they do need to be considered as a potential ecological constraint. The European Communities (Birds and Natural Habitats) Regulations 2011 S.I. 477 detail the legal context regarding the introduction and dispersal of certain non-native invasive plants and animals. Section 49 and 50 of the Regulations specify that it is an offence to disperse or spread any plant species or associated vector material listed on the 3rd Schedule of the Regulations.

No records for invasive plant species such as Japanese knotweed, Himalayan balsam, Giant-rhubarb or Giant Hogweed were recorded by NBDC from within the site. There is a record of Japanese knotweed on the opposite side of the N40 Mahon interchange dating from 2014.

### 9.3.3.3 Aquatic Ecology

There are no freshwater features within or adjacent to the proposed development site.

The River Douglas enters the Douglas River Estuary to the west of the proposed site, and Cork Harbour south of the proposed site. Thus, the wider lands at Jacobs Island are surrounded to the west, south and east by transitional waters. This area known as Lough Mahon is classed as being eutrophic by the EPA and being of Moderate status under the Water Framework Directive.

<sup>7</sup> [http://maps.biodiversityireland.ie/metadata/Landscape\\_Conservation\\_for\\_Irish\\_Bats\\_metadata\(v.3\).pdf](http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata(v.3).pdf)

## 9.4 FIELD SURVEY RESULTS

### 9.4.1 HABITATS

Semi-natural habitats are illustrated on Figure 9.3 (Habitat Map). This should be read in association with the following drawings and assessment from the landscape assessment of the site which identifies all trees groups / vegetation for removal and retention.



Figure 9.3 Habitat Map.

#### 9.4.1.1 Scrub (WS1)

This habitat was widely recorded across the study site and the species composition varied at different locations.

Along the northern end of the site, adjacent to the boundary with the N40 South Ring Road boundary, Bramble was frequently recorded along with occasional Grey willow, Gorse and Dogwood (*Cornus* sp.). A range of immature and sapling trees were recorded occasionally including Oak, Alder, Ash, Sycamore, Aspen, Poplar, Italian alder and Birch.

Small patches of open ground between and around the edges of scrub held frequent Creeping thistle, Common ragwort, Willowherb sp., Bilboa fleabane, Nettle, Ribwort plantain and Spear thistle.

To the western side of the study site, the scrub habitat consisted of frequent Butterfly bush, Grey willow, Gorse, Sycamore, Dogwood and Bramble. Hazel and Guelder rose were rarely recorded. Immature trees in the scrub habitat included Sycamore, Ash and Grey alder.

The scrub habitat grew from 3-5 m high and was dense and impenetrable in places.

Given the built up environment in which the proposed site is located, this habitat provides a potentially important corridor for mammal and bird species. Thus, it is classed as being locally important (higher value).



Plate 9.1 Scrub (WS1) located within the proposed site.

#### 9.4.1.2 Neutral grassland / Scrub / Recolonising bare ground (GS1N/WS1/ED3) mosaic

This habitat was recorded in the open areas in the eastern side of the study site and consisted of a mosaic of formerly disturbed ground that has been recolonised to form a grassland habitat which is undergoing succession to scrub. The open areas consisted of frequent Ribwort plantain, Selfheal, Bilboa fleabane, Bramble, Sweet vernal grass, Lesser trefoil, Creeping cinquefoil, Springy turf-moss (*Rhytidiadelphus squarrosus*) and Pointed Spear-moss (*Calliergonella cuspidata*). Creeping thistle, Lesser hawkbit, Common centaury, Common ragwort, Common bent, Yorkshire fog, Willowherb sp. and Silverweed were recorded occasionally. Tutsan, White melilot, Yarrow, Spear thistle, Red bartsia, Trailing St. Johns-wort, Mouse-ear hawkweed, Common knapweed, Red clover and Birds foot trefoil were rarely recorded.

The encroaching scrub species included Gorse, Willow, Larch (*Larix* sp.), Common alder, Grey alder, Sycamore and Butterfly bush. There was evidence of intensive grazing by rabbits (*Oryctolagus cuniculus*) at some locations and the sward was c. 2-5 cm long.

Given the built up environment in which the proposed site is located, this habitat provides a potentially important corridor for invertebrate, mammal and bird species. Thus, it is classed as being locally important (higher value).



Plate 9.2 Neutral grassland/Scrub/Recolonising bare ground (GS1N/WS1/ED3) mosaic located within the proposed site.

#### 9.4.1.3 Spoil and Bare ground / Recolonising bare ground (ED2/ED3)

This habitat was recorded along existing informal paths that are being utilised by pedestrians through the study area. The habitat consisted of a well-worn path c. 1 m wide with a margin of c. 1 m on both sides where traffic is not as intense and some ruderal species have recolonised. Species recorded in the exposed gravel substrate included Selfheal, Bilboa fleabane, Lesser hawkbit, Pointed Spear-moss, Springy turf-moss, Ribwort plantain, Dandelion, Daisy, Broadleaf plantain, Marsh cudweed, Pendulous sedge, Creeping buttercup, Teasel, Evening primrose (*Oenothera* sp.) Willowherb sp., Soft rush, Hard rush and Great mullein.

This habitat may provide some habitat for invertebrate species. Thus, it is classed as being locally important (lower value).



Plate 9.3 Spoil and Bare ground/Recolonising bare ground (ED2/ED3) located within the proposed site.

#### 9.4.1.4 Recolonising bare ground (ED3)

This habitat was recorded in two main locations; at the northwest corner of the site where recent disturbance and dumped aggregates have been recolonised and a larger area in the centre of the study area which evidence suggests may have been used as a storage or construction compound in the past due to the presence of a boundary chain link fence and a number of areas of concrete foundation pads /tarmac areas amongst the gravel hardstand.

The species at the northwest corner of the site included frequent Winter heliotrope and Ribwort plantain along with occasional Cocksfoot, Common centaury, Bramble, Butterfly bush, Bilboa fleabane, Dogwood, Ash, Yorkshire fog and Mouse ear hawkweed. Pendulous sedge, Red bartsia, Silverweed, Autumn hawkbit and Eyebright (*Euphrasia* sp.) were rarely recorded.

The larger area of recolonising bare ground contained frequent Bilbao fleabane, Ribwort plantain, Lesser hawkbit, Pointed Spear-moss and Butterfly bush. Scarlet pimpernel and Bramble were occasionally recorded. Selfheal, Common centaury, Autumn hawkbit and common mouse-ear were rarely recorded.

This habitat may provide some habitat for invertebrate species. Thus, it is classed as being locally important (lower value).



Plate 9.4 Recolonising bare ground (ED3) located within the proposed site.

#### 9.4.1.5 Mixed Broadleaved Woodland (WD1)

A small area of mixed broadleaved woodland was recorded on the northern side of the scrub habitat on the western side of the study area. The stand of semi-mature trees consisted of Grey alder, Poplar sp., White willow and Sycamore. Elder and immature Sycamore were recorded occasionally growing beneath as well as Willow and Bramble which grew in from the adjacent scrub habitat.

Given the built up environment in which the proposed site is located, this habitat provides a potentially important corridor for invertebrate, mammal and bird species. Thus, it is classed as being locally important (higher value).



Plate 9.5 Mixed Broadleaved Woodland (WD1) located within the proposed site.



9.4.1.6 Treeline (WL2)

This habitat was recorded along the margin of the existing access roadway along the southern boundary of the study area. The treeline consisted ornamental semi-mature Maple (Acer sp.) and Cherry (Prunus sp.) trees growing along a grassy strip next to the footpath. The trees were c. 6-8 m.

Given the built up environment in which the proposed site is located, this habitat provides a potentially important corridor for invertebrate, mammal and bird species. Thus, it is classed as being locally important (higher value), particularly as the trees mature and the crowns grow closer together.



Plate 9.6 Treeline (WL2) located within the proposed site.

9.4.1.7 Amenity grassland (GA2)

This habitat was recorded along the margin of the existing access roadway along the southern boundary of the study area. The habitat consisted of a c. 3 m wide grassy margin which is managed by regular mowing resulting in a sward height of c. 4-5 cm. The species present included frequent Creeping buttercup, White clover, Dandelion, Daisy, Yorkshire fog, Sweet vernal grass, Common bent and Springy turf-moss. Red clover, Annual meadow grass, Selfheal, Cat's ear, Ribwort plantain and Sweet vernal grass were recorded occasionally.

This habitat may provide some habitat for invertebrate species. Thus, it is classed as being locally important (lower value).



Plate 9.7 Amenity grassland (GA2) located within the proposed site.

**9.4.1.8 Dry meadows and grassy verges (GS2)**

This habitat on a sloped bank along the southern boundary of the study area and consisted of a less intensively mown area of grassland which contained frequent Red clover, Cat's ear, Ribwort plantain, Common bent and Sweet vernal grass. Common ragwort, Dandelion, Red fescue and Common centaury were occasionally recorded. Common mouse-ear, Meadow vetchling, Tufted vetch, Birds foot trefoil, Smooth hawk's-beard, Yorkshire fog and Perennial rye grass were rarely recorded. This bank had been strimmed relatively recently but mowing was not as intensive or regular as the adjacent amenity grassland strip. The sward height was c. 5-10 cm. Gorse was occasionally recorded indicating scrub encroachment from the adjacent scrub habitat.

This habitat may provide some habitat for invertebrate species. Thus, it is classed as being locally important (lower value).



*Plate 9.8 Dry meadows and grassy verges (GS2) located within the proposed site.*

**9.4.1.9 Scrub/Semi-natural grassland mosaic habitat (WS1/GS)**

This habitat on a sloped bank along the southern boundary of the study area adjacent to the amenity grassland and dry meadows and grassy verges. However, in this area no management (mowing) has been undertaken for an extended period allowing scrub species to be firmly established. Bramble was frequently recorded along with occasional Gorse. The grassy areas consisted of frequent Common bent, Sweet vernal grass along with Ribwort plantain and Red clover which were occasionally recorded. Creeping thistle, Cocksfoot, Cat's ear, Birds foot trefoil, Common ragwort, Meadow vetchling, Creeping buttercup and Common mouse-ear were rarely recorded. The grassy areas were c. 40-50 cm high, rank and lodged in places.

Given the built up environment in which the proposed site is located, this habitat provides a potentially important corridor for invertebrate and bird species.



*Plate 9.9 Scrub/Semi-natural grassland mosaic habitat (WS1/GS) located within the proposed site.*

### 9.4.2 INVASIVE PLANTS

A stand of 12 Japanese knotweed plants was recorded on the eastern side of the concrete hardstand pad during the ecological walkover. Three large stands of Bohemian knotweed (*Fallopia × bohemica*) were recorded within the large central area of scrub habitat. Himalayan balsam or Giant Hogweed were not recorded within the site during the course of the Phase 1 habitat survey.

Butterfly bush (*Buddleja davidii*), winter heliotrope (*Petasites pyrenaicus*) and old man’s beard (*Clematis vitalba*) were recorded within the proposed site as outlined in Figure 9.4.



Figure 9.4 Invasive Plant Species.

### 9.4.3 FAUNA - GENERAL OBSERVATIONS

#### 9.4.3.1 Mammals

There was widespread evidence of rabbit activity on site. None of the burrows resembled badger setts. A targeted mammal survey should be undertaken during the winter months.

#### 9.4.3.2 Birds

Shorebirds which characterise Cork Harbour SPA are addressed in the accompanying Natura Impact Statement (Atkins, 2022; refer to Appendix 9.1).

A list of terrestrial birds encountered is included in Table 9.5. A variety of birds were encountered highlighting the importance of this area within the wider locality to local biodiversity. However, no species on the BOCCI 2020 red list (Gilbert et al., 2021) were recorded.

Table 9.5 Bird List – Jacob's Island (21/09/2021).

Species	Scientific Name	BoCCI Status	Notes
Magpie	<i>Pica pica</i>	Green	
Woodpigeon	<i>Columba palumbus</i>	Green	
Robin	<i>Erithacus rubecula</i>	Green	
Great tit	<i>Parus major</i>	Green	
Rook	<i>Corvus frugilegus</i>	Green	
Blackbird	<i>Turdus merula</i>	Green	
Hooded crow	<i>Corvus corone</i>	Green	
Starling	<i>Sturnus vulgaris</i>	Amber	
Wren	<i>Troglodytes troglodytes</i>	Green	
Black headed gull	<i>Chroicocephalus ridibundus</i>	Amber	Flying over
Pied wagtail	<i>Motacilla alba yarrelli</i>	Green	
House sparrow	<i>Passer domesticus</i>	Amber	
Goldfinch	<i>Carduelis carduelis</i>	Green	
Chaffinch	<i>Fringilla coelebs</i>	Green	
House martin	<i>Delichon urbicum</i>	Amber	
Dunnock	<i>Prunella modularis</i>	Green	
Chiffchaff	<i>Phylloscopus collybita</i>	Green	
Blue tit	<i>Cyanistes caeruleus</i>	Green	

### 9.4.3.3 Other Observations

Table 9.6 outlines the invertebrates that were recorded during the site visit, along with the conservation status. No species of conservation concern were recorded on site.

Table 9.6 Incidental Sightings (31/08/2021).

Species	Scientific Name	Conservation Status
Butterflies		
Small tortoiseshell	<i>Aglais urticae</i>	Least concern
Peacock	<i>Inachis io</i>	Least concern
Speckled wood	<i>Pararge aegeria</i>	Least concern
Bees		
Common carder bee	<i>Bombus pascuorum</i>	Least concern
Beetles		
Green shieldbug	<i>Palomena prasina</i>	n.a.
Moths		
Straw dot	<i>Rivula sericealis</i>	Least Concern
Silver Y moth	<i>Autographa gamma</i>	Not evaluated
Green Carpet	<i>Colostygia pectinataria</i>	Least Concern

## 9.4.4 BATS

### 9.4.4.1 Daylight survey

The site in question is comprised of grassland overgrown with scrub vegetation including alder, gorse and willow. There are only two mature trees – a sycamore and a beech at the northern boundary of the site close to the N40. These trees are the only structures on site which may provide roosting opportunities for bats. Both trees are heavily overgrown with ivy, which made it very difficult to identify potential roost features such as cavities and broken branches.

There are numerous invasive species on site, including a stand of Japanese knotweed (at GPS 72850 70118). Dogwood is also present on site. Old man's beard (*Clematis vitalba*) is prolific on site.

### 9.4.4.2 Bat Detector Survey (Transects)

The hand-held bat detector survey was conducted by walking transects along the paths and through low vegetation on site.

On the evening of 15<sup>th</sup> September 2021 weather conditions were favourable. Weather = 70% overcast, calm & dry. Temp = 18°C.

Only two bats were recorded on site during the walking transects. A single Common pipistrelle (*Pipistrellus pipistrellus*) was recorded and observed flying repeatedly up and down along the central path and over low vegetation to north of the path from 20.30 onwards. A single Soprano pipistrelle (*P. pygmaeus*) was recorded and observed foraging over the eastern section of the site at 21:10.

A single Leisler's bat (*Nyctalus leisleri*) was recorded passing over the site at 21:55.

Calls from the Speckled bush cricket (*Leptophyes punctatissima*) were recorded from vegetation throughout the site. Stridulations are produced by the crickets at c. 40kHz and are not audible without an ultrasonic detector.

### 9.4.4.3 Remote Bat Detector Surveys

#### Songmeter A

Songmeter A recorded a total of 1,722 sound files. 53 of these files were bat calls (38 Common pipistrelle, 11 Soprano pipistrelle and 4 Leisler's bat). The remaining sound files were from the Speckled Bush Cricket, except for a small number of bird calls at dusk and dawn.

All pipistrelle calls were recorded within the first 3.5 hours after sunset. There was no further pipistrelle activity during the night. Only 4 calls of Leisler's bat were recorded during the night. These bats were passing over the site and not staying to forage.

#### Songmeter B

Songmeter B recorded 161 sound files. Only 22 were bat calls (11 Common pipistrelle, 7 Soprano pipistrelle and 4 Leisler's bat). The remaining calls were from the Speckled Bush Cricket, except for a small number of bird calls recorded at dusk and dawn.

All pipistrelle calls were recorded within the first 3 hours after sunset. There was no further pipistrelle activity during the night. Only 4 calls of Leisler's bat were recorded. These bats were passing over the site and not staying to forage. These calls were recorded between 22:02 and 02:48.

### 9.4.4.4 Conclusions

Development of this site will not have any significant impact on the small numbers of bats using the site.

The level of bat activity recorded on site at Jacob's Island is very low. During walking transects only one individual Common pipistrelle and one individual Soprano pipistrelle were recorded and observed on site. Temperature at sunset was 18°C and weather was highly favourable for bats overnight.

Pipistrelle calls recorded on the remote bat detectors were most likely to be from the individual bats observed on site. These bats left the site prior to 23.00 and were not recorded again during the night. The first bat to be recorded on both detectors was a Common pipistrelle at 20.28 on Songmeter A and at 20:25 on Songmeter B (40 mins & 37 mins).

after sunset respectively. The first Soprano pipistrelle was recorded on Songmeter A was at 21:08 and at 21:06 on Songmeter B (80 mins and 78 mins after sunset respectively). These timings suggest that the Common pipistrelle is roosting relatively close to the site as it appeared relatively early after sunset.

**Photos taken during Bat Survey**



*Plate 9.10 Eastern end of site close to apartment blocks.*



*Plate 9.14 Looking south from central track.*



*Plate 9.18 Section of main track where Songmeter A was positioned.*



*Plate 9.22 Numerous dogweed plants on site.*



*Plate 9.11 Eastern end of central track through site looking west.*



*Plate 9.15 Plant (dogwood) most closely associated with Speckled bush cricket.*



*Plate 9.19 Track running south from main track where Songmeter B was positioned.*



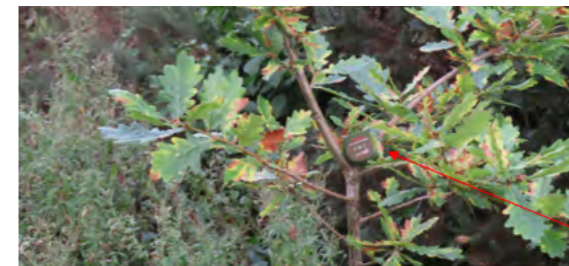
*Plate 9.23 Track to west of fenced area with stand of Japanese knotweed.*



*Plate 9.12 Eastern end of central track looking east.*



*Plate 9.16 Looking west along central pathway towards fenced area.*



*Plate 9.20 Microphone of Songmeter B mounted on young oak.*



*Plate 9.24 Stand of Japanese knotweed (at GPS72850 70118).*



*Plate 9.13 Area of open grassland on site.*



*Plate 9.17 Mature sycamore and beech trees at northern boundary of site.*



*Plate 9.21 Old man's beard is prolific on site.*

**9.4.5 TERRESTRIAL MAMMALS – OTTER**

A total of n=16 otter signs were recorded within the survey area during the current January 2022 otter survey comprising c. 5.1km of linear estuarine, riverine and coastal habitat (Table 9.7). This equated to an average of 3.1 otter signs per kilometre of linear habitat. However, in order to undertake a comprehensive survey of otter, as noted a large study area around Jacobs Island was considered – this stretched from Blackrock Castle to the northwest; south towards Jacobs Island; west toward Black Bridge and Douglas Estuary. [Due to the sensitivity of information on otter details of these observations are not mapped in this report but are described below].

*Table 9.7 Summary of otter signs between Blackrock Castle and Black Bridge*

Otter Sign	Total No.
Spraint site	9
Prints	3
Couch	3
Holt	2
Total	16

Spraint sites accounted for approximately half (n=8, 50%) of all signs recorded. Otter prints were recorded in three areas (with prints abundant in each area). With regards to the breeding and resting areas of otter, three otter couch (resting areas) were identified.

With respect to the environs of Jacobs Island – i) a spraint was noted on the shoreline ca. 0.5km northeast of Jacobs Island; ii) a couch and spraint site was noted in the coastal lagoon ca. 270m to the west.

Furthermore, two otter holts were identified, one of which was considered active. One is 2km from Jacobs Island on the River Lee; while the second is located west of Black Bridge within inner Douglas Estuary.

As noted, this survey recorded a total of n=16 otter signs the majority of which were spraint sites (approx. 50% of signs). However, breeding and resting areas that are afforded legal protection were also recorded, though no holts were noted at Jacobs Island or along the adjoining River Lee/Lough Mahon Waterfront Greenway. There are no otter holts in the immediate environs of Jacobs Island.

Our findings suggest that otter sign distribution and the location of otter sign marking correlates strongly with less disturbed areas of habitat and lower levels of human-related disturbance. This pattern has routinely been identified in other Irish otter studies of urban and peri-urban areas (e.g. Macklin et al., 2019; Brazier & Macklin, 2020). Our comprehensive approach, utilising total corridor otter survey (TCOS) methodology, has facilitated the identification of the most important areas for otter adjoining the study area.

Overall, otter signs were well distributed throughout the survey area (which as noted extended from Blackrock Castle to the northwest; south towards Jacobs Island; west toward Black Bridge and Douglas Estuary); although there was a paucity of signs between Ringmahon Point and Blackrock castle. The lack of signs recorded between Ringmahon Point and Blackrock Castle was considered due to the poorer-quality quality habitat present (i.e. high disturbance and poor seclusion). Furthermore, the low gradient of the mudflats creates a significant distance between the water line and the high tide mark making the habitat less viable for otter through large periods of the tidal cycle.

Currently the identified breeding (holt) and resting locations are situated in low disturbance areas of estuarine habitat that are poorly accessible with a high degree of cover. This site is not in the environs of Jacobs Island and is not accessible from current public paths. While it is vitally important to maintain the observed low disturbance levels given continued fragmentation of habitats inhabited by humans, particularly the constantly evolving urban fabric of cities, as noted these areas are not close to Jacobs Island. Otter breeding areas (holts) are widely accepted as being especially sensitive to direct human disturbance (Mason & Macdonald, 2009), with otter reproductive success known to be higher in less disturbed habitat; hence their preferential fidelity for low disturbance areas of habitat (Scorpio et al., 2016; Ruiz-Olmo et al., 2011; Loy et al., 2009; Kruuk, 2006).



i) Otter prints in mud near Harty's Quay.



ii) Entrance to holt near Black Bridge with spraint.



iii) Spraint site near Black Bridge.



iv) Otter couch area at stream entering lagoon south of N22.



v) Otter prints and tail slide in mud near Black Bridge.



iv) Spraint on Boulder Ringmahon Point.



vii) Intertidal west of Blackrock Castle.



viii) Black Bridge facing south.

Plate 9.28 Otter survey images.

#### 9.4.6 TERRESTRIAL MAMMALS – BADGER

No badger signs were recorded in the development lands or in the adjoining coastal fringe habitats.

The development land area at Jacob's Island was a scrub dominated parcel of land with evident high levels of disturbance. The open areas of the centre of the land parcel had a mosaic of recolonising bare ground, grassy patches, invasive scrub, native scrub and grassy areas. The escarpments on the borders supported more dense scrub and treelines with willow, elder and alder with gorse and bramble. The land parcel had no badger signs and mammal activity was dominated by rabbits with grassy areas heavily grazed with abundant droppings and dig patches. There was very limited activity from other mammals apart from single fox (*Vulpes vulpes*) scat and rat (*Rattus norvegicus*) burrows locally.

The site walkover revealed recent evidence of machinery tracks and disturbed ground near Japanese Knotweed stands in the centre of the land parcel. It was evident that these had been treated but the stands had not been eradicated. The moderate disturbance and openness of the area apart from the dense scrubbed over margins reduced the potential of the land parcel to support badgers. Furthermore, the separation of the land parcel from contiguous ecological corridors (i.e. habitat fragmentation) reduced its viability as an area to support badgers. Foraging opportunity would also be limited due to small areas of open grassy patches that were not considered extensive enough to support a small local population. Indeed, no snuffle holes, trails (other than that from fox, rabbit and rat) were evident.

Overall, the study area was considered of low suitability for badger and the species was not recorded present.

## 9.5 IMPACT ASSESSMENT

The potential impacts arising from the construction and operation of the proposed mixed-use development at Jacobs Island discussed in the following sections.

### 9.5.1 POTENTIAL IMPACTS ASSESSED

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

#### 9.5.1.1 Physical Damage/ Habitat Loss

Physical damage includes the degradation to, modification, fragmentation or loss of habitats. Direct physical damage of habitats could occur within working areas of the proposed project and along access routes where construction works are undertaken. Physical damage of habitats can also be an indirect impact. Physical damage may be temporary or permanent in nature.

#### 9.5.1.2 Disturbance

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

#### 9.5.1.3 Changes in Water Quality

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

#### 9.5.1.4 Dispersal of Invasive Species

Non-native invasive species can have negative impacts on biodiversity. Negative impacts of non-native invasive species on native biota occur through competition, predation, herbivory, habitat alteration, disease and genetic effects such as hybridisation. In the cases of non-native invasive species, the main impacts are a reduction in species diversity due to dense plant growth, heavy shading and disruption of trophic levels. These species can potentially be spread via plant fragments and soil containing plant material, and by vectors such as machinery and personnel.

#### 9.5.2 DO NOTHING SCENARIO

The new EIAR provisions require consideration of the 'do-nothing' scenario (as set out in EIAR Guidance published by the EU in 2017 (EU, 2017)). This should consider how the conditions on the site might evolve in the absence of the proposed development being progressed. In the short-term it is assumed that scrub would continue to dominate the site with more open areas maintained by pedestrian pressure. Under such a scenario biodiversity on site is likely to remain broadly the same. The potential value of the footprint of the proposed project to species such as nesting birds, foraging mammals (e.g. fox and bats) would continue.

#### 9.5.3 PROJECT DESIGN

The following design principles and "designed-in" mitigation have informed the assessment of impacts.

Within the scheme design and operation, good practice environmental and pollution control measures will be employed with regard to current best practice guidance such as Environmental Good Practice On-Site Guide (CIRIA, 2015). A Public Realm and Landscape Strategy Report has been prepared by Doyle O'Troitigh (Appendix 9.3). This sets out the approach to landscape planting within the proposed scheme.

The proposed surface water management system and foul effluent systems are detailed in full in the accompanying Construction and Environmental Management Plan (Appendix 2.1) and Engineering Infrastructure Report (Appendix 9.4).

Taking the above into account, the principal potential impacts of the residential development of the site at Jacobs Island are outlined in the following sections.

#### 9.5.4 CONSTRUCTION PHASE

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

##### 9.5.4.1 Potential Impact on Sites Designated for Nature Conservation

Potential negative impacts on European sites are discussed in the accompanying Natura Impact Statement (Atkins, 2022; refer to Appendix 9.1). As noted, the proposed development is not located within the boundaries of any European site. There will be no direct impacts to European sites; i.e. no land take or the permeant removal of habitat supporting qualifying interest and ecological features of the designated sites.

Jacobs Island adjoins Cork Harbour SPA (004030). Great Island Channel Sac lies ca. 3.6km to the east, on the eastern

side of Lough Mahon. There will be no direct impact on either site. Jacobs Island does not support areas of open grassland that field feeding shorebirds that are qualifying interests of Cork Harbour SPA might use for foraging.

Jacobs Island is hydrologically connected to Cork Harbour, within which these designated sites are located. Discharges to the drainage network will ultimately reach Cork Harbour. The Natura Impact Statement considers the potential for impacts to surface water and groundwater water; this in turn informed by the design of the surface water management systems on site; these are also discussed in terms of general ecology within the estuary below.

In summary, for the reasons set out in detail in the NIS, having regard to the location, nature, extent and duration of the proposed development, the Jacobs Island SHD will not have adverse effects on any European site, including Great Island Channel SAC or Cork Harbour SPA.

##### 9.5.4.2 Potential Impacts on Habitats

###### Direct habitat loss/damage during construction

The area subject to this application is dominated by Scrub (WS1); as well as areas of recolonising bare ground (ED2/ED3) and a mosaic of neutral grassland / scrub / recolonising bare ground (GS1n / WS1 / ED3); which would be removed as part of the proposed development. The area of scrub and grassland / scrub mosaic are both classified as being locally important (higher value). A small area of mixed woodland (WD1) is located in the centre of the site; this would also be removed as part of the development. This is also classified as being locally important (higher value); though it is dominated by a range of non-native tree species (refer also to the accompanying Arboricultural Report; Arborist Associates Ltd. (Appendix 9.3)). This is not part of a wider network of woodland nor an integral part of a woodland corridor within the wider landscape.

There are no habitats on site of greater than local value. No ecological features of regional, national or European importance will be directly impacted by the proposed development.

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

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

As noted, the proposed site is bound to the north by the N40, to the south and west by an internal access road and to the east by the Sanctuary, an existing residential apartment scheme. Following site clearance areas of semi-natural habitat would be restricted to areas west of the access road / lagoon and areas south of the existing housing; i.e. Joe McHugh Public Park / coastal River Lee/Lough Mahon Waterfront Greenway and the estuary. Due to the spatial separation of works from these areas, there should be no direct impact to ecological features in these areas during the course of works.

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

As noted Japanese knotweed and Bohemian knotweed have been recorded within the site (see Figure 9.4). Knotweed is listed on the 3<sup>rd</sup> schedule of the Natural Habitats Regulations, 2011. An Invasive Species Management Plan will be prepared to address treatment of knotweed on site.



In addition to knotweed a range of non-native species not listed on 3<sup>rd</sup> schedule of the Natural Habitats Regulations, 2011 have been noted on the site. These include Winter heliotrope, butterfly bush, Old-man’s beard (also known as Traveller’s-joy), Himalayan honeysuckle and cotoneaster. The accompanying Arboricultural Report (Appendix 9.5) provides additional information on a range of further garden escapes noted growing on site.

O’Donovan Agri Environmental has been employed to carry out treatment of these invasive plants on site. Treatment works commenced on site on 2021. In order to gain access to the growths of knotweed to commence foliar applications and to identify all areas of infestation it was necessary to conduct vegetation clearance. This included clearance of areas of buddleia, gorse and willow in September 2021, after the bird nesting season (refer to Appendix 9.2). Control included a combination of foliar application of herbicides and direct stem injection. Treatment methods are explained in full in the Invasive Species Management Plan prepared by O’Donovan Agri Environmental (Appendix 9.2). Once stems had died back it was possible to cut and remove this dead material without spreading viable plant tissue which could easily lead to spread of knotweed; cut stems were retained within the infested area. Stems were cut just above the first stem node. One is then left with short projecting stems from the plant crowns to 25cms over ground. These are a direct corridor for infusion of additional herbicide into these stems and the herbicide can gradually absorb downwards to the rhizomes. Stem filling is a process developed by O’Donovan Agri group in house a number of years ago along with the dedicated equipment for infusing and hydraulically loading the underground rhizomes. This work was undertaken in January and February 2022. The second year of the herbicide treatment program is being targeted to commence late August – mid September 2022. In combination with treatment, which can take up to 3-5 years, the option of on-site encapsulation of plant material is currently being explored.

#### 9.5.4.3 Potential Impacts on water quality

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

During the construction phase of the project, it is anticipated that the site compound will be located in the southeast portion of the site, located in the proposed green open space within the development. Please refer to drawing 21168-MMS-ZZ-ST-DR-C-10009 in the CEMP (Appendix 2.1). The site compound would not be located in proximity to any drains through which pollutants such as hydrocarbons could be discharged to the estuary.

With respect to surface water drainage, the development’s drainage design includes for a 10% climate change allowance. The proposed development will not increase the stormwater runoff rate when compared to the existing site and satisfies the requirement of the SFRA to reduce flooding and improve water quality (MMOS, 2021b). The surface water network for the entire Jacobs Island development was completed as part of the original works under planning reference 00/24609. This infrastructure was designed for all future development (i.e., all development envisaged under the 00/24609 planning application). Proposed works will not be allowed to drain directly to the existing network without appropriate interception and treatment in order to prevent any silt laden waters or pollutants such as hydrocarbons being discharged to the estuary. This is discussed further under Mitigation, below and is presented in full in the accompanying Engineering Infrastructure Report (Appendix 9.4).

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

Excavation works on site can interact with groundwater and has the potential to expose groundwater to contamination by concrete, hydrocarbons and other chemicals used in construction. However, due to the site topography, the existing levels are both above/below the final floor levels (FFLs) (note that much of the site is also characterised by made ground). Site excavation will be to formation level 500mm below final floor levels (FFLs). However, previous Site Investigation work has found that boreholes largely indicated shallow groundwater, with groundwater frequently being encountered at >5m beyond ground level. Works are therefore not anticipated to have a significant effect on

ground water. Details of previous ground investigation and cut and fill balance calculations, etc. are set out in the accompanying CEMP(Appendix 2.1).

Any localised / temporary alteration of ground water levels on-site is therefore expected to be minor and will not have a significant impact on the Lough Mahon Transitional Water Body ground waterbody feeding Cork Harbour to the east. In landscaped areas of the site surface water will naturally infiltrate to soils and ultimately groundwater; all other waters will be intercepted by the surface water management system as discussed above.

It is therefore considered that the proposed development will not negatively impact on water quality within Great Island Channel SAC; nor will it impact, directly or indirectly, any of the habitats or species listed as features of interest for Great Island Channel SAC. However, as is good practice, a series of environmental protection measures are proposed during both construction and operation, which are detailed in full in the accompanying Construction and Environmental Management Plan (CEMP) (Appendix 2.1) – with the principal measures included in this NIS under the heading “Mitigation” below.

#### 9.5.4.4 Potential Disturbance and/or displacement of faunal species

The proposed clearance works will result in the removal of areas of scrub, grassland and a small patch of mixed woodland which can provide habitat to a range of species. However, no physical signs of badger (i.e. badger sett or field signs) were recorded on site. Mammal activity on site was limited, with only signs of fox and brown rat noted; there was also evidence of intensive grazing by rabbits at some locations. The only notable observation on site was that of large numbers of the non-native Speckled bush cricket, whose calls were recorded during the bat survey work. No terrestrial bird species of conservation concern were noted. Shorebirds which use the adjoining estuary are discussed in the accompanying NIS (Atkins, 2022; refer to Appendix 9.1). However, no opportunities for field feeding shorebirds occur within the proposed development site, nor are there any roost sites.

The level of bat activity recorded on site at Jacob’s Island is very low. No bat roosts were noted. During walking transects only one individual Common pipistrelle and one individual Soprano pipistrelle were recorded and observed on site. Temperature at sunset was 18°C and weather was highly favourable for bats overnight during the survey. Development of this site will not have any significant impact on the small numbers of bats using the site. No light sensitive Myotis bat species were noted. Negative impacts from lighting on bats are not anticipated.

Fauna on site is of low local value and predicted impacts are not expected to be significant. Combined with the abundance of similar habitat beyond the proposed site; therefore, this project will have a slight temporary negative impact to local fauna due to local habitat loss on site. Proposed measures to mitigate these impacts are set out below.

No signs of otter were recorded on site at Jacobs Island. There are otter signs in the adjoining estuary; i.e. spraints on the coastal path north of Jacobs Island as well as spraints/couch in the lagoon west of Jacobs Island. There is, however, no otter holt in the environs of Jacobs Island. The pattern of distribution of otter signs indicates they are utilising areas of low human activity well away from Jacobs Island; a pattern which would not be impacted by the further development at Jacobs Island. However, as noted, given continued fragmentation of habitats inhabited by humans, particularly the constantly evolving urban fabric of cities it is vitally important to maintain the observed low disturbance levels at sites favoured by otter away from Jacobs Island..

### 9.5.5 OPERATIONAL PHASE

#### 9.5.5.1 Impact on Sites Designated for Nature Conservation

During the operational phase, surface waters will discharge to Lough Mahon. The proposed surface water drainage system for the development has been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works and Sewers (GDSDS). The details of the drainage system (as well as matter such as the use of Sustainable Drainage Systems (SuDS) and surface water attenuation) are set out in the Engineering Infrastructure Report (Appendix 9.4) submitted with the planning application.

The surface water network for the entire Jacobs Island development was completed as part of the original works under planning reference 00/24609. This infrastructure was designed for all future development (i.e., all development envisaged under the 00/24609 planning application).

The installed surface water drainage network included a large 600mm diameter and 900 diameter surface water sewers adjacent to the fore shore to an outfall located to the north of the site. The surface water sewer outfalls directly into the Lough Mahon Estuary via a non- return valve.

In 2013 a taking in charge process was undertaken in conjunction with Cork City Council and during this process the constructed sewage network was signed off by Cork City Council following the process of CCTV surveys and visual inspections. In addition, a report that reviewed the design and future capacity of the existing sewers was undertaken and provided to Cork City Council by MMOS. A copy of this report is enclosed in Appendix C of the Engineering Infrastructure Report (Appendix 9.4).

The proposed surface water drainage will be gathered in a dedicated system and will collect runoff from all impermeable areas, such as roofs, terraces, and hardstanding areas within the land boundary.

The surface water drainage will be designed in accordance with the following criteria: -

- BS EN752:2008 – Drain and Sewer Systems outside Buildings;
- BS 8515:2009 – Rainwater Harvesting Systems, Code of Practice (where applicable);
- Minimum pipe diameter will be 225mm on the main network;
- All pipe runs shall be designed to achieve a minimum self-cleansing velocity of 1 m/s; and
- A roughness value (k) of 0.6mm is used in the network design.

The Greater Dublin Strategic Drainage Study (GDSDS) Vol. 2 Section E2.1 requires provision of interception and/or treatment volume for River Water Quality Protection.

It is noted that the point of outfall of the sewer is directly into the Lough Mahon and as recognised in the Greater Dublin Strategic Drainage Study (GDSDS) attenuation is not required in such circumstance where the point of outfall is into an estuary, as specifically advised in section 6.3.3.4., as follows: -

“Where there is little downstream to be concerned about with respect to flooding (discharging to the estuary or sea), criteria on flow rates and volumes of discharge are of little relevance. Water quality is the only issue needing to be addressed (primarily sedimentation)”

Attenuation is not therefore proposed for the current application; however, hydrocarbon interceptors will be provided for all discharge generated off the newly added carparking area and traffic routes.

As is similar with the surface water network, the wastewater sewer network for the entire Jacobs Island development was completed as part of the original works and this infrastructure will cater for the development works that are proposed under this application. This wastewater sewer network is completely separated to the surface water network throughout the site.

A pre connection enquiry has been submitted to Irish Water with regards to the proposed foul discharge for the development on 20.07.2021 (REF: CDS21005115) and we have received back the confirmation of feasibility. Both documents are attached in Appendix G of the Engineering Infrastructure Report (Appendix 9.4). We note that the site layout has changed since the pre connection enquiry and the number of units in the scheme was reduced, so the confirmation of feasibility from Irish Water is provided for a number of units bigger than the present development.

Details of the proposed foul drainage layout are shown indicatively on proposed services drawing presented in Appendix D of Engineering Infrastructure Report (Appendix 9.4). It should be noted that all foul drainage works will be undertaken in accordance with Irish Water standard details and codes of practice for wastewater as required.

A flood risk assessment for the proposed development predicted that there is no risk of tidal or fluvial flooding of the site (refer to Chapter 6.0) during construction or operation of the site. Any flood events do not cause flooding of the proposed development, and the proposed development does not affect the flood storage volume or increase flood risk elsewhere. Thus, the residual risks of flooding can be managed by incorporation of good building practice in design and construction of ground floor level and associated drainage systems, and by maintenance and management of the property. As outlined in the Engineering Infrastructure Report (Appendix 9.4) the proposed development has been demonstrated to be compliant with the core objectives of the Planning System and Flood Risk Management Guidelines.

In the circumstances set out in this report and other application documentation, including the NIS, the operational phase of the proposed development will not negatively impact on water quality within Cork Harbour SPA; nor will it impact, directly or indirectly, on any of the habitats or species listed as features of interest for Great Island Channel SAC/Cork Harbour SPA or any NHAs and pNHAs.

#### 9.5.5.2 Potential Impacts on Habitats

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

#### 9.5.5.3 Potential Impacts on water quality

Refer to Section 9.4.5.1, above.

#### 9.5.5.4 Disturbance and/or displacement of faunal species

The development is sufficiently distant from Cork Harbour that disturbance of birds using the Cork Harbour SPA will not occur. This is discussed in the accompanying Natura Impact Statement (Appendix 9.1).

No significant operational impacts to fauna are anticipated. As, noted, the site does not support badger. Mammals such as fox, brown rat and rabbit are known to use manmade landscapes to forage. The provisions of green spaces linking the site with landscaping along the N40 and the River Lee/Lough Mahon Waterfront Greenway, as well as semi-natural habitats to the west will provide a corridor and foraging ground for both species as well as for the small number of bats

noted to use the site; this is discussed further under proposed Mitigation measures below. Operational impacts to mammal onsite will be imperceptible.

As noted above, local bird populations will be displaced from the works area during the construction stage. Once works have finalised and landscaping becomes established common bird species will use the area again. Therefore, there will be a neutral impact to local bird species during the operational phase.

#### 9.5.5.5 Risk of Major Accidents and Disasters

The risk of a major accident onsite is extremely low (e.g. there will be no oil storage tanks on site, removing the risk of oil spills associated with the finished development) and, in any event, is confined to the construction phase of the development. Events such as a large hydrocarbon spill or release or high volumes of contaminants during the construction phase could potentially have a negative impact on high value sensitive sites such as the Great Island Channel SAC and Cork Harbour SPA. However, given the location of the site relative to conduits, such as watercourses, and given the control measures proposed, there will not be any accident of sufficient scale that would negatively impact on Great Island Channel SAC and Cork Harbour SPA. While impacts to local soil and groundwater could conceivably occur, details of preventative measures and emergency response measures have been included in the accompanying CEMP (Appendix 2.1), and will be implemented, in order to effectively limit the potential scale of this impact. Thus, the magnitude of a major accident on site is likely to be significant only at a site level only and is imperceptible in relation to Internationally important features such as European sites, in excess of 15km distant from the development site.

## 9.6 MITIGATION MEASURES

### 9.6.1 CONSTRUCTION PHASE MITIGATION

#### 9.6.1.1 Protection of Sites Designated for Nature Conservation

A detailed Construction and Environmental Management Plan (MMOS, 2021a) has been appended to the EIAR. For ease of reference, the general pollution prevention measures which will be implemented during the construction phase are outlined below.

#### 9.6.1.2 Mitigation of habitat loss/damage during construction

Landscaping works will commence on the completion of the building facades. Landscaping works will be undertaken within the site perimeter, particularly to the north that is bounded by N40 South Ring Road. Measures will be implemented to ensure that trees or vegetation being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around trees and vegetation being retained and this will enclose their Root Protection Areas (RPAs). To mitigate against the loss of scrub and a small area of woodland, substantial planting will be undertaken on the site. Large areas of open space will be maintained on the site. This will reduce the impact of the proposed development upon habitats in the area and there will be no significant operational impact upon habitats due to the provision of substantial native and pollinator friendly habitats proposed for the site. Landscaping proposals are set out in Chapter 4.0: Landscape and Visual Impact Assessment.

#### 9.6.1.3 Flora & Fauna

Loss of commuting and foraging habitat at the site will be mitigated by the landscaping proposals which include extensive planting through the site. Trees or vegetation to be retained will be protected from any accidental damage during construction through use of measures such as fencing. Measures will be implemented to ensure that trees and vegetation being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around trees and hedge vegetation being retained and this will enclose their Root Protection Areas (RPAs). The fencing will be at least 2.3m. Similarly, a buffer is to be maintained between site and neighbouring stream and riparian margin.

The planting schemes shall ensure connectivity to habitats in the wider landscape. Trees that are being retained at the site shall be protected during clearance and construction works in line with current guidelines e.g. British Standard 5837:2012 and National Roads Authority 2006a.

To minimise disturbance to bats and other fauna that are roosting/resting or active at night, construction operations during the hours of darkness will be kept to a minimum. If construction lighting is required during the bat activity period (April to September), lighting shall be directed away from areas of semi-natural habitat to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill. This shall be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

Lighting within the proposed development site shall be installed with sensitivity for local wildlife while still providing the necessary lighting for human usage.

### 9.6.1.4 Construction and Environmental Management Plan

The following measures are a combination of measures proposed in the accompanying Construction and Environmental Management Plan (MMOS, 2021a) and environmental good practice.

The control measures for the construction stage of the proposed development will follow the following current best practice guidelines: -

H. Masters-Williams et al. (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;

IFI (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin;

Murnane et al. (2002). Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156; and

Murphy, D. (2004). Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.

#### Construction Sequence

The proposed works will be constructed in the following sequence.

Site clearance and reduced levels. It is envisaged that the works will require the excavation to formation level resulting in approximately 18,000m<sup>3</sup> of excavated material, which is proposed to be kept onsite to be reutilized during ground works and landscaping in this development.

- Piled foundations and perimeter retaining walls.
- Construction basement slab and associated water proofing.
- Erection of concrete stairs and lift cores to roof level.
- Construction of concrete columns and intermediate upper basement and ground floor concrete slabs.
- Erection of structural frame super structure and floor slabs.
- Construction of glazing and solid facades in accordance with the architect's drawings.
- Roof completions.
- Internal completions and fitout works.
- External works.

#### Tower Crane

- The construction works will require the erection of at least 4 no. tower cranes within the development site. The tower crane will be required for the erection of the building frame and super structure. It is noted that the location and operation of the tower cranes will be co-ordinated by the main contractor but are likely to be located centrally in each site phase.

#### Piling

- All buildings structures will be supported on piled foundations, subject to further detailed design. Formation levels across the site will vary and they are anticipated to the various areas as 5.65m OD (Block 11), 7.0m OD (Block 12), 6.85m OD (Block 13), 6.8m OD (Block 14), 7.5m OD (Block 15).

- It is proposed that the piling methodology will be continuous flight auger type piles (CFA Piles) so as to limit noise and vibration to the adjoining residential area.
- During the piling installation works an independent specialist will be employed to monitor the noise levels at the site perimeter and vibration levels at specified locations.

#### Basement

Block 15 is proposed to have a basement car parking area and as outlined above, the foundations for the building will likely consist of piled foundations. All basement drainage will be located beneath this slab and will be tanked to prevent future water ingress. The drainage will then connect to the main network in the public road by gravity.

The suspended podium slab will be formed in a concrete frame. This structure will also provide horizontal restraint to the perimeter retaining sheet piled walls and will facilitate the sequenced removal of any temporary propping as required.

The basement structure will require large concrete pour volumes, which will likely require works outside of normal construction hours to be agreed with Cork City Council in advance.

#### Super structure construction

The buildings will likely be constructed as a concrete framed flat slab type structure with columns in rectangular shapes to suit the party wall layouts and required sound resistance. The stair core walls will be reinforced concrete or precast concrete.

#### Building Façades

The building façades will vary depending on the building use. Where possibly an emphasis will be placed on off-site construction including modular unitised facades and precast panels. This will facilitate a swift form of construction and will also reduce site waste.

#### Fit out works

The internal fitout of each building will be on a phased basis and will be subject to final tenant requirements. The fitout works will include mechanical and electrical works, partitions, and finishes. The emphasis will be on lean construction to ensure minimal construction waste.

#### Landscaping works

Landscaping works will commence on the completion of the building facades. Landscaping works will be undertaken within the site perimeter, particularly to the north that is bounded by N40 South Ring Road.

### Construction Access

### Construction Traffic Volumes

Heavy goods vehicle truck movements into and out of the site are expected to peak during the basement excavation works and large concrete pours. Note that the excavated material will be relocated internal within the site and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period.

People movement (in and out) and associated car trips during each construction stage will be circa 20 no. during basement excavation stage and rising to circa 50 during construction with an increase to 60 no. as the frame is being progressed. The numbers on site will maintain at this level during the façade construction but will increase to between 60-70 during internal M&E installation.

Typically, the trips to and from the site will be by private car and vans accommodating 1-2 workers. Some sub-contractors will use minibus transport when in larger crews, such as concrete contractors, M&E, and facades. Public transportation will also be availed of by individual workers. Typically, construction workers will remain on site from between morning start to evening time

### Site Compound

It is anticipated that the location of the site compound will be located to the middle portion of the site, located in the proposed green open space within the development. (Please refer to the CEMP for relevant Drawings; Appendix 2.1).

### Hours of Work

7:30 am to 6 pm Monday to Friday, 7.30 am to 4 pm on Saturdays, or as directed by Cork City Council. It is proposed that hours of work outside of these times will be by agreement with the local authority.

### Dust & Noise

Dust minimisation and dust monitoring is set out in Section 7 Dust Minimisation of the accompanying CEMP; while Noise and Vibration is addressed under Section 8.1 and 8.2 of the CEMP (Appendix 2.1).

### Waste Management

Refer to Section 9 Construction Waste Management of the accompanying CEMP (Appendix 2.1).

### Fuel & Oil Management Procedure

#### Refuelling

Refuelling will take place in the proposed site compound (as set out in the accompanying CEMP; Appendix 2.1).

- Refuelling will be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using.

- Plant nappies or absorbent mats will be placed under refuelling points during all refuelling to absorb drips.
- Mobile bowsers, tanks and drums shall be stored in secure, impermeable storage area, away from drains and open water.
- To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required from the main contractor.
- Potential leaks from delivery vehicles will be reduced by visually inspecting all vehicles for major leaks.
- In the unlikely event of an oil leak or spill, the leak or spill will be contained immediately using oil spill kits; the nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility.
- The Environmental Manager will be immediately informed of the oil leak/spill and will assess the cause and the management of the clean-up of the leak or spill. The Environmental Manager will inspect nearby drains for the presence of oil and initiate the clean-up if necessary.
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound, and also in site vehicles and machinery.
- Correct action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction.
- In the extremely unlikely event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.

#### Oil storage

Oil storage will take place in the proposed site compound (as set out in the accompanying CEMP; Appendix 2.1).

- Fuel containers will be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Leakages of oil from oil stores will be prevented by storing these oils in bunded tanks which have a capacity of 110% of the total volume of the stored oil. Ancillary equipment such as hoses and pipes will be contained within the bunded storage container. Taps, nozzles or valves will be fitted with a lock system.
- The volume of leakages will be prevented through monitoring oil storage tanks/drums for leaks and signs of damage. This will be carried out daily by the Environmental Manager.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re- cycling by an approved service provider.

#### Cement

Concrete should always be placed in a controlled method to prevent spillages as is good construction practice. Where possible concrete should be placed using a concrete pump. It is important that the machinery is well maintained.

At the delivery and wash down point it is important that measures are employed to prevent spillages from concrete delivery trucks contaminating the ground.

### Environmental Controls

Environmental control measures will be stored in the proposed site compound (as set out in the accompanying CEMP; Appendix 2.1).

- Mobile bowsers, tanks and drums will be stored in secure, impermeable storage area, away from drains and open water.
- Fuel containers will be stored within a Secondary Containment System, e.g. bund for static tanks or a drip tray for mobile stores.
- Ancillary equipment such as hoses, pipes shall be contained within the bund.
- Taps, nozzles or valves must be fitted with a Lock System.
- Fuel and Oil Stores including tanks and drums shall be regularly inspected for leaks and signs of damage.
- Only designated Trained Operators who are authorized to refuel plant on site and emergency spill kits will be present at equipment for all refuelling events.
- Procedures and contingency plans will be set up to deal with emergency accidents or spills.
- Suitable spill response materials and emergency instruction shall be available on site and staff shall have been adequately trained.

Other measures such as Dust (Chapter 7.0), Noise (Chapter 8.0) and Waste (Chapter 9.0) management are presented in the CEMP (Appendix 2.1).

### Site Environmental Training & Awareness

- Environmental awareness and training shall be achieved by: -
  - Site induction, including relevant environmental issues.
  - Environmental posters and site notices.
  - Method statement and risk assessment briefings.
  - Toolbox talks, including instruction on incident response procedures.
  - Key project specific environmental issues briefings.
- All managers and supervisors will be briefed on the content and effective implementation of the measures identified in the CEMP (Appendix 2.1).
- Method Statements will be prepared for specific activities prior to the works commencing and will include all environmental protection and mitigation measures identified in the planning application documentation and emergency preparedness appropriate to the activity covered. The Construction Environmental Manager will review key Method Statements prior to their issue.
- Method Statement briefings will be given before personnel carry out key activities for the first time.
- Environmental Training Records are to be retained in the Site Office.

Environmental Controls: Site staff shall be competent to perform tasks that have the potential to cause a significant environmental impact. Competence is defined in terms of appropriate education, training and experience.

The finalised CEMP will also be required to incorporate i) Environmental Emergency Response Plan; ii) set out a Monitoring and Auditing Procedure; iii) present a mechanism for recording Environmental Accidents, Incidents & Corrective Action Procedures and iv) establish an Environmental Complaints Procedure. This should also include Lighting Pollution Control measures.

### Surface Water Management and runoff control measures

#### Sources of Water on the Construction Site

The following are the sources of water that are likely or that may be encountered during the construction works.

- **Rainwater:** The primary source of water to the site is rainwater. The anticipated average annual rainfall at the site is anticipated to be in the region of between 800 and 1200 mm annually. The rainfall amounts vary by the season and can be as much as 50 mm over a 24-hour duration. Heavy rainfall can have a significant effect on the site and can cause flooding and the overwhelming of site drainage systems. Flooding can have an effect on stored site materials that would not normally pose a risk. The contractor will be required to ensure that materials are therefore properly stored on site and to plan site activities to ensure that works such as heavy excavation, drainage and foundation works are postponed during adverse weather conditions.
- **Surface Water:** Surface waters tend to include watercourses and waterbodies. In the case of the proposed development site, the large waterbody adjacent to the site is the adjacent Lough Mahon Estuary. Whilst the construction works do not require any works within the Lough Mahon estuary the works will be taking place in close proximity to the estuary and the contractor will need to have regard for this during the construction works.
- **Groundwater:** Construction works will include the construction of a basement under blocks 15-16. The basement floor level of 8.1 m OD is set above known ground water levels and therefore should not have a significant effect on ground water. The contractor will be required, in advance of and during site establishment, to undertake a series of trial holes to establish the ground water levels.
- **Mains Potable Water:** Jacobs Island is served by a large truck public water main from 2 locations, at the entrance bridge and also at a point directly opposite the Mahon Shopping Centre, as identified on MMOS services drawings. The main infrastructure is complete, and each site is served by a branch of this public water main. The contractor will be required to specifically identify each of these mains and ensure that they are protected during the works.

#### Potential Sources of Water Pollution

The following are a list of potential water pollutions that could arise on the construction site.

- **Suspended Solids:** The contractor is to employ measures to ensure that water pollution does not arise as a result of suspended solid pollution. Sources of suspended solid pollution include, excavation, earth stockpiles, plant and wheel washing, build-up of mud on site roads. Good practice construction measures are proposed in the following sections that the contractor will be required to employ to ensure that suspended sediments from the above potential sources do not enter the watercourse.
- **Oils and Hydrocarbons:** Oils are a potential source of pollutants on a construction site. Diesel, lubricating oil, fuel, petrol, and hydraulic fluids are used quite readily on construction sites for various types of machinery and refuelling and maintenance are required regularly on sites. The contractor will need to employ good practice measures to prevent these potential pollutants entering the water course. These measures will include bunded areas for the storage of fuels, regular maintenance of machinery to ensure that no leakages occur, measures to protect the site from vandalism and the provision of a designated refuelling area on site or refuelling off site.
- **Concrete and Cement Products:** It is important the cement products are carefully stored to withstand various weather conditions such as heavy rainfall and high winds to prevent run off and dust pollution. Concrete products can cause contamination during wash down of the trucks which can cause a large volume of uncontrolled runoff. Good practice measures can be employed on site to prevent such uncontrolled runoff by the use of a special impermeable bunded slab with a collection point and siltation for such operations.

Potential pollution from the site will be managed in accordance with the principals as set out in *CIRIA guide C532 Control of Water Pollution from Construction Sites – Guidance for consultants and contractors*. The site is in close proximity to the Lough Mahon Estuary and construction works will require to be controlled, in particular, controlled surface water runoff procedures implemented. This will include best practice standards and environmental guideline to safeguard qualifying interests.

Specific details will be provided by the contractor on development of the detailed Construction Management Plan at construction stage; these will be agreed in full with the Council's Environmental Department where necessary. The contractor will be required to submit proposed methods for managing surface water runoff from the site during the construction operations. The CEMP (Appendix 2.1) outlines the operations which will require particular attention.

- Implement erosion control to prevent runoff flowing across exposed ground and become polluted by sediments.
- Intercept and divert clean water runoff away from construction site runoff to avoid cross-contamination of clean water with soiled water.
- Implement the erosion and sediment controls before starting site clearance/construction works.
- Minimise area of exposed ground by maintaining existing vegetation that would otherwise be subject to erosion in the vicinity of the development and keeping excavated areas to a minimum.
- Install a series of silt fences or other appropriate silt retention measure where there is a risk of erosion runoff to watercourses from construction related activity particularly if working during prolonged wet weather period or if working during intense rainfall event.
- Implement sediment control measures that includes for the prevention of runoff from adjacent intact ground that is for the separation of clean and 'dirty' water.
- Install appropriate silt control measures such as silt-traps, check dams and sedimentation ponds.
- Washout from concrete trucks and plant will not be permitted on site.
- Provide recommendations for public road cleaning where needed particularly in the vicinity of drains.

Controls need to be regularly inspected and maintained otherwise a failure may result, such as a build-up of silt or tear in a fence, which will lead to water pollution so controls must work well until the vegetation has re-established; inspection and maintenance is critical after prolonged or intense rainfall.

Develop checklists for weekly Site Audits, which must be finalised by the Appointed Contractor and the relevant Personnel informed of their duties.

#### 9.6.1.5 Biosecurity protocols

As it was recorded a presence of high impact invasive species, such as Japanese knotweed and Bohemian knotweed, within the masterplan site area. O'Donovan Agri Environmental has been employed to carry out treatment of these invasive plants on site (see Section 9.5.4).

Biosecurity protocols shall be implemented during the proposed project to prevent the introduction of invasive species, in particular those listed on the third schedule of the 2011 Regulations, to site and the further spread of diseases. The following measures will be adopted: -

- Machinery or plant to be inspected upon arrival and departure from site and cleaned when necessary.
- All equipment intended to be used at the site shall be: -

- power steam washed at a suitably high temperature or at least 65 degrees, or
- disinfected with an approved disinfectant, e.g. Virkon or an iodine-based product. The manufacturer's instructions shall be followed and if required, the correct contact times allowed for during the disinfection process. Items that are difficult to soak shall be sprayed or wiped down with disinfectant.
- During the duration of the proposed development, if equipment is removed off-site to be used elsewhere, the said equipment shall be cleaned and disinfected prior to being brought back to the works area.
- Appropriate facilities shall be used for the containment, collection and disposal of material and/or water resulting from washing facilities of vehicles, equipment and personnel.
- Importation of materials shall comply with Regulation 49 of the EC (Birds and Natural Habitats) Regulations 2011.
- Adequate site hygiene signage should be erected in relation to the management of non-native invasive species material.

A number of medium impact plants such as Butterfly Bush were observed within the present site. These plants shall be grubbed and either chipped or removed from site. The site will be monitored for re-growth and any saplings will be pulled and disposed of appropriately or treated by an application of a suitable herbicide.

In the event that further invasive species are identified an Invasive Species Management Plan shall be prepared and implemented by the Contractor. This shall include plant specific control measures for any invasive species identified.

#### 9.6.1.6 Potential Disturbance of faunal species mitigation

##### Birds

Removal of vegetation such as grassland, woodland and hedgerow will be carried out outside the breeding bird season from 1<sup>st</sup> March to 31<sup>st</sup> August inclusive.

##### Mammals

No mitigation is necessary for terrestrial mammals using the site.

#### 9.6.2 OPERATIONAL PHASE MITIGATION

##### 9.6.2.1 Bats

##### Bat Boxes

It is recommended that two Schwegler 1FF bat boxes are mounted on the mature sycamore and two on the mature beech tree on the northern boundary of the site.

#### 9.6.3 MONITORING

Monitoring will be carried out in accordance with the methodologies set out in the CEMP (Appendix 2.1). During construction, the application of pollution prevention measures as set out within the CEMP will be checked regularly. The mitigation measures to protect hedgerows during construction shall be monitored to ensure its effectiveness.

Once operational, the implementation of the landscape plan and additional habitat (such as wild flower meadows and additional planting) shall be inspected to ensure effective implementation.

## 9.6.4 ENHANCEMENT

In line with Cork County Biodiversity action plan and All Ireland National Pollinator Plan, and in order to create a biodiversity net gain at the site, the landscaping proposals will include areas of ecological enhancement such as wild flower areas and tree planting (including native species) linking with the proposed development.

The landscaping proposals seek to enhance features as appropriate with a scheme which includes both native and non-native planting as appropriate to the location within the scheme, with non-native species also chosen based upon their value to pollinators.

Tree planting serves to enhance the urban realm and provide commuting links to the various habitats. The aim is to improve visual screening while enhancing biodiversity. The following recommendations for enhancement for bats are adapted from Landscape and Urban Design for Bats and Biodiversity (BCT, 2012). To attract nocturnal flying insects, plant: -

- Mixtures of flowering plants, trees (including fruit trees) and shrubs to encourage a diversity of insects to sustain bats and other wildlife throughout the year. New planting shall include pollinator friendly tree species including locally appropriate species listed in the Pollinator Friendly Planting Code (NBDC, 2015). Hedgerows shall include a range of different species to provide food throughout the year, for example willows and blackthorn for early season nectar; hawthorn, bramble and rose for summer flowers and autumn berries; ivy for autumn nectar and later winter berries;
- Flowers that vary in colour, fragrance, shape, amount of nectar and time of flowering;
- Pale flowers that are more easily seen in poor light, so attracting insects at dusk;
- Single flowers, which tend to produce more nectar than double varieties; and
- Flowers with insect-friendly landing platforms and short florets, like those in the daisy or carrot families.

Other enhancement options include: -

- Integrated bat boxes built into the structure of buildings (with the majority located on southern orientations). The advice of the bat specialist would be sought to finalise the location of bat boxes on site.

Within the landscape plan shrubs and trees which have the potential to support foraging populations of birds are proposed in the landscape plan. Details of the planting scheme are presented below.

## 9.6.5 LANDSCAPING PROPOSALS

Landscape planting proposals for the site are as follows: -

### Tree planting to include the following, but not limited to: -

- 13 Norway maple *Acer platanoides* 'Columnare', r/b, 20-25cm girth
- 10 Norway maple *Acer platanoides* 'Drumondii', r/b, 20-25cm girth
- 22 European hornbeam *Carpinus betulus* 'Frans Fontaine', r/b, 18-20cm, clear stem to 2.0m
- 30 Beech *Fagus sylvatica* 'Dawyck's Gold', r/b, 3.5-4.0m tall (feathered)
- 4 American sweetgum *Liquidambar styraciflua* 'Slender Silhouette', r/b, 18-20cm girth

- 3 Callery pear *Pyrus calleryana* 'Chanticleer', r/b, 18-20cm girth
- 4 Flowering cherry *Prunus* 'Sunset Boulevard', r/b, 18-20cm girth

### Open space trees

- 12 Red maple *Acer rubrum* 'Red Sunset', r/b 18-20cm
- 35 Snowy mespil *Amelanchier lamarkii*, r/b, multistem, 3.0-3.5m tall
- 10 Erman's birch *Betula ermanii*, r/b, 18-20cm girth
- 42 Himalayan birch *Betula utilis* 'Jacquemontii', r/b, multistem 4.0-4.5m tall
- 36 Eastern redbud *Cercis canadensis* 'Forest Pansy', r/b, 16-18cm girth, 4.0-4.5m tall
- 6 American witch-hazel *Hamamelis virginiana*, r/b 1.75-2.0m
- 16 Beech *Fagus sylvatica* 'Dawyck's Purple', r/b, 18-20cm girth, clear stem to 2.0m
- 3 Beech *Fagus sylvatica* 'Dawyck's Gold', r/b, 3.5-4.0m tall (feathered)
- 32 American sweetgum *Liquidambar styraciflua* 'Slender Silhouette', r/b, 18-20cm girth
- 30 American sweetgum *Liquidambar styraciflua* 'Worplesdon', r/b, 18-20cm girth
- 11 Tulip tree *Liriodendron tulipifera*, r/b 18-20cm girth
- 9 Scot's pine *Pinus sylvestris*, r/b 2.0-2.5m
- 2 Bird cherry *Prunus padus*, r/b, 18-20cm girth
- 7 Callery pear *Pyrus* 'Chanticleer', r/b, 18-20cm girth
- 8 large-leaved linden *Tilia platyphyllos*, r/b 30-35cm girth

### Courtyard trees

- 40 Snowy mespil *Amelanchier lamarkii*, r/b, multistem, 2.0-2.5m tall
- 11 Strawberry tree *Arbutus unedo*, r/b 1.75-2.0m
- 40 Himalayan birch *Betula utilis* 'Jacquemontii', r/b, multistem 2.0-2.5m tall
- 30 Eastern redbud *Cercis canadensis* 'Forest Pansy', r/b, 16-18cm girth, 4.0-4.5m tall
- 15 Witch-hazel *Hamamelis virginiana*, r/b 1.75-2.0m
- 6 Japanese white pine *Pinus parviflora* 'Glauca', 2.0-2.5m
- 1 Viburnum *bodnantense* 'Pink Dawn', r/b 1.75-2.0m

### Woodland screen planting (420m<sup>2</sup>)

- 14 Alder *Alnus glutinosa* rootball 12-14cm girth
- 13 Downy birch *Betula pubescens* rootball 12-14cm girth
- 13 Beech *Fagus sylvatica* rootball 12-14cm girth
- 13 Scot's pine *Pinus sylvestris* rootball 1.5-2.0m tall
- 13 European Larch *Larix decidua* rootball 1.5-2.0m tall

### Including, Understorey:

- Field Maple *Acer campestre* bare root 60-90cm planted at 1.0m c/cs
- Hawthorn *Crataegus monogyna* bare root 60-90cm planted at 1.0m c/cs
- Hazel *Corylus avellana* bare root 120-150cm planted at 1.5m c/cs
- Spindle *Euonymus europaeus* bare root 40-60cm planted at 1.0m c/cs



- Blackthorn *Prunus spinosa* bare root 60-90cm planted at 1.0m c/cs
- Guelder rose *Viburnum opulus* bare root 40-60cm planted at 1.0m c/cs

**Edged with:**

- Pendulous sedge (*Carex pendula*)

**Hedging to include:**

- European hornbeam *Carpinus betulus* –double staggered row; 5/linear metr
- Portuguese laurel cherry *Prunus lusitanica* ‘Angustifolia’, r/b, 800-1000mm tall. (3 per linear m)

**Shrubs / Perennials, container grown 2L, planted at 5no per m<sup>2</sup>, to include:**

- Anemone ‘Honorine Jobert’
- Ceanothus thyrsoiflorus repens
- Crocosmia ‘Lucifer’
- Helleborus orientalis
- Hydrangea ‘Lime light’
- Hypericum Hidcote
- Miscanthus sinensis ‘Fern Osten’
- Pachysandra terminalis
- Perovskia ‘Blue Spire’
- Prunus ‘Otto Luyken’
- Rudbeckia fulgida ‘Goldsturm’
- Sarcococca confuse
- Stipa gigantea
- Verbena bonariensis

**Bulbs, planted at 15no per m<sup>2</sup>:**

- Allium hollandicum ‘Purple Sensation’
- Camassia leichtlinii
- Leucojum aestivum
- Tulipa ‘Triumphator’

**Meadow grass seeding:**

Grass mix with 25% *Vicia sativa* (Common vetch), 25% *Leucanthemum vulgare* (Ox-eye daisy), 25% *Succisa pratensis* (devil’s-bit scabious), 25% *Centaurea nigra* (Common knapweed). Application rate: 1.5g / m<sup>2</sup>.

Manage by cutting once a year in September.

Leave cuttings on the ground for a couple of days to facilitate seeds dropping and then remove.

**Grass seeding:**

Grass mix (45% Amenity Ryegrass, 40% Slender Creeping Red Fescue, 10% Chewings Fescue, 5% Highland Brown top Bent); Application rate: 35g / m<sup>2</sup>.

## 9.7 RESIDUAL IMPACTS

As noted, there are no habitats on site of greater than local value. No ecological features of regional, national or European importance will be directly impacted by the proposed development. Development of this site will not have any significant impact on the small numbers of bats using the site or on the terrestrial mammals or birds using the site. The effect of the habitat loss during the construction phase of the development will therefore be significant at Site level only.

Mitigation by avoidance is proposed for breeding birds; while strict adherence to on-site biosecurity measures would be implemented to prevent the spread of invasive species onto the site. As noted, control of Japanese knotweed is underway. No bat roosts were recorded on site. Detailed measures to protect vegetation to be retained are set out above. Measures to reduce the effects of loss of habitats are also proposed in the form of detailed landscaping proposals. Details of trees to be planted are presented are included in the accompanying Landscape Masterplan.

Enhancement proposals incorporated into the site landscape masterplan will improve the biodiversity value of the for groups such as bats, bird, and invertebrates and enhance the overall value of the site at a local level. Furthermore, bat boxes are to be provided on site in order to enhance bat roosting opportunities locally.

Overall, the residual impacts of the proposed development on ecology are likely to be slight negative impact at a site level and of short-term duration (i.e. Effects lasting one to seven years as per EPA, 2017). In the short to medium term (i.e. Medium term – seven to fifteen years) as vegetation on site mature the residual impact would increase to neutral to slight positive impact at a local level.

## 9.8 CUMULATIVE EFFECTS

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Plan, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting Strategic Environmental Assessment (SEA) Statement contained in Appendix 2(A) of the Draft Plan. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.

SEO BFF objectives as detailed in Table 5-1 and 7-1 of the Draft Plan are to: -

- To preserve, protect, maintain and, where appropriate, enhance the terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species;
- Ensure no adverse effects on the integrity of any European site, with regard to its qualifying interests, associated conservation status, structure and function;
- Safeguard national, regional and local designated sites and supporting features which function as stepping stones for migration, dispersal and genetic exchange of wild species;
- Enhance biodiversity in line with the National Biodiversity Strategy and its targets; and
- To protect, maintain and conserve the City’s natural capital.

A Strategic Environmental Assessment (SEA) and Natura Impact Report (NIR) was prepared for the draft Cork County

Development Plan, which assessed the CDP and its potential to adversely affect the environment as a whole and the integrity of Natura 2000 sites<sup>8</sup>. This sets out in full the approach to the Appropriate Assessment, how aspects of the Plan were considered and how the Plan will be implemented and delivered while protecting European sites; thus, ensuring that potential impacts were avoided, reduced or offset. Thus, the finding of the assessments was that the Plan will not adversely affect the general biodiversity and the integrity of Natura 2000 sites due to the incorporation of mitigation measures into the Plan as a result of the assessment processes. A summary of the Screening Assessment is presented in Table 5.2 of the NIR. Chapter 6.0 of the NIR further outlines the consideration of In-Combination Impacts. Of particular relevance here is Section 6.4 - Coastal and Marine Habitats and Species. Primary concerns of relevance here include e.g. - pressure on water quality in coastal and transitional waters. Table 6.1 sets out in full the Policy and Plans With Potential To Contribute to In-Combination Effects on EU Sites. Measures for strict protection of watercourses, waterbodies and water quality and expanded upon in Chapter 7.0 Appropriate Assessment; "Policies for zoned land adjoining EU sites have been reviewed to ensure that they provide appropriate caveats highlighting the sensitive location of the site and the likely or potential need for set-backs and screening to ensure the protection of habitats and the avoidance of disturbance to protected species". Great Island Channel SAC and Cork Harbour SPA are discussed specifically in Section 7.3.2 of the NIR.

Projects that have been granted planning permission in the vicinity of the proposed project within the last 5 years were reviewed through the Cork County Council Cork Planning Enquiry System and the National Planning Application Map Viewer (MyPlan.ie).

A full planning history of the site is presented in the accompanying Design Statement (OMP, A summary of planning applications in the immediate environs of the site is presented in Table 9.8.

Table 9.8 Other relevant developments.

Application Reference	Applicant(s)	Description	Outcome/Current Status
ABP Ref.: TA28.313216	Estuary View Enterprises 2020 Limited	'The Meadows' Bessborough	Due 25 <sup>th</sup> July 2022
ABP Ref.: TA28.313206	Estuary View Enterprises 2020 Limited	'The Farm' Bessborough	Due 25 <sup>th</sup> July 2022
Cork City Council Ref.: 22/40809	Hibernia Star Limited	Construction of an office and hotel development at Jacob's Island, Ballinure, Mahon, Cork	Request for Further Information
ABP Ref.: TR28.310378	Montip Horizon Limited	Amendments to previously permitted strategic housing development reference ABP-301991-18 to increase the number of units from 413 no. units to 437 no. units and amendments to Blocks 4, 7, 8, 9 and 10 at Jacob's Island, Ballinure, Mahon, Cork	Granted (11 <sup>th</sup> February 2022)
Cork City Council Ref.: 19/38875	O'Flynn Construction Co. Unlimited Company	Construction of 12,004 sq. m of office floorspace at Blackrock Business Park, Bessboro Road, Mahon, Cork	Granted (11 <sup>th</sup> March 2020)
Cork City Council Ref.: 18/37820 and ABP Ref. PL. 302784	Bessboro Warehouse Holdings Limited	Demolition of the existing buildings and construction of 135 no. residential units at Bessboro Road, Mahon, Cork	Granted (28 <sup>th</sup> February 2019)
ABP Ref.: TA.301991.	Montip Horizon Limited	Construction of 413 no. apartments, neighbourhood centre, creche, road improvement works including upgrades to the Mahon Link Road (R852) to the North of the N40 interchange to incorporate a dedicated bus lane and all site development works at Jacob's Island, Ballinure, Mahon, Cork	Granted (3 <sup>rd</sup> October 2018)

<sup>8</sup> <https://www.corkcity.ie/en/proposed-cork-city-development-plan-2022-2028/draft-plan-documents/phase-2-draft-development-plan-2022-2028/natura-impact-report-for-appropriate-assessment/>

It is considered that the proposed development will not result in negative impacts on any of the features of interest for which the Great Island Channel SAC and Cork Harbour SPA have been designated. In the absence of any significant impacts, it is not anticipated that other projects will act in-combination with the proposed development to give rise to any cumulative effects on any European sites.

#### Interactions with other Environmental Attributes

Biodiversity attributes interact with other environmental attributes as follows:

- **Landscape & Visual** - The biodiversity of the receiving environment has informed the landscape design associated with the proposed development. The most significant proposed soft landscaping feature is the inclusion of tree planting along streets, in open spaces and in courtyards. An area of native woodland planting is also included featuring native tree species such as alder, downy birch, Scot's pine, as well as European larch and beech. Further planting includes hedges and wildflower grasslands; as well as a range of more structured planting of garden species, many of which will also benefit pollinators. The variety of landscape typologies including woodland planting, hedgerows, wildflower meadows, standard sized trees and grasslands will all add to biodiversity within the developed site. Potential impacts on the receiving landscape could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 4 – Landscape and Visual will ensure that this will be largely mitigated.
- **Air Quality & Climate** - Potential impacts on the receiving air quality and climate environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 11 – Climate & Climate Change will ensure that this will not occur.
- **Noise & Vibration** - Potential impacts on the receiving noise and vibration environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 10 – Noise & Vibration will ensure that this will not occur.
- **Water** – Potential impacts on the receiving water (hydrology and hydrogeology) environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 8 – Hydrology will ensure that this will not occur.

## 9.9 DIFFICULTIES IN COMPILING INFORMATION

Ecological field survey work was undertaken on the 25<sup>th</sup> August 2021 (preliminary visit); 21<sup>st</sup> September 2021 (habitat mapping); 15<sup>th</sup> September 2021 (bats); 11<sup>th</sup> January 2022 (River Lee/Lough Mahon Waterfront Greenway) and 17<sup>th</sup> January 2022 (terrestrial mammals). As such there were no seasonal constraints to the survey work. The assessment was undertaken following detailed liaison with the design team (architects & engineers) and the project planners. As such there were no difficulties in compiling this assessment.

## 9.10 REFERENCES

Bat Conservation Trust (2012). Landscape and Urban Design for Bats and Biodiversity. BCT.

Cork City Council (2015). Cork County Development Plan 2015-2021 and all associated Environmental Documentation.

Cork City Council (2022). Cork County Development Plan 2022-2028 and all associated Environmental Documentation.

CIEEM (2017). Guidelines for Preliminary Ecological Appraisal (2<sup>nd</sup> Edition, December 2017). Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

CIRIA (2001). Control of water pollution from construction sites; Guidance for consultants and contractors (C532). Construction Industry Research and Information Association.

CIRIA (2010). Environmental Good Practice on Site. (C692). Construction Industry Research and Information Association.

CIRIA (2015). Environmental good practice on site guide (fourth edition) (C741). Construction Industry Research and Information Association.

CIRIA (2019). Biodiversity net gain. Good practice principles for development. Case studies.

Cunnane Stratton Reynolds (CSR) (2015). Application for extension of duration of 07/32686. Screening for Appropriate Assessment.

Doyle O'Troithigh (2021). Public Realm and Landscape Strategy Report. Jacob's Island, Cork SHD. Report for Hibernia Star Ltd.

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

EU (2013). Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment. [<https://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf>].

EU (2017). Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU).

Entwhistle, A.C., Harris, S., Hutson, A.M., Racey, P.A., Walsh, A. (2001). Habitat Management for bats. A Guide for land managers, landowners and their advisors. JNCC.

Fossitt, J.A. (2000). A guide to habitats in Ireland. The Heritage Council. Published October 2000.

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

Gittings, T. (2013). Proposed Neighbourhood Centre at Jacobs Island, Ballinure, Mahon, Cork (T.P. 13/35575). Appropriate Assessment Screening Report.

Goodwillie, R. (2000). Ecology. In. McCarthy Developments (Cork) Ltd. (2000). Environmental Impact Statement. Residential Development at Mahon Point, Ballinure, Mahon, Cork.

Hartnett, M. and Nash, S. (2015). An integrated measurement and modelling methodology for estuarine water quality management. Water Science and Engineering. Volume 8, Issue 1, Pages 9-19.

Inland Fisheries Ireland (IFI) (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin.

IFI (2021). Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning. A Guideline Developed by Inland Fisheries Ireland.

Lundy, M.G., Aughney, T., Montgomery, W.I., & Roche, N., (2011). Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

Marnell, F., Kingston, N. & Looney, D. (2009). Ireland Red List No. 3: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Marnell, F., Looney, D. & Lawton, C. (2019). Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Masters-Williams et al. (2001). Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA.

McCarthy Developments (Cork) Ltd. (2000). Environmental Impact Statement. Residential Development at Mahon Point, Ballinure, Mahon, Cork.

McGovern, J.V., Nash, S. and Hartnett, M. (2020). Modelling Irish Transitional and Coastal Systems to Determine Nutrient Reduction Measures to Achieve Good Status. EPA Report No. 359.

Mott MacDonald (2008). Cork Harbour Main Drainage Scheme Environmental Impact Assessment. Flora and Fauna chapter prepared by Ecofact.

Murnane et al. (2002). Control of Water Pollution from Construction Sites - Guide to Good Practice. SP156.

Murphy, D. (2004). Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.

National Biodiversity Data Centre. (2015). Pollinator Friendly Planting Code. All-Ireland Pollinator Plan 2015-2020. [www.biodiversityireland.ie/pollinator-plan](http://www.biodiversityireland.ie/pollinator-plan).

NPWS (2013). The Status of EU Protected Habitats and Species in Ireland. The Status of EU Protected Habitats and Species in Ireland.

NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3. Version 1.0. [Ed. Lynn, D. & O'Neill, F.]. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2013). Great Island Channel SAC 001058. Site Synopsis. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. [001058\_Rev13.Doc; Version date: 24.09.2013].

NPWS (2014a). Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014b). Cork Harbour SPA 004030. Conservation Objectives Supporting Documentation. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014c). Conservation Objectives: Great Island Channel SAC 001058. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015). Cork Harbour SPA 004030. Site Synopsis. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

T.J. O'Connor & Associates (2009). Carrigtwohill Sewerage Scheme. Preliminary Report. Appendix N. Details of Harbour Modelling. Report prepared for Cork County Council.

Scott Cawley (2007). Chapter 17.0. Flora and Fauna. Appendix C. T.P. 07/32686 Environmental Impact Statement.

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

Triturus Ecology (2022a). Jacob's Island Otter Survey Note. Prepared by Triturus Environmental Ltd. for Atkins.

Triturus Ecology (2022b). Jacob's Island Badger Survey Note. Prepared by Triturus Environmental Ltd. for Atkins.

#### Additional Information

Water status data available on <http://www.epa.ie> and <http://www.wfdireland.ie>.

#### Bat References

Bern Convention (1982). Convention on the Conservation of European Wildlife and Natural Habitats.

Bonn Convention (1979). Convention on the Conservation of Migratory Species of Wild Animals. In particular: The Agreement on the Conservation of Populations of European Bats.

Collins, J. (ed) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition) The Bat Conservation Trust, London

Corbett, G. B. and Harris, S. (1991). Handbook of British Mammals. 3rd Edition, Blackwell Scientific, Publications.

Council of the European Communities (1992). EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora

Fairley, J. (2001). A basket of weasels. Published Privately, Belfast.

Fossitt, J. (2000). A Guide to Habitats in Ireland. Kilkenny: The Heritage Council.

Kelleher, C. & Marnell, F. (2006). Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland

Marnell, F., Looney, D. and Lawton, C. (2019). Ireland Red List No 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland

O' Sullivan, P. (1994). Bats in Ireland. Special Zoological Supplement, The Irish Naturalists' Journal.

Russ, J. (1999). The Bat of Britain and Ireland – Echolocation calls, sound analysis and species identification. Alana Ecology Ltd.

Wildlife Act 1976 pp 1-209. Dublin: Government Publications.

Wildlife Amendment Act 2000. Dublin: Government Publications.

#### **Otter References**

Bailey, M. & Rochford, J., (2006). Otter survey of Ireland 2004/2005. Irish Wildlife Manual, No 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin.

Brazier, B. & Macklin, R. (2020). Dún Laoghaire-Rathdown otter survey. Report prepared by Triturus Environmental Ltd. for Dún Laoghaire-Rathdown County Council. November 2020.

Chanin, P.R.F. (2003). Ecology of the European otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.

Kruuk, H. (2006). Otters, Ecology, Behaviour and Conservation. Oxford University Press.

Lenton, E.J., Chanin, P.R.F. & Jefferies, D.J. (1980). Otter Survey of England, 1977-79. Nature Conservancy Council, London.

Loy, A., Carranza, M.L., Cianfrani, C., D'Alessandro, E., Bonesi, L., Di Marzio, P. & Regiani, G. (2009). Otter *Lutra lutra* population expansion: assessing habitat suitability and connectivity in southern Italy. *Folia Zoologica*, 58(3), 309.

Macklin, R., Brazier, B. & Sleeman, P. (2019). Dublin City otter survey. Report prepared by Triturus Environmental Ltd. for Dublin City Council as an action of the Dublin City Biodiversity Action Plan 2015-2020. Report available at: <https://a.storyblok.com/f/47927/x/609e85ec32/dublin-city-otter-report-2019.pdf>

Marnell, F., Kingston, N. & Looney, D. (2009). Ireland Red List No. 3: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Marnell, F., Looney, D. & Lawton, C. (2019). Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Mason, C.F., & Macdonald, S.M. (2009). Otters: ecology and conservation. Cambridge University Press.

NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.

Ruiz-Olmo, J., Batet, A., Mañas, F., & Martínez-Vidal, R. (2011). Factors affecting otter (*Lutra lutra*) abundance and breeding success in freshwater habitats of the northeastern Iberian Peninsula. *European Journal of Wildlife Research*, 57(4), 827-842.

Scorpio, V., Loy, A., Di Febbraro, M., Rizzo, A., Aucelli, P. (2016). Hydromorphology meets mammal ecology: river morphological quality, recent channel adjustments and otter resilience. *River Res. Appl.* 32, 267-279

#### **Badger references**

Byrne, A.W., Sleeman, D.P., O' Keefe, J. & Davenport, J. (2012). The Ecology of the European Badger (*Meles meles*) in Ireland: A Review. *Proceedings of the Royal Irish Academy* 112B, 69-96.

Carpenter, P., Pope, L.C., Greig, C., Dawson, D.A., Rogers, L.M., Erven, K., Wilson, G.J., Delahay, R.J., Cheeseman, C.L. & Burke, T. (2005). Mating system of the Eurasian badger, *Meles meles*, in a high density population. *Molecular Ecology* 14, 273-284.

Corner, L.A.L., Stuart, L.J., Kelly, D.J. & Marples, N.M. (2015) Reproductive Biology Including Evidence for Superfecundation in the European Badger *Meles meles* (Carnivora: Mustelidae). *PLoS ONE* 10(10): e0138093.

English Nature (2002) Badgers & Development. External Relations Team  
English Nature Northminster House Peterborough.1 1U.

McDonald, D.W., Newman, C., Dean, J., Buesching, C.D. & Johnson, P.J. (2004). The Distribution of Eurasian Badger, *Meles meles*, Setts in a High-Density Area: Field Observations Contradict the Sett Dispersion Hypothesis. *Oikos* 106(2), 295-307.

NRA (2006). Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes. Prepared by Dr. Chris Smal. National Roads Authority (now Transport Infrastructure Ireland).

Reid, N., Etherington, T.R., Wilson, G., McDonald, R.A. & Montgomery, W.I. (2008) Badger survey of Northern Ireland 2007/08. Report prepared by Quercus and Central Science Laboratory for the Department of Agriculture & Rural Development (DARD), Northern Ireland, UK.

Sleeman, D.P. & Mulcahy, M.F. (1993). Behaviour of Irish badgers in relation to bovine tuberculosis. In T.J. Hayden (ed.), *The badger*, 15465. Dublin. Royal Irish Academy.

Smal, C. (1995). *The Badger & Habitat Survey of Ireland*. Department of Agriculture, Food & Farming.

Thornton, P.S. (1988). Density and distribution of badgers in south-west England - a predictive model. *Mammal Review* 18, 11-23.

## 9.11 APPENDICES

- Appendix 9.1 Natura Impact Statement
- Appendix 9.2 Invasive Species Management Plan
- Appendix 9.3 Landscape Report
- Appendix 9.4 Engineering Report
- Appendix 9.5 Arboricultural Assessment



JACOBS ISLAND



CHAPTER TEN  
Noise & Vibration

# CHAPTER TEN

## Contents

10	Noise and Vibration.....	10
10.1	INTRODUCTION .....	1
10.2	ASSESSMENT METHODOLOGY .....	1
10.3	RECEIVING ENVIRONMENT .....	5
10.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT .....	9
10.5	POTENTIAL EFFECTS.....	9
10.6	MITIGATION MEASURES .....	12
10.7	RESIDUAL EFFECTS.....	14
10.8	CUMULATIVE EFFECTS.....	14
10.9	DIFFICULTIES ENCOUNTERED .....	14
10.10	INTERACTIONS.....	15
10.11	APPENDICES .....	15
10.12	REFERENCES .....	15



# CHAPTER TEN

## NOISE AND VIBRATION

### 10.1 INTRODUCTION

This section of the EIAR has been prepared by AWN to assess the noise and vibration effect of the proposed development in the context of current relevant standards and guidance.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration effect 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 effects on the surrounding environment have been considered as part of the assessment. The potential effect of noise from the surrounding environment has also been assessed.

A schedule of mitigation measures has been proposed to control the noise and vibration emissions associated with the construction and / or operational phases of the proposed development, as appropriate.

### 10.2 ASSESSMENT METHODOLOGY

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. In addition to specific noise and vibration guidance documents, the following Environmental Protection Agency (EPA) guidelines were considered and consulted in the preparation of this Chapter:

- 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); and
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018).

The study has been undertaken using the following methodology:

- Baseline noise monitoring has been undertaken across the development site to determine the range of noise levels at varying locations across the site;
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development, this is

summarised in the following sections;

- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the project at the nearest sensitive locations (NSLs) to the site;
- Predictive calculations have been performed to assess the potential effects associated with the operation of the development at the most sensitive locations surrounding the development site; and,
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development.

#### 10.2.1 CONSTRUCTION PHASE – NOISE

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local Authorities typically control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

##### 10.2.1.1 British Standard BS 5228 – 1: 2009+A1:2014

Reference is made to British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise (hereinafter referred to as BS 5228-1:2009+A1:2014) as appropriate criteria relating to permissible construction noise threshold levels for a development of this scale may be found in BS 5228-1:2009+A1:2014.

Potential noise effects during the construction stage of a project are often assessed in accordance with BS 5228-1:2009+A1:2014. Various mechanisms are presented as examples of determining if an effect is occurring, these are discussed in the following paragraphs.

##### **ABC Method**

The approach adopted here calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise effect is associated with the construction activities, depending on context.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 10.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

Table 10.1: Example Threshold of Significant Effect at Dwellings

Assessment category and threshold value period (L <sub>Aeq</sub> )	Threshold value, in decibels (dB)		
	Category A <sup>A</sup>	Category B <sup>B</sup>	Category C <sup>C</sup>
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends D	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

- A. Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.
- B. Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.
- C. Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.
- D. 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined and rounded to the nearest 5 dB. If the construction noise exceeds the appropriate category value, then a significant effect is deemed to occur. It should be noted that this assessment method is only valid for residential properties and if applied to commercial premises without consideration of other factors may result in an excessively onerous thresholds being set.

The closest neighbouring noise sensitive properties to the proposed development are existing dwellings within Jacobs Island, to the east, southeast and south, including The Sanctuary, Long Shore Drive and The Haven.

**Fixed Limits**

Review of the proposed development surroundings identified commercial premises located 120m to the north of the subject site.

When considering non-residential receptors, reference is made to BS 5228-1:2009+A1:2014, which gives several examples of acceptable limits for construction noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states: -

“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.”

Paragraph E.2 goes on to state: -

“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 areas away from main road traffic and industrial noise;

75 decibels (dBA) in urban areas near main roads in heavy industrial areas”.

**Proposed Threshold Noise Levels**

Taking into account the proposed documents outlined above and making reference to the baseline noise environment monitored around the development site (see Section 10.3), BS 5228-1:2009+A1:2014 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development: -

For residential NSLs it is considered appropriate to adopt 65 dB(A) CNT depending on existing noise level. Results of the baseline monitoring carried out at NM2 indicates that Category A values are appropriate using the ABC method.

For non-residential NSLs it is considered appropriate to adopt the 70 dB(A) CNT, given the urban environment in which the commercial premises reside, in line with BS 5228-1:2009+A1:2014.

**Interpretation of the CNT**

In order to assist with interpretation of CNTs, Table 10.2 includes guidance as to the likely magnitude of effect associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of DMRB: Noise and Vibration and adapted to include the relevant significance effects from the EPA Guidelines (EPA 2017).

Table 10.2: Construction Noise Significance Ratings

Guidelines for Noise Impact Assessment Significance (DMRB)	CNT per Period	EPA EIAR Significance Effects	Determination
Negligible	Below or equal to baseline noise level	Not Significant	Depending on CNT, duration & baseline noise level
Minor	Above baseline noise level and below or equal to CNT	Slight to Moderate	
Moderate	Above CNT and below or equal to CNT +5 dB	Moderate to Significant	
Major	Above CNT +5 to +15 dB	Significant, to Very Significant	
	Above CNT +15 dB	Very Significant to Profound	

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely effects during the construction stages.

### 10.2.1.3 Construction Traffic

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential effect of additional traffic on the human perception of noise, the following two guidelines are referenced DMRB Noise and Vibration (UKHA 2020) and the EPA Guidelines (EPA, 2017). For construction traffic, due to the short-term period over which this effect occurs, the magnitude of effects is assessed against the 'short term' period in accordance with the DMRB Noise and Vibration (UKHA 2020) document.

Table 10.3: Likely Effect Associated with Change in Traffic Noise Level – Construction Phase

Magnitude of Impact	Increase in Traffic Noise Level (dB)
No impact	Less than 1.0
Minor	Greater than or equal to 1.0 and less than 3.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Major	Greater than or equal to 5.0

In accordance with the DMRB Noise and Vibration, construction noise and construction traffic noise effects shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- Ten or more days or night in any 15 consecutive day or nights;
- A total number of days exceeding 40 in any six consecutive months.

### 10.2.2 CONSTRUCTION PHASE – VIBRATION

Vibration standards address two aspects: those dealing with cosmetic or structural damage to buildings and those with human comfort. For the purpose of this scheme, the range of relevant criteria used for surface construction works for both building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

#### 10.2.2.1 Building Damage

With respect to vibration, British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking the above into consideration the vibration criteria in Table 10.4 are recommended.

Table 10.4: Recommended Vibration Criteria During Construction Phase

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:		
Less than 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

Expected vibration levels from the construction works will be discussed further in Section 10.5.

#### 10.2.2.2 Human Perception

People are sensitive to vibration stimuli at levels orders of magnitude below those which have the potential to cause any cosmetic damage to buildings. There are no current standards which provide guidance on typical ranges of human response to vibration in terms of PPV for continuous or intermittent vibration sources.

BS5228-2:2009+A1:2014, provides a useful guide relating to the assessment of human response to vibration in terms of the PPV. Whilst the guide values are used to compare typical human response to construction works, they tend to relate closely to general levels of vibration perception from other general sources.

Table 10.5 below summarises the range of vibration values and the associated potential effects on humans.

*Table 10.5: Guidance on Effects of Human Response to PPV Magnitudes*

Vibration Level, PPV	Effect
0.14mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration.
0.3mm/s	Vibration might be just perceptible in residential environments.
1mm/s	It is likely that a vibration level of this magnitude in residential environments will cause complaint.

Vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin and or the duration of vibration is known. For example, ground breaking can typically be tolerated at vibration levels up to 2.5 mm/s if adequate public relations are in place and timeframes are known. These values refer to the day-time periods only.

During surface construction works (demolition and groundbreaking etc.) the vibration limits set within Table 10.5 would be perceptible to building occupants and have the potential to cause subjective effects. The level of effect is, however, greatly reduced when the origin and time frame of the works are known and limit values relating to structural integrity are adequately communicated. In this regard, the use of clear communication and information circulars relating to planned works, their duration and vibration monitoring can significantly reduce vibration effects to the neighbouring properties.

**Interpretation of the Human Response to Vibration**

In order to assist with interpretation of vibration thresholds, Table 10.6 presents the significance table relating to potential effects to building occupants during construction based on guidance from BS5228-2:2009+A1:2014.

*Table 10.6: Human Response Vibration Significance Ratings*

Criteria	Impact Magnitude	Significance Rating
≥10 mm/s PPV	Very High	Very Significant
≥1 mm/s PPV	High	Moderate to Significant
≥0.3 mm/s PPV	Medium	Slight to Moderate
≥0.14 mm/s PPV	Low	Not significant to Slight
Less than 0.14 mm/s PPV	Very Low	Imperceptible to Not significant

**10.2.3 OPERATIONAL PHASE – NOISE**

**10.2.3.1 Mechanical Plant**

The most appropriate standard used to assess the impact of a new continuous source (i.e. plant items) to a residential environment is BS 4142 Methods for rating and assessing industrial and commercial sound (2014). This standard describes a method for assessing the impact of a specific noise source at a specific location with respect to the increase in “background” noise level that the specific noise source generates. The standard provides the following definitions that are pertinent to this application:

- “Specific sound level, LAeq, Tr” is equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T. This level has been determined with reference to manufacturers information for specific plant items.
- “Rating level” LAr,Tr is the specific noise level plus adjustments for the character features of the sound (if any), and;
- “Background noise level” is the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T. This level is expressed using the LA90 parameter. These levels were measured as part of the baseline survey.

The assessment procedure in BS4142: 2014 is outlined as follows:

1. determine the specific noise level;
2. determine the rating level as appropriate;
3. determine the background noise level, and;
4. subtract the background noise level from the specific noise level in order to calculate the assessment level.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. A difference of +10 dB or more is likely to be an indication of a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact, dependent on the context. Where the rated plant noise level is equivalent to the background noise level, noise impacts are typically considered to be neutral.

### 10.2.3.2 Traffic Noise

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with the development. In order to assist with the interpretation of the noise associated with additional vehicular traffic on public roads, Table 10.7 is taken from DMRB Design Manual for Roads and Bridges (DMRB), Highways England Company Limited, Transport Scotland, The Welsh Government and The Department for Regional Development Northern Ireland, (2020).

Table 10.7: Significance in Change of Noise Level

Change in Sound Level (dB)	Subjective Reaction	Magnitude of Impact	EPA Glossary of Effects <sup>1</sup>
10+	Over a doubling of loudness	Major	Very Significant
5 - 9.9	Up to a doubling of loudness	Moderate	Significant
3 - 4.9	Perceptible	Minor	Slight, Moderate
0.1 - 2.9	Imperceptible	Negligible	Imperceptible
0	None	No Change	Neutral

The guidance outlined in Table 10.7 will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely long-term effects during the operational phase.

### 10.2.3.3 Vibration

The development is residential in nature, therefore it is not anticipated that there will be any effect associated with vibration during the operational phase.

<sup>1</sup> EPA guidelines on the information to be contained in Environmental Impact Assessment Reports, (Draft August 2017)

### 10.2.3.4 Inward Noise

An inward noise assessment of the potential for noise impact on the development itself has been prepared separately. This report is included in Appendix 10.1.

## 10.3 RECEIVING ENVIRONMENT

A previous environmental noise survey was conducted by AWN at the adjacent development site as part of the Jacobs Island Masterplan site. The noise survey was conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2007: Acoustics – Description, measurement and assessment of environmental noise. Specific details are set out below.

The baseline noise environment surrounding the proposed development site has been reviewed and it has been judged that the noise environment has not changed significantly and therefore the noise levels measured as part of the previous assessment are representative of the existing noise levels at the development site.

### 10.3.1 BASELINE NOISE ENVIRONMENT

Baseline noise monitoring has been undertaken across the development site to determine the range of noise levels at varying locations across the site.

#### 10.3.1.1 Environmental Noise Survey

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. Specific details are set out below.

Measurement locations are illustrated in the figure below.

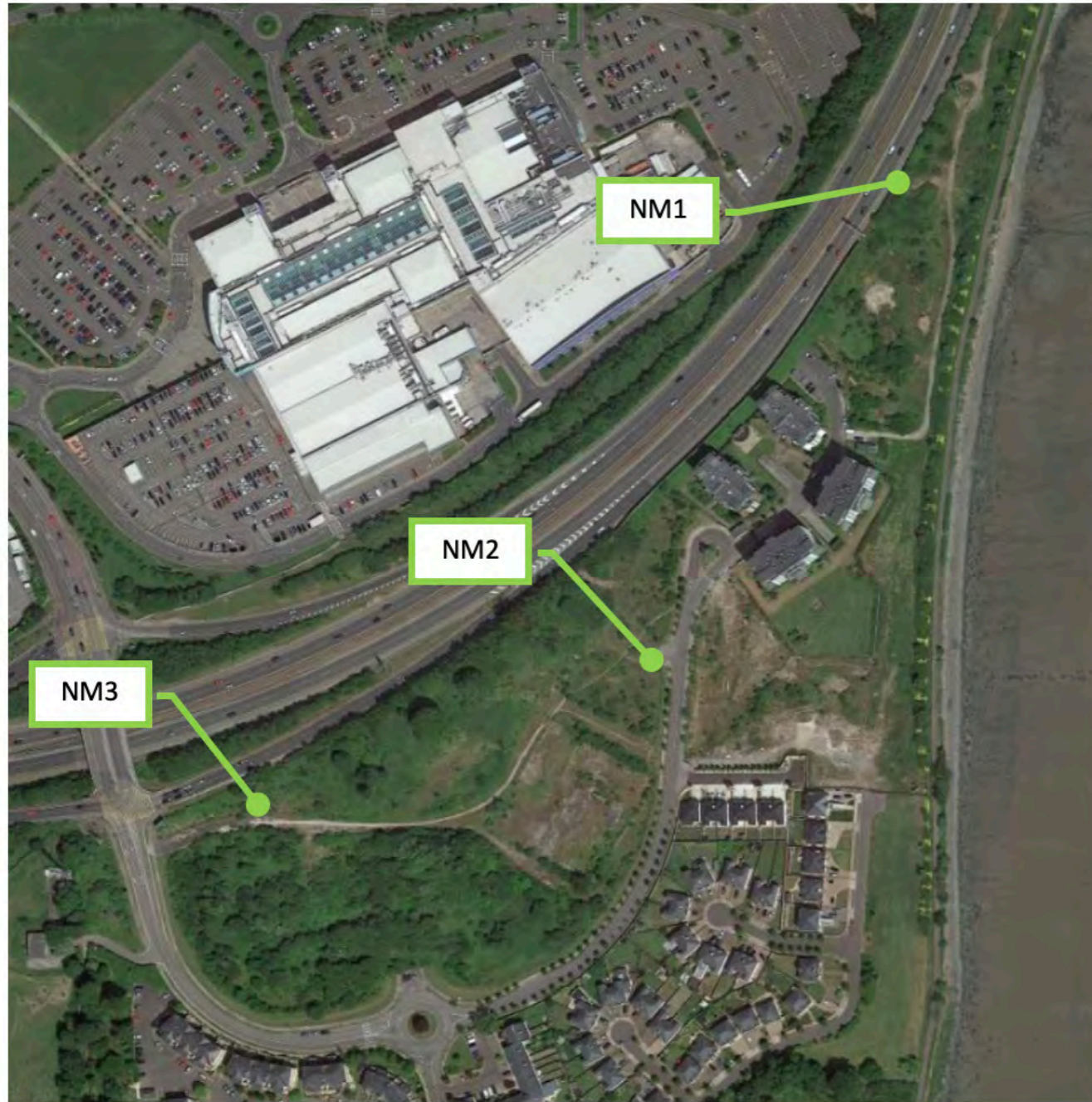


Figure 10.1 Noise Monitoring Locations (Image Source: Google Maps)

**Choice of Measurement Locations**

The measurement locations are described below and shown in Figure 10:1.

- NM1** unattended monitoring position located adjacent to the N40
- NM2** attended monitoring position located in the northern sector of the site.
- NM3** attended monitoring position located in the south west of the site.

**Survey Periods**

The noise survey was carried out over the following periods:

Table 10.9: Survey Periods

Aspect	Survey Position	Survey Period
Noise	NM1 (unattended)	12:00hrs on 8 February to 12:00hrs on 12 February 2018
	NM2	12:40hrs to 14:45hrs on 8 February 2018
	NM3	

**Instrumentation**

The noise measurements were carried out using the equipment listed below. The instrument was calibrated before and after the survey with no significant drift noted.

Table 10.10: Monitoring Equipment Details

Measurement	Manufacturer	Equipment Model	Serial Number	Calibration date
NM1	RION	NL-52	164426	09/04/2016
NM2 and NM3	Bruel & Kjaer	2238	2638292	22/08/2016

**Measurement Parameters**

The noise survey results are presented in terms of the following parameters.

$L_{Aeq}$  is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

$L_{AFmax}$  is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

$L_{A90}$  is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to  $2 \times 10^{-5}$  Pa.

**Survey Results and Discussion**

The results of the noise survey at the four monitoring locations are summarised below.

**Location NM1**

The unattended measurements collected over the survey period are summarised below.

*Table 10.11: Measured Noise Levels at NM1*

Date	Period	Average Measured Noise Levels (dB re. $2 \times 10^{-5}$ Pa)		
		$L_{Aeq}$	$L_{Amax}$	$L_{A90}$
8/2/2018	Day	72	89	67
	Night	68	80	52
9/2/2018	Day	72	82	68
	Night	65	80	50
10/2/2018	Day	72	84	68
	Night	64	79	50
11/2/2018	Day	72	86	66
	Night	66	78	50
12/2/2018	Day	72	86	69
Average	Day	72	-	68
	Night	66	-	51

The noise environment at this location was dictated by local traffic noise. The N40 dual carriageway located adjacent to the boundary was observed to dominate the measured noise levels. Other noise sources included bird song and foliage noise. Daytime ambient noise levels were of the order of 72 dB  $L_{Aeq,15min}$ . Daytime background noise levels were in the range 66 – 69 dB  $L_{A90,15min}$ . Night-time ambient noise levels were in the range 64 – 68 dB  $L_{Aeq,15min}$ . Night-time background noise levels were in the range 50 – 52 dB  $L_{A90,15min}$ .

$L_{AFmax}$  values were measured at 15-minute intervals over the duration of the unattended monitoring survey. Figure 5 presents the number of measured  $L_{AFmax}$  events for various decibel levels during the night period.

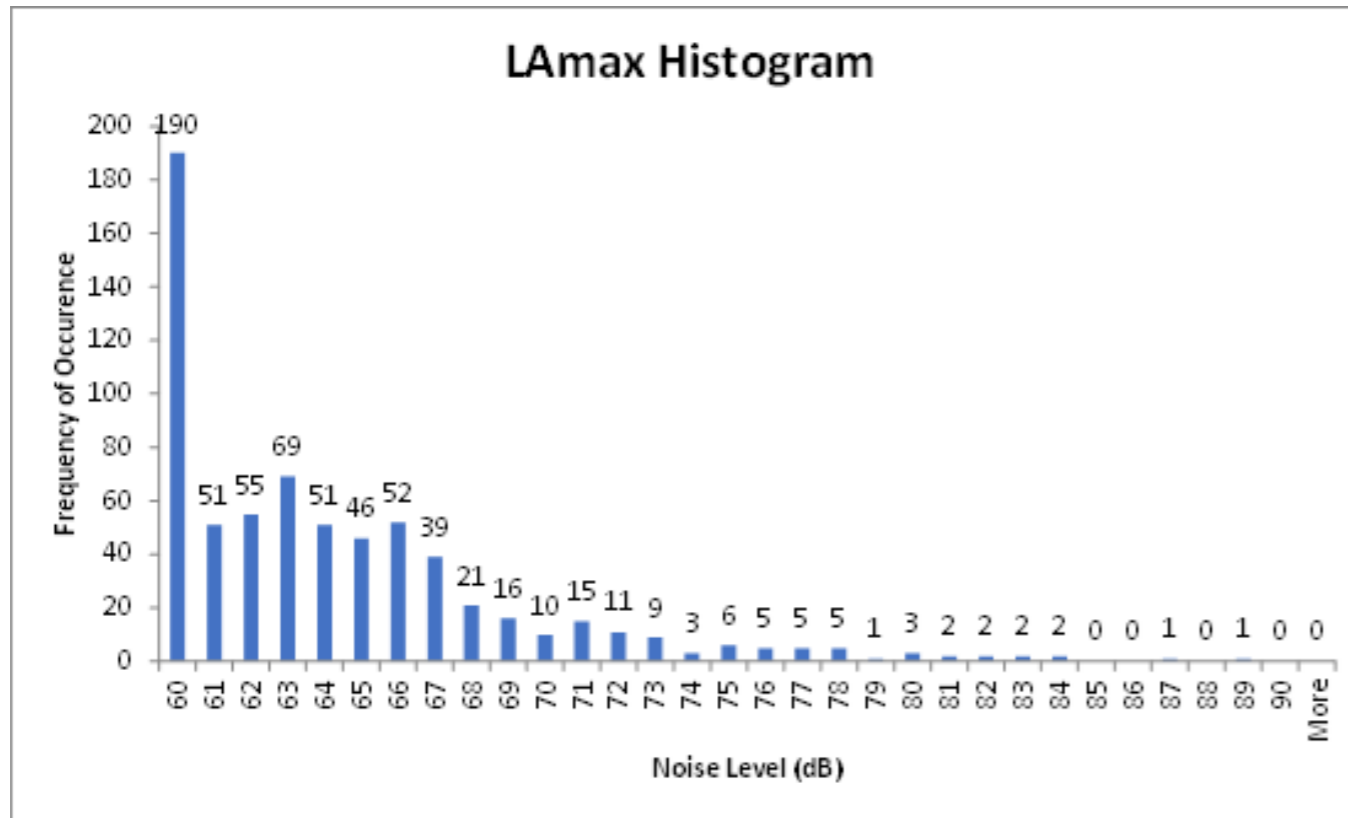


Figure 10.2 Distribution of L<sub>Amax</sub> events – Night-time

The L<sub>AFmax</sub> values range from < 60 to 84 dB during the night period, with individual instances of higher maximum noise levels. For the purposes of assessment, the value of 71 dB L<sub>Amax</sub> is used. Review of the graph above indicates this level is not regularly exceeded on a given night.

**Location NM2**

Table 10.12: Measured Noise Levels at NM2

Period	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)		
		L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>A90</sub>
31 August	13:27	61	67	59
	14:20	63	79	60
	15:12	62	73	60

The noise environment at this location comprised road traffic noise, idling bus engine bird song and foliage noise. Ambient noise levels were in the range of 61 – 63 dB L<sub>Aeq,15min</sub>. Background noise levels were in the range 59 – 60 dB L<sub>A90,15min</sub>.

**Location NM3**

Table 10.13: Measured Noise Levels at NM3

Period	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)		
		L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>A90</sub>
31 August	13:45	58	62	57
	14:37	60	71	58
	15:30	60	66	58

The primary noise source observed at this location was traffic noise from the N40 and the local road. The noise environment also included distant traffic noise, bird song and pedestrian activity. Ambient noise levels were in the range of 58 – 60 dB L<sub>Aeq,15min</sub>. Background noise levels were in the range 57 – 58 dB L<sub>A90,15min</sub>.



### 0.3.1.2 Do Nothing Scenario

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations and within the development site will remain largely unchanged.

## 10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the development is available in Chapter 2.

When considering a development of this nature, the potential noise and vibration effect on the surroundings is considered for each of two distinct stages:

- Construction and demolition phase; and,
- Operational phase.

The construction phase will involve excavation over the development site, construction of foundations and buildings, landscaping, and vehicle movements to site using the local road network. This phase will generate the highest potential noise effect due to the works involved, however the time frame is short term in duration.

The primary sources of outward noise in the operational context are deemed to be long term in duration and will comprise traffic movements to the development site using the existing road network and plant noise emissions from the completed buildings. These issues are discussed in detailed in the following sections.

## 10.5 POTENTIAL EFFECTS

The potential noise and vibration effects associated with the construction and operational phases of the proposed development are discussed in the following sections.

### 10.5.1 CONSTRUCTION PHASE

#### 10.5.1.1 Noise

During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, dumper trucks, compressors and generators. Due to the nature of daytime activities undertaken on a construction site such as this, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels.

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to site clearance, ground excavation and loading lorries (dozers, tracked excavators and wheeled loaders) reach a maximum of 81 dB  $L_{Aeq,T}$  at a distance of 10 m. For this assessment, a worst-case scenario is assumed of 3 no. such items with a sound pressure level (SPL) of 81 dB at 10 m operating simultaneously along the closest works boundary. This would result in a total noise level of 86 dB at 10 m and an equivalent combined sound power level of 114 dB  $L_{WA}$ . This worst-case scenario is the typical assumption made for developments of this size, on the basis that it is unlikely that more than 3 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other.

Guidance on the approximate attenuation achieved by standard 2.4m tall construction hoarding surrounding construction sites is also provided in BS 5228-1. It states that when the top of the plant is just visible to the receiver over the noise barrier, an approximate attenuation of 5 dB can be assumed, while a 10 dB attenuation can be assumed when the noise screen completely hides the sources from the receiver. The calculations also assume that the equipment will operate for 66% of the 12-hour working day (i.e. 8 hours).

This scenario can be assumed in this case due to the proximity of the noise-sensitive locations, i.e. a hoarding height will be chosen so as to completely hide the source.

The closest representative noise sensitive locations have been identified as shown in Figure 10:3 and described below.

**NSL 1** Apartments at the Sanctuary some 25m from areas of major construction.

**NSL 2** Houses at Longshore Avenue some 25m from areas of major construction.

**NSL 3** Houses at Jacob's Island some 20m from areas of major construction.

**NSL 4** Commercial buildings some 125m from areas of major construction.

Review of the baseline noise survey, available noise mapping and the threshold values detailed in Table 10.1 indicates that the appropriate daytime noise criteria for construction noise are as follows:

- Residential receptors 65 dB LAeq,T
- Commercial/industrial receptors 70 dB LAeq,T

A night-time threshold is not included as construction work will not be taking place at night.

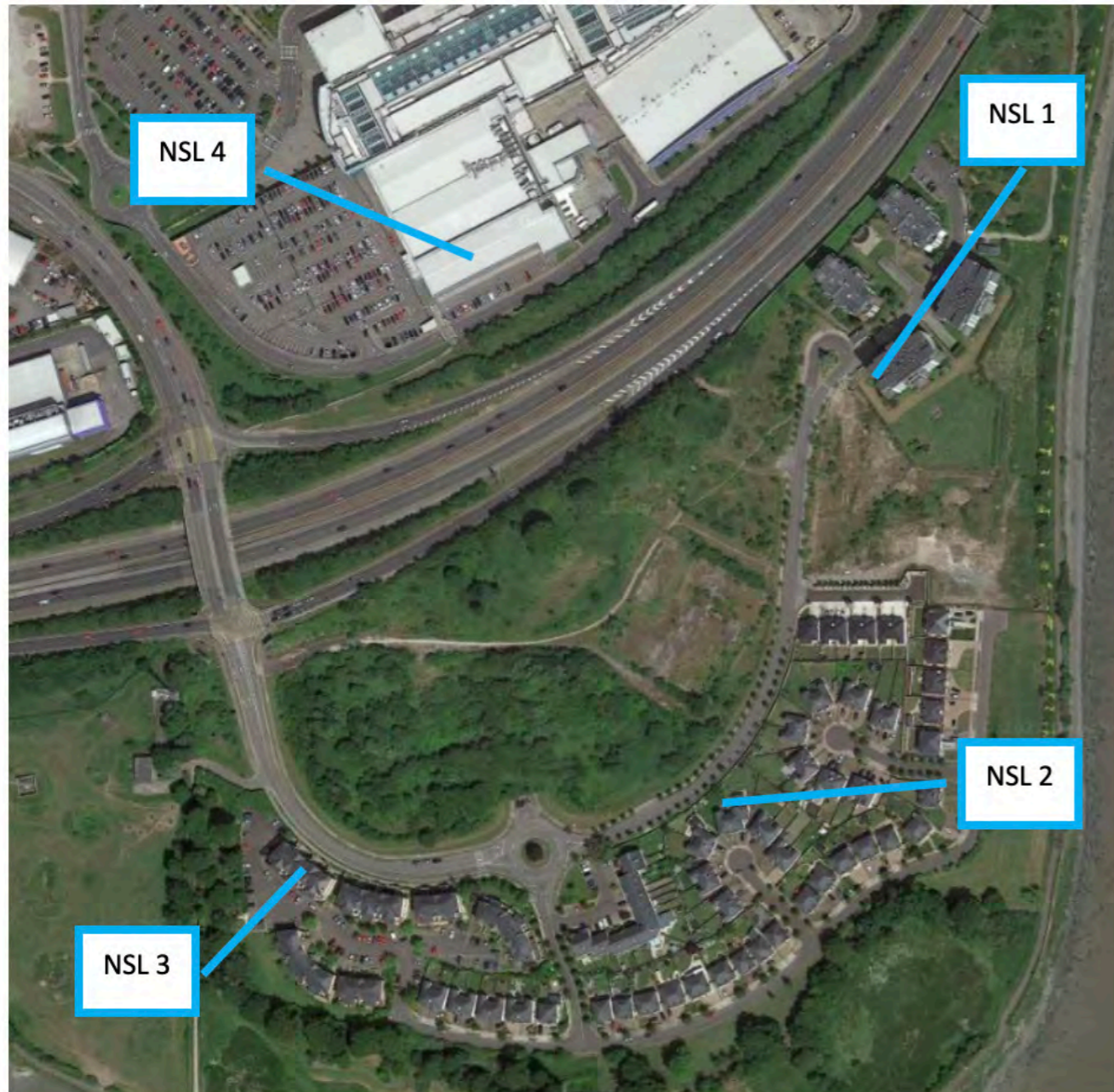


Figure 10.3 Site Context and Sample Noise Sensitive Receivers

Table 10.14 shows the potential noise levels calculated at various distances based on the assumed sound power level and attenuation provided by the barrier of 10 dB.

Table 10.14: Potential Construction Noise Levels at Varying Distances

Description of Noise Source	Sound Power Level (dB L <sub>w(A)</sub> )	Calculated noise levels at varying distances (dB L <sub>Aeq,T</sub> )				
		10m	20m	30m	40m	50m
3 no. items each with SPL of 81 dB at 10 m operating simultaneously.	114	76	70	66	62	56

At a distance of 20-30m from areas of major construction, representative of NSL1, NSL2 and NSL3 the predicted construction noise levels are above the 65 dB(A) CNT. The effect of this is negative, significant to very significant and short-term. These predicted effects are presented in the absence of mitigation measures.

At a distance of 35m from areas of major construction, the predicted construction noise levels are below the CNT, i.e. 65 dB(A) and therefore it is expected that there will be a negative, moderate and short-term effect at residential locations at this distance and greater from the works.

At a distance of 125m from works at locations representative of NSL4, the predicted noise levels associated with the works are comfortably below the CNT for commercial receptors, i.e. 70 dB(A) and therefore it is expected that there will be a negative, not significant and short-term effect at this location in the absence of mitigation.

**Construction Traffic**

During the construction phase of the proposed development there will be additional construction traffic on local roads. Considering that in order to increase traffic noise levels by 1 dB, traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to the construction phase will not result in a significant noise effect.

**10.5.1.2 Vibration**

It is anticipated that excavations will be made using standard excavation machinery, which typically do not generate appreciable levels of vibration close to the source. Taking this into account and considering the distance that these properties are from the works and the attenuation of vibration levels over distance, the resultant vibration levels are expected to be well below a level that would cause disturbance to building occupants or even be perceptible.

The associated effect with these activities is considered to be negative, not significant and temporary.

## 10.5.2 OPERATIONAL PHASE

### 10.5.2.1 Mechanical Plant

It is expected that the principal items of building and mechanical services plant will be associated with ventilation and heating of the apartment blocks. These items will be selected at a later stage, however, they will be designed and located so that there is no negative effect on sensitive receivers in proximity to the proposed development. The services plant will be designed/attenuated to meet the relevant plant noise criteria for day and night-time periods at nearby sensitive receivers as set out in Section 10.2.3.1.

The effect associated with building services plant, once designed to achieve the relevant noise criteria, is categorised as negative, imperceptible and permanent.

### 10.5.2.2 Additional Traffic on Adjacent Roads

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the site on some surrounding roads.

A traffic and transportation assessment relating to the proposed development has been prepared by Sweco consulting engineers, as part of this EIAR. Using this information, the related noise effects along the relevant road links has been assessed.

Table 10.15 below displays the predicted change in noise level at different road links around the site for the year of opening and the design year using the Annual Average Daily Traffic (AADT) flows along the road links under consideration.



Figure 10.4 Road Links Diagram

Table 10.15: Predicted Change in Noise Level associated with Vehicular Traffic

Road Link	Road Name	Opening Year (2024)		
		Do Nothing - AADT Without Development	Do Something - AADT With Development	Change in Noise Level (dB)
A	N40 between Jack Lynch Tunnel and Mahon Jun South Ring Road	71,160	71,733	0.0
B	N40 west of Mahon Interchange, between Mahon and Bloomfield Interchange	75,432	76,486	+0.1
Road Link	Road Name	Design Year (2039)		
		Do Nothing - AADT Without Development	Do Something - AADT With Development	Change in Noise Level (dB)
A	N40 between Jack Lynch Tunnel and Mahon Jun South Ring Road	74,864	75,437	0.0
B	N40 west of Mahon Interchange, between Mahon and Bloomfield Interchange	79,358	80,412	+0.1

With reference to Table 10.7, for the Opening Year 2024 the predicted change in noise level associated with additional traffic on the surrounding existing road network has a negligible effect. The effect is therefore neutral, imperceptible and long term.

With reference to Table 10.7, for the Design Year 2039 the predicted change in noise level associated with additional traffic on the surrounding existing road network has a negligible effect. The effect is therefore neutral, imperceptible and long term.

## 10.6 MITIGATION MEASURES

### 10.6.1 CONSTRUCTION PHASE - NOISE

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. Whilst construction noise and vibration effects are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure effects at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening;
- liaison with the public, and;
- monitoring.

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

#### 10.6.1.1 Selection of Quiet Plant

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

#### 10.6.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures should be considered:

- Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The use of lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant should be switched off when not in use and not left idling.
- For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering

is undertaken at the mixer drum.

- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

#### 10.6.1.4 Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be constructed around the site boundaries as standard. The hoarding will be constructed of a material with a mass per unit of surface area greater than 7 kg/m<sup>2</sup> to provide adequate sound attenuation.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

#### 10.6.1.5 Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

#### 10.6.1.6 Monitoring

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

#### 10.6.1.7 Project Programme

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. During excavation/ piling or other high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

### 10.6.2 CONSTRUCTION PHASE – VIBRATION

10.6.2.1 The vibration from construction activities will be limited to the values set out in Section 10.2.2. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Limit values have been provided for soundly constructed residential and commercial properties.

### 10.6.3 OPERATIONAL PHASE

#### 10.6.3.1 Mechanical Services Plant

Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria are achieved within the development it is expected that there will be no negative effect at sensitive receivers off site, and therefore no further mitigation required.

#### 10.6.3.2 Additional Traffic on Adjacent Roads

During the operational phase of the development, noise mitigation measures with respect to the outward effect of traffic from the development are not deemed necessary.

#### 10.6.3.3 Inward Noise

An assessment of inward noise and recommended mitigation measures is included in Appendix 10.1.

## 10.7 RESIDUAL EFFECTS

### 10.7.1 CONSTRUCTION PHASE

During the construction phase of the project there is the potential for significant and moderate effects on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration effects are reduced.

It is predicted that construction activity will have a negative, moderate to very significant and short-term effect at distances up to 30m from the works.

At distances greater than 30m it is predicted that construction activity will have a negative, slight to moderate and short-term effect.

Noise levels associated with construction vehicles moving to and from the site are predicted to have an effect that is negative, not significant and short-term.

### 10.7.2 OPERATIONAL PHASE

#### 10.7.2.1 Mechanical Plant

Noise levels associated with operational plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise effect from this source will be of negative, imperceptible, long-term effect.

#### 10.7.2.2 Additional Vehicular Traffic

The predicted change noise levels associated with additional traffic is predicted to be of imperceptible effect along the existing road network. In the context of the existing noise environment, in most cases the overall contribution of induced traffic is considered to be of neutral, imperceptible and long-term effect to nearby residential locations.

## 10.8 CUMULATIVE EFFECTS

During the construction phase of the proposed development, construction noise on site will be localised and will therefore likely the primary noise source at the nearest noise sensitive receivers. There are lands reserved for future development within the Masterplan site. Should construction of both sites occur simultaneously there is potential for cumulative noise effects at noise sensitive receivers equidistant from the sites.

In this scenario, it is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative effects on nearby sensitive receptors. Cumulative construction noise effects have the potential to be negative, moderate to significant and short-term at times of high activity on both sites.

The contractor will be required to control noise effects associated with the construction of this future development in line with the guidance levels included in Table 10.1 and follow the best practice control measures within BS 5228 -1.

In the context of the operational phase, permitted developments are included in the traffic effect and therefore the potential for a cumulative effect has been assessed (and found to be negative, imperceptible, and long-term).

Any large scale future projects that are not yet proposed or permitted would also need to be the subject of EIA in turn, to ensure that no significant effects resulting from noise and vibration will occur as a result of those developments.

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Plan, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting Strategic Environmental Assessment (SEA) Statement contained in Appendix 2(A) of the Draft Plan.

Table 5-1 of the Supporting Document of the Draft Cork City Development Plan 2022 indicates that Scenario 3, the 'Compact Liveable Growth Scenario' is determined to likely improve the status of SEOs to a greater degree and potential conflict with status of SEOs - likely to be mitigated to a lesser degree.

## 10.9 DIFFICULTIES ENCOUNTERED

No difficulties were encountered during the preparation of the EIAR chapter.

## 10.10 INTERACTIONS

In compiling this environmental effect assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and information relating to construction activities provided by the engineers. Noise emission sources from the proposed development during the construction and operational phases will be from construction plant and activity, building services and traffic accessing the development. The noise effect assessment has been prepared in consultation with the design team and traffic engineers. Reference can be made to the relevant chapters for additional information.

## 10.11 APPENDICES

Appendix 10.1 – 21\_12413NR01 (Jacobs Island Inward Noise Impact ) Issued 12 May 2022 (AWN Consulting Limited).

## 10.12 REFERENCES

Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);

BSI (1993). BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;

BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound;

BSI (2014). BS 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise;

BSI (2014). BS 5228-2:2009+A:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration;

EPA (2020). EPA Maps [Online] Available from [gis.epa.ie/EPAMaps](https://gis.epa.ie/EPAMaps);

ISO (2016). ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures;

UK Department of Transport (1998). Calculation of Road Traffic Noise;

UKHA (2020). Design Manual for Roads and Bridges Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2; and



JACOBS ISLAND



CHAPTER ELEVEN  
Air Quality & Climate



# CHAPTER ELEVEN

## Contents

ii	AIR QUALITY AND CLIMATE.....	ii
11.1	INTRODUCTION .....	1
11.2	ASSESSMENT METHODOLOGY .....	1
11.3	RECEIVING ENVIRONMENT .....	5
11.4	PREDICTED IMPACTS .....	7
11.5	CUMULATIVE .....	9
11.6	MITIGATION MEASURES.....	11
11.7	MONITORING.....	11
11.8	RESIDUAL IMPACTS.....	11
11.9	INTERACTIONS.....	12
11.10	REFERENCES.....	12

# CHAPTER ELEVEN

## AIR QUALITY AND CLIMATE

### 11.1 INTRODUCTION

This chapter assesses the likely air quality and climate impacts associated with the proposed development at Jacobs Island, Co. Cork. A full description of the proposed development can be found in Chapter 2 – Description of Development.

### 11.2 ASSESSMENT METHODOLOGY

#### 11.2.1 CRITERIA FOR RATING OF IMPACTS

##### Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or “Air Quality Standards” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 11.1 and Appendix 11.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, are relevant to this assessment (see Table 11.1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions (see Appendix 11.1).

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m<sup>2</sup>\*day) averaged over a one year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m<sup>2</sup>\*day) to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

Table 11.1: Air Quality Standards Regulations

Pollutant	Regulation <sup>Note 1</sup>	Limit Type	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m <sup>3</sup>
		Annual limit for protection of human health	40 µg/m <sup>3</sup>
		Critical level for protection of vegetation	30 µg/m <sup>3</sup> NO + NO <sub>2</sub>
Particulate Matter (as PM <sub>10</sub> )	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m <sup>3</sup>
		Annual limit for protection of human health	40 µg/m <sup>3</sup>
Particulate Matter (as PM <sub>2.5</sub> )	2008/50/EC	Annual limit for protection of human health	25 µg/m <sup>3</sup>

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

##### Climate Agreements

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2 °C above pre-industrial levels with efforts to limit this rise to 1.5 °C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement on elevating adaption onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013 (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

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

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019a). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a). The plan contains similar elements as the 2019 CAP and aims to set out how Ireland can reduce our greenhouse gas emissions by 51% by 2030 (compared to 2018 levels) which is in line with the EU ambitions, and a longer-term goal of achieving net-zero emissions no later than 2050. The 2021 CAP outlines that emissions from the Built Environment sector must be reduced to 4 – 5 MtCO<sub>2e</sub> by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland 2019b) followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (hereafter referred to as the 2021 Climate Act) in July 2021 (Government of Ireland, 2021b). The 2021 Climate Act was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act is to provide for the approval of plans 'for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'. The 2021 Climate Act will also 'provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'. The 2021 Climate Act defines the carbon budget as 'the total amount of greenhouse gas emissions that are permitted during the budget period'. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a 'local authority climate action plan' lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

## 11.2.2 CONSTRUCTION PHASE

### Air Quality

The assessment focuses on identifying the existing baseline levels of PM<sub>10</sub> and PM<sub>2.5</sub> in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the proposed development.

Construction phase traffic also has the potential to impact air quality and climate. The UK DMRB guidance (UK Highways Agency, 2019a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. The use of the UK guidance is recommended by the TII (2011) in the absence of specific Irish guidance, this approach is considered best practice and can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT and therefore does not meet the above scoping criteria. As a result a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

### Climate

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

## 11.2.3 OPERATIONAL PHASE

### Air Quality

The air quality assessment has been carried out following procedures described in the publications by the EPA (2015; 2022) and using the methodology outlined in the guidance documents published by the UK Highways Agency (2019a) and UK Department of Environment Food and Rural Affairs (DEFRA) (2016; 2018). Transport Infrastructure Ireland (TII) reference the use of the UK Highways Agency and DEFRA guidance and methodology in their document Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011). This approach is considered best practice in the absence of Irish guidance and can be applied to any development that causes a change in traffic.

In 2019 the UK Highways Agency DMRB air quality guidance was revised with LA 105 Air Quality replacing a number of key pieces of guidance (HA 207/07, IAN 170/12, IAN 174/13, IAN 175/13, part of IAN 185/15). This revised document outlines a number of changes for air quality assessments in relation to road schemes, but can be applied to any development that causes a change in traffic. Previously the DMRB air quality spreadsheet was used for the majority of assessments in Ireland with detailed modelling only required if this screening tool indicated compliance issues with the EU air quality standards. Guidance from Transport Infrastructure Ireland (TII, 2011) recommends the use of the UK Highways Agency DMRB spreadsheet tool for assessing the air quality impacts from road schemes. However, the DMRB spreadsheet tool was last revised in 2007 and accounts for modelled years up to 2025. Vehicle emission standards up to Euro V are included but since 2017, Euro 6d standards are applicable for the new fleet. In addition, the model does not account for electric or hybrid vehicle use. Therefore, this is a somewhat outdated assessment tool. The LA 105 guidance document states that the DMRB spreadsheet tool may still be used for simple air quality assessments where there is unlikely to be a breach of the air quality standards. Due to its use of a "dirtier" fleet, vehicle emissions would be considered to be higher than more modern models and therefore any results will be conservative in nature and will provide a worst-case assessment.

The 2019 UK Highways Agency DMRB air quality revised guidance LA 105 Air Quality states that modelling should be

conducted for NO<sub>2</sub> for the base, opening and design years for both the do minimum (do nothing) and do something scenarios. Modelling of PM<sub>10</sub> is only required for the base year to demonstrate that the air quality limit values in relation to PM<sub>10</sub> are not breached. Where the air quality modelling indicates exceedances of the PM<sub>10</sub> air quality limits in the base year then PM<sub>10</sub> should be included in the air quality model in the do minimum and do something scenarios. Modelling of PM<sub>2.5</sub> is not required as there are currently no issues with compliance with regard to this pollutant. The modelling of PM<sub>10</sub> can be used to show that the project does not impact on the PM<sub>2.5</sub> limit value as if compliance with the PM<sub>10</sub> limit is achieved then compliance with the PM<sub>2.5</sub> limit will also be achieved. Historically modelling of carbon monoxide (CO) and benzene was required however, this is no longer needed as concentrations of these pollutants have been monitored to be significantly below their air quality limit values in recent years, even in urban centres (EPA, 2021a). The key pollutant reviewed in this assessment is NO<sub>2</sub>. Concentrations of PM<sub>10</sub> have been modelled for the base year to indicate that there are no potential compliance issues. Modelling of operational NO<sub>2</sub> concentrations has been conducted for the do nothing and do something scenarios for the opening year and design year.

- The TII guidance (2011) states that the assessment must progress to detailed modelling if:
- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills etc).

The UK DMRB scoping criteria outlined above in Section 11.2.1.2 has been used in the current assessment to determine the road links required for inclusion in the modelling assessment. Sensitive receptors within 200m of impacted road links are included within the modelling assessment. Pollutant concentrations are calculated at these sensitive receptor locations to determine the impact of the proposed development in terms of air quality. The guidance states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling (UK Highways Agency, 2019a). The TII guidance (2011) defines sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of the public are likely to be regularly present.

The following model inputs are required to complete the assessment using the DMRB spreadsheet tool: road layouts, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles (%HGV), annual average traffic speeds and background concentrations. Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptors using generic meteorological data. The DMRB model uses conservative emission factors, the formulae for which are outlined in the DMRB Volume 11 Section 3 Part 1 – HA 207/07 Annexes B3 and B4. These worst-case road contributions are then added to the existing background concentrations to give the worst-case predicted ambient concentrations. The worst-case ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII document Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. The TII significance criteria are outlined in Appendix 10 of the TII guidance and have been adopted for the proposed development. The significance criteria are based on NO<sub>2</sub> and PM<sub>10</sub> as these pollutants are most likely to exceed the annual mean limit values (40 µg/m<sup>3</sup>).

### Conversion of NO<sub>x</sub> to NO<sub>2</sub>

NO<sub>x</sub> (NO + NO<sub>2</sub>) is emitted by vehicles exhausts. The majority of emissions are in the form of NO, however, with greater diesel vehicles and some regenerative particle traps on HGV's the proportion of NO<sub>x</sub> emitted as NO<sub>2</sub>, rather than NO is increasing. With the correct conditions (presence of sunlight and O<sub>3</sub>) emissions in the form of NO, have the potential to

be converted to NO<sub>2</sub>.

Transport Infrastructure Ireland states the recommended method for the conversion of NO<sub>x</sub> to NO<sub>2</sub> in “Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes” (2011). The TII guidelines recommend the use of DEFRA's NO<sub>x</sub> to NO<sub>2</sub> calculator (2020) which was originally published in 2009 and is currently on version 8.1. This calculator (which can be downloaded in the form of an excel spreadsheet) accounts for the predicted availability of O<sub>3</sub> and proportion of NO<sub>x</sub> emitted as NO for each local authority across the UK. O<sub>3</sub> is a regional pollutant and therefore concentrations do not vary in the same way as concentrations of NO<sub>2</sub> or PM<sub>10</sub>.

The calculator includes Local Authorities in Northern Ireland and the TII guidance recommends the use of 'Armagh, Banbridge and Craigavon' as the choice for local authority when using the calculator. The choice of Craigavon provides the most suitable relationship between NO<sub>2</sub> and NO<sub>x</sub> for Ireland. The “All Other Urban UK Traffic” traffic mix option was used.

### Update to NO<sub>2</sub> Projections using DMRB

In 2011 the UK DEFRA published research (Highways England, 2013) on the long term trends in NO<sub>2</sub> and NO<sub>x</sub> for roadside monitoring sites in the UK. This study marked a decrease in NO<sub>2</sub> concentrations between 1996 and 2002, after which the concentrations stabilised with little reduction between 2004 and 2010. The result of this is that there now exists a gap between projected NO<sub>2</sub> concentrations which UK DEFRA previously published and monitored concentrations. The impact of this 'gap' is that the DMRB screening model can under-predict NO<sub>2</sub> concentrations for predicted future years. Subsequently, the UK Highways Agency published an Interim advice note (IAN 170/12) in order to correct the DMRB results for future years. This methodology has been used in the current assessment to predict future concentrations of NO<sub>2</sub> as a result of the proposed development.

### Traffic Data Used in Modelling Assessment

Traffic flow information was obtained from Sweco Engineers for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the base year 2019, opening year 2024 and design year 2039 were provided. The traffic data in AADT is detailed in Table 11.2 along with the % HGV for each link in brackets. Only road links that met the DMRB scoping criteria outlined in Section 11.2.1.2 and that were within 200m of receptors were included in the modelling assessment. The traffic data used in the modelling assessment represents a worst-case approach as it is based on current traffic levels. In reality traffic is likely to decrease in future years and therefore the traffic assessed is likely higher than future traffic levels and therefore allows for the greatest impact in terms of potential traffic related air emissions. Background concentrations have been included as per Section 11.3.2 of this chapter based on available EPA background monitoring data (EPA, 2021a).

Table 11.2: Traffic Data used in Air Modelling Assessments

Link No.	Road Name	Speed (kph)	Base	Do Nothing		Do Something	
			2019	2024	2039	2024	2039
1.	N40 West of Mahon Interchange	100	71,700 (4.1%)	75,432 (4.1%)	79,358 (4.1%)	76,486 (4.1%)	80,412 (4.1%)



Figure 11.1: Locations of Sensitive Receptors Used in Air Quality Modelling Assessment

**Air Quality on Ecological Sites**

For routes that pass within 2 km of a designated area of conservation (either Irish or European designation) the TII requires consultation with an ecologist (TII, 2011). However, in practice the potential for impact to an ecological site is highest within 200m of the proposed scheme and when significant changes in AADT (>5%) occur. Only sites that are sensitive to nitrogen deposition should be included in the assessment. In addition, the UK Highways Agency (2019)

states that a detailed assessment does not need to be conducted for areas that have been designated for geological features or watercourses.

Transport Infrastructure Ireland's Guidelines for Assessment of Ecological Impacts of National Road Schemes (2009) and Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

If both of the following assessment criteria are met, an assessment of the potential for impact due to nitrogen deposition should be conducted: -

- A designated area of conservation is located within 200 m of the proposed development.
- A significant change in AADT flows (>5%) will occur.

The Cork Harbour Special Area of Protection (SPA) (site code 004030) and Douglas River Estuary Proposed Natural Heritage Area (pNHA) (site code 001046) is approximately 150m from the proposed development. An assessment of the impact with regards to nitrogen deposition was conducted for the pNHA and SPA. Dispersion modelling and prediction was carried out at typical traffic speeds at this location. Ambient NOx concentrations were predicted for the opening year of 2024 along a transect of up to 200 m within the SPA and pNHA in line with the UK Highways Agency (2019a) and TII (2011) guidance. The road contribution to dry deposition along the transect was also calculated using the methodology outlined in Appendix 9 of the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011).

**Climate**

Ireland has annual GHG targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013, which has set a target of 30% reduction in non-ETS sector GHG emissions by 2030 relative to 2005 levels.

As per the EU guidance document Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 9.3.3). The impact of the proposed development on climate is determined in relation to this baseline. Road traffic associated with the proposed development will emit certain volumes of carbon dioxide (CO2).

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments LA 114 Climate (UK Highways Agency, 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meets one or more of the below criteria, then further assessment is required.

- a change of more than 10% in AADT;
- a change of more than 10% to the number of heavy duty vehicles; and
- a change in daily average speed of more than 20 km/hr.

Operational phase traffic has the potential to impact climate as a result of increased vehicle movements associated with the proposed development. None of the road links impacted by the proposed development meet the scoping

criteria above and therefore a detailed assessment has been scoped out as there is no potential for significant impacts to climate as a result of traffic emissions.

The EU guidance (2013) also states that indirect GHG emissions as a result of a proposed development must be considered. These include emissions associated with energy usage. The Building Lifecycle Report (see Appendix 11.3) for the proposed development has been reviewed to inform the operational phase climate assessment. A number of measures have been incorporated into the overall design of the development to reduce the impact to climate, where possible.

### 11.3 RECEIVING ENVIRONMENT

#### 11.3.1 METEOROLOGICAL DATA

A key factor in assessing temporal and spatial variations in air quality are the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM10, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM2.5) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM2.5 - PM10) will actually increase at higher wind speeds. Thus, measured levels of PM10 will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Cork Airport meteorological station, which is located approximately 7 km south-west of the site. Cork Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 11.2). For data collated during five representative years (2016 – 2020), the predominant wind direction is north-westerly to south-westerly with generally moderate wind speeds (Met Eireann, 2022).

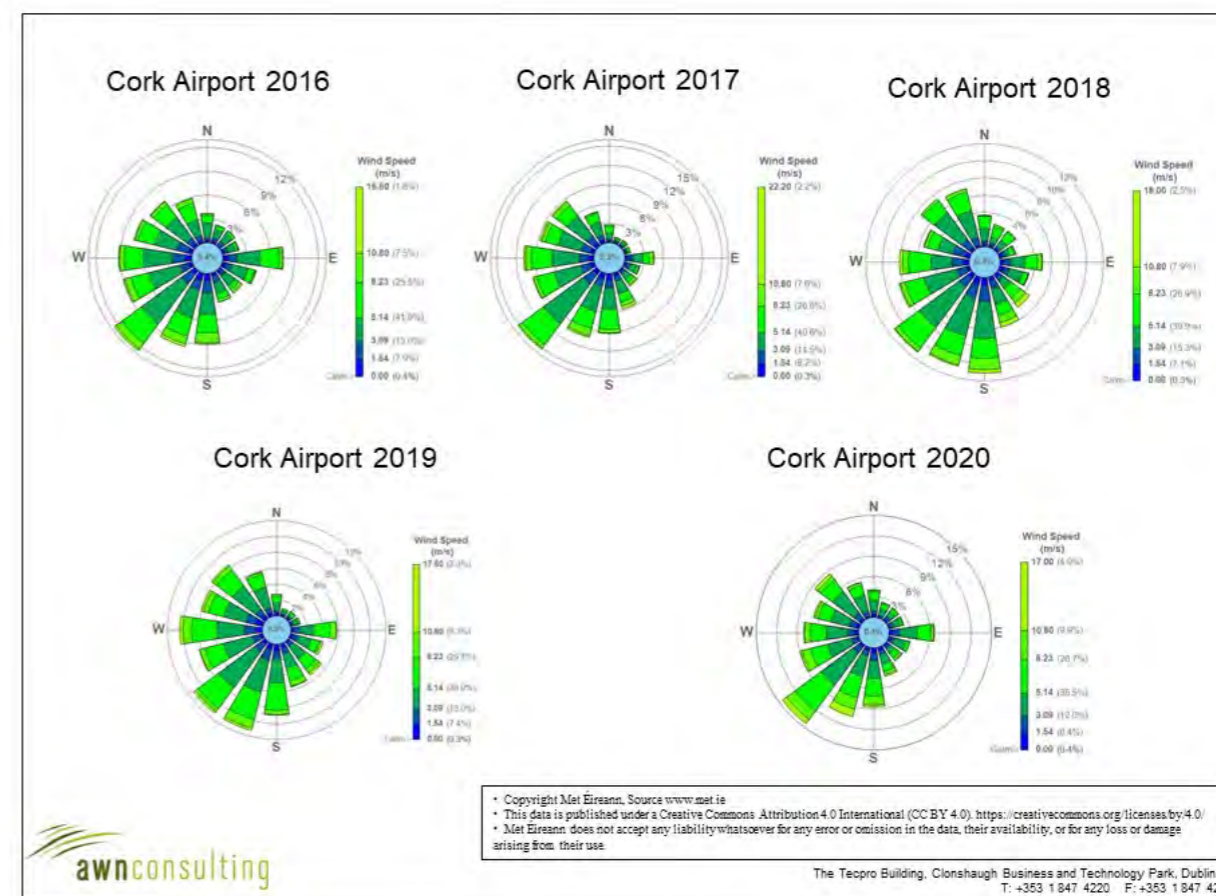


Figure 11.2: Cork Airport Windroses 2016 – 2020 (Source: Met Eireann, 2022)

#### 11.3.2 BASELINE AIR QUALITY

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is “Air Quality In Ireland 2020” (EPA, 2021a). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2022).

As part of the implementation of the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2022). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone B (EPA, 2022). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

In 2020 the EPA reported (EPA, 2021a) that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA Air Quality in Ireland 2020 report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the baseline section and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

Long-term NO2 monitoring was carried out at the Zone B suburban traffic location of South Link Road and the urban background location of UCC for the period 2015 – 2019 (EPA, 2021a). Annual mean concentrations of NO2 range from 10 – 11 µg/m3 over this period for the urban background location and concentrations range from 21 – 27 µg/m3 for the suburban traffic location (Table 11.3). Long term average concentrations are significantly below the annual average limit of 40 µg/m3. The monitoring station at Cork South Link Road is located 4.5km west of the proposed development and can be considered a representative monitoring location to determine background pollutant levels for the proposed development. Based on the above information, a conservative estimate of the current background NO2 concentration in the region of the proposed development is 27 µg/m3.

**Table 11.3: Trends in Zone B Air Quality – Nitrogen Dioxide (NO2)**

Station	Averaging Period <sup>Note 1</sup>	Year				
		2015	2016	2017	2018	2019
Cork South Link Road	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )	22	23	27	25	21
	99.8 <sup>th</sup> tile of 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )	101	104	111	112	-
Cork UCC	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )	-	-	-	11	10
	99.8 <sup>th</sup> tile of 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )	-	-	-	64	-

Note 1. Annual average limit value - 40 µg/m3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011). 1-hour limit value - 200 µg/m3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Continuous PM10 monitoring was carried out at the suburban traffic location of South Link Road and the suburban background locations of Heatherton Park and Bishopstown MTU over the period 2015 – 2019 (EPA, 2021a). Concentrations range from 10 – 15 µg/m3 for the suburban background locations over the five year period and 17 – 25 µg/m3 for the suburban traffic location (see Table 11.4). Hence, long term concentrations are significantly below the annual limit value of 40 µg/m3. In addition, there were at most 7 exceedances (at South Link Road) of the 24-hour limit value of 50 µg/m3 in any year over the period 2015 - 2019, albeit 35 exceedances are permitted per year (EPA, 2021a). The nearest representative location is Heatherton Park which is approximately 4km west of the proposed development. Based on the EPA data, a conservative estimate of the current background PM10 concentration in the region of the development is 15 µg/m3.

**Table 11.4: Trends in Zone B Air Quality – PM10**

Station	Averaging Period <sup>Note 1</sup>	Year				
		2015	2016	2017	2018	2019
Cork South Link Road	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )	17	18	17	25	18
	24-hr Mean > 50 µg/m <sup>3</sup> (days)	3	7	4	0	6
Heatherton Park	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )	11	12	10	11	12
	24-hr Mean > 50 µg/m <sup>3</sup> (days)	0	2	0	0	1
Bishopstown MTU	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )	-	-	-	-	15
	24-hr Mean > 50 µg/m <sup>3</sup> (days)	-	-	-	-	1

Note1. Annual average limit value - 40 µg/m3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011). Daily limit value - 50 µg/m3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Monitoring for both PM10 and PM2.5 is conducted at the monitoring station in Heatherton Park, this allows the PM2.5/PM10 ratio to be calculated. Average PM2.5 levels in Heatherton Park over the period 2015 – 2019 ranged from 6 – 8 µg/m3, with a PM2.5/PM10 ratio ranging from 0.55 – 0.73 (EPA, 2021a). Based on this information, a conservative ratio of 0.8 was used to generate an existing PM2.5 concentration in the region of the proposed development of 12 µg/m3.

Background concentrations for the Opening Year and Design Year of 2024 and 2039 have been calculated for the local air quality assessment. These have used current estimated background concentrations and the year on year reduction factors provided by Transport Infrastructure Ireland in the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011) and the UK Department for Environment, Food and Rural Affairs LAQM.TG(16) (2018).

### 11.3.3 CLIMATE BASELINE

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details provisional emissions up to 2020 (EPA, 2021b). The data published in 2021 states that Ireland will exceed its 2020 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.73 Mt. For 2021, total national greenhouse gas emissions are estimated to be 57.70 million tonnes carbon dioxide equivalent (Mt CO2eq) with 44.38 MtCO2eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2021 at 37.1% of the total, with the transport sector accounting for 17.9% of emissions of CO2.

GHG emissions for 2020 are estimated to be 3.6% lower than those recorded in 2019. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for five years in a row. Emissions from 2016 – 2020 exceeded the annual EU targets by 0.29 MtCO2eq, 2.94 MtCO2eq, 5.57 MtCO2eq, 6.85 MtCO2eq and 6.73 MtCO2eq respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2020 GHG Emissions Projections Report for 2020 – 2040 (EPA, 2021c) notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan (NDP) which was published in 2018 and the Climate Action Plan published in 2019. Implementation of these are classed as a "With Additional Measures scenario" for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these

areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2013 to 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 12.2MtCO<sub>2</sub>eq under the "With Existing Measures" scenario and under the "With Additional Measures" scenario. The projections indicate that Ireland can meet its non-ETS EU targets over the period 2021 – 2030 assuming full implementation of the Climate Action Plan and the use of the flexibilities available (EPA, 2021c).

## 11.4 PREDICTED IMPACTS

### 11.4.1 DO NOTHING SCENARIO

In the Do Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc). The Do Nothing scenario for the operational phase has been assessed within Section 11.4.3. The Do Nothing scenario is considered neutral in terms of air quality and climate.

### 11.4.2 CONSTRUCTION PHASE

#### Air Quality

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust and PM<sub>10</sub>/PM<sub>2.5</sub> emissions. While construction dust tends to be deposited within 350m of a construction site, the majority of the deposition occurs within the first 50m. The proposed development can be considered major in scale and therefore, there is the potential for significant dust soiling impacts within 100m of the site (Table 11.5). The closest high sensitivity receptors (residential properties) to the site are approximately 20m to the south of the site. In the absence of mitigation there is the potential for short-term, negative, slight impacts to nearby sensitive receptors as a result of construction dust emissions.

*Table 11.5: Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place (TII, 2011)*

Source		Potential Distance for Significant Effects (Distance From Source)		
Scale	Description	Soiling	PM10	Vegetation Effects
Major	Large construction sites, with high use of haul roads	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites, with limited use of haul roads	25m	10m	10m

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the DMRB assessment criteria in Section 11.2.1.2. It can therefore be determined that the construction stage traffic will have an imperceptible, neutral, localised and short-term impact on air quality.

#### Climate

There is the potential for a number of greenhouse gas emissions to the atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO<sub>2</sub> and N<sub>2</sub>O emissions. The Institute of Air Quality Management document "Guidance on the Assessment of Dust from Demolition and Construction" (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the impact on climate is considered to be imperceptible, neutral and short term.

#### Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM<sub>10</sub> and PM<sub>2.5</sub> emissions. As per Table 11.5, PM<sub>10</sub> emissions can occur within 25m of the site for a development of this scale. There are a number of high sensitivity receptors within 25m of the site. Therefore, in the absence of mitigation there is the potential for slight, negative, short-term impacts to human health as a result of the proposed development.

### 11.4.3 OPERATIONAL PHASE

#### Air Quality

The impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The impact of NO<sub>2</sub> emissions for the opening and design years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined. The assessment was carried out at 1 no. worst-case high sensitivity receptor (R1) (see Figure 11.1).

Transport Infrastructure Ireland's document Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (2011) detail a methodology for determining air quality impact significance criteria for road schemes and this can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

The results of the assessment of the impact of the proposed development on NO<sub>2</sub> in the opening year 2024 are shown in Table 11.6 and for design year 2039 are shown in Table 11.7. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2024 and 2039. Concentrations of NO<sub>2</sub> are at most 71% of the annual limit value in 2024 and at most 67% in 2039 for the do-something scenario. In addition, the hourly limit value for NO<sub>2</sub> is 200 µg/m<sup>3</sup> and is expressed as a 99.8th percentile (i.e. it must not be exceeded more than 18 times per year). The maximum 1-hour NO<sub>2</sub> concentration is not predicted to be exceeded in any modelled year (Table 11.8).

The impact of the proposed development on annual mean NO<sub>2</sub> concentrations can be assessed relative to "Do Nothing (DN)" levels. Relative to baseline levels, there is predicted to be an imperceptible increase in NO<sub>2</sub> concentrations at the receptor (R1) for the opening year of 2024. There is no predicted change in NO<sub>2</sub> concentrations at receptor (R1) in the design year of 2039. Concentrations will increase by at most 0.00033 µg/m<sup>3</sup> in 2024 (R1). Using the assessment criteria outlined in Appendix 10 of the TII guidance (2011), the impact of the proposed development in terms of NO<sub>2</sub> is considered negligible at the high sensitivity receptor chosen. Therefore, the overall impact of NO<sub>2</sub> concentrations as a result of the proposed development is long-term, negative and imperceptible.



Concentrations of PM10 were modelled for the baseline year of 2019. The modelling showed that concentrations were in compliance with the annual limit value of 40 µg/m<sup>3</sup> at all receptors assessed, therefore, further modelling for the opening and design years was not required as per the UK Highways Agency guidance (2019a). Concentrations reached at most 0.19 µg/m<sup>3</sup> excluding background concentrations. When a background concentration of 15 µg/m<sup>3</sup> is included, the overall impact is 38% of the annual limit value at the worst case receptor (R1).

The impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, negative and imperceptible.

**Table 11.6: Predicted Annual Mean NO<sub>2</sub> Concentrations – Opening Year 2024 (µg/m<sup>3</sup>)**

Receptor	Impact Opening Year 2024				
	DN	DS	DS-DN	Magnitude	Description
R1	28.2	28.2	0.01	Imperceptible	Negligible Increase

Note 1. Based on UK Highways Agency IAN technique for predicting future NO<sub>2</sub> concentrations

**Table 11.7: Predicted Annual Mean NO<sub>2</sub> Concentrations – Design Year 2039 (µg/m<sup>3</sup>)**

Receptor	Impact Opening Year 2039				
	DN	DS	DS-DN	Magnitude	Description
R1	27.0	27.0	0.00	Imperceptible	Negligible (no change)

Note 1. Based on UK Highways Agency IAN technique for predicting future NO<sub>2</sub> concentrations

**Table 11.8: Predicted 99.8th percentile of Daily Maximum 1-hour NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>)**

Receptor	Opening Year 2024		Design Year 2039	
	DN	DS	DN	DS
R1	98.8	98.9	94.4	94.4

**Air Quality Impact on Sensitive Ecosystems**

The existing road network and the proposed development both impact a section of Douglas River Estuary pNHA and the Cork Harbour SPA.

Modelling has been conducted at the worst-case location in closest proximity to the road links impacted by the proposed development. The NOX emissions resulting from traffic associated with the current road network and proposed development have been calculated and are detailed in Table 11.9. Ambient NOX concentrations have been predicted for the opening year of 2024 as per the UK Highways Agency (2019b) and TII guidance (2011). Concentrations are predicted along a transect of up to 200m within the pNHA and SPA.

The predicted annual average NOX concentration within the pNHA and SPA, exceeds the limit value of 30µg/m<sup>3</sup> for the existing “Do Nothing” scenario and the “Do Something” scenario. Concentrations are at most 86% of the annual limit value for the do nothing scenario and the do something scenario, including a background concentration of 15 µg/m<sup>3</sup>, for the protection of ecosystems for the existing scenario without the proposed development in place. The proposed development is predicted to increase NOX concentrations by at most 0.06µg/m<sup>3</sup>.

Appendix 9 of the TII guidelines (2011) state that where the scheme is expected to cause an increase of more than 2µg/m<sup>3</sup> and the predicted concentrations (including background) are close to, or exceed the standard, then the sensitivity of the habitat to NOX should be assessed by the project ecologist. NOX concentrations are predicted to be in exceedance of the limit value both with or without the proposed development in place. However, the proposed development will only increase NOX concentrations by a maximum of 0.06 µg/m<sup>3</sup> at the worst-case location, therefore, effects are predicted to be not significant.

The contribution to the NO<sub>2</sub> dry deposition rate along the 200m transect within the pNHA and SPA is also detailed in Table 11.9. The change in the maximum NO<sub>2</sub> dry deposition rate is 0.003 Kg(N)/ha/yr. This is well below the critical load for coastal habitats of 10-20 Kg(N)/ha/yr (TII,2011).

Overall, the air quality effect on the Douglas River Estuary pNHA and Cork Harbour SPA, is considered negative, long-term and imperceptible.

Table 11.9: Assessment of NOx Concentrations and NO2 Dry Deposition Impact on the Douglas River Estuary pNHA and Cork Harbour SPA

Distance to Road (m)	NO <sub>x</sub> Concentration (µg/m <sup>3</sup> ) <sup>Note 1</sup>		NO <sub>2</sub> Dry Deposition Rate Impact	
	Do Nothing	Do Something	Change in NO <sub>x</sub> Concentration	Kg N ha <sup>-1</sup> yr <sup>-1</sup>
40.1	25.84	25.90	0.06	0.003
50.1	23.51	23.56	0.05	0.003
60.1	21.71	21.74	0.04	0.002
70.1	20.29	20.32	0.03	0.001
80.1	19.16	19.18	0.02	0.001
90.1	18.26	18.28	0.02	0.001
100.1	17.54	17.56	0.01	0.001
110.1	16.98	16.99	0.01	0.001
120.1	16.55	16.56	0.01	0
130.1	16.22	16.23	0.01	0.001
140.1	15.99	15.99	0.01	0
150.1	15.84	15.84	0.00	0.001
160.1	15.76	15.76	0.00	0
170.1	15.72	15.72	0.00	0
180.1	15.60	15.60	0.00	0
190.1	15.48	15.49	0.00	0
200.1	15.37	15.37	0.00	0

Note 1. Based on a background NOx concentration of 15 µg/m<sup>3</sup> in 2026

**Climate**

The impact of the proposed development on emissions of CO2 impacting climate were assessed using the DMRB screening criteria as outlined in Section 11.2.1.2 (UK Highways Agency, 2019b). It was determined that a detailed assessment of CO2 emissions from traffic associated with the proposed development can be screened out as no road links can be classed as impacted. Therefore, the likely overall magnitude of the changes on climate in the operational stage is imperceptible, neutral and long-term.

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A detailed flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. The flood risk assessment includes an assessment of the risk posed by both fluvial and coastal flooding. The mitigation measures outlined in this report include minimum floor levels and minimum levels of site protection during construction. This means construction will not take place below a certain ground level to reduce the risk of flooding. These measures, along with adequate attenuation and drainage for the proposed development means the impact of the proposed development on climate will be imperceptible.

In addition, the proposed development has been designed to reduce the impact to climate where possible. The

following measures have been incorporated into the design of the development: UV free-LED fittings and timer controls are considerations being undertaken to improve the impact lighting may have on climate. Exhaust Air Heat Pumps (EAHP) will be used along with photovoltaic panels to optimise energy use. Further details of the measures to be incorporated into the design of the development are outlined within the Building Lifecycle Report (see Appendix 11.3) prepared in support of this planning application.

**Human Health**

Traffic related air emissions have the potential to impact air quality which can affect human health. However, air dispersion modelling of traffic emissions has shown that levels of all pollutants are below the ambient air quality standards set for the protection of human health. It can be determined that the impact to human health during the operational stage is long-term, negative and imperceptible.

**11.5 CUMULATIVE**

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the 2022 Draft Cork City Development Plan, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Cork City Development Plan 2022, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting document Strategic Environmental Objectives (SEOs), Indicators and Targets. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.

SEO A – Air and SEO C – Climatic factors as detailed in Table 5-1 of the Draft Cork City Development Plan 2022 is to:

- To avoid, prevent or reduce harmful effects on human health and the environment as a whole resulting from emissions to air from all sectors with particular reference to emissions from transport, residential heating, industry and agriculture;
- Maintain and promote continuing improvement in air quality through the reduction of emissions and promotion of renewable energy and energy efficiency;
- Promote continuing improvement in air quality;
- Reduction of emissions of sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and fine particulate matter which are responsible for acidification, eutrophication and ground-level ozone pollution;
- Meet Air Quality Directive standards for the protection of human health – Air Quality Directive;
- Significantly decrease noise pollution by 2020 and move closer to WHO recommended levels;
- To minimise emissions of greenhouse gasses;
- Integrate sustainable design solutions into the City’s infrastructure (e.g. energy efficient buildings; green infrastructure);
- Contribute towards the reduction of greenhouse gas emissions in line with national targets;
- Promote development resilient to the effects of climate change; and
- Promote the use of renewable energy, energy efficient development and increased use of public transport.

Table 5-1 of the Supporting Document of the Draft Cork City Development Plan 2022 indicates that Scenario 3, the ‘Compact Liveable Growth Scenario’ is determined to likely improve the status of SEOs to a greater degree and potential conflict with status of SEOs – likely to be mitigated to a lesser degree.

**11.5.1 CONSTRUCTION PHASE**

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction phase of any other developments within 350m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. Table 11.10 details a number of projects which have the potential for cumulative effects. However, provided the mitigation measures outlined in Section 11.6 and Appendix 11.2 are implemented throughout the construction phase of the proposed development, significant cumulative dust impacts are not predicted.

Due to the short-term duration of the construction phase and the low potential for significant CO2 emissions cumulative impacts to climate are considered imperceptible.

There are no significant cumulative impacts to air quality or climate predicted for the construction phase.

*Table 11.10: List of Relevant Cumulative Projects with Planning Permission/ Submitted for Planning Permission*

Application Reference	Applicant(s)	Description	Outcome/Current Status
ABP Ref.: TA28.313216	Estuary View Entreprises 2020 Limited	'The Meadows' Bessborough	Due 25 <sup>th</sup> July 2022
ABP Ref.: TA28.313206	Estuary View Entreprises 2020 Limited	'The Farm' Bessborough	Due 25 <sup>th</sup> July 2022
Cork City Council Ref.: 22/40809	Hibernia Star Limited	Construction of an office and hotel development at Jacob's Island, Ballinure, Mahon, Cork	Request for Further Information
ABP Ref.: TR28.310378	Montip Horizon Limited	Amendments to previously permitted strategic housing development reference ABP-301991-18 to increase the number of units from 413 no. units to 437 no. units and amendments to Blocks 4, 7, 8, 9 and 10 at Jacob's Island, Ballinure, Mahon, Cork	Granted (11 <sup>th</sup> February 2022)
Cork City Council Ref.: 19/38875	O'Flynn Construction Co. Unlimited Company	Construction of 12,004 sq m of office floor-space at Blackrock Business Park, Bessboro Road, Mahon, Cork	Granted (11 <sup>th</sup> March 2020)
Cork City Council Ref.: 18/37820 and ABP Ref. PL. 302784	Bessboro Warehouse Holdings Limited	Demolition of the existing buildings and construction of 135 no. residential units at Bessboro Road, Mahon, Cork	Granted (28 <sup>th</sup> February 2019)
ABP Ref.: TA.301991.	Montip Horizon Limited	Construction of 413 no. apartments, neighbourhood centre, creche, road improvement works including upgrades to the Mahon Link Road (R852) to the North of the N40 interchange to incorporate a dedicated bus lane and all site development works at Jacob's Island, Ballinure, Mahon, Cork	Granted (3 <sup>rd</sup> October 2018)

**11.5.2 OPERATIONAL PHASE**

The traffic data used to assess the operational stage impacts to air quality and climate included the cumulative traffic associated with the proposed development as well as other existing and permitted developments in the local area where such information was available (see Chapter 5 Traffic and Transport). Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term, negative and imperceptible with regards to air quality and long-term, neutral and imperceptible with regard to climate.

## 11.6 MITIGATION MEASURES

### 11.6.1 CONSTRUCTION PHASE

#### Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 11.2. These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site.

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

#### Climate

Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO<sub>2</sub> emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

### 11.6.2 OPERATIONAL PHASE

The impact of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

The proposed development has been designed to minimise the impact to climate where possible during operation. Details of the measures to be incorporated into the design of the development are outlined in the Building Lifecycle Report (Appendix 11.3) prepared in support of this planning application.

## 11.7 MONITORING

### 11.7.1 CONSTRUCTION PHASE

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m<sup>2</sup>\*day) during the monitoring period between 28 - 32 days.

### 11.7.2 OPERATIONAL PHASE

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

## 11.8 RESIDUAL IMPACTS

### 11.8.1 CONSTRUCTION PHASE

#### Air Quality

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan (Appendix 11.2). Provided the dust minimisation measures outlined in the plan are adhered to, the predicted residual air quality impacts during the construction phase are short-term, negative, localised and imperceptible at nearby receptors.

#### Climate

According to the IAQM guidance (2014), site traffic, plant and machinery are unlikely to make a significant impact on climate during the construction phase. Therefore, the predicted residual impact on climate of the construction phase is considered to be imperceptible, neutral and short-term.

#### Human Health

The mitigation measures outlined in Section 11.6 are best practice mitigation measures. They are proposed for the

construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact complies with all EU ambient air quality legislative limit values which are based on the protection of human health (see Table 11.1). Therefore, the predicted residual impact of construction of the proposed development is negative, short-term, localised and imperceptible with respect to human health.

## 11.8.2 OPERATIONAL PHASE

### Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the UK DMRB model. The modelling assessment determined that the change in emissions of NO<sub>2</sub> at nearby sensitive receptors as a result of the proposed development will be imperceptible. Therefore, the operational phase impact to air quality is long-term, localised, negative and imperceptible.

### Climate

The traffic associated with the operational phase of the proposed development is below the criteria requiring a detailed climate assessment. As detailed above, the design of the proposed development includes numerous features that are expected to mitigate its operational carbon footprint, including energy efficiency measures and bicycle-friendly design. The residual impact to climate during the operational phase is predicted to be long-term, neutral and imperceptible.

### Human Health

As the air dispersion modelling has shown that emissions of air pollutants are significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are long-term, negative and imperceptible.

## 11.8.3 WORST CASE IMPACT

Conservative background concentrations were used in order to ensure a robust assessment. Thus, the predicted results of the operational stage assessment are worst-case and will not cause a significant impact on either air quality or climate.

## 11.9 INTERACTIONS

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures (see Appendix 11.2) that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term and imperceptible with regard to the construction phase and long term and imperceptible with respect to the operational phase.

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air

quality are assessed by reviewing the change in annual average daily traffic on the surrounding road network. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and biodiversity along with interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures, outlined in Appendix 11.2, to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils once mitigation measures are in place.

There is the potential for interactions between air quality and biodiversity as works will take place within close proximity to the Douglas River Estuary pNHA and Cork Harbour SPA. There is the potential for NO<sub>x</sub> and NO<sub>2</sub> emissions from traffic accessing the site to impact the SPA and pNHA. However, it has been determined that there is an imperceptible impact to the designated sites as a result of traffic emissions. It has been determined that there is an overall low risk of dust related emissions causing ecological impacts. Once the mitigation measures outlined within Section 11.6 are implemented dust related impacts are predicted to be short-term, neutral and imperceptible.

No other significant interactions with air quality and climate have been identified.

## 11.10 REFERENCES

BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites

Department of the Environment, Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements – Draft

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

Environmental Protection Agency (2021a) Air Quality Monitoring Report 2020 (& previous annual reports)

Environmental Protection Agency (2021b) Ireland's Provisional Greenhouse Gas Emissions 1990 – 2020

Environmental Protection Agency (2021c) GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2020 - 2040

Environmental Protection Agency (2022) EPA website Available at: <http://www.airquality.ie>

European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019a) Climate Action Plan 2019

Government of Ireland (2019b) Draft General Scheme of the Climate Action (Amendment) Bill 2019

Government of Ireland (2021a) Climate Action Plan 2021

Government of Ireland (2021b) Climate Action and Low Carbon Development (Amendment) Act 2021

Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1

Institute of Environmental Management and Assessment (IEMA) (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance

Met Éireann (2022) Met Eireann website: <https://www.met.ie/>

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

UK DEFRA (2016) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM. PG(16)

UK DEFRA (2018) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG(16)

UK DEFRA (2020) NOx to NO2 Conversion Spreadsheet (Version 8.1)

UK Highways Agency (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 - HA207/07 (Document & Calculation Spreadsheet)

UK Highways Agency (2019a) UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality

UK Highways Agency (2019b) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)



JACOBS ISLAND



CHAPTER TWELVE  
Cultural Heritage

# CHAPTER TWELVE

## Contents

12	CULTURAL HERITAGE .....	12
12.1	INTRODUCTION .....	1
12.2	METHODOLOGY .....	1
12.3	BASELINE EXISTING ENVIRONMENT .....	4
12.4	ASSESSMENT OF EFFECTS .....	14
12.5	MITIGATION .....	15
12.6	CUMULATIVE EFFECTS.....	16
12.7	RESIDUAL EFFECTS .....	16
12.8	DIFFICULTIES ENCOUNTERED .....	16
12.9	INTERACTIONS WITH OTHER DISCIPLINES .....	16
12.10	REFERENCES .....	16
12.11	APPENDICES .....	18



# CHAPTER TWELVE

## 12.0 CULTURAL HERITAGE

### 12.1 INTRODUCTION

This chapter comprises an assessment of the likely effects the proposed development, as detailed in Chapter 2 will have on the archaeological, architectural and cultural heritage environment.

#### 12.1.1 SOME TERMS USED IN THIS CHAPTER ARE EXPLAINED HEREUNDER:

The phrase 'Cultural Heritage' is a generic term covering a multitude of cultural, archaeological and architectural sites and monuments within the landscape. For the purpose of this report, Cultural Heritage is divided into three sub-groups, namely Archaeology, Cultural Heritage and Architecture.

#### **Archaeological Heritage**

Archaeological heritage can be described as the study of past human societies through their material remains and artifactual assemblages. The Valletta Treaty (or the European Convention on the Protection of the Archaeological Heritage, 1992) defines archaeological heritage as "all remains and objects and any other traces of humankind from past times" this includes "structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or underwater". In order to obtain a comprehensive appraisal of the archaeological heritage of the proposed development site, much of which is no longer visible above ground, a study area comprising circa 2km radius of the site was examined. Significant archaeological sites which are located outside the immediate study area but reflect human activity within the broader landscape are included, where relevant.

#### **Cultural Heritage**

Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation. This includes customs, practices, places, objects, artistic expressions and values. Cultural Heritage is often expressed as either Tangible or Intangible Cultural Heritage (ICOMOS, 2002). Environmental Protection Agency Guidelines (2015) define Tangible Cultural Heritage as movable cultural heritage (artefacts), immovable cultural heritage (monuments, archaeological sites and so on) and underwater cultural heritage (shipwrecks, underwater ruins and cities). Intangible cultural heritage encompasses oral traditions, folklore, history and language.

The cultural heritage aspects of this assessment include the history of Lakeland House and its demesne (of which the proposed development site is part), the history of Lough Mahon and the harbour area and a study of the placenames in and around the proposed development site.

#### **Architectural Heritage**

Architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

The assessment includes an appraisal of all buildings of architectural, historical and social interest within a 1.5km radius of the proposed development site. It provides a history, record and description of structures of architectural significance and an evaluation of their characteristics and importance to the area around the proposed development site.

## 12.2 METHODOLOGY

The methodology for the archaeological, architectural, and cultural heritage section of the EIAR consists of the following steps:

- A review of the relevant legislation and guidelines;
- A desktop study of the proposed development site and Study Area;
- A walkover inspection of the proposed development site in November 2021;
- An evaluation of the likely impacts of the proposed development on the archaeological, architectural and cultural heritage. Impacts are assessed in accordance with Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Proposed mitigation measures to be undertaken to prevent or reduce any potential impacts on the archaeological, architectural and cultural heritage.

### 12.2.1 LEGISLATION AND GUIDELINES

In Ireland, the principal legislative measures protecting cultural heritage assets are the National Monument (Amendments) Acts 1930 to 2014, the Heritage Act 1995, the relevant provisions of the National Cultural Institutions Act 1997, the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 and the Planning and Development Act 2000. Moreover, policies for both the archaeological and architectural heritage are relayed in a series of specific published guidelines.

This chapter has been undertaken with regard to general EIA guidance as described in Chapter 1 Introduction and the following guidelines were also consulted as part of the assessment.

Framework & Principles for the Protection of the Archaeological Heritage, (Department of Arts, Heritage, Gaeltacht & the Islands, 1999);

Policy & Guidelines on Archaeological Excavation, (Department of Arts, Heritage, Gaeltacht & the Islands, 1999);

Architectural Heritage Protection, Guidelines for Planning Authorities, (Department of the Environment, Heritage and Local Government, 2004).

### 12.2.2 DESKTOP STUDY

The desktop study provides an overview of the archaeological, architectural, and cultural heritage environment of the proposed development site and study area using the following sources:

#### Record of Monuments and Places (RMP)

This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It lists all monuments and places believed to be of archaeological importance in the County. The numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey map number (six inch to the mile scale); the second part is the number of a circle surrounding the site on the RMP map, e.g. (CO075-022) refers to circle 022 on OS sheet 075 for County Cork. The area within the circle is referred to as the Zone of Archaeological Potential (ZAP) or zone of notification for that site. Its diameter can vary depending on the size and shape of the site but it averages out at approximately 180m. The RMP for County Cork was published in 1998. All RMP sites within 2km of the proposed development site are listed in Table 12.1 below.

#### Sites and Monuments Record (SMR) Database of the ASI

The purpose of the Archaeological Survey of Ireland (ASI) is to compile a base-line inventory of the known archaeological monuments in the State. It contains details of all monuments and places or sites known to the ASI which pre-date AD 1700, and a selection of monuments which post-date 1700. The large record archive and databases resulting from the survey are continually updated. Archaeological sites which are added to the database are proposed to be included in the next published edition of the RMP and will then be afforded its protection. This database, complete with maps, is available for consultation via the National monuments Service (NMS) website. All SMR sites within 2km of the proposed development site are listed in Table 12.1 below.

#### Archaeological Inventory

The inventories for each county are follow-ons by the ASI to the RMPs. They give a written description of each archaeological site in the county. The archaeological inventory for East and South Cork, Volume 2 (Power, Byrne, Egan, Lane & Sleeman, 1994) was published in 1994 and a follow up volume, Volume 5 (Ronan, Egan & Byrne, 2009), was published in 2009.

### 12.2.3 CONSULTATIONS

During the compilation of the EIAR the following were consulted:

#### City Archaeologist, Cork City Council

Consultation was held with Ms. Ciara Brett, Cork City Archaeologist. Her recommendations are detailed and incorporated in the mitigation measures in Section 12.7 below.

#### Files of the NMS, DAU

These files were consulted in order to retrieve information on lists of RMP sites that have been afforded added protection such as;

- National Monuments in the ownership or guardianship of the state – None in the Study Area
- National Monuments in the ownership or guardianship of the local authority – None in the Study Area
- Monuments subject to Preservation Orders and Temporary Preservation Orders – None in the Study Area
- Monuments listed in the Register of Historic Monuments –None in the Study Area

#### Files of the National Museum of Ireland (NMI)

The topographical files contain the reports, including correspondence, present location and occasionally, illustrations of archaeological material recovered throughout the country. Two finds are recorded for the townlands within the study area up to and including 2016. They include a bronze axehead in Ballinure and a stone axehead in Mahon. Files that post-date 2016 could not be researched as the NMI files were temporarily closed.

#### Database of Irish Excavation Reports ([www.excavations.ie](http://www.excavations.ie))

This website provides a database of summary accounts of archaeological excavations and investigations in Ireland undertaken between 1970 and 2022. The database was queried for any investigations undertaken in any of the townlands within proximity of the proposed development site and are listed in Table 12.2 below.

#### Cork City Development Plan (CCDP) (2015-2021) and Draft CCDP (2022-2028)

The CCDP (2015-2021) and Draft CCDP (2022-2028) outlines Cork City Council's objectives with regard to the preservation of the archaeological, architectural and cultural heritage of the City and suburbs. The Plan sets out Cork City Council's commitment to identifying and safeguarding sites and settings, structures and objects of archaeological and architectural interest within the Cork City and suburbs. Volume 3 of the CCDP lists Protected Structures (PS) and

Architectural Conservation Areas (ACA) in Cork City and suburbs. All PS's within 1.5km of the proposed development site are given in Table 12.3 below.

### **National Inventory of Architectural Heritage (NIAH)**

The NIAH was set up under the Convention for the Protection of the Architectural Heritage of Europe or the Granada Convention of 1985. It was established on a statutory basis under Section 2 of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The work of the NIAH involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner. It is divided into two parts; The Building Survey and Historic Garden Survey ([www.buildingsofireland.ie](http://www.buildingsofireland.ie)). The main function of both is to identify and evaluate the State's architectural heritage in a uniform and consistent manner, so as to aid its protection and conservation. The NIAH carried out a survey of the buildings of County Cork between 2006 and 2011. Under Section 53 of the Planning and Development Act 2000, all structures considered of regional, national or international importance within the survey are recommended for inclusion in the Record of Protected Structures (RPS) by the Minister for Arts Heritage and the Gaeltacht. If this is not adopted by the local authority, the reasons must be communicated to the Department. The Building and Historic Garden Survey for County Cork is available online. The NIAH for County Cork includes approximately 6,500 items of architectural importance in the County. All structures listed within 1.5km of the proposed development site are given in Table 12.3 below.

### **Aerial photographs**

The Ordnance Survey of Ireland (OSI) and Google maps have posted a number of online aerial photographs dating from 1995 (OSI; 1995, 2000 and 2005-2012 and 2013-2018). These were examined to identify any previously unrecorded features of archaeological/cultural heritage significance that may only be visible from the air. The aerial photographs show the proposed development site since 1995, when it was a nursery to its current condition. No potential archaeological features are apparent in the photographs.

### **LiDAR**

LiDAR (light detection and ranging) is a remote sensing technology using lasers as topographic scanners that can penetrate foliage and provide detailed landscape data. This survey method can provide detailed landscape data and information on the earth's topography which enables a better understanding of historical landscapes and their past uses. The proposed development site is covered by LiDAR survey and no potential archaeological features were apparent on the images. The scarring of the proposed development site by development over the last 20 years, however, is quite evident.

### **Cartographic Sources**

The following maps were consulted;

- Down Survey Parish and Barony maps (1654-1659) (see Appendix 12.1);
- 1:50,000 OSI Discovery Series;

- The three editions of the Ordnance Survey (OS) 6-inch to one mile maps: the first edition of 1841-1842, the second edition of 1902 and the third edition of 1935 - for OS sheet 075 and 1950 - for OS sheet 074.
- The 25-inch to one mile OS map (1902), from which the second edition 6-inch map was derived.

### **12.2.3 PREVIOUS ARCHAEOLOGICAL ASSESSMENTS OF THE PROPOSED DEVELOPMENT SITE**

In the 1990's archaeological investigations (Hurley 1994) were carried out during construction of the N40, linking Cork City to the Jack Lynch Tunnel, which lies c. 1.7km to the north of the proposed development site and the remains of Lakeland House were identified within the road corridor (Hurley pers. com.). The N40 runs directly outside the northern edge of the proposed development site. In 1998 a cultural heritage assessment was carried out of the entire Mahon Point area in advance of development (Lane 1998). Recommendations in this assessment were included in the following grants of planning by CCC and consequently a number of archaeological assessments and investigations were carried out in advance of all development in the area and these are summarised below.

Archaeological Assessment and test trenching 2003 (Report included as Appendix 12.3) – An archaeological assessment, including archaeological test trenching, was undertaken in the area of the proposed development site in 2003 to comply with a grant of planning permission from Cork City Council and An Bord Pleanála (planning reference 24611/00) (Purcell, A., Brett, C. and O'Rourke, N. 2003). A total of ten test trenches were excavated under Licence (No. 03E0580) across the site, mainly at the northern end in the approximate location of Lakeland House (see Figure 12.1 below). No traces of Lakeland House were revealed during testing and it was confirmed that the site of the house was removed in the mid 1990's during construction of the N40 South Ring Road which runs adjacent to the north. Traces of cobbling and gravel surfaces and fragments of walls were identified in a number of trenches and were recorded. A cellar associated with Lakeland House was identified in Trench 8. This cellar was initially identified, photographed and recorded during construction of the N40 South Ring Road (Hurley, 1994). The structure was again photographed and surveyed as part of the assessment in 2003 which is included in Appendix 12.3. The cellar lies within the proposed development site to the west of proposed Apartment Block 12 at the northern end of the site. No other features or finds of archaeological significance were identified and the report concluded that much of the site had been subject to extensive ground disturbance.

Archaeological Assessment 2007 – An archaeological assessment was undertaken on the proposed development site in 2007 in advance of a development proposal. The assessment again highlighted the cellar as a site of Cultural Heritage Significance. The report concluded that much disturbance had occurred on the proposed development site over a long period of time, beginning with extensive landscaping associated with Lakeland demesne probably in the early 19<sup>th</sup> century. This was followed in the mid-1990s with the construction of the N40 South Ring Road which likely caused ground disturbance on the northern portion of the development site that adjoins the road. The report also concluded that topsoil had been removed from a large part of the southern portion of the proposed development site (Purcell, 2007).

Site Investigation (SI) Works 2021 – A number of trial pits were excavated in June 2021 as part of SI works in an adjacent permitted development (ABP-301991-18). These trial pits were archaeologically monitored in accordance with planning condition 14 of that grant of planning. No finds or features of archaeological significance were identified (Purcell, pers. com.).

### 12.2.4 WALKOVER SITE INSPECTION

The primary purpose of a site inspection is to assess the physical environment in which the proposed development will take place and identify any possible features of cultural heritage significance which have not been previously recorded. Current land use, local topography and environmental conditions are assessed to gain an overall picture of the area and to highlight possible Areas of Archaeological Potential (AAP) where potential subsurface archaeological remains may survive. The proposed development site was inspected in November 2021 in dry bright weather conditions (Appendix 12.2; Plates 1 - 5).

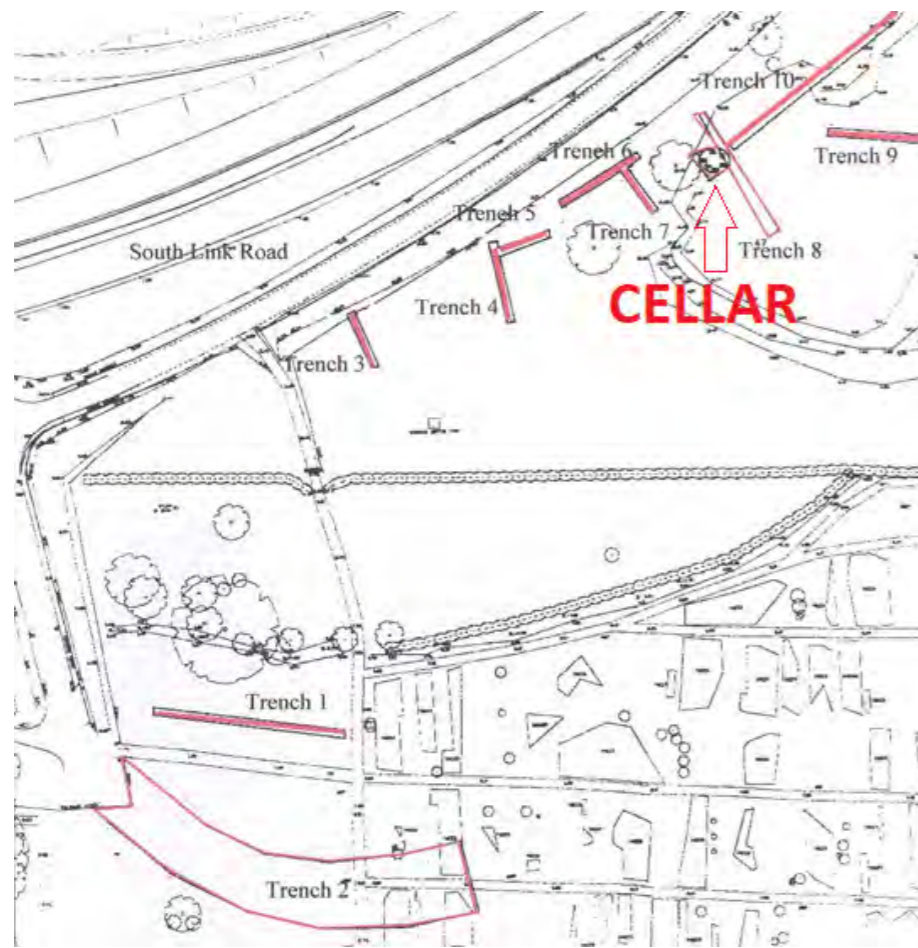


Figure 12.1: Archaeological test trenches excavated in 2003 within the proposed development site with cellar location shown (Purcell, A., Brett, C. and O'Rourke, N. 2003)

## 12.3 BASELINE EXISTING ENVIRONMENT

### 12.3.1 SITE LOCATION AND DESCRIPTION

The proposed development site is situated in the townland of Ballinure, in the parish of St. Finbarrs and barony of Cork at the southern tip of the Mahon Peninsula, overlooking Lough Mahon to the east and the Douglas Estuary to the south (Fig. 12.2). The Mahon Peninsula, a suburb of Cork City (c. 5km to the west), lies in the inner reaches of Cork Harbour defined to the north by the River Lee, to the south by the River Douglas and to the east by Lough Mahon.

The area has always been attractive as a place to live as evidenced by the Neolithic and Bronze Age pits (CO074-130) found in 2005 in Ballinure 450m to the northwest (Purcell, 2005). The proposed development site itself was part of a country house and its demesne in the 18<sup>th</sup> and 19<sup>th</sup> centuries, when the Mahon Peninsula was chosen by many of Cork city's merchant elite as an attractive alternative to living in the city centre. One of the most impressive houses in the peninsula was Lakeland, owned for much of its existence by the Crawford family. The proposed development site lies within the former demesne lands of Lakeland House, which was demolished in c. 1920. The only surviving remnants of the house and demesne are a cellar which lies within the proposed development site and the remains of a warehouse situated 130m outside the development site to the south. The cellar was identified during the course of construction of the N40 South Ring Road in the 1990s (Hurley, 1994) and again in 2003 during archaeological test trenching of the proposed development site (Purcell, A., Brett, C. and O'Rourke, N. *ibid.*). The remains of the warehouse are fenced off and lie on the edge of a green public walkway to the south of Longshore Drive road.

The proposed development site is now a neglected overgrown area surrounded by commercial and housing developments. It is bordered to the north by the N40 South Ring Road, to the south and east by residential developments (Jacobs Island - built in the 2000's) and to the west by an access road running south from the N40. Prior to construction of the residential areas on Jacobs Island, the southern portion of the development site was in use as a nursery by Cork City Council with extensive stands of semi-mature trees (Purcell, 2007). This nursery is evident on aerial photographs of the site from 1995 and 2000 (Fig. 12.3).

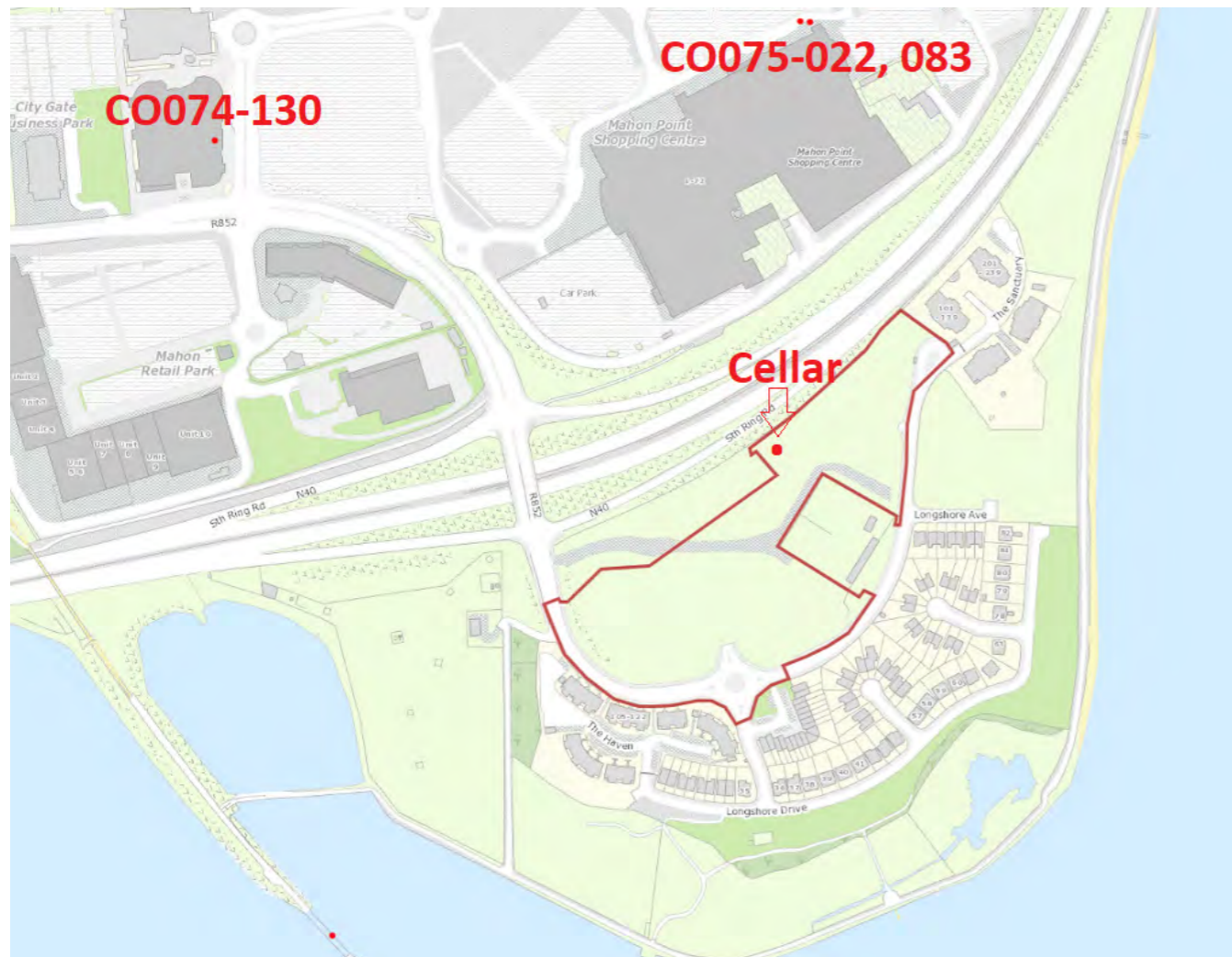


Figure 12.2 Proposed development site outlined on OS map with closest RMP detail and location of cellar associated with the former Lakeland House [www.archaeology.ie](http://www.archaeology.ie)



Figure 12.3: Proposed development site outlined on OS aerial 2000 [www.osi.ie](http://www.osi.ie)

### 12.3.2 ARCHAEOLOGY AND CULTURAL HERITAGE WITHIN A 2KM STUDY AREA

There are no recorded archaeological sites listed in the RMP or SMR within the proposed development site (Figure 12.4). The closest RMP/SMR sites to the proposed development are the site of Lakeview House (CO075-022) and an excavated pit (CO075-083), 230m to the north in an area now occupied by Mahon Point Shopping Centre.

In total, there are nineteen recorded archaeological sites within a 2km radius of the proposed development site (Table 12.1 and Figure 12.4). While these monuments provide evidence for human settlement and activity within the study area dating back to the Bronze Age, it should be noted that nine of these sites date to the post medieval period demonstrating the proximity of the area to Cork City and its consequent development at this time. From earliest times human populations have organised and altered the landscape in which they live for a diversity of purposes, be it agricultural, social, political, or religious and although there appears to be very few recorded prehistoric monuments in the area this does not mean that their remnants do not continue to exist below ground.

Table 12.1 RMP sites within 2km of the proposed development site

RMP/SMR, PS, NIAH	SITE TYPE	TOWNLAND	DISTANCE
C0074-050	Quarry	Dundanion	1.7km to NW
C0074-051	Icehouse	Ballinure	1km to W
C0074-052	Tower house	Mahon	1.8km to N
C0074-053, PS665	Tower house	Mahon	1.35km to NW
C0074-059	Fortified house – Ronayne’s Court	Monfieldstown	650m to SW
C0074-063	Midden	Ballinlough	1.4km to W
C0074-068	Railway bridge	Ballinure	300m to SW
C0074-077; PS490	Country house	Ballinure	850m to NW
C0074-089	Country house	Maryborough	1.9km to SW
C0074-100; PS493	Country House	Ballinure	1.6km to NE
C0074-121	Railway bridge	Ballinure	1.35km to N
C0074-130	Excavated hearths and pits	Ballinure	450m to NW
C0075-022	Country house – Lakeview	Mahon	300m to N
C0075-045	Midden	Monfieldstown	500m to S
C0075-083	Excavated pit	Mahon	300m to N
C0086-101	Country house	Moneygurney	1.2km to SW
C0086-136	Enclosure	Monfieldstown	1.7km to S
C0087-001	Ringfort	Oldcourt	1.7km to S
C0087-121	Standing stone	Monfieldstown	1.4km to S

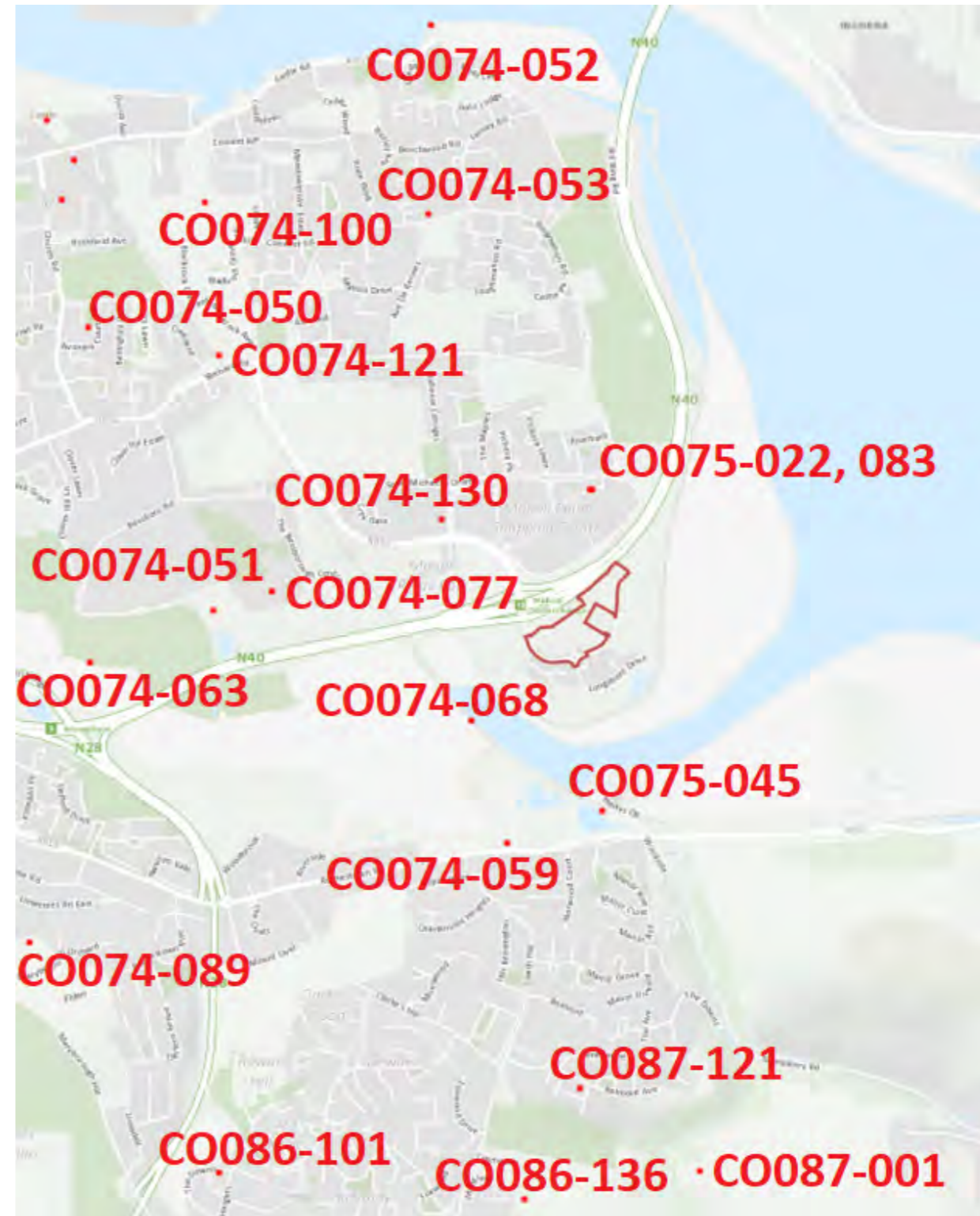


Figure 12.4: Proposed development site outlined on OS map with RMP detail within a 2km radius [www.archaeology.ie](http://www.archaeology.ie)

The pace of landscape change in Ireland accelerated in the second half of the 20<sup>th</sup> century and many archaeological sites have been levelled by activities associated with modern development such as agriculture, industry and infrastructural improvements. This has ensured that the present day archaeological landscape is not fully representative of the human occupation of this island, which has spanned at least ten thousand years. While many archaeological sites survive today as partially upstanding structures, such as earthworks and stone monuments, many more survive only as subsurface remains, often forgotten and concealed from view. Much of the physical evidence for the existence of past societies has been altered by each successive community, all of which leave their mark on the landscape they have occupied.

The archaeological timescale can be divided into two major periods, each with a number of sub-sections:

1. The prehistoric period: Mesolithic - (circa 8000 to 4000 BC); Neolithic - (circa 4000 to 2400 BC); Chalcolithic c. 2450-2200; Bronze Age (circa 2200 to 700 BC) – Iron Age (circa 700 BC to AD 400)
2. The medieval period: Early medieval 5<sup>th</sup> – 12<sup>th</sup> century; high medieval 12<sup>th</sup> century – circa 1400; late medieval circa 1400 – 16<sup>th</sup> century.

The earliest evidence for human activity within a 2km radius of the proposed development site, is a prehistoric settlement (RMP CO074-130), 450m to the northwest identified during archaeological testing (Licence No. 02E1666) in advance of construction of City Gate Business Park (Purcell, 2005). It was subsequently excavated (Licence no. 03E0060) and found to comprise six pits and a hearth surrounded by a significant number of stake holes and a shallow linear feature, possibly the lower portion of a truncated slot trench. Charcoal from three features was radiocarbon dated and dates from the Neolithic and Bronze Age were returned. Finds recovered included worked quartz and flint, prehistoric pottery identified as possible Bell Beaker, two saddle querns, and post-medieval pottery (ibid.). The excavated remains were quite ephemeral in nature but demonstrated a prolonged sequence of activity beginning in the early prehistoric period and continuing on a temporary, sporadic basis for several millennia. It was suggested that the site may have represented a prehistoric camp site, which was revisited sporadically over an extensive period of time. Its repeated re-use, particularly in the Bronze Age, hinted at the exploitation of particular resources in the area on an intermittent basis (ibid.). One feature of archaeological potential was identified during archaeological testing in 2002 in advance of the development of Mahon Point Shopping centre. Excavation revealed a small pit (0.76m N-S; 0.65m E-W; D 0.24m) filled with charcoal-rich silty clay (CO075-083). No finds were identified in the pit; hence dating was uncertain (Purcell, 2004).

Within the broader area of Cork Harbour, 3.5km to the east of the proposed development site, a Neolithic polished stone axe almost 0.12m long was identified during monitoring of topsoil removal prior to the construction of the wastewater treatment plant at Carrigrenan (Lane 2001). A number of Neolithic polished stone axes have now been recovered from the Cork Harbour area. On Fota Island, 7km across the harbour to the northeast, a settlement dating to the Neolithic/Bronze Age transition was identified, (CO075-077) (Power et al. 1994) while the Files of the NMI give details of a dugout canoe that was washed ashore in the townland of Pembroke, Passage West, c. 3.5km to the southeast of the proposed development site. Although the boat wasn't dated, it was considered typical of boats dating to the prehistoric period found in Ireland. The NMI also lists a stone axe head from Mahon. While no date or typology is given for the axe, such objects broadly date to the earlier period of Irish prehistory. In the townland of Ballinure, a bronze axe was found indicating Bronze Age activity in the area.

Across the Douglas Estuary 1.4km to the south is a standing stone (CO087-121) in the townland of Monfieldstown. Standing stones may have had a number of functions in the prehistoric landscape. They were often erected in prominent locations and may have marked routeways or tribal boundaries, but others may have marked burials or had a ceremonial or ritual purpose. More recent examples may have been erected as scratching posts for animals. They date to the Bronze Age, but these monuments were also erected in the Iron Age and some can even date to more recent centuries. Those erected in the prehistoric period tend to have a NE-SW orientation. The example in Monfieldstown (0.6m x 0.65m; H. 1.55m) is roughly square in plan and orientated NNW-SSE (Ronan et al. 2009).

The majority of recorded archaeological monuments within a 2km radius of the proposed development site, however, date from the medieval and post medieval period. Across the Douglas Estuary to the south, in the townland of Oldcourt is a ringfort (CO087-001). Ringforts (also known by the names rath, lios, cathair or caiseal/cashel) are defended farmsteads and are the most characteristic monument of the Early Medieval Period. Their main phase of construction and occupation dates from the beginning of the 7<sup>th</sup> century AD to the end of the 9<sup>th</sup> century. The ringfort in Oldcourt is indicated on the OS 6-inch map of 1842 as an oval enclosure with a diameter of approximately 35m. According to Ronan et al. (2009), the site was levelled in 1953 and is not visible at ground level. Approximately 500m to the west of this ringfort is an enclosure (CO086-136). While no information is available on the ASI database on the site, the term enclosure is applied to archaeological sites, which cannot be definitively classified. Very often these enclosures are ringforts or cashels, which fall beyond the accepted size range for these monuments (i.e. less than 20 m or more than 60 m in diameter). Sometimes they can be of indeterminate shape and may date to as early as the Bronze Age or as recently as the last century, when they were used as animal shelters.

There are two castles within 2km of the proposed development site, Blackrock Castle (CO074-052) and Ringmahon Castle (CO074-053; PS665), both situated in the townland of Mahon at the north-eastern end of the Mahon peninsula overlooking the River Lee on the approach to Cork city. Blackrock Castle was built by the citizens of Cork to defend the city at this crucial location overlooking a key approach point to the city by water. It is one of the few circular tower houses built for cannon. The original tower survives to 1<sup>st</sup> floor level but is depicted in 18<sup>th</sup> century paintings standing at least two storeys higher. It was rebuilt in the first half of the 19<sup>th</sup> century to the design of the architects the Pain brothers in neo-Gothic style (Power et al. 1994, 229). Ringmahon Castle survives as a three-storey gate tower. The castle is now free-standing but the shadow of a curtain wall is visible on the east face at ground-floor level. Projecting masonry at the northwest and southwest corners also suggest the presence of a curtain wall. There are no historic references to date this structure or to place it in any context (ibid. 230). The fortified house, Ronayne's Court (CO074-059), was located 650m across the Douglas Estuary to the southwest of the proposed development site at Monfieldstown and overlooked the southern side of the Mahon peninsula and the Douglas Estuary. The house is depicted on all three OS maps. No surface trace of the building remains, but a fireplace from the house remains in Blackrock Castle (ibid. 1994).

In the post-medieval period when Cork city flourished, the Mahon peninsula became an area where many of the city's merchant elite chose to live and the proposed development site, as noted above, lies within Lakeland demesne. There are five country houses listed in the RMP within 2km of the proposed development site, three on the Mahon Peninsula (CO075-022, CO074-100 and CO074-077) and two across the Douglas Estuary to the south (CO074-089 and CO086-101). Approximately 300m to the north of the proposed development site, was a country house called Lakeview (CO075-022). The site of the house is now occupied by Mahon Point Shopping Centre. Lakeview House was occupied by Miss Allen in 1837 and by William Prittie Harris in the early 1850's and was valued at £28 ([www.landestates.ie](http://www.landestates.ie)). The house is depicted on the OS maps of 1841 and 1902 but had been demolished by the time of the 1935 OS map. The Ursuline Convent in Ballinure (CO074-100; PS493) at the northern end of the peninsula, previously named 'Pleasant Fields', was built in 1720. It was modified on a number of occasions and in 1770 was described as "a monstrous, large, old-fashioned building" (Henchion 2005, 82-3). Bessborough (CO074-077; PS490) is a mid-18<sup>th</sup> century house,

3 storey, 7 bay, 3 bays deep building overlooking the Douglas Estuary at the southern end of the peninsula which has now being converted into a heritage centre (Power et al. 1994, 316). An ice house (CO074-051) lies within its demesne in woodland, 200m to the southwest of the house. The structure, with an interior diameter of 3.7m, is constructed on mortared rough limestone with a domed roof (H 2.55m) which has been infilled to ground floor level (ibid.). An ice house associated with Lakeland was excavated in advance of development in 2003 (Purcell 2003). A brief description of the excavation and the outline of the icehouse can be seen inside the northeast entrance to Mahon Point shopping centre. The country houses across the Douglas estuary include Maryborough House in the townland of the same name (CO074-089), a large 18<sup>th</sup> century 3-storey over basement house with a 7-bay garden front (ibid 327). This house was originally the seat of the Newenham family (Bence-Jones 1988, 204). To the southeast of this was Broadale in Moneygurney (CO086-101). This house, no longer extant, was a 2-storey, 3-bay early 19<sup>th</sup> century house which was linked with adjoining farm buildings to the east and west (ibid. 327). In its time, Lakeland (and its gardens) was one of the more impressive of the country houses in the area but is not listed in the RMP or NIAH as it was demolished before compilation of these inventories. The area of the house and gardens was the subject of a full archaeological investigation in advance of the development of Mahon Point and details of these investigations are given below.

Shell middens can date from as early as the Neolithic period to the 19<sup>th</sup> century. There are two shell middens in the study area, one of which is in Monfieldstown (CO075-045) close to where the Douglas River enters Lough Mahon. No trace of this midden now survives and it was probably destroyed during the construction of the railway line (now closed) in the 19<sup>th</sup> century (ibid., 70). The second midden was located in Ballinlough (CO074-063) and is now on the Mahon golf course. This site was inspected in the mid-20<sup>th</sup> century and it was dated to the 18<sup>th</sup> or early 19<sup>th</sup> century (ibid. 68).

There are two railway bridges, listed in both the RMP and NIAH, within the study area. One (CO074-068; NIAH20872013) crosses the Douglas estuary 300m to the southwest and the second is in Ballinure (CO074-121; NIAH20868052), 1.35m to the northwest. Both were part of the Cork, Blackrock and Passage railway line which opened in 1850 (see section 11.3.3 below) and both are now part of a public walkway developed by CCC.

Since Lane's (1998) initial Cultural Heritage Assessment in 1998, seven archaeological investigations have been carried out as part of the Mahon Point development. These are listed and summarised in Table 12.2 below ([www.excavations.ie](http://www.excavations.ie)). It should be noted that prior to these investigations a comprehensive archaeological study of the area had been carried out as part of the N40 South Ring Road (Hurley 1994).

Table 12.2: Archaeological Investigations undertaken in the vicinity of the proposed development site

Excavation Reference	Townlands	Details
2002:0219	Ballinure and Mahon	Archaeological testing – Licence O2E1666. Numerous drainage features and post medieval pits along with one feature of archaeological potential; a small pit filled with charcoal-rich silty clay measuring (0.76m N-S x 0.65m x 0.24m deep) (CO075-083). No finds identified thus dating was uncertain. Ice house associated with Lakeland House was also identified (Purcell, 2002).
2003:0297	Ballinure, Mahon	Archaeological testing – Licence O2E1666: Prehistoric activity (CO074-130) and post medieval activity identified and excavated (Purcell, 2003). See 2003:0299 and 2003:0300 respectively, below.
2003:0298	Ballinure/Mahon	Archaeological Excavation – Licence O3E0059: Excavation of an icehouse associated with Lakeland (Purcell, 2003).
2003:0299	Ballinure/Mahon	Archaeological Excavation – Licence O3E0060: Prehistoric hearth and pits, excavated. Finds - a possible quartz scraper, a fragment of small flint bladelet, a flint flake, small sherd of possible Bell Beaker pottery (CO074-130) (Purcell, 2003).
2003:0300	Ballinure/Mahon	Archaeological Excavation – Licence O3E0181: A number of features associated with Lakeland House excavated including two access roads and garden features (Purcell, 2003) and unpublished report (Purcell, A., Brett, C. and O'Rourke, N. 2003).
2003:0301	Ballinure, Mahon	Archaeological testing and monitoring – Licence O3E0531: No archaeological finds or features were identified (Purcell, 2003). Warehouse building associated with Lakeland House identified (unpublished report Purcell, 2004).
2003:0302	Ballinure, Mahon	Archaeological testing – Licence O3E0580: (licence O2E0580) in advance of development on Jacobs Island. Garden features associated with Lakeland House identified and an oval subterranean cellar was opened and recorded (Purcell, 2003) and unpublished report (Purcell, A., Brett, C. and O'Rourke, N. 2003).



During the course of archaeological testing in advance of the development of Mahon Point Shopping centre, the remains of an ice house and other demesne features associated with Lakeland House were revealed (Purcell, 2002). Archaeological excavation of the ice house (licence 03E0059) found that it consisted of a brick built egg-shaped structure, the roof of which had collapsed. It was accessed by a short passage of random rubble construction which opened into a sub-circular cobbled courtyard which was itself defined by a random rubble wall. Other excavated features (03E0181) associated with Lakeland included two roads and a number of pits (Purcell, 2003). The easternmost road was the primary access to the house and was well-built, gravel-surfaced and flanked with drains outside of which were what appeared to be flowerbeds. The western road was an estate road which was probably used only by those working on the estate. It was roughly constructed and only partially cobbled with rough drains flanking the road. Contemporary rubbish pits and layers of dumped material were found close to this road (Purcell, Brett and O'Rourke, 2003). Archaeological excavation (03E0060) of a hearth and pits outside to the west of Lakeland and its demesne in 2003 revealed a possible quartz scraper, a fragment of small flint bladelet, a flint flake, small sherd of possible Bell Beaker pottery (C0074-130) (Purcell, 2003).

Archaeological testing (03E0580) was carried out in the area of the proposed development site in 2003. A total of ten test trenches were excavated across the site (Purcell, 2003). The trenches were focused on the high ground at the northern end of the proposed development site in the approximate location of Lakeland House. A significant quantity of broken glass and pottery, generally China, was revealed in the test trenches. Much of this was sealed by a humic deposit representing a buried sod layer that appears to have developed following the demolition of the house and general abandonment of the area. Garden features consisting mainly of cobbled and gravel surfaces or paths defined in places by random rubble walls and the base of two limestone gate posts were found in places (Purcell, A., Brett, C. and O'Rourke, N. 2003).

The cellar identified by Hurley (1994) during the construction of the N40 South Link Road and associated with Lakeland house was again revealed and accessed. It comprised a subterranean vaulted oval chamber with a short vaulted entrance passage accessed from an external stairwell. It had been partially backfilled but was accessible once the rubble at the entrance passage had been partially removed. It measured 8.6m northeast-southwest by 6.6m northwest-southeast, including wall thickness. The structure was of random rubble construction with a vaulted roof, the vault was a complex groin-vault in four compartments to accommodate the oval plan of the building. Brick compartments were built against the southern, southwestern and south-eastern walls of the cellar, presumably to accommodate wine storage. The cellar was accessed via a smaller vaulted passage which opened from the base of a stairwell that was only partially intact. There was no evidence to suggest that it had been physically accessible from Lakeland House, however, it was certainly associated with it and was located in the general vicinity of where the house would have previously stood. A full written, photographic and drawn record of the cellar was undertaken (Appendix 12.3) and the entrance passage was then backfilled. An L-shaped wall, possibly associated with a small structure partially overlaid the cellar (Purcell, A., Brett, C. and O'Rourke, N. 2003).

Archaeological testing and monitoring (03E0531) were carried out in the land adjoining the proposed development site to the south where the residential developments of Longshore Drive and The Haven are now located (Purcell, 2003). No features or finds of archaeological significance were revealed (ibid). A building also associated with Lakeland was identified which was thought to have functioned as a warehouse for goods which were brought onto a small quay, known locally as Crawford Quay, the remains of which are located c. 100m to the southwest of this structure. The warehouse is on the edge of a green public walkway to the south of Longshore Drive road and a plaque gives a description as to its use (Purcell, 2004).

Cultural Heritage can be site specific, when an archaeological or architectural site has cultural heritage associations, or

non-site specific, where less tangible aspects of cultural heritage cannot be pinpointed to a particular place but can be tied to a specific region. Our cultural heritage provides a link with our past, is part of our identity and who we are as a people and as a region. The proposed development site, Study Area and broader region is steeped in a rich and varied tradition that is centred on its location at the southern tip of the Mahon Peninsula adjacent to Lough Mahon in Cork Harbour.

The proposed development site was once occupied by Lakeland and its demesne. Records in the Valuation Office, Dublin record that Lakeland was marked in 1922 as having been 'temporarily demolished, but may yet be restored' (Purcell, 2007) and this did not occur as the house is not depicted on the 1935 OS 6 inch map. Its demolition was mentioned in connection with a new race-course that was to have been constructed at that time.

Lakeland was, by all accounts, a most impressive house and estate. In 1810 West described the house as 'one of the most neat and handsome that opulence could desire. The plan, elevation and everything about it, forms a complete picture, being built upon a rising ground, commands a most extensive view at every point, and exquisite rows of beech interspersed with a variety of evergreens, descends to the brink of the lake, from which this seat took its name of ... Lakeland. It was lately the residence of Benjamin Bonfield, esq. a gentleman of considerable literary ability...and this eloquent mansion is now occupied by William Crawford, esq.'" (West, 1810, 14-15).

Lakeland was renowned for its gardens which were created by William H. Crawford and attracted numerous visitors. Exotic trees and plants were grown successfully in the gardens having been introduced from foreign locations such as the Himalaya and South America (Lamb and Bove 1995, 147-148). Although West (ibid.) refers to Lakeland as the residence of Benjamin Bonfield, esq. (who presumably sold it to William Crawford), this contradicts another account which states that William Crawford built Lakeland when he came to Cork from Co Down in 1792 and with William Beamish founded Beamish and Crawford Brewery (Murray 1991, 4). Lakeland was occupied by three William Crawfords (a father, son and grandson) until 1888 when William H Crawford (the grandson) died leaving no children. The Cork Post Office Directory (1843, 105) refers to William Crawford living in Lakeland in 1842-3 and Guys Directory (1876, 164) also refers to Lakeland as the residence of William Crawford in 1876.

The same William H. Crawford was responsible for financing an extension to the Crawford School of Art in 1884 in Cork city as well as numerous other architectural and cultural developments during the 19<sup>th</sup> century (including the construction of St Finn Barre's Cathedral and University College Cork). However it was his contribution to the extension at the School of Art in the former Customs House building at Emmet Place that placed the name Crawford at the cultural centre of Cork. This association has endured and extends to the Crawford College of Art and Design (now relocated to Sherman Crawford Street and part of MTU) and the Crawford Art Gallery located in Emmet Place in the old school of art building.

The only remaining features associated with the house and demesne are the remains of the probable warehouse and the cellar, both of which are detailed above.

On the OS 6-inch map of 1841 the area of the proposed development site is shown as being within the demesne of Lakeland. The northern border of the proposed development site appears to extend over a section of the house (Fig. 12.5). Lakeland is depicted as a large slightly irregular U-shaped building. The central east-facing wing has three bow fronts. There are two similarly sized wings extending from the rear of the central wing, to form an open quadrangle on this side. A smaller curving return sweeps southwest from the southern end of the central section. Numerous other

buildings and features within the demesne are depicted including substantial farm buildings, walled gardens, a boat house, bathing house and ice-house and roadways and pathways. While the house remains much the same on the OS 25-inch map of 1902, the demesne has become much depleted (Fig. 12.6). The substantial farm buildings on the earlier map to the west of the main house have been added to and are now labelled Lakeland Farm. The landscaped gardens have decreased in extent, with the walled gardens to the northwest now occupied by several 'Tanks'. On the OS 6-inch map of 1935 (Fig. 12.7), Lakeland is no longer extant and the ornate landscaped demesne grounds are also no longer evident. Many of the buildings to the west of where the house stood are depicted as roofless.



Figure 12.5: Proposed development site outlined on OS 6-inch map 1841 with Lakeland House depicted within demesne lands [www.archaeology.ie](http://www.archaeology.ie)



Figure 12.6: Proposed development site outlined on OS 6-inch map 1902 with Lakeland House and demesne [www.archaeology.ie](http://www.archaeology.ie)

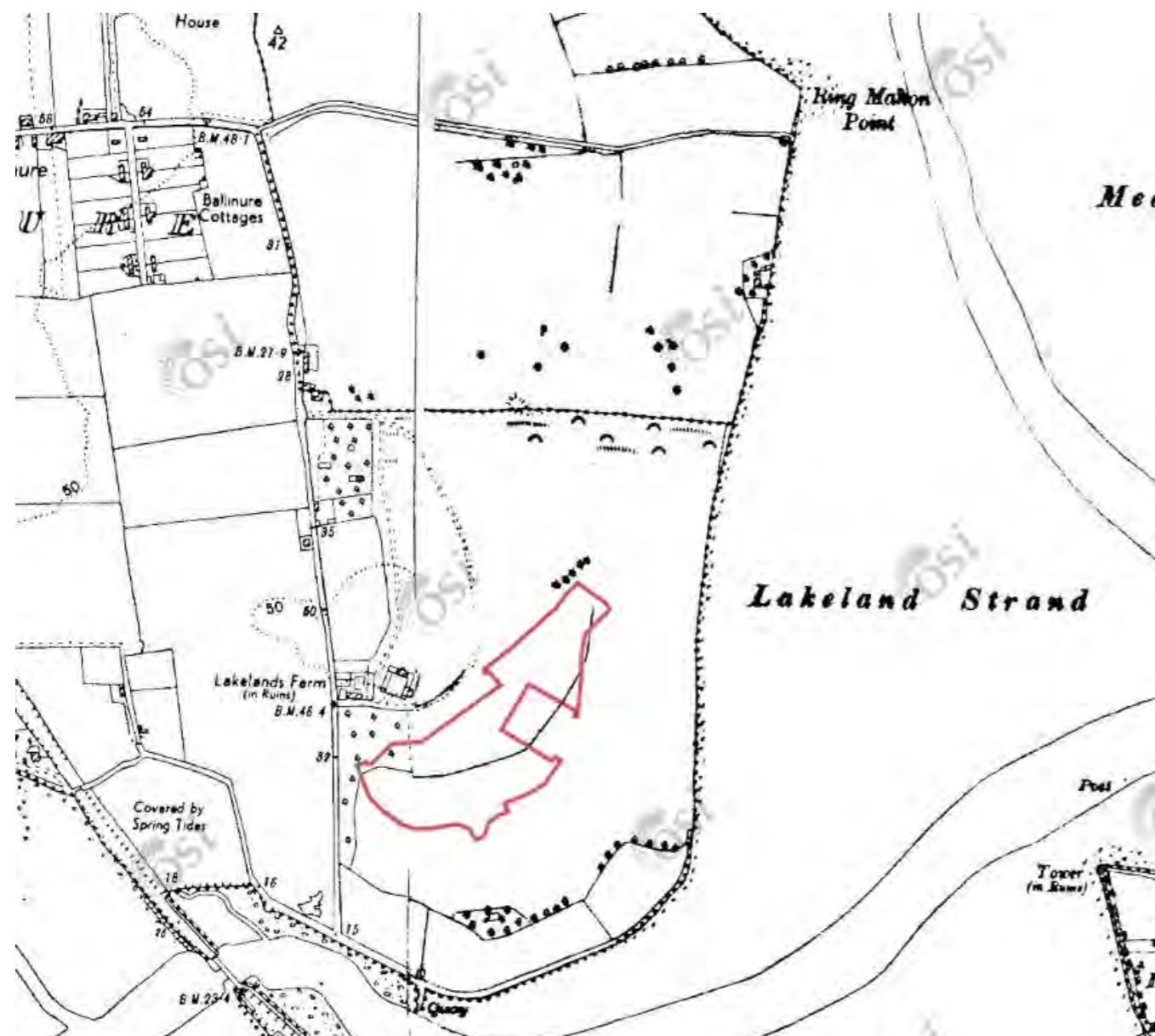


Figure 12.7: Proposed development site outlined on OS 6-inch map 1935 [www.archaeology.ie](http://www.archaeology.ie)

The proposed development site is situated in the townland of Ballinure. The Irish landscape is divided into over 62,000 townlands and this system of landholding is unique in Western Europe for its scale and antiquity. The townland boundaries recorded by the Ordnance Survey may well be aligned on older land divisions dating to early historic times and may physically overlie archaeological evidence for such early forms of land division. Many townlands are pre-Anglo/Norman in origin and Irish historical documents consistently use townland names throughout the historic period to describe areas and locate events accurately in their geographical context. The townland names and boundaries were standardised in the nineteenth century when the Ordnance Survey began to produce large-scale maps of the country. Townlands existed long before parish and county divisions. The original Irish names were eventually systematically

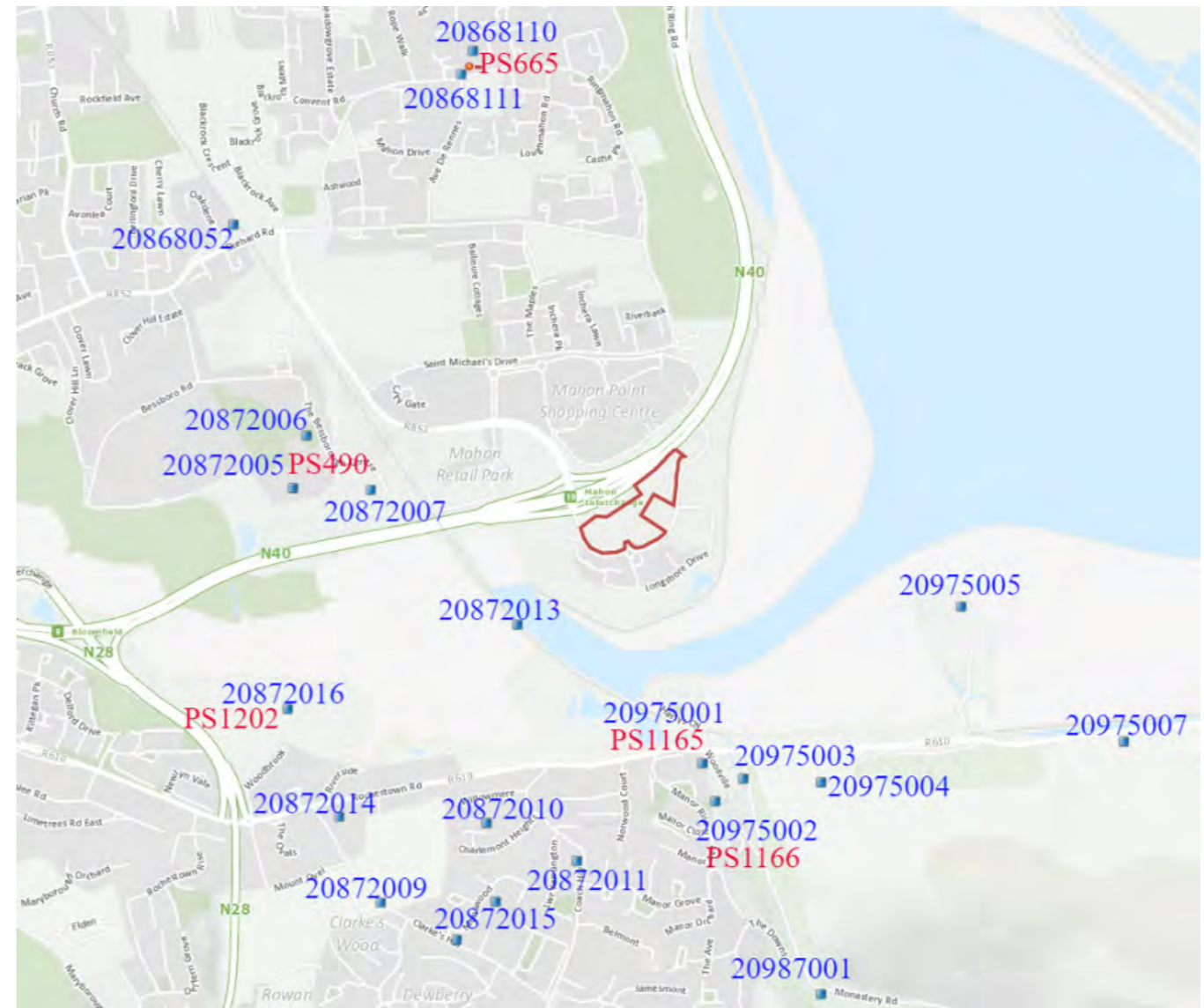
recorded in anglicised form in the mid-19<sup>th</sup> century during compilation of the OS 6-inch maps. Many townlands throughout Ireland took their names from early habitation sites, both ecclesiastical and secular. Others, like the proposed development site, are descriptive of the topography of that piece of land. The townland name Ballinure, in Irish 'Baile an líur' means town of the yew.

### 12.3.3 ARCHITECTURAL HERITAGE WITHIN A 1.5KM STUDY AREA

There are no Protected Structures (PS) listed in the CCDP and Draft CCDP within the proposed development site. The closest PS to the proposed development site is Bessborough House (PS490) which is also detailed in the NIAH (208725005-007). There are twenty one structures within 1.5km of the proposed development site, twenty of which are listed in the NIAH and five of which are PS. These buildings and structures date from approximately the mid-late 18<sup>th</sup> century to the late 19<sup>th</sup> century and are listed in Table 12.3 and displayed on Figure 12.8 below. There are no Architectural Conservation Areas (ACA's) within the Study Area, the closest ACA is that proposed for Blackrock Road in the Draft CCDP (2022-2028), approximately 1.8km to the north and northwest.

Table 12.3: PS and NIAH sites within 1.5km of the proposed development site

PS/NIAH/RMP	DESCRIPTION	TOWNLAND	DISTANCE
NIAH 2086052 RMP C0074-121	Railway bridge - 1850	Ballinure	1.35km to NW
PS665 RMP C0074-053	Ringmahon tower house	Mahon	1.35km to NW
NIAH 20868110	Ringmahon House – c. 1820	Mahon	1.4km to N
NIAH 20868111	Gates, railings, walls	Mahon	1.4km to N
PS490 NIAH 20872005 C0074-077	Bessborough House – c. 1760	Ballinure	850m to NW
NIAH 20872006	Walled garden	Ballinure	850m to NW
NIAH 20872007	Folly	Ballinure	650m to NW
NIAH 20872009	Gates, railings, walls to Hill House – c. 1800	Monfieldstown	1.25km to SW
NIAH 20872010	Charlemont House – c. 1820	Monfieldstown	900m to SW
NIAH 20872011	Thornbury House – c. 1885	Monfieldstown	950m to S
NIAH 20872013 RMP C0074-068	Railway Bridge - 1850	Rochestown	300m to SW
NIAH 20872014	House – Beechvale Lawn - 1933	Monfieldstown	1.1km to SW
NIAH 20872015	House – Old Wood - 1797	Monfieldstown	1.3km to SW
PS1202 NIAH 20872016	Bloomfield House - 1896	Monfieldstown	1km to SW
PS1165 NIAH 20975001	Gate Lodge Woodhill House – c. 1870	Rochestown	650m to S
PS1166 NIAH 20975002	Woodville House – c.1860	Rochestown	800m to S
NIAH 20975003	Post box – c. 1900	Rochestown	1.5km to SE
NIAH 20975004	Rochestown House – c. 1840	Rochestown	450m to SE
NIAH 20975005	Hop Island House – c. 1770	Hop Island	900m to SE
NIAH 20975007	Gate Lodge, Rochestown Wood House – c. 1880	Rochestown	1.5km to SE
NIAH 20987001	Gates, railings, walls to Old Court House – c. 1820	Oldcourt	1.4km to SE



Heart Order built a chapel in 1929 adjoining the west side of the house and in 1932 they added a hospital to the immediate northwest. A large farmyard complex and walled garden (PS490; NIAH 20872006) was built to the north of the house in 1880 which, according to the NIAH, are of high quality construction and form a significant part of this historic complex of buildings. A folly (PS490; NIAH 20872007), built in c. 1880 lies in the gardens of the house. A burial ground associated with the Sacred Heart convent is located immediately to its north (NIAH). Ringmahon House (NIAH 208680110) stands at the northern end of the Mahon peninsula, a four-bay two-storey over half-basement house, built in 1820 and home to the Murphy brewing family in the early years and the Dunne family in the twentieth century (NIAH). The house and grounds are enclosed by boundary walls and an entrance of fine limestone ashlar pillars and Victorian cast-iron gates (NIAH 20868111).

There are numerous houses across the Douglas Estuary and Lough Mahon, to the south and southeast of the proposed development site, the earliest of which is Hop Island House (NIAH 20975005) built in c. 1770 and three of which are listed as PS in the CCDP and Draft CCDP. Hop Island House is a five-bay, two-storey Georgian structure and is, according to the NIAH, an impressive middle sized house of its time which retains much of its early character. At the time of Griffith's Valuation (undertaken between 1848 and 1864), Osborne Edwards was leasing this property from the Chatterton estate when it was valued at £16 ([www.landedestates.ie](http://www.landedestates.ie)). Those houses listed as PS include Woodville House (PS1166; NIAH 20975002) and its associated gate lodge (PS1165; NIAH 20975001) built in 1860 and 1870 respectively. Woodville House, a three-bay, two-storey over basement house is described as a pleasing Victorian country house in the NIAH which has retained its early character and form. The associated gate lodge, although in a ruinous condition, is, according to the NIAH, greatly enhanced by the use of red and yellow brick in its construction. Bloomfield House, (PS1202; NIAH 20872016) situated in the townland of Monfieldstown, 1km to the southwest is a detached three-bay, two-storey with attic Tudor Revival house, dating to 1896. Built on the site of an earlier structure, also named Bloomfield and depicted on the OS map edition of 1841, the house is described in the NIAH as retaining many features of cut stonework and iron monger displaying a high degree of craftsmanship and stands is highly visible at several locations across Douglas estuary. Other country houses across Lough Mahon date between the late 18<sup>th</sup> to the late 19<sup>th</sup> centuries.

There are two railway bridges listed in the NIAH, which are also RMP sites; one (NIAH20872013; CO074-068) which crosses the Douglas estuary 300m to the southwest of the proposed development site and the other in Ballinure (NIAH20868052; CO074-121), 1.35m to the northwest. Both bridges were part of the Cork, Blackrock and Passage railway line which opened in 1850. The bridge over the estuary is a triple-span structure built in c. 1850 (NIAH) and is now in use as a public walkway. The bridge in Ballinure is described as a single-arch limestone structure, also built in c. 1850 to carry the road over the railway line and is likewise in use as a public walkway (NIAH).

### 12.3.4 PROPOSED DEVELOPMENT SITE HISTORY AND SITE INSPECTION

The proposed development site has been subject to ground disturbance over a lengthy period of time commencing with the construction of Lakeland demesne in the early 19<sup>th</sup> century which would have involved extensive landscaping works, particularly in the higher ground at the northern end of the site which is in the general vicinity of Lakeland House. The construction of the N40 South Ring Road bordering the site to the north in the mid-1990s would have required extensive ground reduction in adjoining land, in particular at the northern end of the proposed development site.

An archaeological assessment was undertaken as part of an earlier proposal for the proposed development site in 2003 (see Appendix 12.3). As part of that assessment, archaeological test trenches were excavated in the northern section of the site in the approximate location of Lakeland. No trace of the house was found but the cellar, initially

identified and recorded during construction of the N40 South Ring Road, was again identified (Purcell, A., Brett, C. and O'Rourke, N. 2003). The report concluded that the larger part of the site had formerly been in use as a temporary halting site and had been subject to extensive ground disturbance. Topsoil had been stripped from parts of the site prior to archaeological testing and several pathways ran through it (ibid.).

The proposed development site had been utilized as a compound/dumping area in the early 2000's during construction of the residential developments on Jacobs Island to the south and east. Aerial photographs from 2000 show the north-eastern part of the development site stripped of topsoil while later aerial photographs (2005-2012) show extensive ground disturbance caused during construction works associated with the bordering residential developments. Later aerial photographs (2001-2013 and 2013-2018) show the proposed development site as it is today, with regeneration of scrub vegetation over much of the site.

The proposed development site was inspected in November 2021 in dry, bright weather conditions. The primary purpose of a site inspection is to assess the physical environment in which the development will be undertaken and to identify any possible features of cultural heritage significance which have not been previously recorded. Current land use, local topography and environmental conditions are assessed to gain an overall picture of the area. The proposed development site is outlined on the aerial photograph below (Fig. 12.9) while photos are given in Appendix 12.2.

The proposed development site is bordered to the north by the N40 South Ring Road and to the northeast and south by the residential developments of Long Shore Drive, the Haven and The Courtyard. An access road from the N40 runs along its western boundary. Joe McHugh Park and Lough Mahon and the Douglas Estuary lie outside the residential developments to the south and east.

The development site slopes from north to south and is cut through by a roughly east-west construction road. In 2007 (Purcell, 2007), a construction compound was noted to the north of this road. The ground to the north of the construction road is very uneven with heaped overgrown mounds of soil and rubble throughout. The area is overgrown with dense briars and scrub vegetation and previous ground disturbance is evident everywhere. In places the topsoil appears to have been stripped and a stoney, rubble surface is evident which has been recolonised by shallow vegetation. The cellar lies within this dense vegetation (Fig. 12.9).

The southern end of the proposed development site is in a low-lying area of ground which was recorded in 2007 as stripped of topsoil (Purcell, 2007). Upon site inspection in November 2021, this southern area of the site was overgrown with trees and scrub vegetation, some of which had been cleared to form rough trackways through it.



Figure 12.9: Proposed development site outlined in red on aerial photo (2011-2013) [www.archaeology.ie](http://www.archaeology.ie)

## 12.4 ASSESSMENT OF EFFECTS

The assessment of impacts (both direct and indirect) during construction and operation of the proposed development has been carried out in accordance with Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022).

### 12.4.1 DO-NOTHING EFFECTS

If development does not proceed, the existing landscape will remain in its current condition with potential archaeological/cultural heritage sites beneath the surface. In a do-nothing scenario, the cellar will remain concealed beneath the surface within dense vegetation cover.

### 12.4.2 CONSTRUCTION PHASE EFFECTS

There are no recorded archaeological sites listed in the RMP for Cork or on the SMR database of the ASI within the proposed development site. There will be no significant direct or indirect effect on any known recorded archaeological site.

The proposed development site has been subject to ground disturbance over an extended period of time from the mid-19<sup>th</sup> century construction of Lakeland and its demesne to disturbances related to the adjoining N40 South Ring Road (in the mid 1990's), its use as a temporary halting site (also in the 1990's), as a nursery and finally as a compound/dumping ground during construction of the residential developments to the south (in the 2000's). Given the extensive ground disturbance that has taken place, the likelihood of finding subsurface archaeological sites is therefore limited. No likely significant effects on potential subsurface intact archaeological remains are therefore foreseen.

There are no Protected Structures listed in the CCDP and Draft CCDP and no structures listed in the NIAH within the proposed development site. The proposed development will, therefore, not impact on any registered structures of architectural merit. There will be no significant direct or indirect effect on any registered architectural site.

There is one Cultural Heritage Site, a cellar, situated within the proposed development site to the west of proposed Apartment Block 12 (Figure 12.10). The cellar is associated with Lakeland (demolished c. 1920). The cellar will not be impacted by the proposed development and will be preserved in situ within a 10m buffer zone within a green open space. Following mitigation, there will be no significant direct or indirect effect on this cultural heritage site.

While no evidence for Lakeland House was found following archaeological testing in 2003, traces of cobbling and gravel surfaces and fragments of walls were identified. These features will be removed during construction of the proposed development. The proposed development will have a direct imperceptible effect on these fragmentary remains associated with Lakeland demesne and any other trace remains of contemporary activity which may exist beneath the surface in the northern portion of the site.

### 12.4.3 OPERATIONAL PHASE EFFECTS

Following construction, the cellar will remain in situ beneath a green open space to the west of Block 12. Access to the structure will not be maintained. No direct or indirect significant operational effects on archaeology, architecture and cultural heritage as a result of the operation of the proposed development are envisaged.

## 12.5 MITIGATION

### 12.5.1 CULTURAL HERITAGE SITE - CELLAR ASSOCIATED WITH THE FORMER LAKELAND HOUSE

Discussions were held with Ciara Brett, Cork City Archaeologist, on the 25<sup>th</sup> of November 2021 during the compilation of this report. It was agreed that the cellar (8.6m NE-SW x 6.6m NW-SE externally), as outlined on the site layout plan (Fig. 12.10 Below) will be preserved in situ within a 10m buffer zone within a green open space within the proposed development.

A site inspection of the cellar location in November 2021 revealed it to be situated in an area of rough ground which is completely overgrown with impenetrable dense vegetation. The entrance to the subterranean structure was backfilled following archaeological testing in 2003 and the site is not accessible from the surface.

### 12.5.2 CONSTRUCTION PHASE

During construction, the following mitigation measures to be overseen by an archaeologist will apply;

- The site of the cellar will be cleared of vegetation and a buffer zone of 10m will be placed around the site;
- There will be no ground disturbance work within the area of the buffer zone which will be securely fenced during the construction process and will remain in place until all elements of construction are completed;
- The site of the cellar and a 10m buffer zone will be levelled/graded, re-topsoiled and reseeded with grass to form part of a green open space to the southwest of Apartment Block 12 at the north-western end of the development site. This work will be carried out under archaeological supervision.

### 12.5.3 OPERATIONAL PHASE

Following construction, an information plaque/board will be erected at a suitable location with relevant information relating to the cellar and its association with the former Lakeland Demesne. The style, design and content of the plaque will be agreed in advance with Cork City Council.

The implementation of mitigation measures will preserve the cellar in situ and will provide information and acknowledge its presence in the landscape. The overall effect on the cellar, following mitigation, will be positive.

### 12.5.4 MONITORING

Archaeological monitoring of groundworks will be carried out elsewhere during construction. In the event of features associated with the Lakeland demesne being identified, such features will be removed and a written and photographic record will be made. In the event of archaeological material being uncovered such material will be preserved in situ, where possible or preserved by record. Preservation in situ will require the relocation of the element of the development beyond the area of archaeological sensitivity. Preservation by record will require the excavation of the archaeological material and such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands). This work will be funded by the developer.

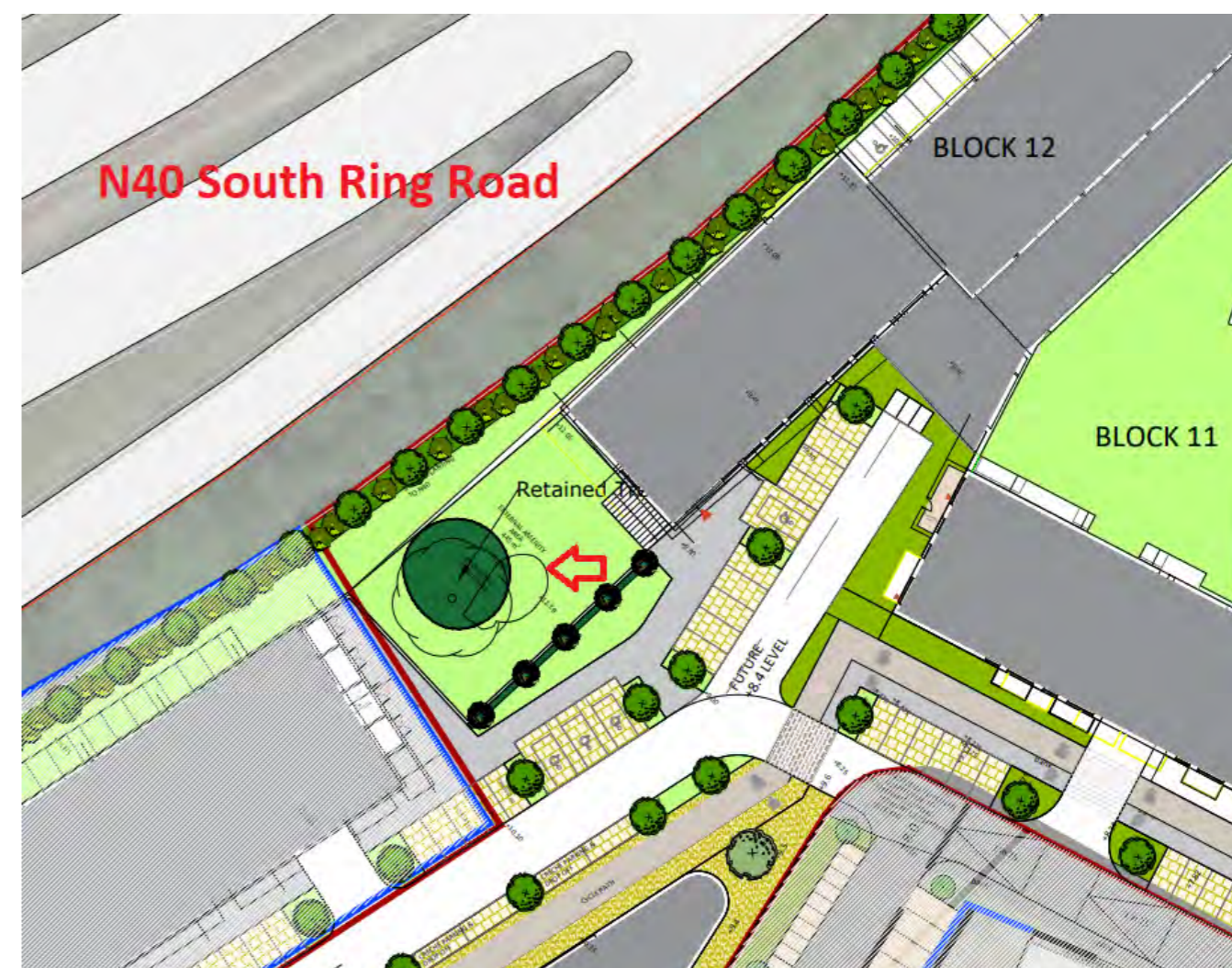


Figure 12.10: Section of proposed landscape plan showing cellar outline arrowed in red within a proposed amenity grass space (after Doyle & O'Troithigh Landscape Architecture)

## 12.6 CUMULATIVE EFFECTS

No significant cumulative effects on the archaeological, architectural or cultural heritage are predicted.

The potential cumulative impact of the relevant plan for the area was assessed, which is considered to be the Draft Cork City Development Plan 2022 - 2028, which will come into effect in August 2022. The assessment of the potential impacts on the environment of the Draft Plan, was undertaken utilising the Strategic Housing Objectives (SEO), which are detailed in Table 5-1 of the supporting Strategic Environmental Assessment (SEA) Statement contained in Appendix 2(A) of the Draft Plan. The potential cumulative impacts of the Plan were assessed having regard to both these SEOs.

SEO CH, Material Assets objectives as detailed in Table 5-1 and 7-1 of the Draft Plan are to:

- Protect places, features, buildings and landscapes of cultural, archaeological or architectural heritage.

Table 5-1 of the Supporting Document of the Draft Cork City Development Plan 2022 indicates that Scenario 3, the 'Compact Liveable Growth Scenario' is determined to likely improve the status of SEOs to a greater degree and potential conflict with status of SEOs – likely to be mitigated to a lesser degree.

## 12.7 RESIDUAL EFFECTS

No residual significant effects on the archaeological, architectural and cultural heritage environment are foreseen.

## 12.8 DIFFICULTIES ENCOUNTERED

No difficulties were encountered during compilation of this EIAR.

## 12.9 INTERACTIONS WITH OTHER DISCIPLINES

In this EIAR, cultural heritage will interact with the Townscape and Visual Impact Assessment (Chapter 4).

There is one cultural heritage feature, a cellar, within the proposed development site. The cellar will be preserved in situ and incorporated into a green open space as shown on the landscape plan, Fig. 12.10 above. The cellar, a subterranean structure, is not visible above ground. However, the establishment of an information plaque/board within the green open space will acknowledge its presence in the landscape. The plaque/board will provide relevant information relating to the cellar and its association with the former Lakeland House and Demesne. The overall effect on the cellar, following mitigation, will be positive.

## 12.10 REFERENCES

Aalen, F.H.A, Whelan, K. & Stout, M. 1997. Atlas of the Irish Rural Landscape. Cork University Press.

Bence-Jones, M. 1978. (new edition 1988) Burke's Guide to country houses, vol. 1: Ireland. Burke's Peerage Limited, London.

Henchion R. 2005 East to Mahon. Dahadore Publications.

Department of Arts, Heritage, Gaeltacht & the Islands, 1999. Framework & Principles for the Protection of Archaeological Heritage.

Department of Arts, Heritage, Gaeltacht & the Islands, 1999. Policy & Guidelines on Archaeological Excavation.

Department of Housing, Planning and Local Government, 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.

Department of the Environment, Heritage and Local Government 2004. Architectural Heritage Protection, Guidelines for Planning Authorities.

Dúchas National Monuments and Historic Properties Service 1998. Record of Monuments and Places, County Cork, Volumes 1 and 2.

Environmental Protection Agency, 2002. Guidelines on the information to be contained in Environmental Impact Statements.

Environmental Protection Agency 2017. Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Environmental Protection Agency, 2003. Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.

Environmental Protection Agency 2015. Draft Revised Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.

Feehan, J 2003. Farming in Ireland, Walsh Printers, Ireland.



General Alphabetical Index to The Townlands and Town, Parishes and Baronies of Ireland 2000 (original 1861), Genealogical Publishing Co. Inc.

Gwynn, A. and Hadcock, R. N. 1970. Medieval Religious Houses: Ireland. London.

Hanley, K. and Hurley, M. 2013. Generations, The archaeology of five national road schemes in County Cork Vols. 1 and 2, National Roads Authority, Dublin.

Healy, J.N. 1988. The Castles of County Cork, Mercier Press, Cork.

Henchion, R. 2005 East to Mahon. Cork.

Hurley M. 1994 Photographic Record of Lakelands yard and cellars (unpublished report).

Jenkins S. 1993 The Cork Blackrock & Passage Railway. The Oakwood Press, Oxford.

Johnson, S. 2005. Lost Railways of County Cork, Stenlake Publishing Ltd. U.K.

Lamb K. and Bowe P. 1995 A History of Gardening in Ireland. Dublin

Monk, M. 2007. A greasy subject. Archaeology Ireland 21, 22-4.

Monk, M. 2019. Early Medieval Settlement in Johnston, P. and Kiely, J. (editors) Hidden Voices The Archaeology of the M8 Fermoy-Mitchelstown Motorway. TII Heritage 7

Murray P. 1991. The Crawford Municipal Art Gallery. City of Cork Vocational Educational Committee

O' Brien, W. 1994. Mount Gabriel: Bronze Age Mining in Ireland, Bronze Age Studies, Galway: Galway University Press.

O' Brien, W. 2004. Ross Island: Mining, Metal and Society in Early Ireland, Bronze Age Studies 6. Galway: National University of Ireland Galway.

Ó Drisceoil, D. 1988 Burnt Mounds: cooking or bathing? Antiquity 62, (237), 671-80.

O'Kelly M. 1961 The Cork Horns, the Petrie Crown and the Bann Disc. Journal of the Cork

Historical and Archaeological Society Vol LXVI No. 203

Power, D., Byrne, E., Egan, U., Lane, S. and Sleeman, M (1994). Archaeological Inventory of County Cork Vol 2, East and South Cork. The Stationery Office.

Purcell A. 2003 Archaeological Excavation Lakeland Ice-house, Ballinure, Mahon Peninsula, Cork. Unpublished report by Sheila Lane & Associates.

Purcell A. Brett C. and O'Rourke N. 2003 Archaeological Assessment Zone E, Ballinure,

Mahon Peninsula, Cork. Unpublished report by Sheila Lane & Associates.

Purcell A. 2004 Proposal for the conservation of the remains of the Coach House/Warehouse building and the Boathouse at Ballinure, Mahon Peninsula, Cork. Unpublished report by Sheila Lane & Associates.

Purcell, A. 2007 Environmental Impact Study Mahon Point, Cork. Unpublished report by Sheila Lane & Associates.

Quinn, B. & Moore, D. 2007. Ale, brewing and fulachta fiadh. Archaeology Ireland 21 (3) Issue No 81. 8-11.

Reeves-Smith, T 1997. The Natural History of Demesnes in Foster, W. eds. Nature in Ireland, A Scientific and Cultural History, Lilliput Press, Dublin.

Ronan, S., Egan, U., Byrne, E., et al. (2009). Archaeological Inventory of County Cork, Volume 5. The Stationery Office, Dublin

Rynne C. 1993 The Archaeology of Cork City and Harbour from the Earliest Times to Industrialisation. The Collins Press, Cork.

Smith, C. (1750) The Ancient and Present of the County and City of Cork.

Taylor, G. and Skinner, A. 1969. Maps of the Roads of Ireland, Irish University Press, Shannon, Ireland.

West, W. 1810 A Directory, and Picture, Of Cork and its Environs

**Online Sources**

Campbell, K. 2002:0329 – River lee and Lough Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Cork City Development Plan 2015-2021 and Draft CDP 2022-2028 [www.corkcity.ie](http://www.corkcity.ie)

Cork Past and Present [www.corkpastandpresent.ie](http://www.corkpastandpresent.ie)

Down Survey of Ireland, Trinity College Dublin, [www.downsurvey.tcd.ie](http://www.downsurvey.tcd.ie)

Elder, S. 2001:160 – Lough Mahon, Cork [www.archaeology.ie](http://www.archaeology.ie)

Heritage Maps Viewer [www.heritagemaps.ie](http://www.heritagemaps.ie)

Irish Placenames Database [www.loganim.ie](http://www.loganim.ie)

Lane, S. 2000:0153 – Harty's Quay, Monfieldstown, Rochestown, Cork [www.excavations.ie](http://www.excavations.ie)

Lane, S. 2002:0352 – Monfieldstown, Rochestown, Cork [www.excavations.ie](http://www.excavations.ie)

Lewis Topographical Dictionary of Ireland, 1837 [www.libraryireland.com](http://www.libraryireland.com)

National Inventory of Architectural Heritage [www.buildingsofireland.ie](http://www.buildingsofireland.ie)

National Monuments Service (in progress) Sites and Monuments Database of the

Archaeological Survey of Ireland [www.archaeology.ie](http://www.archaeology.ie)

NUI Galway Landed Estates Database [www.landedestates.ie](http://www.landedestates.ie)

Ordnance Survey aerial photographs dating to 1995, 2000 and 2005-2012 and 2013-2018 [www.map.geohive.ie](http://www.map.geohive.ie)

Purcell, A. 2002:0219 – Ballinure and Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Purcell, A. 2003:0297 – Ballinure, Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Purcell, A. 2003:0298 – Ballinure, Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Purcell, A. 2003:0299 – Ballinure, Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Purcell, A. 2003:0300 – Ballinure, Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Purcell, A. 2003:0301 – Ballinure, Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Purcell, A. 2003:0302 – Ballinure, Mahon, Cork [www.excavations.ie](http://www.excavations.ie)

Summary of archaeological excavation from 1970-2020 [www.excavations.ie](http://www.excavations.ie)

## 12.11 APPENDICES

Appendix 12.1 Down Survey Parish and Barony maps (1654-1659)

Appendix 12.2 Photos of site inspection of Proposed Development Site

Appendix 12.3 Archaeological Assessment (Purcell, A., Brett, C. and O'Rourke, N. 2003).



JACOBS ISLAND



CHAPTER THIRTEEN  
Population and Human Health

# CHAPTER THIRTEEN

Contents

13	POPULATION AND HUMAN HEALTH.....	13
13.1	INTRODUCTION .....	1
13.2	DESCRIPTION OF EXISTING BASELINE ENVIRONMENT .....	2
13.3	LAND USE .....	6
13.4	IMPACT ASSESSMENT .....	15
13.5	MITIGATION MEASURES & MONITORING.....	26
13.6	CUMULATIVE IMPACTS.....	27
13.7	DIFFICULTIES IN COMPILING INFORMATION.....	27
13.8	REFERENCES .....	28

# CHAPTER THIRTEEN

## POPULATION AND HUMAN HEALTH

### 13.1 INTRODUCTION

#### 13.1.1 CHAPTER CONTEXT

The 'Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report' 2017 specifies the following in relation to the assessment of population and human health:

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

As noted in Figure 13.1 below, there are several inter-related environmental topics such as the potential impacts of the proposed development on air quality and climate, noise and vibration, water, traffic and access, construction and waste management, which are of intrinsic direct and indirect consequence to human health. While the baseline scenario for these environmental topics is not duplicated in this section, in line with the EPA guidance, the assessment of impacts on population and human health refers to those environmental topics under which human health effects might occur.

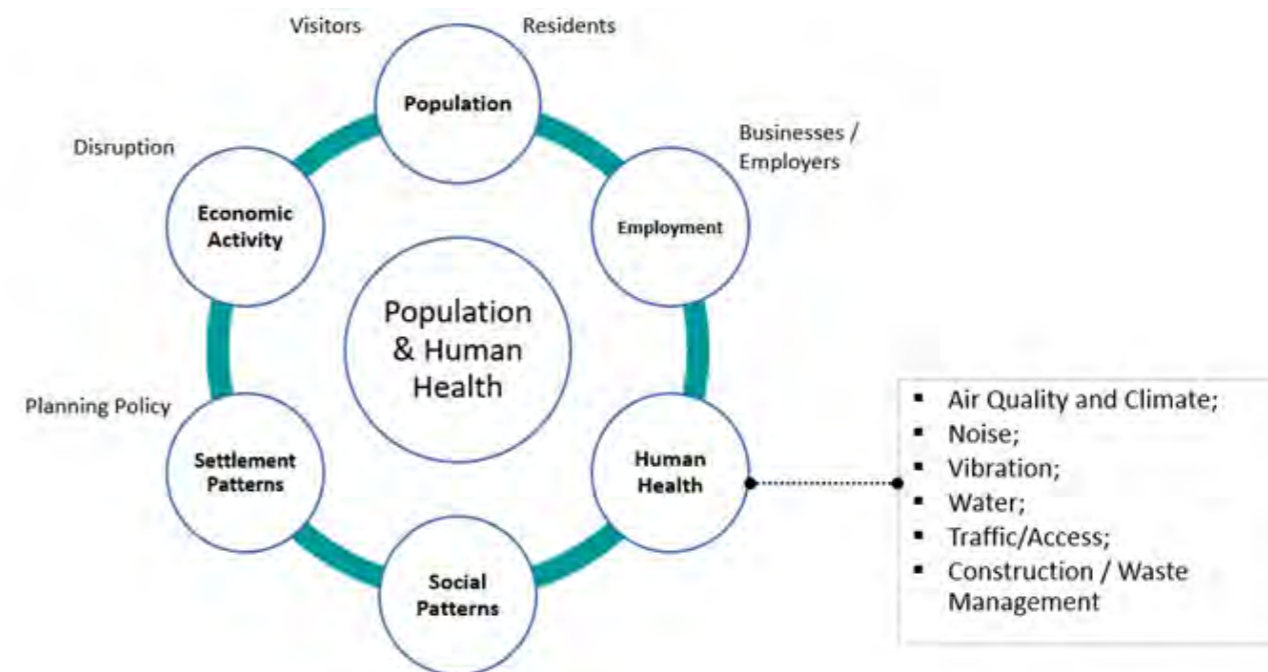


Figure 13.1: Potential Impacts on Population and Human Health

#### 13.1.2 METHODOLOGY

This chapter of the EIAR document has been prepared with reference to the Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in August 2022, as well as European Commission's 'Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report' 2017. A desktop study of the following published policy documents and data was undertaken to appraise the location and likely significant potential impact upon population and human health receptors and to assess population trends in the subject site and in the wider hinterland:

- Central Statistics Office (CSO) Census 2011 & 2016 data;
- Cork City Development Plan 2015;
- Draft Cork City Development Plan 2022 - 2028;
- Mahon Local Area Plan 2014 (now lapsed);

This assessment is a study of the potential indirect and direct socio-economic impacts of the construction phase and the operational phases of the development. Effects on receptors were assessed in terms of magnitude, quality, significance and duration.

## 13.2 DESCRIPTION OF EXISTING BASELINE ENVIRONMENT

### 13.2.1 DEMOGRAPHICS

#### 13.2.1.1 Settlement Context

In assessing the demographic trends in the vicinity of the subject site a focused assessment of the relevant Central Statistics Office (CSO) boundaries has been conducted. This initially considered the subject site in relation to Electoral Divisions (EDs), the smallest legally defined administrative areas in the State. The area falls within the boundary of the Mahon B ED, which is characterised by a mix of uses, incorporating a number of key strategic employment areas to the north, east and west, including the Mahon District Centre (Mahon Point Shopping Centre), Mahon Retail Park, and a number of technology and business parks (City Gate, Loughmahon Technology, Mahon Industrial Estate, Blackrock Business Park, Heritage Business Park and Riverview Business Park). The ED also includes established residential areas to the south and north in Jacobs Island and Ballinure/Mahon which are supported by a range of amenities in the form of pedestrian and cycling facilities at the Joe McHugh Park (developed in conjunction with the existing residential development at Jacob's Island) which continues along the western edge of Lough Mahon via the River Lee/Lough Mahon Waterfront Greenway and links the site with Blackrock and onto the City Centre, similarly the Passage West Greenway provides excellent linkage to Passage West, the Marina and the City Centre, with other amenities including Mahon Golf Club, Ballinure and Saint Michael's Gaelic Football Clubs, Skehard Road Park and Lough Mahon Park. The ED is relatively discrete, bounded and delineated by an inlet of Cork Harbour and the N40 to the south and east and by Skehard Road and Ringmahon Road to the north. However, the residential element of the area extends slightly northwards into the smaller, predominantly residential ED of Mahon A where the Mahon and Blackrock neighbourhoods meet.

It was considered that while it would not be appropriate to include the entire Mahon A ED within the study area, the small south-western portion which includes residential areas off Ferney Road, Beechwood Road and Dunlocha Cottages, readily accessed from Ringmahon Road, should naturally be included within the study area to represent more realistically the population of the Mahon neighbourhood area. Therefore, five Census Small Areas (SAs), were included to the north. Small Areas are areas of population generally comprising between 80 and 120 dwellings, designed as the lowest level of geography for the compilation of statistics and which nest within ED boundaries. These SAs are listed below:

- 048042002,
- 048042011,
- 048042012,
- 048042013,
- 048042016.

We note that the resulting study area corresponds to the Mahon Neighbourhood Area as defined in the Cork City Neighbourhood Profile prepared by AIRO to support the Cork City Draft Development Plan 2022 - 2028.

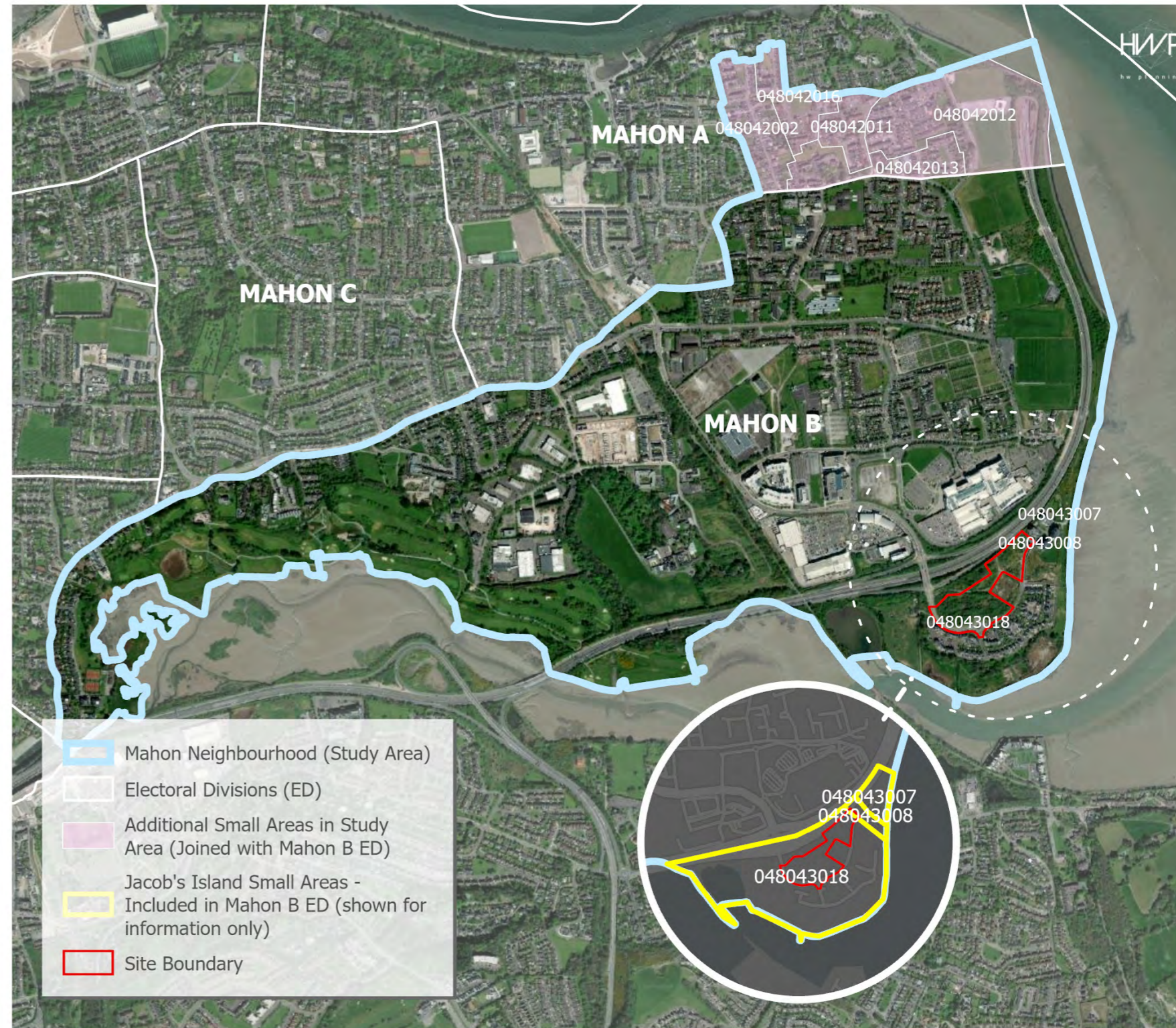


Figure 13.2: Study Area

13.2.1.2 Population

Mahon is amongst Cork's strongest performing areas in terms of population and employment growth during the last two intercensal periods 2006-2016, presenting sustainable and viable employment opportunities for existing and future residents of the area. The most recent available Census data dates from 2016, as the 2022 Census data is still being collated by the CSO. In 2016 the Mahon Neighbourhood Study Area accounted for 3% or 6,421 persons of the extended Cork City population of 210,853 persons.

Small Area Statistics have only been captured by the CSO since 2011 so it is not possible to determine a long-term trend in the Study Area population. However, the trend for the two ED areas that include the study area indicates that between 1996 and 2016 the population in both Mahon A and Mahon B EDs increased by 22%. This is in stark contrast to the wider city whose population declined by -1.2% in this period. Continued growth was experienced within the study area, with the population increasing by 2.7% in the last intercensal period. This recent growth rate, while lower than that experienced by the city as a whole, masks the fact that exceptionally high growth was still being experienced within areas of the subject site, namely the Small Areas 048042002 (15.9%) and 048042016 (7.7%) where rates in excess of the city, county and state population increases of 5% and 4% were recorded in the same period. Specifically in the 3 no. small areas that make up Jacob's Island extremely strong growth was also evident with population growth between 2011 and 2016 ranging from 8.3% to 21.7%. By contrast the Small Areas 048042013 experienced a -1.3% population decline.

Area	1996	2002	2006	2011	2016	% Change 1996 - 2016	% Change 2011 - 2016
Mahon A ED	4150	4168	4206	4931	5,066	22.1%	2.7%
Mahon B ED	4042	4275	4241	4843	4,937	22.1%	1.9%
048042002,				244	290		15.9%
048042011,				245	248		1.2%
048042012,				358	367		2.5%
048042013,				232	229		-1.3%
048042016				323	350		7.7%
Study Area Total				6245	6421		2.7%
Cork City Boundary *	127,187	123,062	119,418	119,230	125,657	-1.2%	5.1%
Cork County	420,510	447,829	481,295	519032	542868	29.1%	4.4%
State	3,626,087	3,917,203	4,239,848	4588252	4761865	31.3%	3.6%

\* pre-2019 City Boundary

Table 13.1: Population Trends in the Study Area

Figure 13.3 indicates that the population density of the majority of the study area is relatively low with fewer than 2000 persons/km<sup>2</sup>, this reflects the presence of the former Bessborough Estate, the Mahon Golf Course, the Joe McHugh Park and numerous employment and retail hubs in the area. The population density increases in the more residential areas of Mahon/Ballinure towards Blackrock to the north, with pockets of high population density, between 3000 to 4,500 persons/km<sup>2</sup> in evidence. Similarly pockets of higher population density are evident in Jacobs Island.

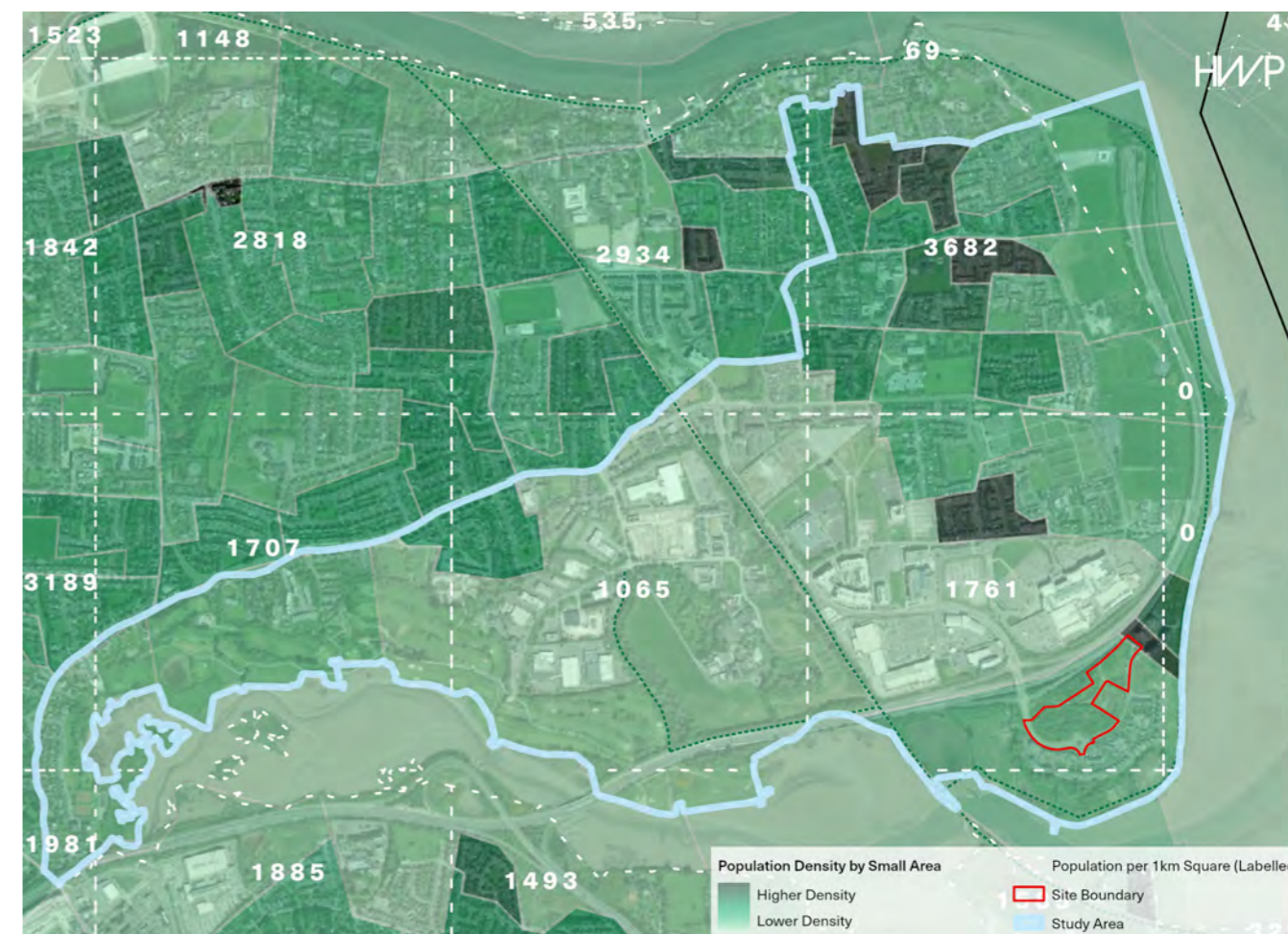


Figure 13.3: 2016 Population Density by Census Small Area

13.2.2.2 Households

The average household size in the study area, at 2.82, is higher than the state and city averages, and more in line with suburban areas in Cork County. The average household size is less in general in the more mature and long-established communities of Mahon A ED to the north. However, Small Area 048042016, containing Nutley Road and Avenue, Beechwood Court, Coach House Avenue and Hunters Green, is an outlier of this pattern, located in Mahon A ED but having an average household sizes of 3.15, significantly in excess of city, county and state averages. A similarly high average household size of 3.14 is apparent if we look specifically at the small area that covers the majority of Jacob's Island (048043018).

Area	Average Household Size
Mahon B ED	2.84
048042002,	2.87
048042011,	2.65
048042012,	2.88
048042013,	2.21
048042016	3.15
Study Area	2.82
Mahon A ED	2.66
Cork City *	2.45
Cork County	2.83
State	2.75

\* pre-2019 City Boundary

**Table 13.2: Average Household Size in the Study Area**

These large household sizes are accounted for by the relatively high percentage of families in the area with children between pre-school and adolescent family cycle stages. The city average for family members which are in this cohort is 44% whereas in the study area overall it is 52%. This is more in line with the with County and State population profile. It should be noted that in the small areas with notably high average household sizes, small areas 048042016 and 048043018, as highlighted above, the percentage of family members between pre-school and adolescent family cycle stages is 60% and 76% respectively. The latter small area accounts for over half of the Jacobs Island population.

There is a clear correlation between the type and date of the housing stock developments and the family lifecycle of the residents. In Jacob's Island the pre-school to adolescent population is aligned to the city average or below the city average in the small areas which are predominantly apartments. Whereas this section of the population in small area (048043018) which is predominantly housing, at 76% is significantly above the city average.

Overall, there are more adolescent and adult families in this area, with retirees notably under-represented compared to the wider city. In particular this trend is visible in Small Areas 048042016, and 048043018 where there are 1% and 0% retirees respectively. In fact there are no retirees recorded in any of the 3 no. small areas within Jacobs Island. There is a large divergence across the study area however, with Small Area 048042013 conversely having 8.3% of the family members retired and lower than the city average in the pre-school to adolescent cohort. This Small Area is notable for including a wider housing mix, ranging from the mature residential area of Eden Court and Eden Grove, Ferney Close, the Orchard to the more recent Ringmahon Court.

Family Cycle	Pre-school	Early school	Pre-adolescent	Adolescent	Adult	Retired
Study Area Total	9%	12%	15%	16%	32%	3%
Cork City *	9%	11%	11%	13%	32%	8%
Cork County	10%	15%	15%	16%	27%	6%
State	10%	14%	15%	16%	27%	6%

\* pre-2019 City Boundary

**Table 13.3: % of Family Member Population by Family Cycle Stage the Study Area**

### 13.2.2.3 Travel Patterns

Table 13.4 outlines the travel mode statistics for commuting trips to school, college and work. It is evident that there is a significantly higher number of commuters using private motor vehicles in the area than the city average, with a correspondingly low number of pedestrian and cyclists. However, the use of public transport is in line with the city figure. The pattern overall corresponds more closely with the state average figures and use of sustainable modes of transport is in excess of that in the County or rural areas.

Commute Mode	On-foot or Bicycle	Public Transport	Car, Motorbike or Van
Study Area Total	20%	11%	64%
Cork City *	33%	11%	49%
Cork County	9%	8%	75%
Rural Areas	4.40%	2%	85.50%
State	17%	13%	63%

\* pre-2019 City Boundary

**Table 13.4: Commuting Modes for persons aged 5 and over in the Study Area**

Underlying these figures is that fact that although Mahon is a major employment hub CEMP, only 6.8% of these positions are filled by workers who live in the Mahon neighbourhood. Fewer than a quarter of the 2,522 resident workers have jobs in the neighbourhood with 47% commuting to other areas within the city and a further 13% working outside of the city. This predominantly outward commuting flow of the resident workers has resulted in this pattern of higher use of private transport than the city average<sup>1</sup>.

The commuting pattern of workers travelling into the neighbourhood indicates that 54.2% of Mahon workers come from elsewhere in the City and 38.9% commute from outside the city. The use of private transport amongst this group at 80% is higher than the resident population (64%) and significantly higher than the city average (49%).

1. Based on CSO POWSCAR Data as outlined in the AIRO Neighbourhood Profile Document – part of the Draft Cork City Development plan 2021



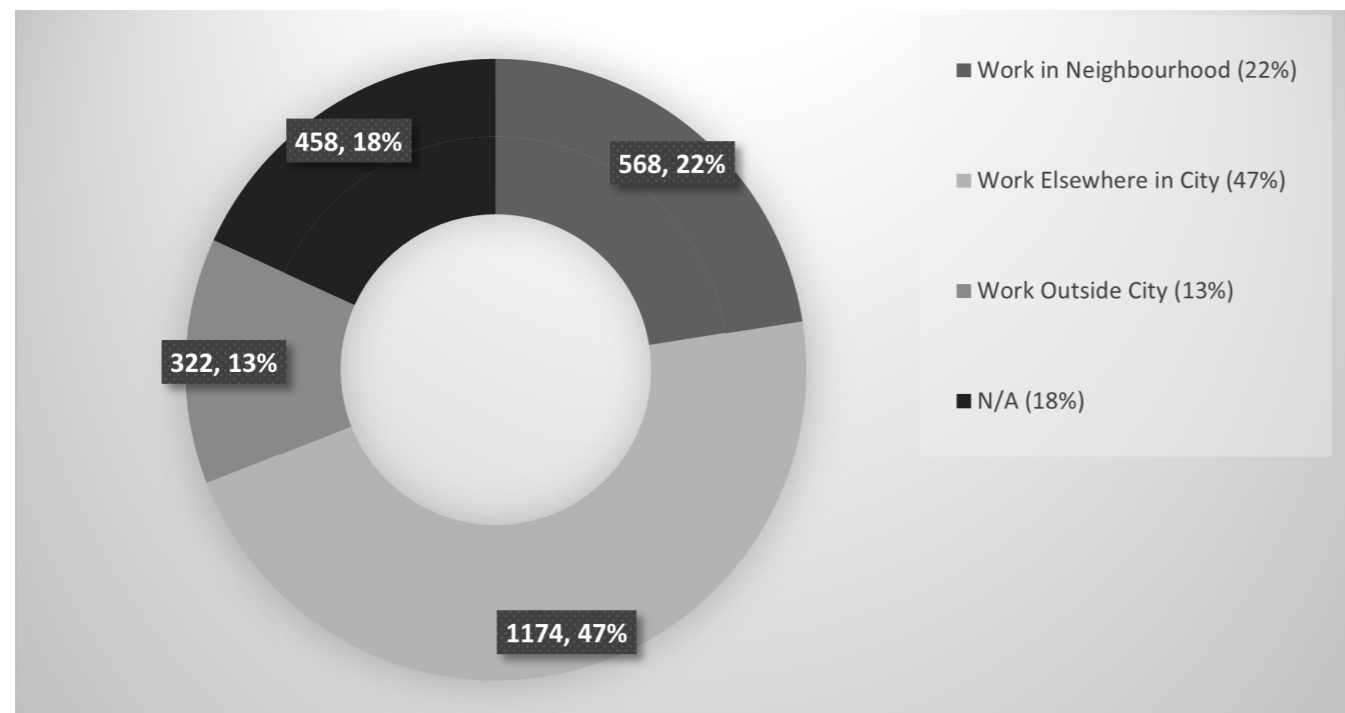


Figure 13.4: Resident Workers Commuting Pattern

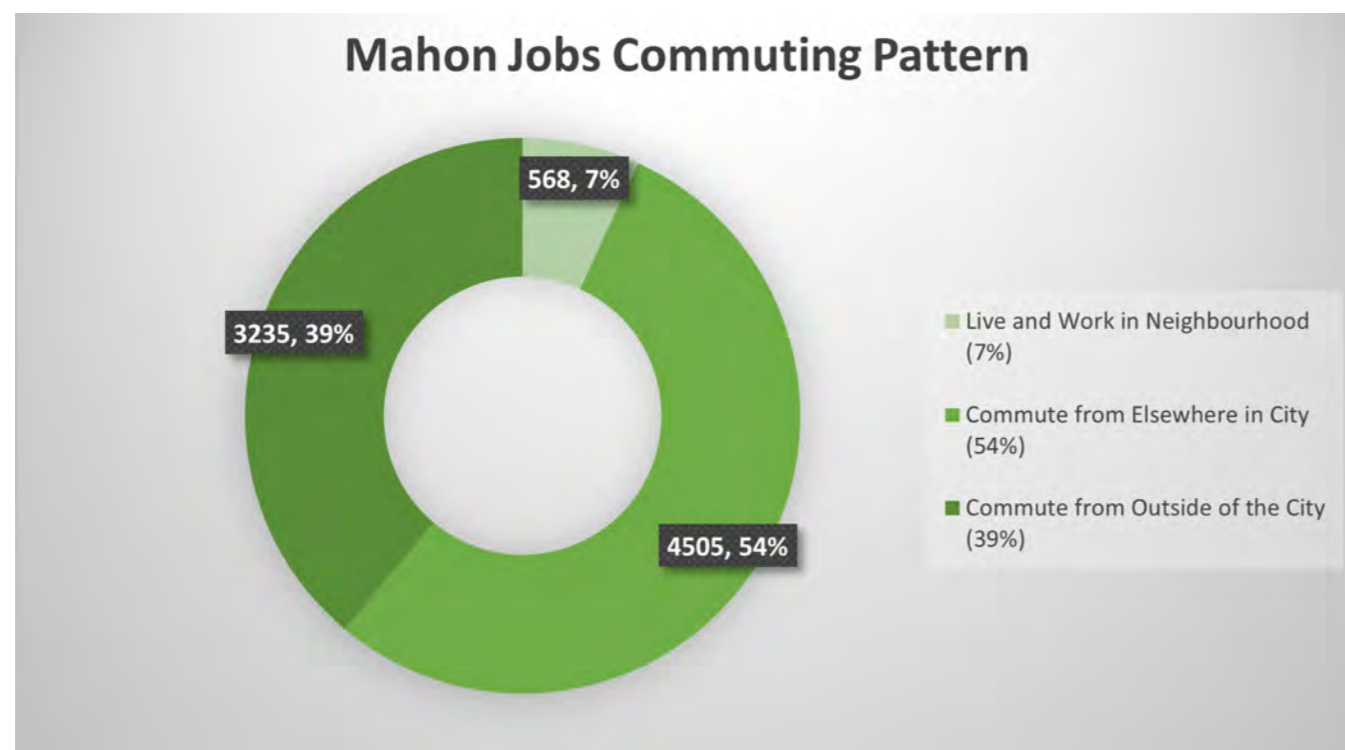


Figure 13.5: Mahon Jobs Commuting Patterns (2016 CSO)>

13.2.2.4 Affluence and Deprivation

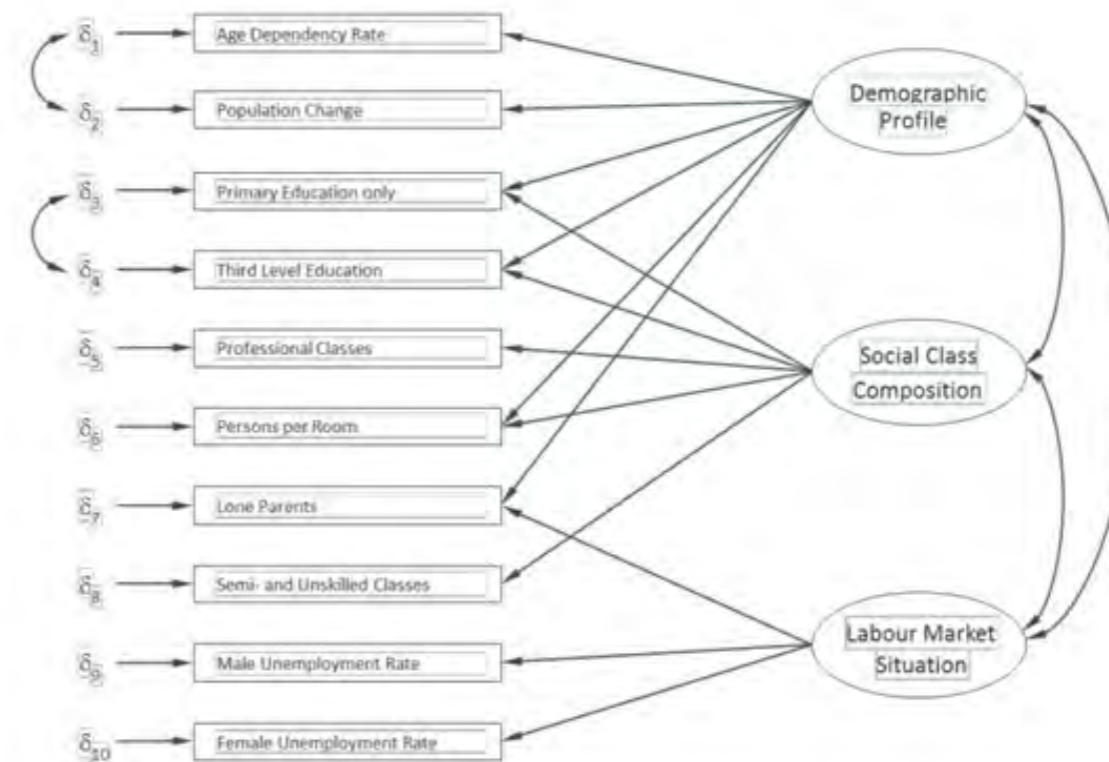


Figure 13.6: Pobal Deprivation Index Indicators

The Pobal Deprivation Index shows the level of overall affluence and deprivation at the scale of CSO Small Areas in 2016 based on a number of census indicators, as set out in Figure 13.6. At an ED level the Mahon B area, comprising the majority of the study area, is classified as 'Marginally Below Average' in terms of affluence, with a score of -5 in the Pobal HP Deprivation Relative Score. The Mahon A ED area to the north, which partially falls within the study area is classified as 'Marginally Above Average'. Cork City overall is scored at of +3.01, which classifies it as 'Marginally Above Average'.

However, as Figure 13.6 indicates, when the deprivation index is viewed at SA level the Deprivation Index classes range from 'Very Affluent' to 'Disadvantaged'. There is a distinct dichotomy within the study area, with areas to the west of the Link Road predominantly of above average affluence and areas to the east predominantly below average affluence. There are, pockets of 'Affluence' in both areas, in the Park Hill, Douglas Hall and Ravenscourt Estates to the west and in Jacobs Island to the east. In the latter area the SA containing part of the Sanctuary development is classed as 'Very Affluent'.

Overall, the percentage of the Study Area population living in disadvantaged areas equates to 56.5% or 3,629 persons. This picture of a community grappling with deprivation is also reflected in the percentage of households in Local Authority and Voluntary Body housing, which at 36% across the Study Area, is double the City area average of 17.7%<sup>2</sup>.

Social housing represents the housing tenure of over half the households in several Small Areas in the Study Area, with it representing the tenure of 68% of the households in Small Area 048042012. These relatively high levels of deprivation can also be correlated with the fact that the percentage of the workforce within the Study Area on disability is 19.6%, which is 4.1% higher than the city average. Again, Jacobs Island is an anomaly, with the percentage of households in Local Authority housing ranging from 0 – 2.7%.

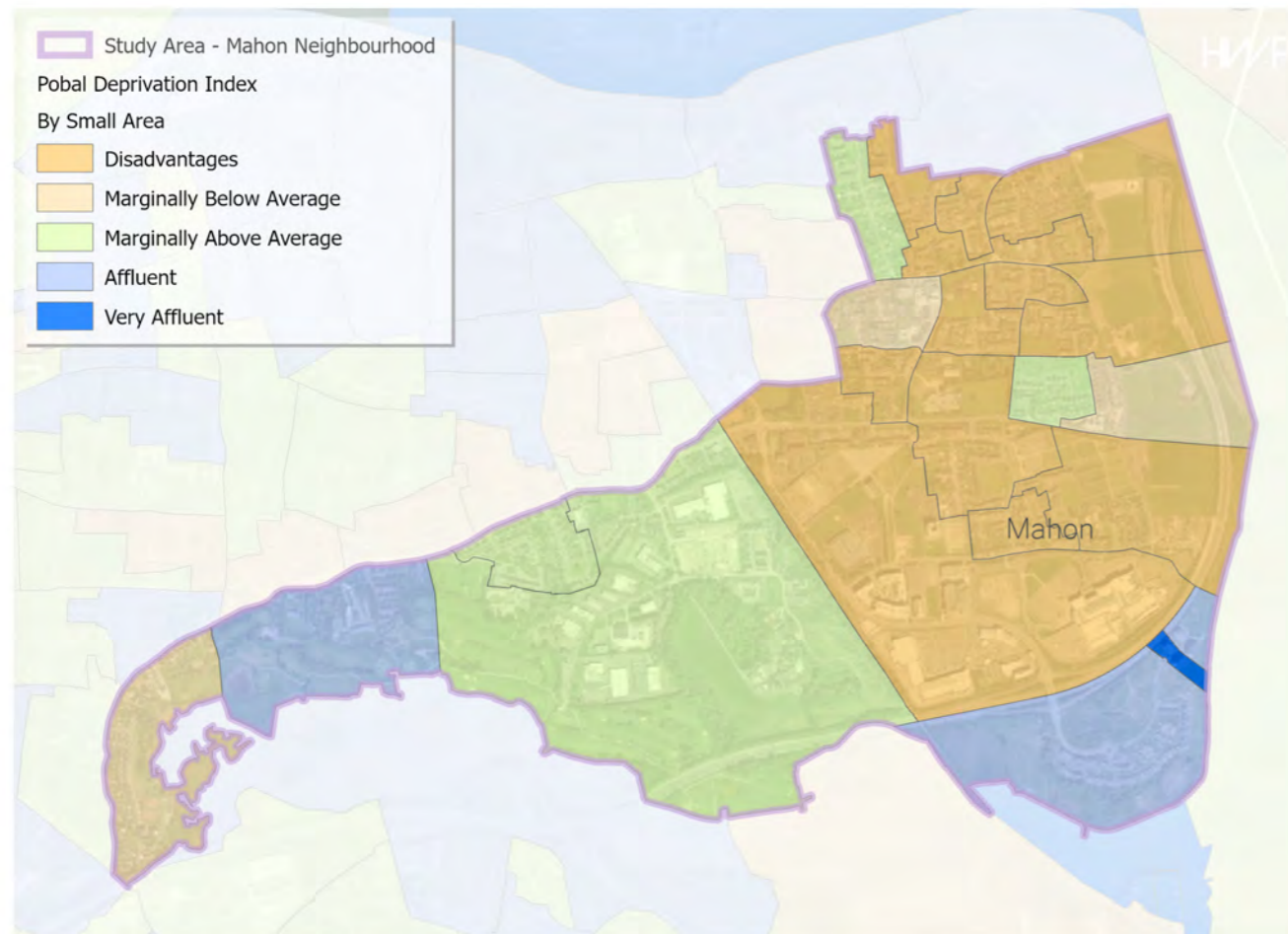


Figure 13.7: Pobal Deprivation Index by 2016 CSO Small Area

13.2.2.5 Employment

The strategic importance of Mahon as an employment hub is highlighted in the 2016 census POWSCAR data which indicates that while there were 2,522 resident workers, there are 8,308 local jobs in the study area. So, while the Mahon neighbourhood accounts 3% of the extended Cork City population, 8.27% of the total jobs in the City are based there. This equates to a worker:job ratio of 3.294, which compares very favourably with the ratios of Cork City and Suburbs at 1.169 and the Southern Regional Assembly at 1.06.

2. Based on 2016 Census figures for the pre-2019 City Area

However, as noted previously only 6.8% of these jobs are held by local workers. Indeed, the unemployment rate amongst the local workforce at 17.2% in 2016, was significantly higher than the City average of 12.0%. The large outward and inward commuting flows seem to indicate that there is a mismatch between the local jobs available in Mahon and the skills of the resident workforce. The 2016 census identified that 27.3% of the population aged over 15 years had completed a third level qualification. This is less than the city average of 37.2%. It is also significantly lower than the 69.5% of the workers who fill the 8,308 local jobs in Mahon, the majority of which (51.5%) are in the areas of ICT, Financial, Real Estate, Professional, Admin and Support Service Activities.

13.3 LAND USE

The study area is situated within South Mahon, within the South-eastern Suburbs of Cork City. South Mahon is identified in the Draft Cork City Development Plan 2022 - 2028 (CDP) as a 'City Regeneration and Expansion Area'. Figure 3.3 of the Draft Plan identifies Mahon as a 'Primary Urban Corridor & Principal Town', where prevailing building heights range from 2 – 5 storeys and where the target is set for 4 – 6 storeys. The Core Strategy identifies Mahon as an area for growth consolidation and enhancement by providing a mix of new neighbourhood uses in suitable and underutilised locations. The subject site is located to the south of the Mahon District Centre, which includes Mahon Point Shopping Centre, from which it is separated by the N40.

In the Corine 2018 Land Use Classification there are three landcover types within the study are:

- Discontinuous Urban Fabric,
- Industrial or Commercial Units,
- Sport and Leisure Facilities,

Blackrock, Mahon and Jacobs Island account for the Discontinuous Urban Fabric, which accounts for the majority of the study area. The Loughmahon Technology Park, City Gate, The Mahon Retail Park and Mahon point Shopping Centre, located to the centre of the study, represent the Industrial or Commercial Units. The Sport and Leisure Facilities classification relates to the Mahon Golf Club along the south-western boundary.

Mahon is one of Cork's most sustainable locations, with strong existing and proposed pedestrian and cycle infrastructure, many of which, such as the Passage West Greenway and the River Lee/Lough Mahon Waterfront Greenway are entirely separate from the road network and provide pedestrian access to Joe McHugh Park to the south and the Mahon District Centre and a range of key strategic employment areas to the north. In addition, these existing links offer existing and future residents convenient and safe pedestrian access to employment, retail and amenity opportunities beyond Mahon. The existing pedestrian and cycling route at Joe McHugh Park (which were developed in conjunction with the existing residential development) continues along the western edge of Lough Mahon and links the site with Blackrock and onto the City Centre.

Mahon is an area earmarked for considerable growth and investment in the coming years. The Cork Metropolitan Area Transport Strategy (CMATS) includes proposals for a high frequency Light Rail Transit (LRT) network linking Ballincollig to Mahon, via the City centre and Docklands. The LRT will be preceded by a high-frequency bus service between Mahon and Ballincollig. This will be delivered in the short-term to underpin higher development densities along the

corridor including the regeneration of the Docklands. New BusConnects routes are proposed next to the subject lands. The indicative Cork BusConnects Core Bus Corridor (CBC) 11 is proposed to run from Jacobs island to City Centre via Balinlough and CBC 12 is proposed to run between Mahon and the City Centre via Ballintemple.

As noted in Chapter 12 of this EIAR, in the 18<sup>th</sup> and 19<sup>th</sup> Century, as the city flourished, the Mahon Peninsula became the home to many of the city's merchant elite. With five country houses located within 2km of the subject site. A significant portion of the study area was formerly demesne lands of these country houses, such as Ravenscourt House, Ringmahon House and the former Ursuline Convent, previously named 'Pleasant Fields' to the north and Bessborough House to the south. The subject site lies within the former demesne lands of Lakeland House, which was demolished in c. 1920. The only surviving remnants of the house and demesne are a cellar which lies within the proposed development site and the remains of a warehouse situated 130m outside the development site to the south. Prior to construction of residential development in the 2000s, areas on Jacobs Island were in use as a temporary halting site (1990s) and as a nursery by Cork City Council with extensive stands of semi-mature trees.

Across the study area, large tracks of these former demesne lands have now been redeveloped for commercial and residential use. A portion of the Bessborough estate lands now forms the Mahon Retail Park, City Gate and Mahon Industrial Estate, with other areas in parkland and more peripheral areas now neglected and overgrown. Similarly, the subject lands are currently overgrown and underutilised, inaccessible for public recreational use and surrounded by commercial and housing developments.

While much of the north of the study area is an existing built-up area, the Draft Plan makes provision for Business and Technology, Public Open Space, Retail Warehousing and Mixed-use Development across the study area. The subject site has the latter zoning. The coastal area in the study area is defined as an 'Area of High Landscape Value', as is a significant area to the west of the study areas and along the Passage West Greenway. Significant lands to the south of the study area are zoned 'ZO 18 Landscape Preservation Zone'.

### 13.3.3 COMMUNITY AND SOCIAL INFRASTRUCTURE

The existing community and social infrastructure assets in the local area have been identified in accordance with the categories outlined in the Table 13.5 below.

Category	Description
Amenity, Open Space and Sports	Parks, Playgrounds, Amenity Walks/Greenways, Pitches, Green Areas, Golf Courses, Sports Pitches, Sports Centres, Swimming Pools, Gyms
Childcare and Education	Childcare, Primary Schools, Post Primary Schools, Special Schools, Third Level Universities, Other Educational Institutions
Community facilities	Community Centres, Religious Facilities, Post Offices, Libraries.
Retail services	Supermarkets, Convenient Shops, Specialty Services, Restaurants/Take-aways, ATM, Petrol Station
Health	Hospitals, Health Centres, Clinics, Pharmacies, Addiction Services, GPs, Mental Health Services
Emergency	Fire Station, Garda Station
Public Transport	Bus and Train Routes

*Table 13.5: Community and Social Infrastructure Categories*

#### 13.3.3.1 Amenity, Open Space and Sports

The Mahon neighbourhood is well served by a mix of open spaces, recreational and sporting amenities. The Passage West Greenway runs centrally through the area, while the River Lee/Lough Mahon Waterfront Greenway loops around the Loughmahon peninsula to the east, linking with the Joe McHugh Park, providing the neighbourhood with direct access to Cork City Centre and Passage West to the southeast. Within the study area alone, there is c. 4km of high-quality fully accessible greenway. Several public parks are distributed evenly throughout the neighbourhood, namely Skehard Road Park, Cork Heritage Park, Sean Cronin Park, Lough Mahon Park and Playground, and Joe McHugh Park. Due to the location of these amenities, residents of the Mahon neighbourhood are generally within a 5-to-10-minute walk of a local park or greenway. The planned Marina Park and Marina Walk are readily (c. 15 minutes) accessible from the site via the Passage West Greenway.



Figure 13.8: Extract of Cork Passage Railway Greenway Improvement Scheme in Mahon

Several sporting pitches are located along the eastern boundary of the study area, which are in use by local GAA, rugby, and soccer clubs (St. Michael's GAA Club, Ballinure GAA pitch, Mahon Rugby Grounds, and Ringmahon Rangers AFC). Oakgrove Leisure Centre is also situated to the northeast of the Mahon neighbourhood, in proximity to the sporting pitches. Further adding to Mahon's sports offering, Mahon Golf Club, and Douglas Lawn Tennis Club are situated west of the greenway. A Gym Plus Cork is located alongside the Mahon District Centre, which lies at the core of the neighbourhood.

Significant investment in walking and cycling infrastructure is planned within the Mahon neighbourhood, namely via the c. €30 million funding announced by the National Transport Authority for improving sustainable transport in Cork City.<sup>3</sup> This funding will further add to existing amenity in the area, and will further improve the quality of life for the local population.

<sup>3</sup> City Council welcomes NTA sustainable transport funding announcement

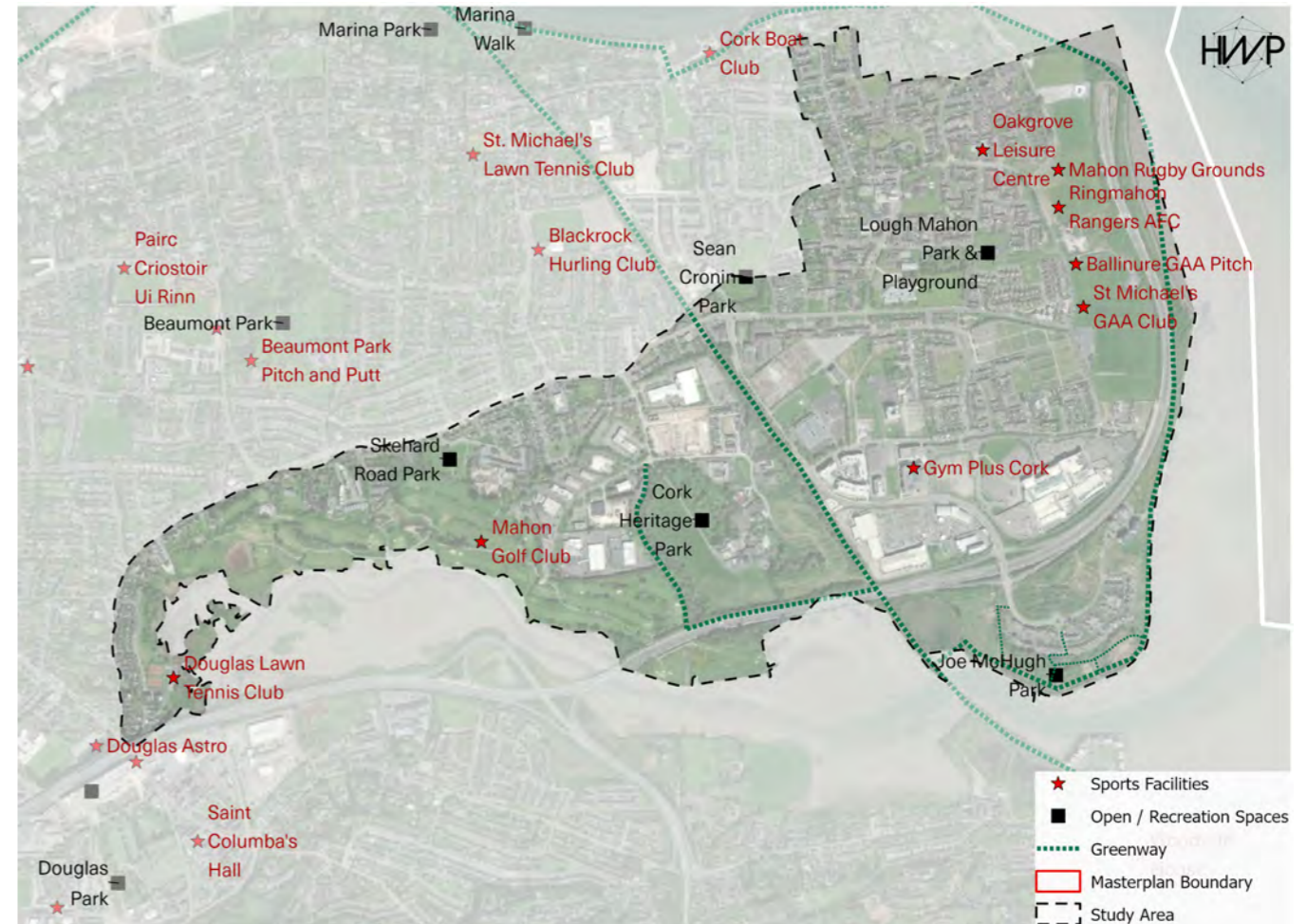


Figure 13.9: Details of Existing Amenity, Open Space and Sports outlets in study area

### 13.3.3.2 Childcare

The study area contains 7 no. existing creches/childcare facilities, 2 no. primary schools and 1 no. secondary school. Details of existing childcare facilities are shown in Table 13.7.

Childcare Provider	Capacity	Theoretical Capacity <sup>4</sup>
Nurture Childcare Blackrock	135	70
Bessborough Centre Creche	124	46
The Village Montessori AMI	88	7
Beginnings Creche Mahon	31	18
Mahon CDP	22	6
Mahon Community Preschool	40	16
Naíonra Cró na nÓg	22	0
<b>Total</b>	<b>462 places</b>	<b>163 vacancies</b>

Table 13.7: Childcare Facilities

In addition, we note that a 60 childcare place facility has been permitted in the adjoining site (ABP-301991-18). Furthermore, an additional 60 childcare places are included in 2 no. SHD applications, within the lands of the former Bessborough Demesne (application ref ABP-313206-22, ABP-313216-22) which are currently under consideration by An Bord Pleanála. The Cork City Childcare Committee were engaged at an early stage of the EIAR process, providing valuable information on childcare provision in the Mahon area. This information has directly informed this study.



Figure 13.10: Details of Existing Childcare facilities in Study Area

### 13.3.3.3 Schools and Education

The study area is served by 2 no. primary schools, namely Scoil na Croise Naofa and Gaelscoil Mhacan. An overview of the primary schools within the study area is provided in table 13.8 as shown. The information in table 13.7 was obtained from a review of the preliminary 'Data on Individual Schools' 2021/2022 database of the Department of Education<sup>5</sup>.

<sup>4</sup> The most recent TUSLA Reports were consulted for each facility to determine the theoretical capacity for same. Attendance figures were compared with maximum capacity figures for each facility to determine same.

<sup>5</sup> <https://www.education.ie/en/Publications/Statistics/Data-on-Individual-Schools/>

Settlement	Primary School	Type	Capacity
Within 10-minute cycle	Scoil na Croise Naofa	Mixed	168
Within 10-minute cycle	Gaelscoil Mhacan	Mixed	172

Table 13.8: Summary of Existing Primary Schools in Study Area

In total there are 341 no. primary school places in the 2 no. primary schools within the study area.

**Existing Post-Primary/Secondary Schools**

Post-primary schools by their nature are generally of a larger scale and catchment area. Due to Mahon's location within Cork City, and the high level of public transport provision that exists within the area, it is reasonable to consider that the local population will have sustainable access to schools outside of the study area.

For the purposes of this assessment, we have included post primary schools within a 20-minute cycle of the subject area. There are currently six post primary schools with a 20-minute cycle of the subject lands, with a combined enrolment of 2,907 students. 1,069 of these places (37%) are located within a 10-minute cycle of the subject lands. An overview of the post-primary schools within the study area is provided in Table 13.9 as shown. The information in Table 13.9 was obtained from a review of the 'Data on Individual Schools' 2021/2022 database of the Department of Education <sup>6</sup>.

Catchment	Secondary School	Type	Capacity
Within 5/6-minute cycle	Nagle Community College	Mixed	228
Within 10 min cycle	Regina Mundy College	Girls	570
Within 10 min cycle	Ursuline Secondary School	Girls	271
Within 15 min cycle	Ashton School	Mixed	514
Within 15 min cycle	Douglas Community School	Boys	529
Within 15 min cycle	St Francis Capuchin College	Boys	795

Table 13.9: Summary of Existing Secondary Schools in Study Area

<sup>6</sup> <https://www.education.ie/en/Publications/Statistics/Data-on-Individual-Schools/>

**Third Level Institutions**

There are no third level institutions such as colleges or universities with the study area. Mahon's location within Cork City, and access to frequent bus routes, provides the area with ready access to the third level institutions in Cork City and further afield.

**Special Schools**

According to the Data on Individual Schools' 2021/2022 database the closest special school to Mahon is the School of Divine Child, Ballintemple, Cork which is approximately 2.5km northwest of Mahon. There are several other special schools in Cork City that are served by public transport links with Mahon. The National Council for Special Education information map also records that there are dedicated special classes for students with Autism/Autistic Spectrum Disorders in both primary and post primary schools within the study area.

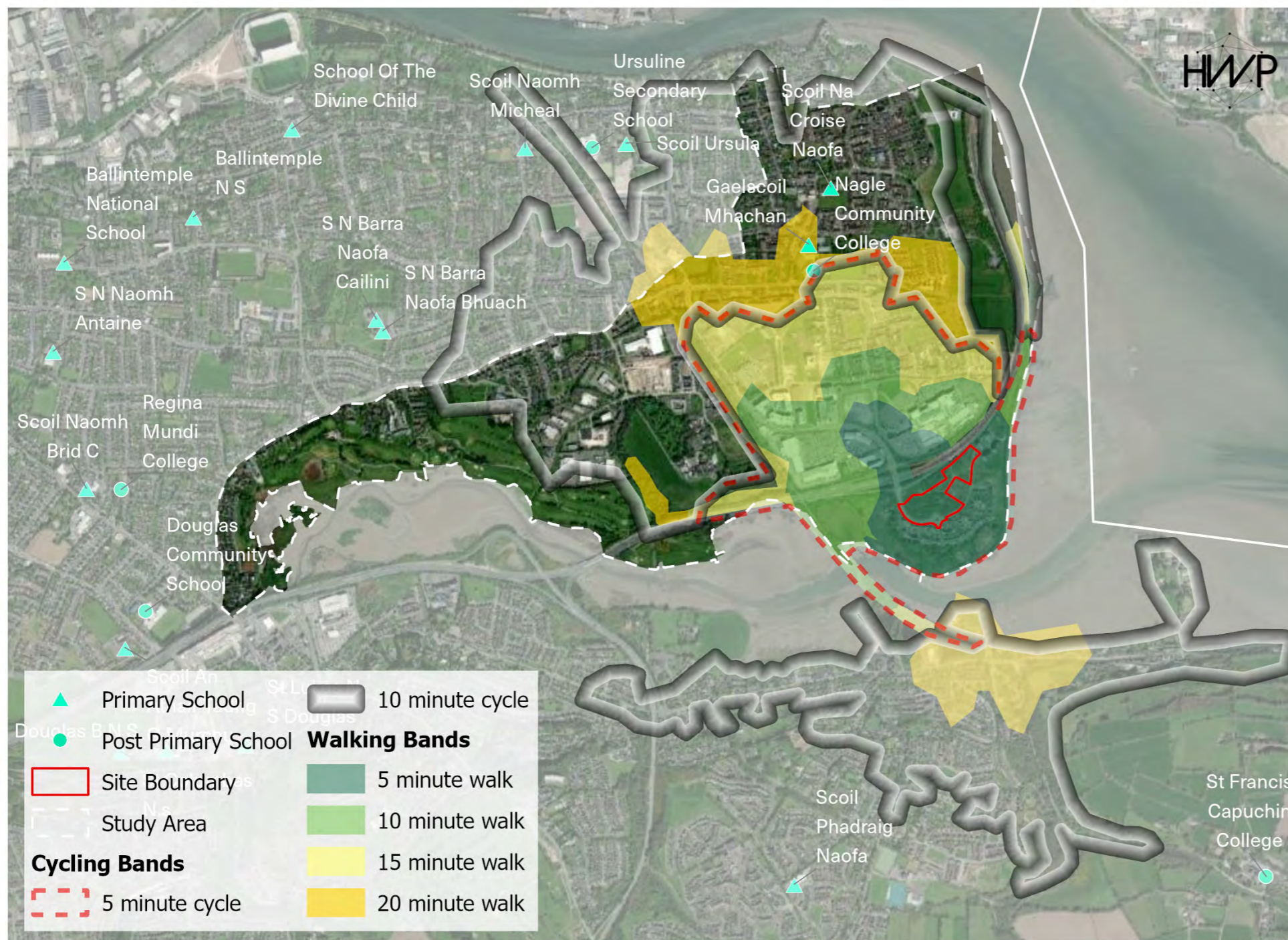


Figure 13.11: Details of Existing Education Facilities in Study Area

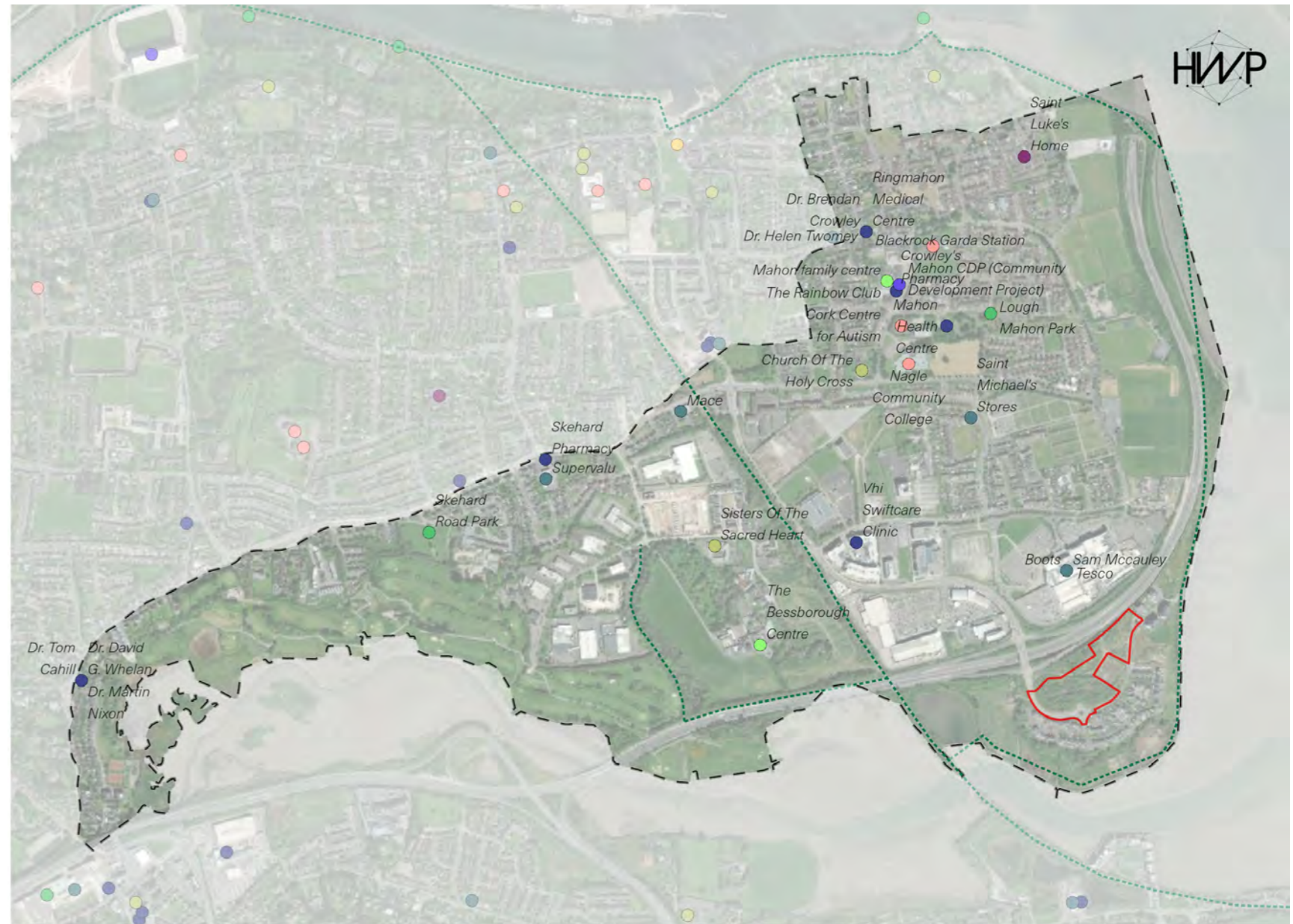
13.3.3.4 Community Facilities & Emergency Services

Mahon is well served by a variety of community support services, as illustrated in Table 13.10. These services are primarily clustered within and around the several zoned neighbourhood centres, and district centre within the study area.

Category of Service/Facility	Count
Community Help	2
Garda	1
Get Active/Wellbeing	2
Health Services	12
Income/Social Support	2
Older People Support	1
Retail	4
Spiritual/Religious	2
<b>Total</b>	<b>26</b>

Table 13.10: Summary of Community Support Services in Study Area

Given Mahon's location, and excellent connectivity with Cork City centre, its local population is particularly well-served by essential community facilities and emergency services.



- Community Support Services and Facilities**
- Business Support
  - Health Services
  - Spiritual/Religious
  - Community Help
  - Housing/Accommodation
  - Transport
  - Council Services
  - Legal Support
  - Wellbeing
  - English Language/Translation Support
  - Migrant Support
  - Greenway
  - Family & Income Support
  - Older People Support
  - Site Boundary
  - Food Distribution
  - Other
  - Study Area
  - Gardai
  - Schools & Education
  - Shopping

Figure 13.12: Details of Existing Community Facilities in Study Area



### 13.3.3.5 Retail

Reflecting its status as a District Centre, Mahon is served exceptionally well served by retail services. The largest contributor to this being Mahon Point Shopping Centre, which comprises over 60 retail units including retailers such as Tesco, Zara, Rituals, Boots, Specsavers, and Lifestyle Sports. The nearby Mahon Point Retail Park also houses several well-known retailers and automotive dealers (B&Q, EZ Living Interiors, Home Focus, Currys, Halfords, Homestore and More, and Johnson and Perrot Car dealers).

Multiple local convenience stores are also located throughout the neighbourhood, namely Scally's Supervalu, Mace, Aldi, and St. Michael's stores. The majority of the study area is within a 5-to-10 minute walk of same. Figure 13.13 offers an overview of the retail services within the study area. For context, 5, 10, and 15 minute cycle time isochrones have been shown which confirm how well connected the study area is to the many retail outlet centres in the study area.

Alongside this 595m<sup>2</sup> of retail space has been permitted in the adjacent neighbourhood centre site (ABP-301991-18 as amended by ABP-310378-21), which will provide convenient access to a range of retail services to the future residents and employees of the proposed development.



Figure 13.13: Details of Existing Retail Facilities in Study Area

### 13.3.3.6 Healthcare

A range of health services exist within the study area, which are detailed in Table 13.11. The Mahon Health Centre (a Primary Care Centre) located towards the heart of the neighbourhood, offers a wide range of health and social care services to the local community. Several General Practitioners are operating within Mahon, alongside four pharmacies as shown in Figure 13.11.

Type of Health Service	Count
General Practitioners	7
Health Centre	1
Pharmacy	4
<b>Grand Total</b>	<b>12</b>

Table 13.11: Summary of Health Services in Study Area



Figure 13.14: Details of Existing Health Facilities in Study Area

13.3.3.7 Public Transport

Mahon is currently well served by a number of existing public transport services. Table 13.12 and Figure 13.15 show the several existing bus routes within the study area. The area is also earmarked for significant future transport investment as per the Cork Metropolitan Area Transport Strategy (CMATS), which includes a longer-term objective for a Light Rail Transit (LRT) along the Passage West Greenway, travelling between Mahon and Ballincollig, via the city centre.

Route ID	Route Name	Weekday Midday Frequency
202	Hollyhill to Mahon Point	20 minute combined peaktime frequency of c. 15 minutes)
202A	OL Hollyhill to Mahon Point	
212	Kent Station to Mahon Point	60 minute
215	Jacobs Island to Cloghroe	30 minute (combined peaktime frequency of c. 15 minutes)
215A	Jacobs Island to Churchyard Lane	
219	CIT to City Gate	60 minute

Table 13.12: Summary of Existing Public Transport Services in Study Area

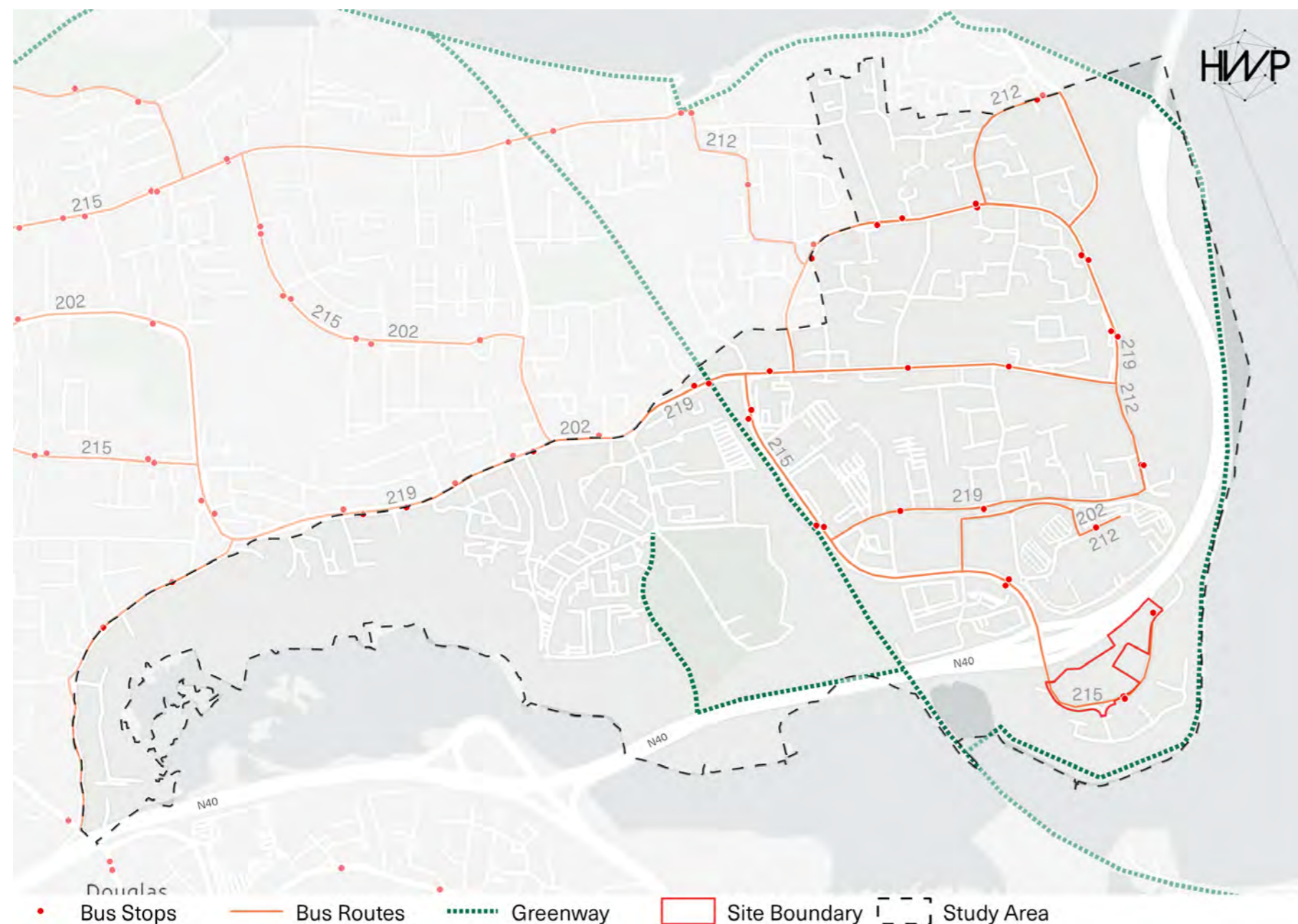


Figure 13.15: Existing Public Transport provision in Mahon

In advance of this, the Draft New Network published by BusConnects includes Core Route 1 from Ballincollig to Mahon Point at a 10 minutes frequency. Core Route 9 which runs from Jacobs Island to the city centre via Ballinlough at a 20 minutes frequency, Route 11 which runs between Mahon and Farranree at a 30 minutes frequency, Route 14 between Mahon and Cork University Hospital, at a frequency of 30 minutes and a new route, Route 20 is proposed which will connect Bessborough with Cork Bus Station at a 60 minutes frequency. Table 13.13 show proposed public transport services as per CMATS and BusConnects Cork.

Route ID	Route Name	Weekday Midday Frequency
1	Ballincollig to Mahon Point	10 minute
9	Jacobs Island to Kent Station	20 minute
11	Mahon Point to Farranree	30 minute
14	CUH to Little Island	30 minute
20	Bessboro to Cork Bus Station	60 minute

Table 13.13: Summary of Proposed Public Transport Services in Study Area

These network coverage improvements will be provided in tandem with higher frequency routes and additional services on weekends throughout the neighbourhood. The recently published BusConnects Cork – Sustainable Transport Corridors Report 2022<sup>7</sup>, identifies 12 no. Core Bus Corridors (CBCs) that will support the efficient running of the bus services in the City. They will also include the provision for bus priority and safe cycle and pedestrian facilities Network. CBC J is proposed to serve the wider Mahon area, travelling along Skehard Road, Ringmahon road and the Mahon Link Road to serve Mahon Point and Jacobs Island.

### 13.4 IMPACT ASSESSMENT

#### 13.4.1 DO NOTHING SCENARIO

In the 'do nothing' scenario, the subject lands will remain undeveloped. If the proposed development of 489 no. apartment units does not proceed the population of Mahon and the wider city will continue to be adversely impacted due to housing shortages. It will result in the continuation of the recent trend of underperformance of the Study Area in terms of population growth. With a growth rate of 2.7% in the last intercensal period, this designated 'Strategic Growth' area experienced lower growth than the city as a whole, contrary to national and regional policies of co-locating employment, public transport and population growth. Alongside this, the proposed 4,112.4 m<sup>2</sup> of proposed office floor space will not be developed, and will not contribute towards the future, clustered expansion of the strategic employment hub of South Mahon, which would enhance its attractiveness as a place to work and live. The local community facilities will not be enhanced by the delivery of a 381m<sup>2</sup> creche, which could increase the childcare provision of the area by up to 53 no places.

<sup>7</sup> <https://busconnects.ie/busconnects-cork/>

Similarly, in the 'do nothing' scenario, the lands will remain inaccessible for public recreational use. The key urban design consideration of the masterplan for this area was to position the blocks around a central public open space providing key linkages throughout Jacob's Island which will encourage sustainable modes of travel. It is proposed to have further pockets of functional space dispersed throughout the application site to provide strong connections to the surrounding green infrastructure. In the 'do nothing' scenario this enhanced connectivity, with the knock-on impact on the sustainability of the travel patterns of the existing Jacob's Island residents will not be realised and the lands will remain publicly inaccessible and underutilised. Neither would the proposed development's aim to respond to the existing environment be realised, and proposes active street frontage along the internal access road where it currently lacks passive surveillance, would not be progressed.

The potential public health benefits, which would arise from the development delivering pedestrian/cyclist connections through the application site along anticipated desire lines, connecting future and existing residents with the Passage Greenway and the urban amenities of Mahon, who not ensue. The proposed enhancement of public facilities and amenities in the form of public open space would also not materialise. Notwithstanding the above, in this scenario there will be no additional impacts on population and human health factors.

### 13.4.2 IMPACTS ON EXISTING POPULATION AND HUMAN HEALTH

#### 13.4.2.1 Construction Phase

The proposed development will be constructed on a phased basis and on a block-by-block basis from north-east to south-west. The construction period of the various blocks ranges from 18 – 36 months, and it is envisaged that there will be overlapping of phases. It is estimated that first occupation on the site will be 2025. The construction methods employed and the hours of construction proposed will be designed to minimise potential impacts on nearby residents. Construction of the proposed development will be implemented in accordance with the Construction and Environmental Management Plan (CEMP) prepared by MMOS Consulting Civil & Structural Engineers, which is included in Appendix 2-1 of this EIAR. This document describes a suite of mitigation measures to be strictly implemented and monitored during the construction phase of the development.

It is expected that the number of workers on site will vary across the different construction phases from a minimum of 20 during basement excavation to 60-70 construction workers during internal Mechanical and Electrical (M&E) installation. It is envisaged that construction workers will travel from their existing residence rather than taking temporary accommodation in the local area. Typically, the trips will be via private cars or vans at a ratio of 1-2 workers per vehicles, with some sub-contractors utilising minibus transport. Some workers will also avail of public transport to the site. Impacts are likely to be associated with construction traffic and possible nuisances associated with construction access requirements.

Road Closures may be required for a short period to enable the 4 no. tower cranes to be transported to/from site. The impacts on the local road users will be temporary, short-term, limited in extent for this stage of the works. The CEMP sets out that any works on public roads outside the site will be undertaken in agreement with the City Council and all relevant stakeholders will be kept informed of any such works. The CEMP sets out that a Construction Stage Traffic Management Plan will be submitted to the Planning Authority in advance of the works. Notwithstanding the above, the CEMP notes that heavy goods vehicle (HGV) truck movements into and out of the site are expected to peak during the basement excavation works and large concrete pours. Therefore, HGV traffic is expected to be greater at the initial

stage of development and to reduce as the construction of the buildings advance.

The CEMP (Appendix 2.1 refer) estimates that HGVs movements will average 30 no. trips across the construction programme. These trips are expected to peak during the semi-basement and lower ground excavation works and large concrete pours, when an estimated 50 no. HGV movements are predicted daily. Note that the excavated material will be relocated internal within the site and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period

It is anticipated that this traffic will be minimised during peak hours on the local road network to reduce the impact on the road network during the morning and evening peak. It is considered that construction workers will generally travel to site prior to the peak time in light of the 07.30 working hours start time. Appropriate measures will be put in place to ensure sufficient on-site employee and visitor parking is provided to prevent overflow onto the local road network during the construction phase. Wheel cleaning facilities will be provided to reduce the tracking of mud and dirt onto local roads. Measures will also be implemented on-site to monitor and control construction traffic during construction works. The assessment also notes that any specific recommendations of the Planning Authority with regard to construction traffic will be adhered to. With appropriate mitigation is implemented Chapter 5 considers that the potential impacts in respect of traffic during the construction phase will be negative, not significant and short-term in duration.

Chapter 4 of this EIAR (Townscape and Visual Impact) prepared by AECOM Ireland Limited, considers that the construction phase of the proposed development will result in the following townscape and visual effects:

- Potential effects to townscape character or visual amenity within the locality or the wider study area as a result of the visibility of construction activities such the construction of buildings, associated scaffolding, and machinery including cranes.
- Effects of temporary site infrastructure such as site traffic and construction compounds especially those located in areas adjacent to sensitive townscape and visual receptors.
- Potential physical effects arising from construction of the development and in particular on the townscape resource within the site area.

It concludes that these effects will be temporary - short-term, with principal views of construction works predominantly confined within a radius of approximately up to 350m from the site boundary. While these effects will be experienced 'locally from the adjacent road network and local residents. The sensitivity of the views is generally considered Low for road users and High for residential receptors. Areas experiencing the most prominent construction effects will be residents of Jacob's Island and the N40/R852 road users where open views of the site will be possible'. Within 350m of the site the magnitude of visual effects is considered medium to high in close distance views. Their significance / quality is considered moderate-significant / adverse. Section 2.3 of the CEMP notes that 2.4m high decorative site hoarding will be erected on the public street to minimise the visual impact of the construction works in the immediate vicinity.

Beyond 350m of the site Chapter 4 determines that effects are most likely to be associated with the visibility of construction traffic, with visibility of construction works being limited to the upper sections of the building construction including cranes. It is likely these will be visible from south of the River Douglas/Lough Mahon, as well as from the local road network.

The construction stage impacts on landscape/townscape character are considered 'short-term', within an urban fabric where the construction of multi-storey buildings has been long established. The magnitude of construction stage landscape/townscape impacts is deemed to be moderate – significant within 350m of the site. However, the presence of considerable existing vegetation, will help to partially screen and integrate the proposed works.

Chapter 6 of the EIAR, prepared by MMOS Consulting and Structural Engineers refers to potential impacts on human health relating to the implementation of services, infrastructure and utilities. Potential adverse impacts could arise due to local pollution of surface and foul water from spills of spoil/fuel/hazardous materials during the excavation phase. Measures set out to address these include the regular cleaning of surrounding roads to remove any spilt spoil, the storage of all hazardous materials within secondary containment, the use of temporary bunds for oil/diesel storage tanks and safe material handling of all potentially hazardous materials to be emphasised to all construction personnel. Chapter 6 anticipates the impacts will be moderate with the employment of the recommended remedial and ameliorative measures.

There is potential for brief, temporary disruptions of existing local water services to occur during the construction phase due to installation of new watermains and connection works from the proposed development to existing local services. Chapter 6 considers the construction impact on existing electricity and telecommunications infrastructure resulting from the proposed development will be neutral, imperceptible and temporary. The construction of below ground services for natural gas infrastructure may result in a temporary, moderate negative impact if appropriate measures are not implemented to prevent localised pollution during the works.

Regarding human health effects, Chapter 7 Land and Soils, prepared by MMOS Consulting notes that on-site stockpiling of topsoil and suitable excavated material for later re-use is a potential source of dust pollution to both construction workers and local residents. Chapter 7 recommends the protection of these stockpiles to obviate this risk. Similarly, appropriate environmental measures are to be implemented to ensure materials being transported off-site are subject to appropriate licensing and do not become a source of pollution.

Both Chapter 7 and Chapter 8 Hydrology and Hydrogeology, prepared by Sweco note potential sources of water pollution as suspended solids arising from excavation, stockpiles, plant and wheel washing and mud build-up on roads. Human health risks are also associated with the risk of leakage and accidental spillage from construction machinery and materials at the site. Oil and hydrocarbons, concrete and cement products are noted as potential sources of contaminated run-off, with the latter also a potential source of dust nuisance. However, with the proposed site design and mitigation measures outlined in EIAR Chapters 7 and 8 and the CEMP, it is predicted that the potential for surface water contamination from excavation activities, accidental spillage, concrete wash water and waste are considered to be brief duration, neutral and not significance.

Alongside this Chapter 8 notes that some of the excavations will include 'Made' ground, which may include unknown sources of materials, however, there was no evidence of contaminated ground in investigations undertaken in 1999. Overall Chapter 8 considers the potential risk to human health in terms of water and hydrology are expected to be of low significance.

Chapter 10 of this EIAR prepared by AWN Consulting assesses the potential impacts of noise and vibration during construction phase and predicts that the main source of noise and vibration will be due to the use of heavy plant and machinery, ground works excavators and HGV movements to, from and around the site. In the absence of appropriate measures it is predicted that noise impacts of the construction phase will be short-term negative and ranging from

not significant to very significant depending on the distance of the receptor from the construction site. However, best practice measures will be adopted, including: selection of quiet plant, enclosures and screens around noise sources, location of plant away from sensitive receptors. These measures in addition to limiting the hours of work, the application of binding noise limits, and noise and vibration monitoring, will ensure the noise effects are reduced. Additional construction traffic will not result in a significant noise effect. Vibration impacts are considered to be temporary, negative and not significant.

Chapters 11 of this EIAR, also prepared by AWN Consulting, assesses the potential impacts on air quality and climate during the construction stage of the project. In the absence of appropriate measures, the Construction Phase could potentially have a short-term, slight negative impact on human health in nearby sensitive receptors as a result of construction dust emissions through the release of PM<sub>10</sub> and PM<sub>2.5</sub> emissions. However, Chapter 11 includes a Dust Management Plan the implementation of which will pro-actively control fugitive dust to prevent significant emissions (ref CEMP and Appendix 11.2).

There is also potential for traffic emissions to impact air quality, which can affect human health, in the short-term during the construction phase, particularly due to the increased number of HGV's accessing the site. However, the review in Chapter 11 determines that the construction stage traffic will have an imperceptible, neutral, localised and short-term impact on air quality.

Chapter 11 also concludes that the potential impact on climate from construction stage site traffic and plant would be imperceptible, neutral and short-term. Potential flood risk arising from climate change has been addressed by the establishment of minimum levels of site protection during construction, with no construction taking place below a certain ground level to reduce the risk of flooding. This alongside adequate attenuation and drainage design will ensure climatic impacts will be imperceptible.

Chapter 12 of this EIAR, prepared by Lane Purcell Archaeology assesses the potential cultural heritage impacts of the project during the construction phase. This is of relevance to this chapter in terms of heritage, recreational and amenity use for the population. As there has been extensive ground disturbance within the subject site since the mid-19<sup>th</sup> Century, it is not anticipated that the proposed development will have any direct impact on any archaeological sites or protected or NIAH listed structures on site. The one existing cultural heritage feature on-site is the cellar of the demolished Lakeland House. This will be preserved in situ with a 10m buffer zone within an area of public amenity space. Following these measures no significant direct or indirect cultural heritage effect is anticipated. A direct imperceptible effect is anticipated in the removal of trace remains of Lakeland House during construction.

#### 13.4.2.2 Operational Phase

Once constructed, the proposed development will be permanent and non-reversible. The proposed development will result in several significant long-term positive impacts for the local population including:

- The proposed development will result in the delivery of 489 no. residential units and assist in addressing the housing shortage in the Mahon area and the wider city and counter-act the recent slow-down in growth in this designated 'Strategic Growth Area'.
- The Core Strategy in the Draft CDP identifies Mahon as an area for growth consolidation and enhancement by providing a mix of new neighbourhood uses in suitable and underutilised locations. The subject site is

such a location, and the proposed mix-use development will contribute towards delivering the Core Strategy objective.

- Section 13.2.2.3 of this chapter notes that although Mahon is a major employment hub with 8,308 local jobs recorded in the 2016 census, only 6.8% of these positions were locally filled, resulting in large commuter in and outflows in the area. In the interest of sustainability, there is a need for a balance between residential and employment uses. The proposed development would contribute towards addressing this imbalance. It will assist in clustering residential growth alongside the strategic employment hub of Mahon, with consequent positive impacts on the current unsustainable commuter in and out flows in the area.
- It will contribute towards the provision of improved local services and amenities in the form of public open space, a creche and 4,112.4 m<sup>2</sup> of office space.
- It will contribute towards the achievement of the critical mass required to support the provision of enhanced public transport services, in particular the proposed Light Rail Transit.
- The arrangement of the blocks around a central public open space will facilitate pedestrian and cyclist connectivity through the site and enhance linkages between employment, residential, recreation and retail destinations throughout Jacob's Island. This will deliver associated public health and safety benefits.
- The non-residential development to the north of the site, will provide a noise buffer to the N40 and thereby improve the conditions of the wider Jacob's Island residential community.
- The proposed central open space with further pockets of functional space dispersed throughout subject site, will be accessible to all existing and future residents of the settlement. At present the subject lands are not accessible to the public.

A number of technical studies have been undertaken, and their results have informed the design to safeguard the residential amenity of the existing and future population in the vicinity of the proposed development. The Wind and Microclimate Study undertaken by B-Fluid Ltd. (Appendix 13-1 refers) notes that the impact of wind has been considered and analysed throughout the design process. Landscaping amelioration measures have been introduced in communal open spaces where potential high wind speeds were identified, with the report predicting that the resulting design will produce a high-quality environment that is attractive and comfortable for pedestrians. Balcony designs are deemed acceptable for seasonal use. The study concludes that the proposed development will not affect or give rise to negative or critical wind speed profiles at the nearby adjacent roads, or nearby buildings.

The application is supported by a Sunlight and Daylight Access Analysis Report prepared by ARC Architectural Consultancy Ltd. (Appendix 13.2 refers). This concludes that the proposed will have no impact on the majority of existing buildings in the vicinity in terms of sunlight access, and where potential impacts are predicted these vary from imperceptible to moderate. Similarly, the impact on the daylight access of the adjacent buildings will predominantly be imperceptible, with predicted impacts ranging from imperceptible to moderate in all other cases. Furthermore, the open space has been designed so that the central park, and courtyards for blocks 12, 13 and part of 15 achieve levels of sunlight in excess of the BRE Guide recommendations. While the courtyards for Blocks 11,14, and part of 15 are unlikely to achieve this level, they have been designed to receive some sunlight throughout the day. ARC's analysis indicates that all the sample rooms assessed within the proposed residential units achieve the average daylight factor recommended in the BRE Guidance.

As detailed in EIAR Chapter 4 (Townscape and Visual), the proposed development itself will give rise to a direct and permanent operational phase townscape effects locally. This is, however, considered to make a positive contribution

to local built environment and present a 'placemaking' opportunity. Indirect medium beneficial changes, of moderate significance are envisaged on the surrounding road network, at a local level. At a city level it represents a medium, beneficial change by contributing to the intensification of land use and adding a new urban scale to the area.

Chapter 4 considers the proposed development combines high-quality design and materials and forms a new urban edge along the N40. Significant visual effects will be experienced in proximity to the site boundary, however existing boundary screen planting will be bolstered to obscure lower portions of the development, with the screening enhancing over time. However, it is considered that the proposed development will introduce a new urban quality to the area and a prominent entry point to Jacob's Island. It is assessed that visual effects will reduce quickly over medium and long distance views, appearing as one component along with several existing built structures visible in the area.

Chapter 5 of this EIAR (Material Assets - Traffic & Transport) assesses the current and future capacity of vehicular junctions in the vicinity of the site. Chapter 5 assesses the subject junctions both with/without development traffic for both AM and PM peak hours. Results are presented starting in 2024 as the opening year, and 2029 and 2039 modelled design years. The proposed development is modelled to give rise to an imperceptible to slight increase to morning peak queuing on the northern and southern interchanges. However, the impact on the evening peak queuing ranges from significant to very significant in the northern interchange and moderate to significant on the southern interchange.

Measures outlined to address these impacts include:

- Undertaking a review in conjunction with the Council of the signal operations of the Mahon Interchange and Retail Park signalised junctions.
- Provision of internal pedestrian and cycling infrastructure to connect to surrounding network
- Provision of a higher rate of cycling parking spaces than required by the standard to encourage the use of cycling as a viable option to car travel.
- A Mobility Management Plan will be prepared to encourage sustainable travel practices for all journeys to and from the site.

The operation phase of the development will result in the increase in generation of effluent and sanitary waste and result in the increase in water demand and service infrastructure. As detailed in Chapter 6 of this EIAR relating to the implementation of material assets, services and utilities, the capacity of the existing surface water network is more than sufficient to cater for full storm discharge from the proposed development. However, following good practice SUDS measures have been included in the design. Similarly, Irish Water have confirmed that the existing water and foul water infrastructure have sufficient capacity to accommodate the proposed development.

Poor construction methods could lead to issues with the performance of the system. Increased volumes outfall/ demand and local blockages could lead to overloading/ undersupply of the system. In such a worse-case scenario the potential impacts on human health from groundwater contamination arising from damaged foul sewers and drains is considered to be temporary and slight.

Chapter 7 - Land and Soil - considers that as the development will be constructed above the local aquifer and on

conventional foundations it is not anticipated that there will be any operational effects.

Chapter 8 – Hydrology and Hydrogeology – concurs with the assessments of Chapters 6 and 7 that the existing connections downstream of surface water and foul water systems have been inspected and taken in charge and the capacity have been reviewed and confirmed to be satisfactory to support the proposed development. Potential effects are rated as neutral for quality, with imperceptible significance if not mitigated against. Any impact would be considered to be of brief duration. In view of the proposed use of the units, it is not expected that significant quantities of hazardous material will be brought on site. The potential risks to human health in terms of water and hydrology are expected to be of low significance. Standard maintenance practice measures during the operation and maintenance phase, involving the monitoring of the drainage system for blockages, leakages and repairing in a timely fashion should be implemented. With these measures in place the potential impact during the operational phase for water and hydrology is reduced to neutral for quality, with imperceptible significance and of momentary duration.

Regarding potential 'Noise and Vibration' impacts on human health during the operational phase of the development, Appendix 10-1 of Chapter 10 of this EIAR determines that the baseline noise environment at this location is dictated by local traffic noise, the N40 dual carriageway located adjacent to the boundary was observed to dominate the measured noise levels. Following initial noise modelling a re-design of the development site layout was undertaken following the principles of Good Acoustic Design. Subsequent noise modelling carried out for the final development design concluded that the majority of habitable rooms within the development achieve a good internal noise environment with standard double glazing. For those facades overlooking the N40 dual carriageway, appropriate glazing and vents have been provided to ensure that when windows are closed and vents open, the internal noise environment achieves the adopted noise design criteria within BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings.

The review of predicted noise levels determines that inhabitants will have access to quiet external areas that are screened from road traffic and other noise sources by the on-site development buildings.

Chapter 10 predicts that once operational, noise associated with building services plant will be negative, imperceptible and permanent. Predicted noise effects from increased small vehicle traffic are considered to be neutral, imperceptible and long term and not considered to give rise to any significant human health considerations.

Negative impacts on air quality or emissions can result in knock on effects for population and human health. However, air dispersion modelling of NO<sub>2</sub> and PM<sub>10</sub> generated through increased vehicular traffic at the development, as detailed in Chapters 11 of this EIAR, has shown that levels of all pollutants remain below the ambient air quality standards set for the protection of human health. It predicts the impact of the operational phase of the development to be long-term, localised, negative and imperceptible.

In terms of climate, the majority of the operational CO<sub>2</sub> emissions arise from the energy usage of the buildings. The CO<sub>2</sub> reduction measures as set out in the Building Lifecycle Report (Appendix 2-2 refers) will minimise the impact of the proposed development by reducing these emissions. The overall magnitude of the changes on climate in the operational stage is predicted to be imperceptible, neutral and long-term. Potential flood risk arising from climate change has been addressed by the establishment of minimum floor levels, alongside adequate attenuation and drainage design to ensure climatic impacts will be imperceptible.

Chapter 12 – Cultural Heritage - of this EIAR, considers that following construction, the remaining cellar from the

previously demolish Lakeland House will remain in situ beneath a green open space to the west of Block 12. However, access to the structure will not be maintained. An information plaque/board will be erected providing information about the cellar and acknowledge its presence in the landscape and its association with the former Lakeland Demesne. Following these measures the cultural heritage operational impacts are considered to be positive.

### 13.4.3 IMPACTS ON LOCAL ECONOMY

#### 13.4.3.1 Construction Phase

The duration of the construction phase is likely to result in moderate temporary positive impacts for the local economy within the study area. Construction workers will likely avail of local retail outlets and restaurants in mornings and lunchtimes in particular. Supplies and materials for proposed construction works may also be supplied locally further resulting in positive impacts on the local economy. The construction phase will provide for construction related employment opportunities.

#### 13.4.3.2 Operational Phase

The proposed development will result in significant permanent positive impacts on the local economy. The 2016 Census confirms that the average household size the study area is approximately 2.82 no. persons per household, slightly higher than the state (2.75) and city average (2.45). The proposed development of 489 no. dwellings translates to an approximate uplift of approximately 1379 no. persons. The projected increase in population of the wider Mahon area is appropriate and will reverse the recent trend of slight underperformance of the Study Area in terms of population growth. With a growth rate of 2.7% in the last intercensal period, this designated 'Strategic Growth' area experienced lower growth than the city as a whole, contrary to national and regional policies of co-locating employment, public transport and population growth. The proposed development will contribute towards countering the massive inward commuter flow into Mahon, where currently 93.2% of the local jobs are held by people who commute into the area, 80% of whom use private transport. In addition, the delivery of 4,143m<sup>2</sup> of office space and a childcare facility will facilitate the natural and clustered expansion of the adjacent Strategic Employment Hub. By creating more homes adjacent to the existing and future jobs that Mahon provides, a more sustainable balance will be achieved, with associated quality of life benefits for the residents and workers of the area.

It is also envisaged that the creation of new homes and more jobs at this location will create additional demand for local retail and service provision, further increasing local employment opportunities.

The proposed development will result in the creation of a sustainable community with a diverse range of uses, consistent with the original mixed-use concept for the site which has been permitted on two previous occasions. The mix has been designed to serve under-catered for aspects of the current housing market and address the current housing shortage in the Metropolitan Cork Area. It should be noted that the average household size in the Mahon area at 2.8 persons per household is significantly above the city and state average and represents the dominance of the traditional, suburban house type in the area. The development will support the recent and proposed expenditure in upgrading the bus infrastructure and will contribute towards the achievement of the critical mass necessary to realise the medium-term future proposals for an LRT in close proximity to the site.

### 13.4.4 IMPACTS ON AMENITY, OPEN SPACE AND SPORTS

#### 13.4.4.1 Construction Phase

The developable area in its current overgrown and neglected form, comprises significant areas of impenetrable scrub and recolonising areas of bare ground, with some evidence of historic dumping and provides limited public amenity. Nonetheless a number of existing informal paths are being utilised by pedestrians as shortcuts through the study area. In addition, Chapter 4 – Landscape and Visual Impact notes that the majority of the proposed site and its immediate environs are designated as 'Urban Sylvan character' which enhances the green rural character of the city landscape.

Chapter 4 considers that there may be a short-term construction impact on the nearby residential receptors with the replacement of the existing site character with construction views. While trees and vegetation will be maintained where appropriate, to mitigate against the loss of scrub and a small area of woodland, substantial planting will be undertaken on the site, with proposals for the extensive planting of new trees within the landscape strategy, complemented by large areas of usable public open space being introduced.

The temporary loss of the pedestrian shortcuts through the site during the construction phase is unavoidable. However, the CEMP sets out that a Construction Stage Traffic Management Plan will be submitted to the Planning Authority in advance of the works. This will ensure that a safe alternative route is provided to accommodate continued pedestrian/cyclist connectivity in the area during the construction phase.

Therefore, the overall construction impact on the landscape is deemed to be of a short-term moderate significance. It is not anticipated that the construction phase of the proposed development will result in any impacts on other existing sports and recreational facilities in the area.

#### 13.4.4.2 Operational Phase

Once operational the projected uplift in resident and working population will result in some short-term slight negative impacts relating to an additional demand for the use of local amenities, open spaces and sports facilities. However, as described previously, Mahon, and the defined study area is already well equipped for such facilities to serve the existing population. Local sports clubs such as St. Michael's GAA Club, Ballinure GAA pitch, Mahon Rugby Grounds, and Ringmahon Rangers AFC will likely benefit from increased volunteer numbers and participation rates resulting in increased membership and financial/social benefits. Mahon's current location on the high frequency bus network and pedestrian and cyclist greenway to Cork City Centre, and its potential future position on the LRT network, will result that the future residents of the scheme being in a position to avail of amenity and sport facilities in adjacent neighbourhood of Blackrock and Cork City.

Once operational, the subject lands, which are largely currently inaccessible to the public, will be readily accessible, resulting in the existing and future residents of Ballinure and Mahon having convenient linkages between the Mahon District Centre and the Joe McHugh Park and the wider River Lee/Lough Mahon Waterfront Greenway. The proposed central public open space will provide key linkages throughout Jacob's Island, reflecting the current informal desire lines through the site, the formal development of which will encourage greater use of sustainable modes of travel.

In addition to new linkages, the proposed development provides for a range of public open spaces and amenity areas which will not only cater for the future residents of the proposed development but also the existing residents of Mahon and Cork City. In addition to the central public open space, the proposed development provides for several other smaller open space areas, which in combination will positively contribute to the long-term public and amenity space provision in Mahon.

Regarding visual amenities, as referenced previously the most notable operational phase landscape/townscape impact of the proposed development will be experienced in open and partial views within 200-400m from the development site. The presence of adjacent treelines will soften the vertical scale. Once the screen planting matures the visual setting of the development will improve incrementally over time.

Longer distance views experienced by pedestrians and cyclists from the Passage West Greenway and the wider River Lee/Lough Mahon Waterfront Greenway will also recognize the proposed development as a new high quality design element acting as an entry point to the overall Jacob's Island development and as an urban quarter in panoramic views.

### 13.4.5 IMPACTS ON CHILDCARE AND EDUCATION

#### 13.4.5.1 Construction Phase

It is considered that the proposed development will result in no significant impacts on childcare or education facilities/services in the area during the construction phase. In the absence of appropriate mitigation measures during construction some slight negative short-term impacts relating to noise, vibration, dust emissions and increased traffic levels may occur to the permitted creche (ABP 301991-18) should it be constructed and operational prior to the construction phase on the subject site. However, it is concluded that the impacts of proposed construction phase will be neutral and will not negatively impact the operations of any childcare/education facility, subject to the specified mitigation measures as described in the CEMP (Appendix 2-1) being implemented.

#### 13.4.5.2 Operational Phase

##### Childcare

Section 13.3.3.2 of this EIAR notes that there are 7 no. existing childcare facilities within the study area, with an overall capacity of 462 no places and an estimated vacancy level of 163 child places based on the most recent Tusla reports. Three of these facilities are within 1.5km distance of the subject site. In addition, we note that a 392 m<sup>2</sup> childcare facility has been permitted in the adjoining site (ABP-301991-18) and an additional 60 childcare places are included in 2 no. SHD applications, within the lands of the former Bessborough Demesne (application ref ABP-313206-22, ABP-313216-22) which are currently under consideration by An Bord Pleanála.

The proposed development consists of the construction of 489 no. residential units comprising

- 327 no. 2 bedroom apartments (67%),
- 161 no. 1 bedroom apartments (33%),
- 1 no. 1 bedroom studio apartment (0.2%).



It is envisaged that the primary market for the proposed apartments in Jacob's Island will be individuals working in the Mahon District Centre and Cork City Centre. As there are no 3 no. bedroom units allocated within the scheme, we do not envisage that it will be attractive to larger families and as a result, it is not expected that the demand for childcare on Jacob's Island will be comparable to an average suburban residential development.

It is noted that Section 4.7 of the 2020 Apartment Guidelines states that:

*One-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms.*

Should the two-bedroom units be considered in full in the childcare demand calculations this quantum triggers a requirement for 80 child care places<sup>8</sup>. Having regard to the age profile of adjacent CSO SA in Jacob's Island and the envisaged primary market for the units, it is considered that the proposed creche providing 53 no. place childcare places will meet the needs of future residents. This reduction in childcare spaces is considered to be appropriate given the decrease in the national birth rate between 2018 and 2020 of 8%<sup>9</sup>. The quantum is also considered appropriate having regard to the fact that the subject site is within walking distance of three existing childcare facilities, another yet to be constructed creche, granted under application ABP-301991-18 and two further facilities, whose application are currently being considered by ABP.

The creche, is located centrally within the land parcel, while readily accessible from the access road, is also accessible from the pedestrian and cycle paths through the site.

Consultation with the Cork City Childcare Committee indicated that childcare facilities should be developed in the first phase of any multi-phase development, to prevent the scenario whereby facilities permitted in later phases remain unbuilt. Each phase of the proposed development includes a self-contained creche to address this issue. The Committee's request that provision be made for full day care, part time and sessional care for ages birth to 2 years, is a creche management issue and outside the remit of the subject application. Overall, it is considered that the creche will result in a positive long-term impact, as the proposed creche will not only cater for the childcare needs of the proposed development but also the wider neighbourhood of Mahon.

**Schools**

Of the proposed 489 no. units, as with creche demand, the 1 bedroom units are unlikely to generate much demand for school places, similarly this applies in part to the 2 bedroom units. We have taken a precautionary approach in relation to the latter and considered school provision for 75% of the 2 bedroom units, equating to 245 units.

It should also be noted that it generally takes multiple years for residential developments to become established and that the development is likely to initially be occupied by younger couples, young professionals and empty nesters. Due to this, it is envisaged that demand initially will be primarily for childcare services and as the development becomes more established, demand for primary and secondary will increase.

<sup>8</sup> In line with Appendix 2 of the Childcare Facilities Guidelines  
<sup>9</sup> Based on CSO information provided by Cork Childcare Committee

However, for the purposes of this assessment, the 'worst case scenario' has been assessed. According to 2016 Census figures, approximately 11.7% of the resident population of the study area are of primary school age (between 5 – 12 years old) with 6.7% of the population of secondary school age (between 13 – 17 years old).

Given the average household size in the study area is approximately 2.8 persons per household, the population uplift generated from the proposed development of 489 no. units would be c. 1379 no. people. Therefore, it is estimated that the proposed development would result in an additional c. 161 no. children (11.7%) of primary school age in the 'worst case' scenario. If 245 no. units only are considered, which are identified above as likely to generate demand for school places then an uplift of c. 81 no children of primary school is anticipated. Therefore, the likely range is a demand for 81 – 161 primary school places.

The 2016 census figures confirm that approximately 6.7% of the study areas resident population is of secondary school age (13-17 years). This indicates that the proposed development would result in an additional c. 92 no. children of secondary school age in future years in the 'worst-case scenario'. Again, if the more realistic 245 no. units only are considered, which are identified above as likely to generate demand for school places then an uplift of c. 46 no children of secondary school is anticipated. Therefore, the likely range is a demand for 46 – 92 secondary school places.

2016 Census Reference	No. of Persons in Private Households	Average Household Size	% of population of Primary School Age (4-12 years)	% of population of Post-Primary School Age (13-17 years)
Mahon Neighbourhood	6,421	2.8 persons per household	11.7%	6.7%

*Table 13.9: Summary of 'School Going' Population of Study Area (Source: 2016 Census - based on AIRO Neighbourhood Area Study in Support of the Draft City Development Plan 2022 - 2028)*

Projections from the Department of Education and Skills estimate that enrolment levels in schools will decrease in the coming years, initially in primary schools and subsequently in post-primary schools. This is supported by the CSO figures indicating a decrease in the national birth rate between 2018 and 2020 of 8%<sup>10</sup>. While the unanticipated number of Ukrainian pupils enrolled in Irish schools reached c. 6,000 by May 2022, this represents less than 5% of the projected decline in combined primary and secondary school enrolment anticipated between 2018 and 2036.<sup>11</sup>

The Department of Education published the 'Projections of Full-Time Enrolment Primary and Second Level 2018-2036' (2018) which outlines various scenarios of future intake for both primary and post-primary schools. The report estimates that primary school enrolment peaked in 2018 and a continuous decline in new enrolments is expected until 2036.

<sup>10</sup> Based on CSO information provided by Cork Childcare Committee  
<sup>11</sup> Based on a combined M1F1 projection of a c. 125,000 decline in student enrolments 2018 - 2026

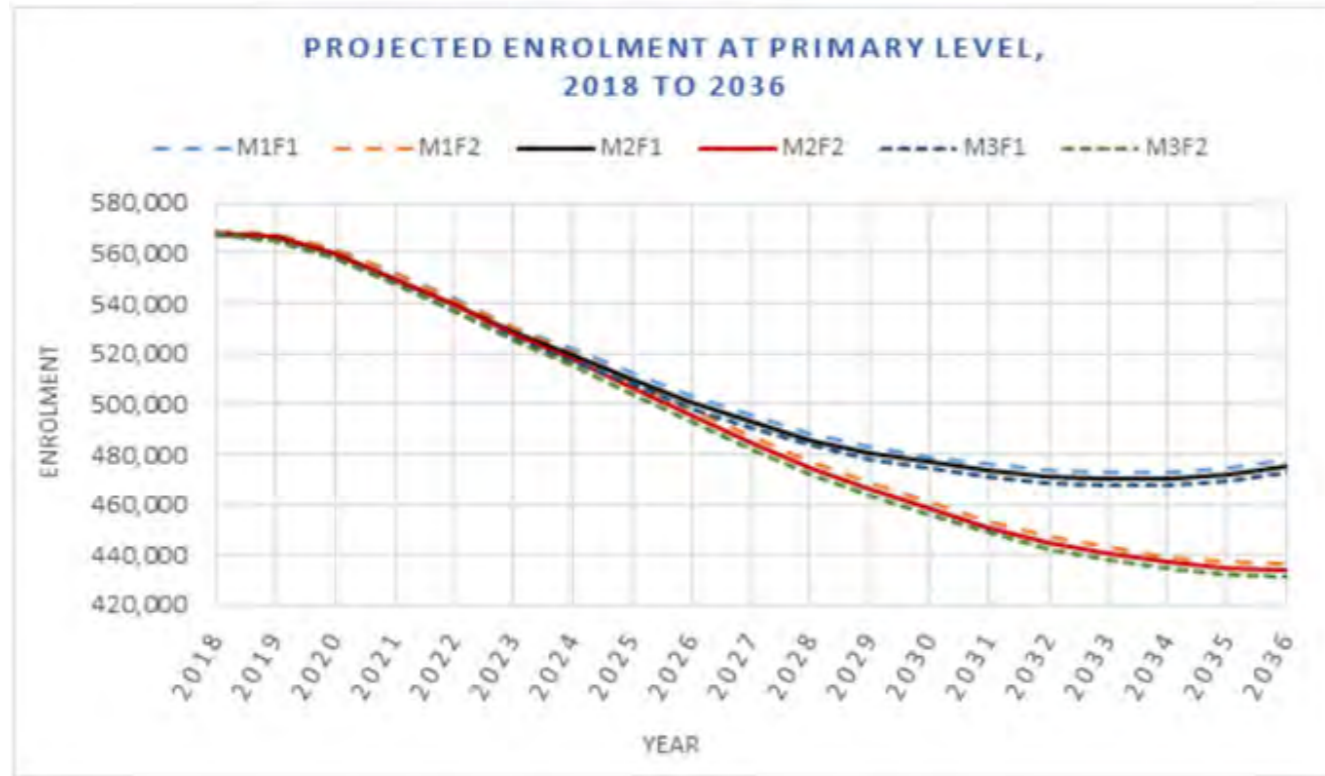


Figure 13.16: Projections of Enrolment at Primary Level, 2018–2036 (Source: Projections of Full-Time Enrolment Primary and Second Level 2018-2036 - Department of Education and Skills)

Post-primary school enrolment is not envisaged to peak until 2024/2025. Similar to trends for primary schools, a continuous decline in post primary enrolment is then expected until 2036.

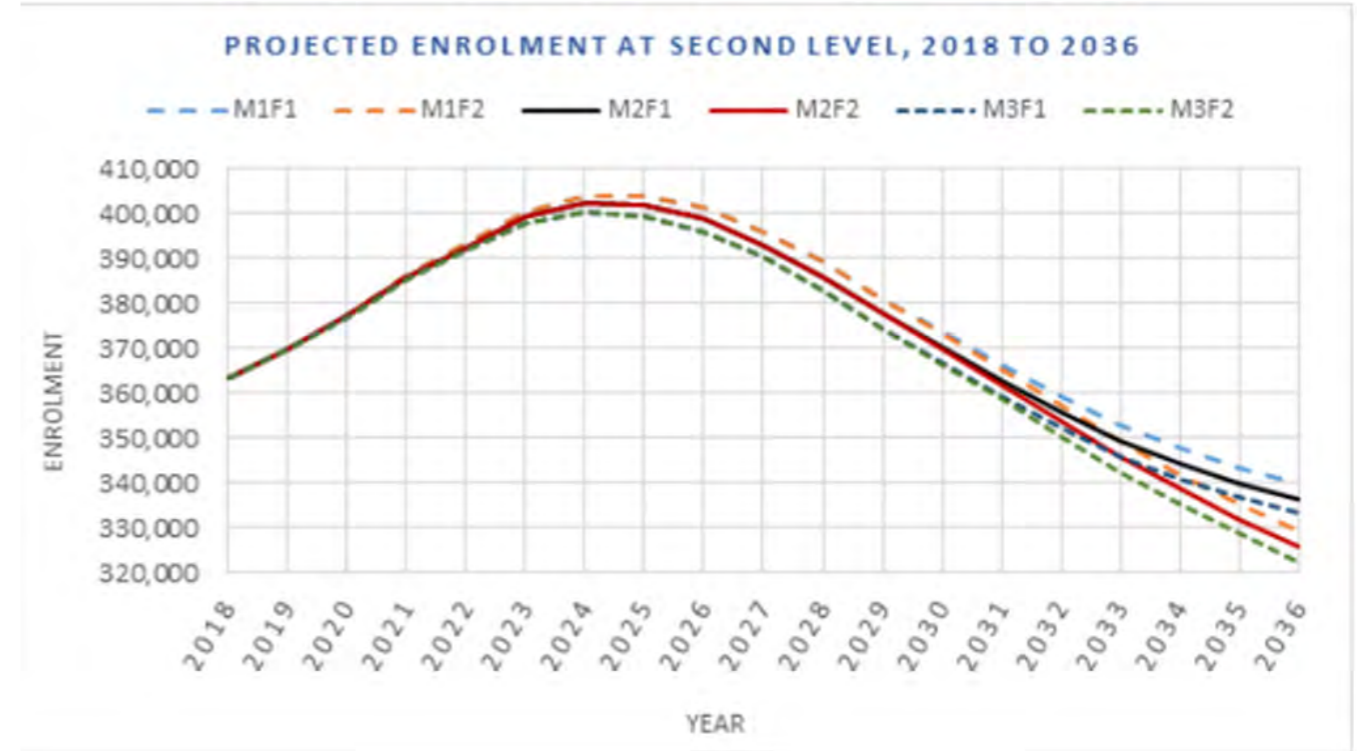


Figure 13.17: Projections of Enrolment at Second Level, 2018–2036 (Source: Projections of Full-Time Enrolment Primary and Second Level 2018-2036 - Department of Education and Skills)

Given the projected fall in both primary and secondary school enrolments in the coming years and the factors described relating to the proposed housing mix, it is considered likely, that the demand for school places will be less than the 'worst-case' scenario outlined above.

The Department of Education and Skills, 'Forward Planning' section has previously been approached in relation to obtaining local school's spare capacity data. To-date the Department has not been in a position to provide current schools capacity information.

Having regard to Figure 13.11, which indicates there is both a primary and secondary school within 20 minutes walks of the subject site, and the wider network of existing schools in the area, with 4 no. primary schools and 2 no secondary schools within approximately a 10 minute cycle of the subject site, it is considered that there will be sufficient capacity locally to cater for future demand arising from the proposed development and that the development will result in neutral impacts on local schools and educational facilities.

The proposed development will provide a dedicated pedestrian/cycle route from the proposed development to the wider River Lee/Lough Mahon Waterfront Greenway, and connect directly with the Passage West Greenway, providing safe, segregated pedestrian and cycling access to a range of schools. In addition, the subject site has easy pedestrian and public transport access to a wide number of schools off Skehard Road and in the neighbouring Blackrock area.

### 13.4.6 IMPACTS ON COMMUNITY FACILITIES

#### 13.4.6.1 Construction Phase

Due to the distance between the subject site and the majority of the nearest community facilities it is expected that any impacts during construction phase will be imperceptible. However, due to its proximity some slight negative short-term impacts relating to noise, vibration, dust emissions and increased traffic levels may occur at the permitted adjacent creche (ABP 301991-18) should it be constructed and operational prior to the construction phase on the subject site. It is concluded that the impacts of proposed construction phase will be neutral and will not negatively impact the operations of any community facilities, subject to the specified mitigation measures as described in the CEMP (Appendix 2-1) being implemented.

#### 13.4.6.2 Operational Phase

Once operational the proposed development will likely result in an increased demand for local community services such as the local post office, community centre, churches and banks amongst other similar uses. In addition to the various public open spaces and play areas within the proposed development, provision is made for a creche and a range of communal residents' facilities.

### 13.4.7 IMPACTS ON RETAIL SERVICES

#### 13.4.7.1 Construction Phase

The construction phase of the proposed development is likely to result in moderate short term positive impacts to local retail outlets. Construction workers will likely avail of local retail services for food and refreshments reflecting increased economic and retail activities in the settlement.

#### 13.4.7.2 Operational Phase

Once operational, the residential and working population increase arising from the proposed development will result in significant positive and permanent impacts to the local economy and retail services in Mahon. In addition to supporting the continued successful development of the Mahon District Centre, the proposed uplift in population will assist in achieving a critical population base to support the Skehard Road, Avenue de Rennes and Blackrock Hall retail areas, where it will supporting the continued viability of existing retail outlets and also create further opportunities to diversify the existing retail/commercial environment.

### 13.4.8 IMPACTS ON HEALTH SERVICES

#### 13.4.8.1 Construction Phase

Due to the subject site's lack of immediate proximity to the nearest health outlet/service, it envisaged that the construction phase of the development will result in no significant impacts.

#### 13.4.8.2 Operational Phase

Once operational, the population increase generated by the proposed development will result in increased demand for local healthcare services, particularly in the Mahon Health Centre and other services in the Mahon area. Given the wide variety of medical facilities in the study area and the predicted demographics of the proposed scheme it is considered that the proposed development will result in imperceptible impacts on local health services.

### 13.4.9 IMPACTS ON EMERGENCY SERVICES

#### 13.4.9.1 Construction Phase

There are no emergency services in the site's immediate vicinity. The construction phase will not result in any imperceptible impacts for local emergency services.

#### 13.4.9.2 Operational Phase

As referenced previously, the closest Garda Station to Mahon is at Blackrock and the closest fire station is at Anglesea Street in Cork City. The closest hospitals include the Mater Private in Mahon, St Finbarrs Hospital and South Infirmary Hospital in Cork City. Due to the scale and nature of the proposed development in addition to the availability of emergency services in the area, it is considered that the proposed development will result in imperceptible impacts on emergency service provision.

### 13.4.10 IMPACTS ON PUBLIC TRANSPORT

#### 13.4.10.1 Construction Phase

The site is adjacent to a bus stop which is currently well served by the 215 and 215A existing public transport services (See Table 13.12) at a combined peak time frequency of 15 minutes. The subject site's location is also in close proximity and linked by existing pedestrian infrastructure to the Mahon District Centre, where the 202, 202A and 212 bus routes can be availed of which also have a combined frequency of 15 minutes at peak time. During construction,

the proposed development is likely to result in an uplift in the use of public transport services with an associated moderate short-term positive impact. The increased use of public transport will promote sustainable commuting patterns and positively support public transport services in the area.

13.4.10.2 Operational Phase

Once operational, it is envisaged that the proposed development will likely result in profound positive, permanent impacts in terms of public transport provision. The proposed development will support the continued viability of public transport services in the area, reduce car car-dependent inward commuter flows into Mahon by juxtaposing population and employment centres and promote sustainable modes of transport. In addition, increased population density at this location will support proposal for an LRT in proximity to the site, serving the City Centre. Future residents of the scheme will have convenient pedestrian/cyclist access to a high frequency public transport link.

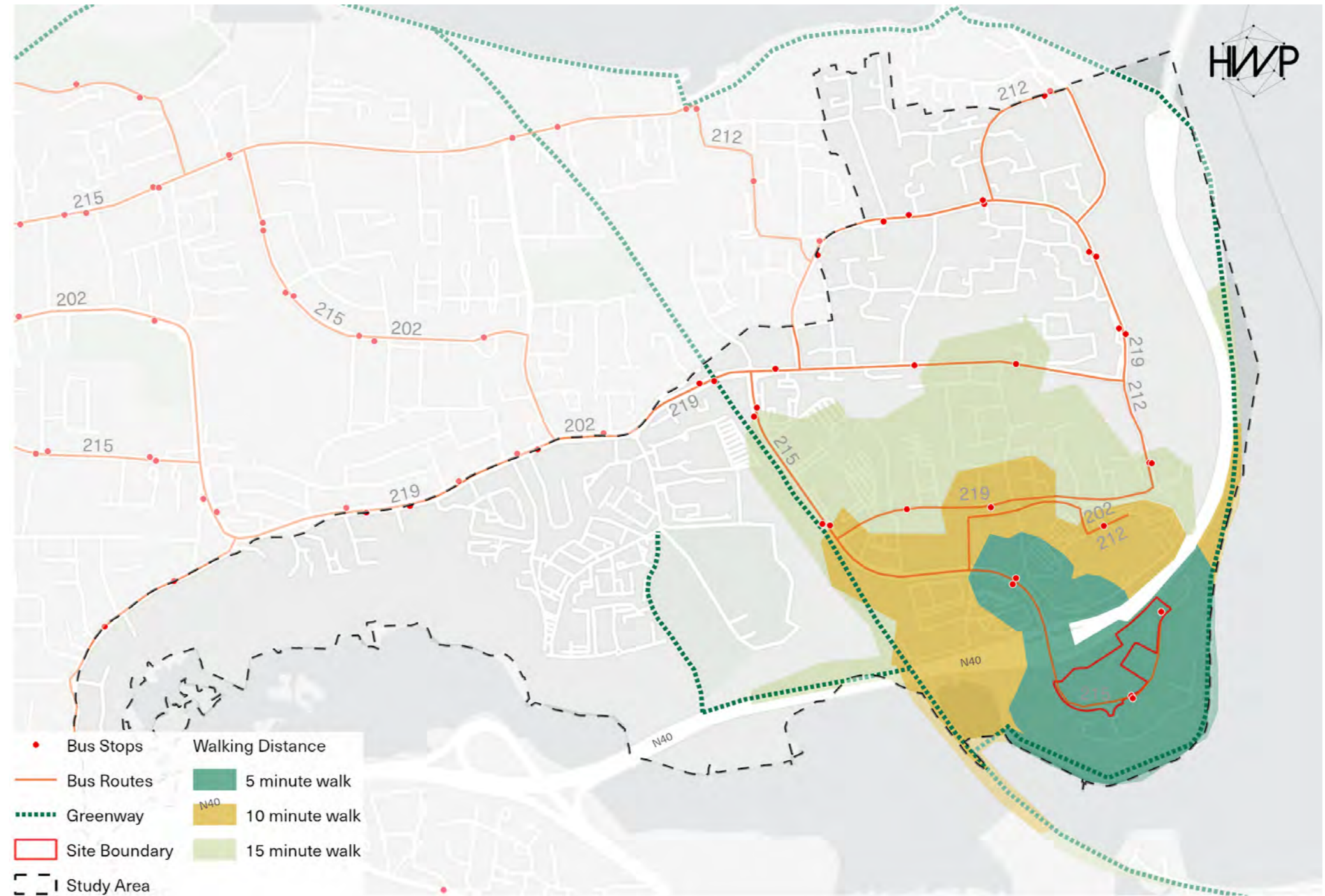


Figure 13.18: 5-10 minute Walking Times from the Subject Lands

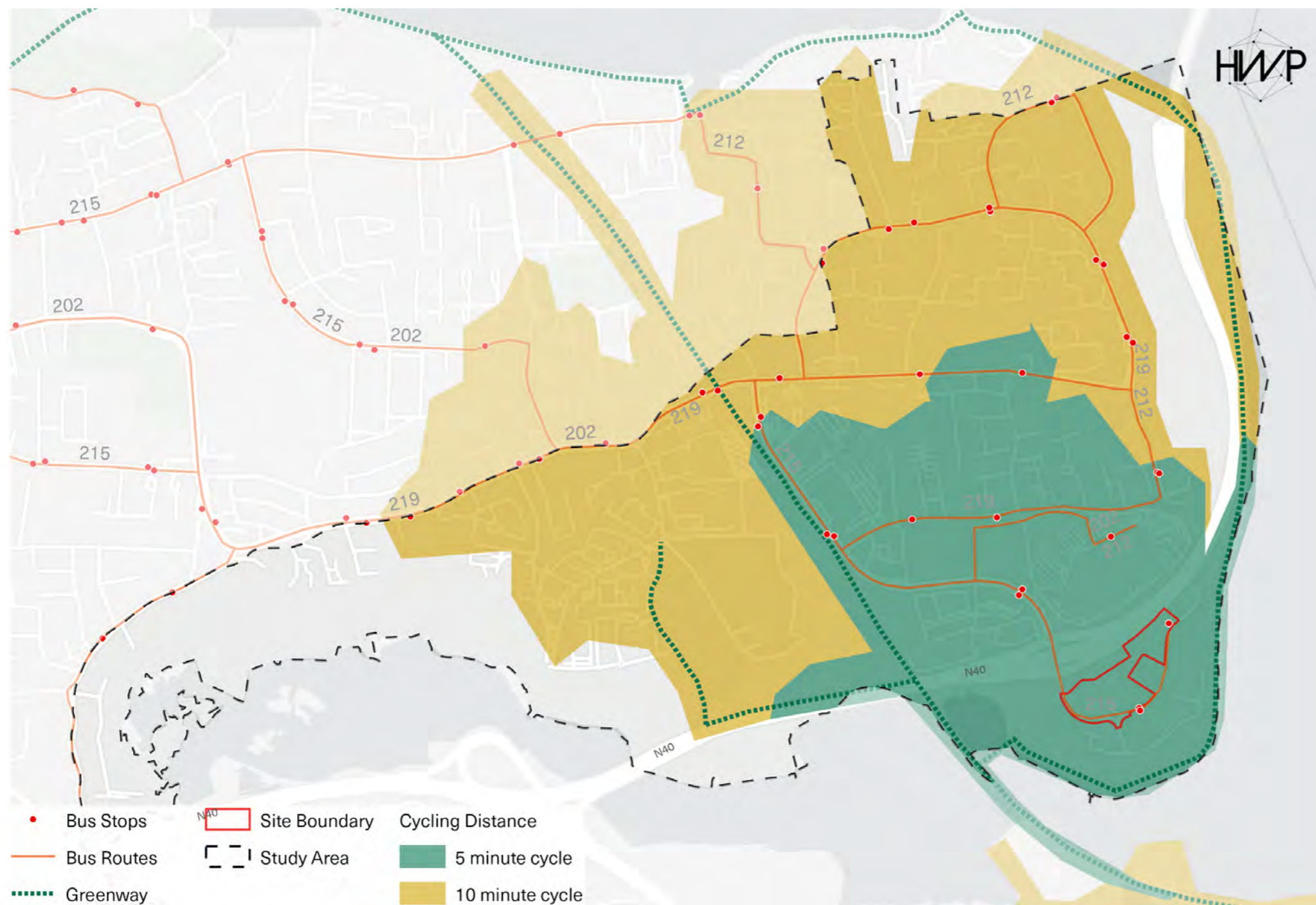


Figure 13.19: 5-10 minute Cycling Times from the Subject Lands

The population uplift generated from the development will result in the creation of a new community who will avail of public transport as a means of commuting to other urban centres such as the City Centre, Blackrock, Douglas and Rochestown.

As evidenced by 2016 census information, Mahon's inward commuter flows are disproportionately car-dependant. The proposed development represents the concentration of growth on an undeveloped site within walking/cycling distance of the Strategic Employment Hub. The public realm upgrades proposed will promote sustainable commuting patterns and reduce car dependency. This will result in significant positive long-term impacts on sustainable modes of travel and public transport.

## 13.5 MITIGATION MEASURES, MONITORING AND RESIDUAL IMPACTS

### 13.5.1 MITIGATION & MONITORING

#### 13.5.1.1 Construction Phase

The potential impacts on the human environment relate to other environmental aspects such as air quality, noise and vibration, water quality and traffic and where required, the related mitigation measures are dealt with in the corresponding chapters of this EIAR. Full details of all mitigation and monitoring procedures during construction phase are described in the CEMP (Appendix 2-1) prepared by MMOS. The CEMP has been specifically designed and will be monitored to ensure that any negative impacts arising from the construction phase of the development on neighbouring properties or surrounding areas are minimised through mitigation measures which include.

- A Dust Minimisation Plan will be implemented. Nearby public roads, the site access and internal hard surfaces will be regularly cleaned and areas with potential to give rise to fugitive dust will be regularly watered when weather conditions require. Environmentally significant raw materials will be stored appropriately, vehicles delivering or removing material with dust potential will be covered, and mesh netting will be erected around the site scaffolding if necessary.
- In relation to the management of potential noise generation, noise levels as set out by the Council will be adhered to. In addition, communication will be established between the contractor/developer, local authority, and residents; with a site representative responsible for matters relating to noise. Selection of plant type and location will be appropriate to the sensitivities and constraints of the site.
- Vibration, typically due to piling and lorry movement on uneven surfaces will be closely monitored and maintained below agreed levels.
- The principles of CIRIA guide C532 Control of Water Pollution from Construction Sites – Guidance for consultants and contractors will be adhered to. The contractor will ensure materials are properly stored and that site activities such as heavy excavation, drainage and foundation works are postponed during adverse weather conditions. The contractor will have regard to the proximity of Lough Mahon Estuary during construction works. A series of trial holes will be undertaken to establish ground water levels. Existing water mains will be identified and protected during works.
- Surface water management techniques will be implemented to prevent potential water pollution in relation to suspended solids, oils and hydrocarbons and concrete and cement products.
- A construction stage traffic management plan will be prepared in advance of works, providing details in relation to construction access, delivery routes and times of delivery.
- Site hoarding and barriers will prevent undue visual impacts and restrict unauthorised access to the each works area.
- A monitoring regime will be put in place to protect neighbours & neighbouring properties with a full and detailed vibration, noise, dust, and groundwater monitoring regime put in place for the duration of the works.

#### 13.5.1.2 Operational Phase

The proposed layout responds to the site's location within the evolving development context of Mahon. The proposed landscape and planting strategy will mitigate the loss of areas of scrub and a small area of woodland, with substantial planting proposed on the site, resulting in a series of enhanced public amenity spaces. The loss of existing informal movement desire lines through the site will be mitigated by their replacement with formal pedestrian/cyclist routes through the site, which will result in significant positive and permanent impacts to pedestrian and cyclist mobility in the wider Mahon neighbourhood.

By promoting the usage of walking, cycling and public transport as a viable means of commuting to nearby District Centre and other employment and education destinations, the proposed development will result in a positive impact on the private car based inward commuter flows into Mahon identified in the 2016 Census. The proposed public open spaces and creche will all significantly positively and permanently contribute to the communal and public facilities in Mahon.

### 13.5.2 RESIDUAL IMPACTS

Residual impacts refer to those impacts that remain following the implementation of mitigation measures. It is considered that subject to the mitigation measures outlined in the CEMP, and EIAR being implemented, the proposed development will result in many positive and permanent residual impacts including.

- The creation of a new community in Ballinure, orientated around a high frequency public transport link which can promote sustainable commuting patterns to nearby urban and employment centres.
- The delivery of a new formalised pedestrian/cyclist linkages between Jacob's Island and Mahon.
- The delivery of a new creche and public amenity areas which will positively contribute to the Mahon neighbourhood's childcare and community facilities.

It is acknowledged that a residual impact of the proposed development will be changes to the townscape character, in terms of intensifying the built-up nature of the townscape. However, Chapter 4 of this EIAR predicts this impact to be Very Significant / Beneficial and will not introduce elements that are uncharacteristic to the existing townscape character.

Similarly, the visual change arising from the proposed development are considered to range from beneficial to neutral in nature depending on the distance from the development. Chapter 4 considers the proposed scheme will add a strong urban edge along the N40 and act as a focal entry point from Mahon to Jacob's Island.

In relation to the impact of the proposed project on Population and Human Health it is considered that the monitoring measures outlined in regard to the other environmental topics such as water, air quality and climate and noise etc. sufficiently address monitoring requirements.

## 13.6 CUMULATIVE IMPACTS

The projects in the area which have been assessed in terms of cumulative effects re outlined in chapter 1 of this EIAR.

### 13.6.1 CONSTRUCTION PHASE

Assessing the cumulative impacts of the construction phase of the development is contingent on a number of other permitted developments in the area, which are currently under construction. These include.

Application Reference	Applicant(s)	Description	Outcome/Current Status
ABP Ref.: TA28.313216	Estuary View Enterprises 2020 Limited	'The Meadows' Bessborough	Due 25 <sup>th</sup> July 2022
ABP Ref.: TA28.313206	Estuary View Enterprises 2020 Limited	'The Farm' Bessborough	Due 25 <sup>th</sup> July 2022
Cork City Council Ref.: 22/40809	Hibernia Star Limited	Construction of an office and hotel development at Jacob's Island, Ballinure, Mahon, Cork	Request for Further Information
ABP Ref.: TR28.310378	Montip Horizon Limited	Amendments to previously permitted strategic housing development reference ABP-301991-18 to increase the number of units from 413 no. units to 437 no. units and amendments to Blocks 4, 7, 8, 9 and 10 at Jacob's Island, Ballinure, Mahon, Cork	Granted (11 <sup>th</sup> February 2022)
Cork City Council Ref.: 19/38875	O'Flynn Construction Co. Unlimited Company	Construction of 12,004 sq m of office floorspace at Blackrock Business Park, Bessboro Road, Mahon, Cork	Granted (11 <sup>th</sup> March 2020)
Cork City Council Ref.: 18/37820 and ABP Ref. PL. 302784	Bessboro Warehouse Holdings Limited	Demolition of the existing buildings and construction of 135 no. residential units at Bessboro Road, Mahon, Cork	Granted (28 <sup>th</sup> February 2019)
ABP Ref.: TA.301991.	Montip Horizon Limited	Construction of 413 no. apartments, neighbourhood centre, creche, road improvement works including upgrades to the Mahon Link Road (R852) to the North of the N40 interchange to incorporate a dedicated bus lane and all site development works at Jacob's Island, Ballinure, Mahon, Cork	Granted (3 <sup>rd</sup> October 2018)

*Table 13.10: Cumulative Impacts – Projects Considered*

For the purposes of this assessment of impacts a 'worst case' scenario has been assessed based on the information contained in these planning applications and the other projects stated in Chapter 1. In this scenario, it is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative effects on nearby sensitive receptors. It is envisaged that subject to the implementation of the appropriate best practice measures proposed, that the proposed development will result in no significant human health considerations relating to air quality, noise, vibration or traffic.

### 13.6.2 OPERATIONAL PHASE

Once constructed, the proposed development will be permanent and non-reversible. It is considered that cumulative impacts relating to human health factors including traffic, road safety, air quality, water quality, noise and vibration will be not significant.

The proposed development will contribute to the diversity of character in the new urban townscape, improving its legibility as it ties together a number of existing, permitted and proposed developments. Chapter 4 consider this will allowing the development of a cohesive townscape character and create a significant new urban quarter at Jacob's Island, where people can work and live.

In this respect it will also have a profound benefits in terms of the delivery of much needed residential development adjacent to this strategic employment hub, well served by public transport with access to 2 no. greenways and including a creche and public open space, it is considered that the development will result in significant benefits in terms of wider human health considerations.

## 13.7 DIFFICULTIES IN COMPILING INFORMATION

In preparation of this Chapter, the following difficulties were encountered.

- The census data which informed this chapter's analysis are from 2016 and may be considered out of date. However, this is the most recent census data available.
- This chapter has been prepared during the Covid-19 pandemic. Not only was the 2021 Census deferred due this, it also impacted on the ease of collecting and availability of data. For example, Tusla Childcare Inspection Reports, used as a source of attendance figures, have not been carried out as routinely as in pre-Covid circumstances.
- Despite a request from the Department of Education and Skills, 'Forward Planning' section in respect of local school's spare capacity data, at the time of preparation of this EIAR no information was provided by the Department regarding the current excess capacity of existing schools within the study area.
- Notwithstanding the above, we consider that the data collected, and analyses outlined reflects an accurate representation of the population and human health considerations with respect of the proposed development.

## 13.8 REFERENCES

[www.education.ie](http://www.education.ie)

[www.cso.ie](http://www.cso.ie)

[www.irishrail.ie](http://www.irishrail.ie)

[www.pobal.ie](http://www.pobal.ie)

Cork City Development Plan 2015.

Draft Cork City Development Plan 2022 - 2028.

Cork City Councils Planning Enquiry System.





JACOBS ISLAND



CHAPTER FOURTEEN  
Interaction of Impacts

# CHAPTER FOURTEEN

Contents

I4	Interaction of Impacts .....	I4
14.1	CHAPTER AUTHOR .....	1
14.2	CHAPTER CONTEXT .....	1
14.3	DESCRIPTION OF SIGNIFICANT INTERACTIONS .....	1

# CHAPTER FOURTEEN

## INTERACTION OF IMPACTS

### 14.1 CHAPTER CONTEXT

Article 3(1) of the EIA Directive states.

The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

- (a) population and human health;
- (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- (c) land, soil, water, air and climate;
- (d) material assets, cultural heritage and the landscape;
- (e) the interaction between the factors referred to in points (a) to (d)."

Annex IV of the amended Directive states that a description of impacts should include:

"...the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project"

Table 14.1 as shown summarises the relevant interactions and interdependencies between specific environmental aspects.

### 14.2 DESCRIPTION OF SIGNIFICANT INTERACTIONS

#### 14.2.1 LANDSCAPE AND VISUAL

##### 14.2.1.1 Construction Phase

Chapter 4 of this EIA assesses landscape and visual impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with landscape and visual impacts:

**Material Assets – Traffic and Transport** – The visibility of construction traffic associated with the proposed development may give rise to temporary local visual impact considerations. The CEMP (ref Appendix 2.1) notes that a Construction Traffic Management Plan will be developed prior to commencement to reduce any construction phase

effects.

**Material Assets – Services, Infrastructure & Utilities /Water**– The necessary earthworks/excavations to facilitate the proposed development will result in the permanent loss of the existing landscape of the site, representing an interaction between townscape/visual and material assets impacts during the construction phase. Chapter 6 of this EIA and the CEMP (ref Appendix 2.1) describes a suite of measures to reduce any construction phase effects.

**Land, Soils and Geology** – The initial development of the site would require extensive removal or stripping of the existing topsoil for enabling works for the pile installation, pile capping and other site services. The removal of the subsoils would be necessary to accommodate levelling of the site, the construction of the foundations of the buildings, the provisions of drainage and service infrastructure and road construction. This will result in a permanent relocation of soil and subsoil. The excavations and earthworks during the construction phase will result in interactions with the existing townscape. Chapter 7 of this EIA and the CEMP (ref Appendix 2.1) describes a suite of appropriate measures to be adopted to minimise any construction phase effects.

**Biodiversity** - The majority of habitats and flora within the site's interior will be removed, this includes areas of Scrub (WS1); as well as areas of recolonising bare ground (ED2/ED3) and a mosaic of neutral grassland / scrub / recolonising bare ground (GS1n / WS1 / ED3). A small area of mixed woodland (WD1) is located in the centre of the site; this would also be removed as part of the development. While several of these habitats are classified as being locally important (higher value), there are no habitats on site of greater than local value. No ecological features of regional, national or European importance will be directly impacted by the proposed development. Effects on terrestrial habitats are generally restricted to direct removal of habitats and possible impacts from the spread of invasive species. The construction phase will result in interactions between townscape and biodiversity in the form of negative impacts to semi-natural habitats, however, these will be restricted to within the development site. The habitats are therefore assessed overall as important at a Site level and the effect of the habitat loss during the construction phase of the development will be significant at Site level only. Furthermore, Chapter 9 indicates that fauna on site is of low local value and predicted impacts are not expected to be significant. Combined with the abundance of similar habitat beyond the proposed site; therefore, a slight temporary negative impact to local fauna due to local habitat loss on site is predicted, with measures outlined in Chapter 9 to address these impacts.

**Cultural Heritage** – Chapter 12 notes that there is one cultural heritage feature, a cellar, within the proposed development site. The cellar will be preserved in situ and incorporated into a green open space. A 10m buffer zone will be established around the feature and no construction works are proposed within this buffer zone. Chapter 12 lists a series of measures that when implemented will ensure that no direct or indirect impact occur during the construction phase on this feature, these include archaeological supervision of the works in relation to Block 12.

**Population and Human Health** - Potential short-term impacts to visual amenity in the area as a result from construction works, include the necessary removal of scrubland and a limited number of existing trees, construction traffic, earthworks and erection of tall tower cranes, gradual emergence of proposed buildings, material storage, site hoardings and site lighting. Chapter 4 notes that the sensitivity of residential receptors is generally considered high while the receptors and activities associated with the Mahon Retail Park and Shopping Centre are considered low. The construction effects predominantly relate to the visibility of construction traffic and the upper part of the site where cranes and scaffolding will be visible above the hoarding. These effects impact elevated long and mid and near distance views, with impacts predicted to be most prevalent in the latter. The construction phase of the development provides for measure to ameliorate these impacts, which Chapter 4 consider to be temporary and medium-significant adverse in close distance views.

### 14.3.1.2 Operational Phase

During the operational phase of the development potential interactions are:

**Material Assets – Traffic and Transportation** – The proposed development will deliver landscape benefits arising from the enhanced pedestrian and cyclist connectivity through the site connecting a series of internal public spaces and externally with the Joe McHugh Park and the Passage West Greenway. The proposed scheme will deliver enhanced versions of the current informal permeability desire lines through the site. Alongside this enhanced permeable public realm will establish direct local linkages between employment, residential, recreation and retail destinations.

**Material Assets – Services, Infrastructure & Utilities** – On completion, increased impermeable surfaces could reduce the amount of rainfall that infiltrates to the soil zone as rainfall will be diverted to storm water run-off from the site. This could have a permanent impact on this existing surface water sewers due to increasing the watercourse flow volume/ discharge during heavy rainfall and may increase the flooding risk. However, the existing large diameter surface water sewers have sufficient capacity to service this development as the surface water strategy for the entire Jacobs Island has been designed and implemented as permitted by TP 00/24609.

**Utilities** such as public lighting will result in interactions with landscape and visual considerations, however, the proposed lighting is in accordance with national & international industry standards and no significant impact is anticipated in this urban context.

**Land, Soils and Geology/Water** – The proposed landscape design seeks to respond to the site-specific context including by utilising appropriate areas for public open space and incorporating Sustainable Urban Drainage (SUDs) measures such as roadside bioretention swales and roadside bioretention tree pits to reduce run-off and provide biodiversity benefits where appropriate.

**Biodiversity** – Chapter 9 notes the biodiversity of the receiving environment has informed the landscape design associated with the proposed development. The most significant proposed soft landscaping feature is the inclusion of tree planting along streets, in open spaces and in courtyards. An area of native woodland planting is also included featuring native tree species such as alder, downy birch, Scot’s pine, as well as European larch and beech. Further planting includes hedges and wildflower grasslands; as well as a range of more structured planting of garden species, many of which will also benefit pollinators. The variety of landscape typologies including woodland planting, hedgerows, wildflower meadows, standard sized trees and grasslands will all add to biodiversity within the developed site. Potential impacts on the receiving landscape could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 4 – Landscape and Visual will ensure that this will be largely mitigated.

Overall, Chapter 9 considers, with appropriate amelioration measures in place, the impacts of the proposed development on ecology are likely to be slight negative impact at a site level and of short-term duration. As vegetation on site matures the residual impact would increase to neutral to slight positive impact at a local level.

**Cultural Heritage** – Chapter 12 of this EIA considers that at the operational phase an information plaque/board will be erected at a suitable location with relevant information relating to the cellar and its association with the former Lakeland Demesne. With this measure the cellar will be preserved in situ and information and an acknowledgement of its presence in the landscape will be provided. The overall interaction between the cellar and the operational landscape will be positive.

**Population and Human Health** – Chapter 4 of this EIA notes that the proposed development will not introduce

elements that are uncharacteristic to the existing townscape character and concludes that the significance / quality and changes to the townscape character are considered to be Very Significant / Beneficial. The proposal will add a new and prominent building block along the N40 and constitute a new edge and entry point in the northern part of Jacob’s Island. It will provide structure and introduce a new urban quality to a current brownfield site. Existing and proposed boundary screen planting will obscure views of the lower portions of the Proposed Development and over time the extent of screening will increase as vegetation matures. With regard to longer distance views, while the visual effect will reduce quickly with distance, the proposed development will still form a new focus point in available open views, particularly in views west from Hop Island, but it will be one component and several in these views and will integrate into the increasingly built-up environment on Jacob’s Island and Mahon.

Potential impacts of Landscape and Visuals have been assessed and considered within each chapter/discipline of this EIA. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

### 14.3.2 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION

#### 14.3.2.1 Construction Phase

Chapter 5 of this EIA assesses traffic impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with traffic/transportation impacts.

**Landscape and Visual** – The visibility of construction traffic associated with the proposed development may give rise to predominantly local visual impact considerations.

**Material Assets – Services, Infrastructure & Utilities** – During construction, interactions between Material Assets and Traffic /Transportation, may include road openings to install project utilities. These are not considered to be significant.

**Land, Soils and Geology** – Site excavations and earthworks will require HGV’s, heavy machinery and vehicles to access the site during the construction phase, the CEMP (ref. Appendix 2.1) notes that these trips are expected to peak during the semi-basement and lower ground excavation works and large concrete pours, estimated as 50 no. HGV movements daily. The excavated material will be relocated internal within the site, where possible and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period. In addition, the CEMP notes that the construction works will require the erection of at least 4 no. tower cranes within the development site.

Increased traffic associated with these construction works would have the effect of compacting existing subsoil layers within the site. In the absence of appropriate construction management mitigation procedures, the regular movement of heavy machinery and plant to and from the site would also result in an increased risk to the integrity of the surrounding road network, as well as facilitating the unwelcome transfer of mud and dust to surrounding access routes. However, with the mitigation measures and traffic management measures proposed in Chapter 7 and in the CEMP (ref. Appendix 2-1), it is predicted that any interactions will not be significant, with any negative interactions being slight and short term.

**Water (Hydrology and Hydrogeology)** – In the absence of appropriate mitigation measures, construction vehicles at the site may give rise to hydrocarbon spills and other pollutants, potentially impacting on local water quality. Alongside this

silt carried on the wheels of vehicles leaving the site may result in deposits onto the public road which are subsequently conveyed into existing drainage systems. However, with the proposed suite of appropriate measures detailed in Chapter 8 and in the CEMP, no significant interactions are envisaged.

**Biodiversity** – Any vehicular spillages or incidents resultant from refuelling on site would result in negative impacts on water quality and biodiversity. However, with the suite of construction management measures identified in the CEMP (ref. Appendix 2-1), it is not considered likely that there will be any significant interactions. Noise and vibrations from construction traffic could potentially cause disturbance to fauna on-site. However, Chapter 9 notes that the range of fauna on site is limited and of low local value, with predicted impacts not expected to be significant. Combined with the abundance of similar habitat beyond the proposed site; therefore, this project will have a slight temporary negative impact to local fauna.

Non-native invasive species can potentially be spread via plant fragments by vectors such as construction vehicles and can have negative impacts on biodiversity through a reduction in species diversity due to dense plant growth, heavy shading and disruption of trophic levels. With the implementation of management measures identified in the CEMP (ref. Appendix 2-1), it is not considered likely that there will be any significant interactions

**Noise and vibration** – Chapter 10 notes that during the construction phase of the proposed development there will be additional construction traffic on local roads. In order to increase traffic noise levels by 1 dB, traffic volumes would need to increase by the order of 25%. On this basis it is considered that additional traffic introduced onto the local road network due to the construction phase will not result in a significant noise effect.

**Air Quality and Climate** – Chapter 11 reviews the potential for traffic emissions to impact air quality in the short-term over the construction phase, in particular due to the increase in HGVs accessing the site. It concludes that none of the road links impacted by the proposed development satisfy the Design Manual for Roads and Bridges assessment criteria. It can therefore be determined that the construction stage traffic will have an imperceptible, neutral, localised and short-term impact on air quality. While there is potential for construction vehicles to give rise to CO<sub>2</sub> and N<sub>2</sub>O emissions. Chapter 11 refers to The Institute of Air Quality Management documentation and states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the impact on climate is considered to be imperceptible, neutral and short term.

**Population and Human Health** – Chapter 5 considers that construction traffic has potential to result in temporary/short-term, not significant negative impacts on local residents, businesses and services and other uses in the area by way of traffic volumes. Chapter 13 notes that the closing off of the current informal desire lines through the site, which will be replaced by formal pedestrian and cycle routes at the operational phase, will result in minor short-term inconvenience in terms of pedestrian access. Road Closures may be required for a short period to enable the tower cranes to be transported to/from site. The impacts on the local road users will be temporary, short-term, limited in extent for this stage of the works.

### 14.3.2.2 Operational Phase

During the operational phase of the development potential interactions are:

**Landscape and Visual** – The proposed development will deliver landscape benefits arising from the enhanced pedestrian and cyclist connectivity through the site linking a series of internal public amenity spaces and external landscape amenities in the form of the Joe McHugh Park and the Passage West Greenway. The proposed scheme will deliver enhanced versions of the current informal permeability desire lines through the site. Alongside this the

enhanced permeability of the public realm will establish direct local linkages between employment, residential, recreation and retail destinations.

**Material Assets – Services, Infrastructure & Utilities** – Interactions between Material Assets and traffic / transportation, may include road openings to maintain and upgrade utilities. These are not considered to be significant.

**Land, Soils and Geology** – Chapter 7 does not anticipate any operational impacts on either the underlying aquifer or on the geology of the site.

**Water (Hydrology and Hydrogeology)** – In the absence of appropriate measures, operational traffic at the site may give rise to hydrocarbon spills and other pollutants, potentially impacting on local water quality. However, the proposed suite of measures detailed in the Chapter 8 includes the provision of Hydrocarbon interceptors for all discharge points generated off the newly added carparking area and traffic routes. Therefore, no significant interactions are envisaged.

**Biodiversity** – Chapter 9 also notes the proposed Hydrocarbon interceptors for all discharge points generated off the newly added carparking area and traffic routes and on this basis does not consider there will be any significant interaction between biodiversity and operational traffic.

**Noise and Vibration** – During the operational phase of the development, Chapter 10 of this EIAR predicts that there will be an increase in vehicular traffic associated with the site on some surrounding roads. Chapter 10 assesses the related noise effects for the Design Year 2039 as being neutral, imperceptible and long term based on predicted additional traffic on the surrounding existing road network.

**Air Quality and Climate** – Chapter 11 of this EIAR examines the impact of the proposed development on air quality. Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on the surrounding road network. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

**Population and Human Health** – Once operational the proposed development will result in increased traffic volumes accessing the site and on the surrounding road network. Users of the local road network may experience increased delays in car journeys. However, Chapter 5 sets out a number of measures to address these impacts including optimising the signal operations of the Mahon Interchange and Retail Park signalised junctions, providing pedestrian and cycling facilities through the site to promote modal change and preparing a Mobility Management Plan to encourage sustainable travel practices. It is predicted that the site's location, relative to public transport opportunities and 2 no. greenways will promote human health through sustainable and active modes of travel. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

**Potential impacts of Material Assets** – Traffic and Transport have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

## 14.3.3 MATERIAL ASSETS – SERVICES, INFRASTRUCTURE & UTILITIES

### 14.3.3.1 Construction Phase

Chapter 6 of this EIAR assesses servicing impacts resultant from the proposed development. During the construction

phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with 'Material Assets – Services, Infrastructure & Utilities' impacts:

**Landscape** – As Chapter 6 of this EIAR outlines, the installation of surface water, wastewater, water pipework and a temporary foul connection (to service the site compound) will involve construction activities within the subject lands mainly involving trench excavations. This will result in temporary, moderate negative changes to the existing landscape/land cover if appropriate measures are not implemented. The installation of the power and telecommunication utilities for the development will be conducted in parallel with the other services and will primarily involve construction of ducting and chambers using open excavation. This will result temporary, imperceptible and neutral changes to the existing landscape/land cover. Visual impacts during construction will be mitigated through the erection of hoardings and appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and public areas are kept free from building material and site waste.

**Material Assets – Traffic and Transportation** - During construction, interactions between Material Assets and traffic /transportation may include necessary periods of road openings to deliver utilities. During these times minor local traffic management may result in slight temporary negative impacts. In addition, the construction phase may give rise to a potential temporary disruption to the local road network. As referenced previously, the CEMP (ref. Appendix 2-1) details the management of construction traffic matters. However, the works for the original Jacob's Island development, completed under planning reference 00/24609, included the surface water, foul water and water mains infrastructure for the entire future masterplan development. Given that a significant element of the services/utilities infrastructure has already been delivered, with the remaining works focussed within the development site, it is not considered that there will be significant inconveniences caused or interactions between Material Assets and traffic /transportation considerations.

**Land, Soils and Geology** – During construction, the installation of services and utilities will have direct interactions with Land, Soils and Geology. As Chapter 6 of this EIAR outlines, the installation of surface water, wastewater, water pipework and a temporary foul connection (to service the site compound) will involve trench excavation within the subject lands. Without appropriate measures this may result in localized ground pollution by spillage of hydrocarbons, fuels, or pollution from hazardous materials, resulting in temporary, moderate negative changes to the lands and soils. Appropriate measures are outlined in Chapter 6 and in the CEMP to reduce this likelihood. The installation of the power and telecommunication utilities for the development will primarily involve construction of ducting and chambers using open excavation resulting in temporary, imperceptible and neutral changes to the land land soils.

Re-usable excavated material will be stockpiles on-site, with potential to become a source of dust pollution, without appropriate measures being implemented. As detailed in Chapter 7 of this EIAR, there is considered to be a minimal possibility of reaching groundwater during excavation works. In this unlikely event, the water could increase a risk of local flooding in the site area, therefore having a brief negative impact in the environment. Suitable measures for managing excavated material and controlling any possibility of reaching groundwater are outlined in Chapter 7. With appropriate measures in place and a risk assessment is carried out in advance of and during the works, the significance of these impacts will reduce to imperceptible.

**Water (Hydrology and Hydrogeology)** – In Chapter 8 of this EIAR activities relating to the construction of utility and service infrastructure is primarily considered under 'Earthworks'. In the absence of appropriate mitigation measures, these works could result in suspended solids and other pollutants mixing with surface water run-off and reaching the shoreline. In addition, as the excavations are of primarily 'made ground', contaminated ground may be included, however, there is no evidence of this in site investigations to-date. Potential effects are rated as temporary, negative for water quality, with a slight significance if not mitigated against.

**Biodiversity** –As detailed in EIAR Chapter 9 potential impacts on the receiving water (hydrology and hydrogeology) environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 - Biodiversity, and those relevant in Chapter 8 – Hydrology will ensure that this will not occur. A Natura Impact Assessment has also been prepared with respect of the proposed development which concludes that no significant adverse effects arising from the proposed development are likely to occur in relation to the Cork Harbour SPA. Utilities construction noise and artificial construction lighting may result in disturbance of sensitive species, however, Chapter 9 concludes that development of this site will not have any significant impact on the small number of bats using the site, none of which are light sensitive species. Fauna and Local bird populations will be displaced from the works area during the construction stage, however, with the abundance of similar habitat beyond the proposed site this is considered a slight, temporary negative impact.

**Noise and Vibration** – The implementation of service infrastructure and utilities may result in noise and vibration emissions during construction. The appropriate management measures stated in the CEMP and EIAR Chapter 10, including the erection of noise barriers where necessary, will minimise any potential negative impacts relating the noise and vibration interactions during construction.

**Air Quality and Climate** - Chapter 11 notes that the greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust and PM10/PM2.5 emissions. In the absence of appropriate mitigation measures, the installation of material assets including necessary trench excavation works and connections may result in temporary nuisances such as dust emissions which would negatively impact on air quality. Chapter 11 considers there is the potential for short-term, negative, slight impacts to nearby sensitive receptors as a result of utilities trench excavation. The appropriate management measures stated in the CEMP and EIAR Chapter 11, will minimise any potential negative impacts during construction.

**Population and Human Health** – The construction phase could give rise to potential temporary impacts on existing services such as water, communications, electrical infrastructure resulting from connections from the proposed development to existing local services. However, with the proposed mitigation measures outlined, it is not expected that these impacts will be significant. Potential human health considerations in relation to air quality and noise nuisances arising from the trench excavation will be ameliorated by adherence to the measures outlined in Chapters 10 and 11 and the CEMP.

#### 14.3.3.2 Operational Phase

During the operational phase of the development potential interactions are.

**Landscape and Visual** – The proposed utility/servicing proposals will result in an altered landscape with increased public lighting, including the series of proposed public open spaces which will be served by public lighting resulting in more useable communal areas of the development on a year-round basis. The landscape proposals for the site also include the provision of a landscaped public open spaces which facilitate SUDs principles.

**Material Assets** – Traffic and Transportation - Interactions between Material Assets – Utilities and traffic / transportation, may include road openings to maintain and upgrade utilities. These are not considered to be significant.

**Land, Soils and Geology** – No significant effects are highlighted in Chapter 7 during the operational phase.

**Water (Hydrology and Hydrogeology)** – Chapter 8 notes that the connections downstream of both the surface water and foul sewer systems have been inspected and taken in charge and the capacity has been reviewed and confirmed as being satisfactory for the conveyance of flows from the Proposed SHD Development. The manholes in the internal drainage system and at the adjacent connection points in the existing system are sealed with lockable covers where these are below the level of 5.31 m OD. Potential effects are rated as neutral for quality, with imperceptible significance if not mitigated against. Any impact would be considered to be of brief duration.

**Biodiversity** – Chapter 9 states that the operational phase of the proposed development will not negatively impact on water quality within Cork Harbour SPA; nor will it impact, directly or indirectly, on any of the habitats or species listed as features of interest for Great Island Channel SAC/Cork Harbour SPA or any NHAs and pNHAs. Negative impacts from lighting on bats are not anticipated.

**Noise and Vibration** – Potential noise and vibration sources during the operational phase include mechanical and electrical plant used to service the buildings. As stated in EIAR Chapter 10, with building services plant, once designed to achieve the relevant noise criteria, is categorised as negative, imperceptible and permanent.

**Population and Human Health** – Interactions between population and Human Health and material assets during the operational phase of the development will include the generation of effluent and sanitary waste and result in the increase in water demand and service infrastructure including telecommunications. Irish Water have confirmed that there will be sufficient water and wastewater capacity to accommodate the proposed development (ref. Appendix 6.1). Chapter 6 of this EIAR indicates that with appropriate measures outlined within the chapter and the CEMP no significant impacts are likely arising from the operational phase of the proposed development on the foul water drainage, potable water, power, gas and telecommunications networks.

Potential impacts of Material Assets – Services, Infrastructure & Utilities have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

### 14.3.4 LAND, SOILS AND GEOLOGY

#### 14.3.4.1 Construction Phase

Chapter 7 of this EIAR assesses ‘Land, Soils and Geology’ impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with ‘Land, Soils and Geology’ impacts.

**Landscape and Visual** - The necessary earthworks/excavations and piling to facilitate the proposed development will result in permanent changes to the existing landscape setting of the site. Soil and subsoil excavations will be required for site levelling, the installation of foundations, service trenching and proposed landscaping measures reflecting interactions between both areas. This will result in a permanent relocation of soil and subsoil at most excavation locations. The CEMP describes a suite of best practice measures including stripped topsoil being re-used and incorporated within the landscaping proposals and features of the development to be delivered during the construction phase.

**Material Assets – Traffic and Transportation** – Site excavations and earthworks will require HGV's, heavy machinery and vehicles to access the site during the construction phase, the CEMP (ref. Appendix 2.1) notes that these trips are

expected to peak during the semi-basement and lower ground excavation works and large concrete pours, estimated as 50 no. HGV movements daily. Excavated material will be relocated internal within the site, where possible, and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period. In addition, the CEMP notes that the construction works will require the erection of at least 4 no. tower cranes within the development site. Increased traffic associated with these construction works would have the effect of compacting existing subsoil layers within the site. In the absence of appropriate construction management mitigation procedures, the regular movement of heavy machinery and plant to and from the site would also result in an increased risk to the integrity of the surrounding road network, as well as facilitating the unwelcome transfer of mud and dust to surrounding access routes. However, with the mitigation measures and traffic management measures proposed in Chapter 7 and in the CEMP (ref. Appendix 2-1), it is predicted that any interactions will not be significant, with any negative interactions being slight and short term.

**Material Assets – Services, Infrastructure & Utilities** – During construction, the installation of services and utilities will have direct interactions with Land, Soils and Geology. As Chapter 6 of this EIAR outlines, the installation of surface water, wastewater, water pipework and a temporary foul connection (to service the site compound) will involve trench excavation within the subject lands. Without appropriate measures this may result in localized ground pollution by spillage of hydrocarbons, fuels, or pollution from hazardous materials, resulting in temporary, moderate negative changes to the existing land and soils. Appropriate measures are outlined in Chapter 6 and in the CEMP to reduce this likelihood. The installation of the power and telecommunication utilities for the development will primarily involve construction of ducting and chambers using open excavation resulting in temporary, imperceptible and neutral changes to the existing land and soils.

Re-usable excavated material will be stockpiled on-site, with potential to become a source of dust pollution, without appropriate measures being implemented. As detailed in Chapter 7 of this EIAR, it is considered that there is a minimal possibility of reaching groundwater during excavation works. In this unlikely event, the water could increase a risk of local flooding in the site area, therefore having a brief negative impact in the environment. Suitable measures for managing excavated material and controlling any possibility of reaching groundwater are outlined in Chapter 7. With appropriate measures in place and a risk assessment is carried out in advance of and during the works, the significance of these impacts will reduce to imperceptible.

**Water (Hydrology and Hydrogeology)** - There is potential for surface water or groundwater to be contaminated with pollutants associated with construction activity. Excavations will include the excavation of made ground and this may include unknown sources of material, but no evidence of contaminated ground from previous ground investigation. The removal of topsoil and localised excavations across the site will potentially increase the vulnerability of the underlying groundwater aquifer. Without appropriate measures uncontrolled and polluted surface water run-off has the potential to impact on the environment and the depth to groundwater and ground conditions can facilitate pathways for potential pollutants to impact on the environment. With adoption of the measures outlined in Chapter 8 and the CEMP it is considered that the potential impacts of these interactions can be reduced to short-term and local.

**Biodiversity** - The proposed development provides for vegetation clearance, excavations, earthworks and piling which will result in disturbance/displacement of existing habitats/flora/fauna during the construction phase. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape. Chapter 9 of this EIAR assesses the habitats to be removed to be predominantly of local value only. In view of the abundance of similar habitat beyond the proposed site; only a slight temporary negative impact to local fauna due to local habitat loss on site is predicted. With the implementation of appropriate measures, as outlined in Chapter 9 of this EIAR, it is not predicted that there will be any significant negative interactions between Land and Soil and Biodiversity.

**Noise and Vibration** – Chapter 10 identifies potential noise and vibration sources that could arise during the construction phase as including piling and excavation works. Both these activities have interactions with soil and geology. Without noise reduction measures at a distance of 20-30m from areas of major construction, the effect is predicted to be negative, significant to very significant and short-term. At a distance of 35m from areas of major construction, the predicted construction noise levels are expected to have a negative, moderate and short-term effect. In terms of vibration the associated effect with these activities is considered to be negative, not significant and temporary. The adoption of the extensive best practice measures outlined in Chapter 10 and the CEMP will ensure that noise and vibration effects are reduced.

**Air Quality and Climate** - In the absence of appropriate mitigation measures, Chapter 7 identifies potential for dust generated through the construction phase works, particularly during the piling and excavation works, to result in a temporary nuisance such as dust emissions which would negatively impact on air quality. However, with the proposed suite of mitigation and monitoring measures enforced, it is predicted that any negative impacts/interactions relating to air quality/climate will not be significant and temporary in nature.

**Cultural Heritage and Archaeology** - As detailed in EIAR Chapter 12 there is one cultural heritage site, a cellar, situated within the proposed development site. The cellar will not be impacted by the proposed earthworks and will be preserved in situ within a 10m buffer zone within a green open space. Following the measures outlined in Chapter 12, there will be no significant direct or indirect effect on this cultural heritage site.

**Population and Human Health** – In the absence of appropriate measures potential interactions with population and human health during construction earthworks may result in increased dust, noise and vibration levels in the locality. With adoption of the appropriate measures outlined in Chapter 7 and the CEMP, these effects can be minimised. Alongside this the risk of leakage and accidental spillage from construction machinery and materials, oil and hydrocarbons, concrete and cement products are noted as potential sources of contaminated run-off, which could result in soil pollution. The potential residual impacts associated with soil or ground contamination and subsequent health effects are predicted to be of brief duration, neutral and not significant.

Chapter 8 also notes that some of the excavations will include 'Made' ground, which may include unknown sources of materials, possibly contaminated. However, there is no evidence of this in site investigations to date.

#### 14.3.4.2 Operational Phase

During the operational phase of the development potential interactions are:

**Water (Hydrology & Hydrogeology)** – Chapter 7 notes that as the development will be constructed well above the local aquifer, with no foundations penetrating it, it is not anticipated that there will be any operational impacts on the aquifer. There also will be no impacts on the geology or the site users during the operational phase.

Potential impacts of Land, Soils and Geology have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

### 14.3.5 WATER (HYDROLOGY AND HYDROGEOLOGY)

#### 14.3.5.1 Construction Phase

Chapter 8 of this EIAR assesses Water (Hydrology and Hydrogeology) impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with Water (Hydrology and Hydrogeology) impacts.

**Material Assets – Traffic & Transport** – In the absence of appropriate measures, operational traffic at the site may give rise to hydrocarbon spills and other pollutants, potentially impacting on local water quality. However, the proposed suite of measures detailed in the Chapter 8 includes the provision of Hydrocarbon interceptors for all discharge points generated off the newly added carparking area and traffic routes. Therefore, no significant interactions are envisaged.

**Material Assets – Services, Infrastructure & Utilities** – In Chapter 8 of this EIAR activities relating to the construction of utility service infrastructure is primarily considered under 'Earthworks'. In the absence of appropriate mitigation measures, these works could result in suspended solids and other pollutants mixing with surface water run-off and reaching the shoreline. In addition, as the excavations are of primarily 'made ground', contaminated ground may be included, however, there is no evidence of this in site investigations to-date. Potential effects are rated as temporary, negative for water quality, with a slight significance if not mitigated against.

**Land, Soils and Geology**– There is potential for groundwater to be contaminated with pollutants associated with construction activity. Excavations will include the excavation of made ground and this may include unknown sources of material, but no evidence of contaminated ground from previous ground investigation. The removal of topsoil and localised excavations across the site will potentially increase the vulnerability of the underlying groundwater aquifer. Without appropriate measures uncontrolled and polluted surface water run-off has the potential to impact on the environment and the depth to groundwater and ground conditions can facilitate pathways for potential pollutants to impact on the environment. With adoption of the measures outlined in Chapter 8 and the CEMP it is considered that the potential impacts of these interactions can be reduced to short-term and local.

**Biodiversity** – Potential impacts on the receiving water (hydrology and hydrogeology) environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 8 – Hydrology will ensure that this will not occur.

**Population and Human Health** – In the absence of appropriate mitigation measures, there is potential for groundwater to be contaminated with pollutants associated with construction activity, resulting in negative impacts relating to human health. Other potential health effects are associated with flooding. The proposed site design and mitigation measures ensures that the potential for impacts on the water environment and on human health are not significant.

#### 14.3.5.2 Operational Phase

During the operational phase of the development potential interactions are.

**Landscape and Visual** - The landscape proposals seek to respond to the site-specific context including by utilising appropriate areas for public open space and incorporating Sustainable Urban Drainage (SUDs) measures such as roadside bioretention swales and roadside bioretention tree pits to reduce run-off and provide biodiversity benefits where appropriate.



**Material Assets-Services Infrastructure & Utilities** – A key environmental interaction with Water is Material Assets – Services, Infrastructure & Utilities which outlines the existing wastewater and surface water networks capacity to facilitate scheme discharges. Irish Water have confirmed that there will be sufficient water and wastewater capacity to accommodate the operational phase of the proposed development (ref. Appendix 6.1).

**Biodiversity** – Chapter 9 notes that potential impacts on the receiving water (hydrology and hydrogeology) environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 8 – Hydrology will ensure that this will not occur.

**Population and Human Health** – Potential effects arising from operational surface and foul water issues are rated as neutral for water quality, with imperceptible significance if not mitigated against. Any impact would be considered to be of brief duration. In view of the proposed use of the units, it is not expected that significant quantities of hazardous material will be brought on site. The potential risks to human health in terms of water and hydrology are expected to be of low significance. Standard maintenance practice measures during the operation and maintenance phase, involving the monitoring of the drainage system for blockages, leakages and repairing in a timely fashion should be implemented. With these measures in place the potential impact during the operational phase for water and hydrology is reduced to neutral for quality, with imperceptible significance and of momentary duration.

**Potential impacts of Water (Hydrology and Hydrogeology)** have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

## 14.3.6 BIODIVERSITY

### 14.3.6.1 Construction Phase

Chapter 9 of this EIAR assesses Biodiversity impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with Biodiversity impacts.

**Landscape and Visual** - The majority of habitats and flora within the site's interior will be removed, this includes areas of Scrub (WS1); as well as areas of recolonising bare ground (ED2/ED3) and a mosaic of neutral grassland / scrub / recolonising bare ground (GS1n / WS1 / ED3). A small area of mixed woodland (WD1) is located in the centre of the site; this would also be removed as part of the development. While several of these habitats are classified as being locally important (higher value), there are no habitats on site of greater than local value. No ecological features of regional, national or European importance will be directly impacted by the proposed development. The construction phase will result in interactions between townscape and biodiversity in the form of negative impacts to semi-natural habitats, however, these will be restricted to within the development site. The habitats are therefore assessed overall as important at a site level and the effect of the habitat loss during the construction phase of the development will be significant at site level only. Furthermore, Chapter 9 indicates that fauna on site is of low local value and predicted impacts are not expected to be significant. Combined with the abundance of similar habitat beyond the proposed site; therefore, a slight temporary negative impact to local fauna due to local habitat loss on site is predicted, with measures outlined in Chapter 9 to address these impacts.

**Material Assets – Traffic and Transportation** – Any vehicular spillages or incidents resultant from refuelling on site would result in negative impacts on water quality and biodiversity. However, with the suite of construction management measures identified in Chapter 9 and the CEMP (ref. Appendix 2-1), it is not considered likely that there will be any

significant interactions. Noise and vibrations from construction traffic could potentially cause disturbance to fauna on-site. However, Chapter 9 notes that the range of fauna on site is limited and of low local value, with predicted impacts not expected to be significant. Combined with the abundance of similar habitat beyond the proposed site; therefore, this project will have a slight temporary negative impact to local fauna.

The spreading of non-native invasive species via plant fragments by vectors such as construction vehicles can have negative impacts on biodiversity through a reduction in species diversity due to dense plant growth, heavy shading and disruption of trophic levels. With the implementation of management measures identified in the CEMP (ref. Appendix 2-1), it is not considered likely that there will be any significant interactions

**Material Assets – Services, Infrastructure & Utilities** - Noise and artificial construction lighting during utilities installation may result in disturbance of sensitive species, however, Chapter 9 concludes that development of this site will not have any significant impact on the small number of bats using the site, none of which are light sensitive species. Fauna and local bird populations will be displaced from the works area during the construction stage, however, with the abundance of similar habitat beyond the proposed site this is considered a slight, temporary negative impact.

**Land, Soils and Geology** – The proposed site excavations/groundworks, clearance and piling have the potential to result in the disturbance of existing habitats during the construction phase. However, as described in detail in EIAR Chapter 9, given the abundance of similar habitats in the vicinity it is not predicted there will be significant negative impacts and interactions between ecology and Land, Soils and Geology, with the treatment of existing invasive species on the site considered a beneficial aspect.

**Water -Hydrology and Hydrogeology** – As detailed in EIAR Chapter 9 potential impacts on the receiving water (hydrology and hydrogeology) environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 - Biodiversity, and those relevant in Chapter 8 – Hydrology will ensure that this will not occur. Natura Impact Assessment has also been prepared with respect of the proposed development which concludes that no significant adverse effects arising from the proposed development are likely to occur in relation to the Cork Harbour SPA.

**Noise and Vibration** – As outlined in EIAR Chapter 9 potential impacts on the receiving noise and vibration environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 10 – Noise & Vibration will ensure that this will not occur.

**Air Quality and Climate** – Potential impacts on the receiving air quality and climate environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 11 – Climate & Climate Change will ensure that this will not occur.

### 14.3.6.2 Operational Phase

During the operational phase of the development potential interactions are.

**Landscape and Visual** - The biodiversity of the receiving environment has informed the landscape design associated with the proposed development. The most significant proposed soft landscaping feature is the inclusion of tree planting along streets, in open spaces and in courtyards. An area of native woodland planting is also included featuring native tree species such as alder, downy birch, Scot's pine, as well as European larch and beech. Further planting includes hedges and wildflower grasslands; as well as a range of more structured planting of garden species, many of which will also benefit pollinators. The variety of landscape typologies including woodland planting, hedgerows, wildflower

meadows, standard sized trees and grasslands will all add to biodiversity within the developed site. Potential impacts on the receiving landscape could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 4 – Landscape and Visual will ensure that this will be largely mitigated.

**Material Assets – Traffic and Transportation** – Chapter 9 of this EIAR notes that hydrocarbon interceptors will be provided for all discharge generated off the newly added carparking area and traffic routes, reducing the potential operational impact on water and biodiversity. Noise and vibrations from operational traffic could potentially cause disturbance to fauna. However, Chapter 9 notes that the range of fauna on site is limited and of local value only, of species accustomed to foraging in urban environments with predicted impacts not expected to be significant.

**Material Assets – Services, Infrastructure & Utilities** - Chapter 9 states that during the operational phase of the proposed development the surface water and wastewater infrastructure will not negatively impact on water quality within Cork Harbour SPA; nor will it impact, directly or indirectly, on any of the habitats or species listed as features of interest for Great Island Channel SAC/Cork Harbour SPA or any NHAs and pNHAs. Negative impacts from lighting on bats are not anticipated.

**Water (Hydrology & Hydrogeology)** - Restricted operational surface-water run-off associated with the site will be discharged via the existing surface water drainage network which discharges to Lough Mahon. The surface water strategy for the development will incorporate SuDS features to reduce run-off and provide biodiversity benefits. Surface water runoff directed to the SuDS features will benefit from their pollutant removal qualities. Surface water design measures will ensure there is no significant impact on local water quality or on aquatic receptors within the Lough Mahon/Douglas Estuary or any other waterbodies.

**Noise and Vibration** - Chapter 9 notes that the site is sufficient distance from Cork Harbour that disturbance to birds using the Cork harbour SPA will not occur due to noise from operational plant and vehicular traffic. Furthermore, no significant impacts to fauna are anticipated, as the species present locally are accustomed to foraging in urban areas, with associated noise levels. With the adoption of the measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 10 – Noise & Vibration will ensure that disturbance will not occur.

**Air Quality and Climate** – Potential operational impacts on the receiving air quality and climate environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 11 – Climate & Climate Change will ensure that this will not occur.

Potential impacts of biodiversity have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

### 14.3.7 NOISE AND VIBRATION

#### 14.3.7.1 Construction Phase

Chapter 10 of this EIAR assesses Noise and Vibration impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with Noise and Vibration impacts.

**Material Assets – Traffic and Transportation** – Chapter 10 notes that during the construction phase of the proposed development there will be additional construction traffic on local roads. In order to increase traffic noise levels by 1

dB, traffic volumes would need to increase by the order of 25%. On this basis it is considered that additional traffic introduced onto the local road network due to the construction phase will not result in a significant noise effect.

**Material Assets – Services, Infrastructure & Utilities** – The implementation of service infrastructure and utilities may result in noise and vibration emissions during construction. The appropriate management measures stated in the CEMP and EIAR Chapter 10, including the erection of noise barriers where necessary, will minimise any potential negative impacts relating the noise and vibration interactions during construction.

**Biodiversity** – As outlined in EIAR Chapter 9 potential impacts on the receiving noise and vibration environment could also result in associated biodiversity impacts. However, the mitigation measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 10 – Noise & Vibration will ensure that this will not occur.

**Air Quality and Climate** – Emissions such as dust and other nuisances may arise as a result of vibration occurrences during construction, negatively impacting the local air quality and microclimate. However, it is not predicted that these interactions will result in any significant impacts given the mitigation measures proposed during construction regarding these areas.

**Population and Human Health** - Increased levels of noise and vibration during construction activities may result in negative impacts to the amenity of local residents. Chapter 10 identifies potential noise and vibration sources that could arise during the construction phase as including piling and excavation works. Without noise reduction measures at a distance of 20-30m from areas of major construction, the effect is predicted to be negative, significant to very significant and short-term. At a distance of 35m from areas of major construction, the predicted construction noise levels are expected to have a negative, moderate and short-term effect. In terms of vibration the associated effect with these activities is considered to be negative, not significant and temporary. The adoption of the extensive best practice measures outlined in Chapter 10 and the CEMP will ensure that noise and vibration effects are reduced.

#### 14.3.7.2 Operational Phase

During the operational phase of the development potential interactions are.

**Material Assets – Traffic and Transportation** – During the operational phase of the development, Chapter 10 of this EIAR predicts that there will be an increase in vehicular traffic associated with the site on some surrounding roads. It assesses the related noise effects for the Design Year 2039 as being neutral, imperceptible and long term based on predicted additional traffic on the surrounding existing road network.

**Material Assets – Services, Infrastructure & Utilities** – The main potential sources of noise and vibration during the operational phase include mechanical and electrical plant used to service the buildings. As stated in EIAR Chapter 10, building services plant, once designed to achieve the relevant noise criteria, is categorised as negative, imperceptible and permanent.

**Biodiversity** - Chapter 9 notes that the site is sufficiently distance from Cork Harbour that disturbance to birds using the Cork harbour SPA will not occur due to noise from operational plant and vehicular traffic. Furthermore, no significant impacts to fauna are anticipated, as the species present locally are accustomed to foraging in urban areas, with associated noise levels. With the adoption of the measures described in Chapter 9 – Biodiversity, and those relevant in Chapter 10 – Noise & Vibration will ensure that disturbance will not occur.

**Population and Human Health** - It is not predicted that noise and vibrations sources from increased traffic, building services plant, deliveries and waste collections and other activities will result in significant impacts/interactions with human health impacts during the operational phase.

Potential impacts of Noise & Vibration have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

### 14.3.8 AIR QUALITY AND CLIMATE

#### 14.3.8.1 Construction Phase

Chapter 11 of this EIAR assesses Air Quality and Climate impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with Air Quality and Climate impacts.

**Material Assets – Traffic and Transportation** – Chapter 11 reviews the potential for traffic emissions to impact air quality in the short-term over the construction phase, in particular due to the increase in HGVs accessing the site. It concludes that none of the road links impacted by the proposed development satisfy the Design Manual for Roads and Bridges assessment criteria. It can therefore be determined that the construction stage traffic will have an imperceptible, neutral, localised and short-term impact on air quality. While there is potential for construction vehicles to give rise to CO<sub>2</sub> and N<sub>2</sub>O emissions. Chapter 11 refers to The Institute of Air Quality Management documentation and states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the impact on climate is considered to be imperceptible, neutral and short term.

**Material Assets – Services, Infrastructure & Utilities** - Chapter 11 notes that the greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust and PM10/PM2.5 emissions. In the absence of appropriate mitigation measures, the installation of material assets including necessary trench excavation works and connections may result in temporary nuisances such as dust emissions which would negatively impact on air quality. Chapter 11 considers there is the potential for short-term, negative, slight impacts to nearby sensitive receptors as a result of utilities trench excavation. The appropriate management measures stated in the CEMP and EIAR Chapter 11, will minimise any potential negative impacts during construction.

**Land, Soils and Geology** – - Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate measures, outlined in Appendix 11.2, to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils once mitigation measures are in place.

**Biodiversity** – There is the potential for interactions between air quality and biodiversity as works will take place within close proximity to the Douglas River Estuary pNHA and Cork Harbour SPA. There is the potential for NO<sub>x</sub> and NO<sub>2</sub> emissions from traffic accessing the site to impact the SPA and pNHA. However, it has been determined that there is an imperceptible impact to the designated sites as a result of traffic emissions. It has been determined that there is an overall low risk of dust related emissions causing ecological impacts. Once the mitigation measures outlined within Section 11.6 are implemented dust related impacts are predicted to be short-term, neutral and imperceptible.

**Noise and Vibration** – Emissions such as dust and other nuisances may arise as a result of vibration occurrences during construction, negatively impacting the local air quality and microclimate. However, it is not predicted that these

interactions will result in any significant impacts given the mitigation measures proposed during construction regarding these areas.

**Population and Human Health** - The most significant air quality interaction is with human health. An adverse impact due to air quality in the construction phase has the potential to cause health and dust nuisance issues. The mitigation measures (ref. Appendix 11.2) that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term and imperceptible with regard to the construction phase.

#### 14.3.8.2 Operational Phase

During the operational phase of the development potential interactions are.

**Material Assets – Traffic and Transportation** – Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on the surrounding road network. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

**Population and Human Health** – The most significant air quality interaction is with human health. An adverse impact due to air quality in the operational phase has the potential to cause health and dust nuisance issues. The mitigation measures (see Appendix 11.2) that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is long term and imperceptible with respect to the operational phase.

Potential impacts on Air Quality and Climate have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

### 14.3.9 CULTURAL HERITAGE

#### 14.3.9.1 Construction Phase

Chapter 12 of this EIAR assesses Cultural Heritage impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with Cultural Heritage impacts.

**Landscape and Visual** - Chapter 12 notes that there is one cultural heritage feature, a cellar, within the proposed development site. The cellar will be preserved in situ and incorporated into a green open space. A 10m buffer zone will be established around the feature and no construction works are proposed within this buffer zone. Chapter 12 lists a series of measures that when implemented will ensure that no direct or indirect impact occur during the construction phase on this feature, these include archaeological supervision of the works in relation to Block 12.

**Cultural Heritage and Archaeology** - As detailed in EIAR Chapter 12 there is one cultural heritage site, a cellar, situated within the proposed development site. The cellar will not be impacted by the proposed earthworks and will be preserved in situ within a 10m buffer zone within a green open space. Following the measures outlined in Chapter 12, there will be no significant direct or indirect effect on this cultural heritage site.

### 14.3.9.2 Operational Phase

**Landscape and Visual/ Population and Human Health** - Chapter 12 of this EIAR notes that at the operational phase an information plaque/board will be erected at a suitable location with relevant information relating to the cellar and its association with the former Lakeland Demesne. With this measure the cellar will be preserved in situ and information and an acknowledgement of its presence in the landscape will be provided. The overall interaction between the cellar and the operational landscape and population will be positive.

Potential impacts of cultural heritage and archaeology have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

## 14.3.10 POPULATION AND HUMAN HEALTH

### 14.3.10.1 Construction Phase

Chapter 13 of this EIAR assesses Population and Human Health impacts resultant from the proposed development. During the construction phase of the proposed development, in the absence of the effective implementation of appropriate mitigation measures, the following aspects may give rise to potential interactions with Population and Human Health impacts.

**Landscape and Visual** – Potential short-term impacts to visual amenity in the area as a result from construction works, include the necessary removal of scrubland and a limited number of existing trees, construction traffic, earthworks and erection of tall tower cranes, gradual emergence of proposed buildings, material storage, site hoardings and site lighting. Chapter 4 notes that the sensitivity of residential receptors is generally considered high while the receptors and activities associated with the Mahon Retail Park and Shopping Centre are considered low. The construction effects predominantly relate to the visibility of construction traffic and the upper part of the site where cranes and scaffolding will be visible above the hoarding. These effects impact elevated long and mid and near distance views, with impacts predicted to be most prevalent in the latter. Chapter 4 of this EIAR and the CEMP (ref Appendix 2.1) provide for measure to ameliorate these impacts, which Chapter 4 consider to be temporary and medium-significant adverse in close distance views.

**Material Assets – Traffic and Transportation** – Chapter 5 considers that construction traffic has potential to result in temporary/short-term, not significant negative impacts on local residents, businesses and services and other uses in the area by way of traffic volumes. The closing off of the current informal desire lines through the site, which will be replaced by formal pedestrian and cycle routes at the operational phase, will result in minor short-term inconvenience in terms of pedestrian access. Road Closures may be required for a short period to enable the tower cranes to be transported to/from site. The impacts on the local road users will be temporary, short-term, limited in extent for this stage of the works.

**Material Assets – Services, Infrastructure & Utilities** - The construction phase could give rise to potential temporary impacts on existing services such as water, communications, electrical infrastructure resulting from connections from the proposed development to existing local services. However, with the proposed mitigation measures outlined, it is not expected that these impacts will be significant. Potential human health considerations in relation to air quality and noise nuisances arising from the trench excavation will be ameliorated by adherence to the measures outlined in Chapters 10 and 11 and the CEMP.

**Land, Soils and Geology** - In the absence of appropriate measures potential interactions with population and human health during construction earthworks may result in increased dust, noise and vibration levels in the locality. With adoption of the appropriate measures outlined in Chapter 7 and the CEMP, these effects can be minimised. Alongside this the risk of leakage and accidental spillage from construction machinery and materials, oil and hydrocarbons, concrete and cement products are noted as potential sources of contaminated run-off, which could result in soil pollution. The potential residual impacts associated with soil or ground contamination and subsequent health effects are predicted to be of brief duration, neutral and not significant.

**Water (Hydrology and Hydrogeology)** – In the absence of appropriate mitigation measures, there is potential for surface water or groundwater to be contaminated with pollutants associated with construction activity, resulting in negative impacts relating to human health. Other potential health effects are associated with flooding. The proposed site design and mitigation measures ensures that the potential for impacts on the water environment and on human health are not significant.

**Noise and Vibration** - Increased levels of noise and vibration during construction activities may result in negative impacts to the amenity of local residents. Chapter 10 identifies potential noise and vibration sources that could arise during the construction phase as including piling and excavation works. Without noise reduction measures at a distance of 20-30m from areas of major construction, the effect is predicted to be negative, significant to very significant and short-term. At a distance of 35m from areas of major construction, the predicted construction noise levels are expected to have a negative, moderate and short-term effect. In terms of vibration the associated effect with these activities is considered to be negative, not significant and temporary. The adoption of the extensive best practice measures outlined in Chapter 10 and the CEMP will ensure that noise and vibration effects are reduced.

**Air Quality and Climate** - The most significant air quality interaction is with human health. An adverse impact due to air quality in the construction phase has the potential to cause health and dust nuisance issues. The mitigation measures (ref. Appendix 11.2) that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term and imperceptible with regard to the construction phase

### 14.3.10.2 Operational Phase

During the operational phase of the development potential interactions are.

**Landscape and Visual** – Chapter 4 of this EIAR notes that the proposed development will not introduce elements that are uncharacteristic to the existing townscape character and concludes that the significance / quality and changes to the townscape character are considered to be Very Significant / Beneficial. The proposal will add a new and prominent building block along the N40 and constitute a new edge and entry point in the northern part of Jacob's Island. It will provide structure and introduce a new urban quality to a current brownfield site. Existing and proposed boundary screen planting will obscure views of the lower portions of the Proposed Development and over time the extent of screening will increase as vegetation matures. With regard to longer distance views, while the visual effect will reduce quickly with distance, the proposed development will still form a new focus point in available open views, particularly in views west from Hop Island, but it will be one component and several in these views and will integrate into the increasingly built-up environment on Jacob's Island and Mahon.

**Material Assets – Traffic and Transportation** - Once operational the proposed development will result in increased traffic volumes accessing the site and on the surrounding road network. Users of the local road network may experience increased delays in car journeys. However, Chapter 5 sets out a number of measures to address these impacts including optimising the signal operations of the Mahon Interchange and Retail Park signalised junctions, providing

pedestrian and cycling facilities through the site to promote modal change and preparing a Mobility Management Plan to encourage sustainable travel practices. It is predicted that the site's location, relative to public transport opportunities and 2 no. greenways will promote human health through sustainable and active modes of travel. With the proposed mitigation measures in place, no significant residual negative impacts are predicted.

**Material Assets – Services, Infrastructure & Utilities** – Interactions between population and Human Health and material assets during the operational phase of the development will include the generation of effluent and sanitary waste and result in the increase in water demand and service infrastructure including telecommunications. Irish Water has confirmed that there will be sufficient water and wastewater capacity to accommodate the proposed development (ref. Appendix 6.1). Chapter 6 of this EIAR indicates that with appropriate measures outlined within the chapter and the CEMP no significant impacts are likely arising from the operational phase of the proposed development on the foul water drainage, potable water, power, gas and telecommunications networks.

**Water (Hydrology and Hydrogeology)** – Chapter 8 notes that potential effects arising from surface and foul water operational issues are rated as neutral for water quality, with imperceptible significance if not mitigated against. Any impact would be considered to be of brief duration. In view of the proposed use of the units, it is not expected that significant quantities of hazardous material will be brought on site. The potential risks to human health in terms of water and hydrology are expected to be of low significance. Standard maintenance practice measures during the operation and maintenance phase, involving the monitoring of the drainage system for blockages, leakages and repairing in a timely fashion should be implemented. With these measures in place the potential impact during the operational phase for water and hydrology is reduced to neutral for quality, with imperceptible significance and of momentary duration.

**Noise and Vibration** – It is not predicted that noise and vibrations sources from increased traffic, building services plant, deliveries and waste collections and other activities will result in significant impacts/interactions with human health impacts during the operational phase.

**Air Quality and Climate** - The most significant air quality interaction is with human health. An adverse impact due to air quality in the operational phase has the potential to cause health and dust nuisance issues. The mitigation measures (see Appendix 11.2) that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is long term and imperceptible with respect to the operational phase.

**Cultural Heritage** – Chapter 12 of this EIAR considers that at the operational phase an information plaque/board will be erected at a suitable location with relevant information relating to the cellar and its association with the former Lakeland Demesne. With this measure the cellar will be preserved in situ and information and an acknowledgement of its presence in the landscape will be provided. The overall interaction between the cellar and the operational landscape and population will be positive.

Potential impacts on Population and Human Health have been assessed and considered within each chapter/discipline of this EIAR. With the proposed mitigation measures in place, no significant residual negative impacts are predicted

Table 14.1: Potential Interaction of Effects Matrix for the proposed development (Con = Construction, Op= Operational. If there is considered to be no potential for an effect, the box is left blank.)

Interaction	Landscape & Visual	Material Assets – Traffic & Transport	Material Assets – Services, Infrastructure & Utilities	Land, Soils & Geology	Water (Hydrology & Hydrogeology)	Biodiversity	Noise & -Vibration	Air Quality & Climate	Cultural Heritage	Population & Human Beings
Landscape & Visual		Con & Op	Con & Op	Con & Op	-	Con & Op	-	-	Con & Op	Con & Op
Material Assets – Traffic & Transport	Con & Op		Con & Op	Con	Con & Op	Con & Op	Con & Op	Con & Op	-	Con & Op
Material Assets – Services, Infrastructure & Utilities	Con & Op	Con & Op		Con	Con & Op	Con & Op	Con & Op	Con	-	Con & Op
Land, Soils & Geology	Con	Con	Con		Con & Op	Con	Con	Con	Con	Con
Water (Hydrology & Hydrogeology)	Op	Con	Con & Op	Con		Con & Op	-	-	-	Con & Op
Biodiversity	Con & Op	Con & Op	Con & Op	Con	Con & Op		Con & Op	Con & op	-	-
Noise & Vibration		Con & Op	Con & Op	-	-	Con & Op		Con	-	Con & Op
Air Quality and Climate	-	Con & Op	Con	Con	-	Con	Con		-	Con & Op
Cultural Heritage	Con & Op	-	-	Con	-	-	-	-		Op
Population and Human Beings	Con & Op	Con & Op	Con & Op	Con & Op	Con & Op	-	Con & Op	Con & Op	Op	



JACOBS ISLAND



CHAPTER FIFTEEN  
Summary of Mitigation Measures

# CHAPTER FIFTEEN

## Contents

15	Summary of Mitigation Measures.....	15
15.1	INTRODUCTION .....	1
15.2	MITIGATION MEASURES PROPOSED .....	1



# CHAPTER FIFTEEN

## SUMMARY OF MITIGATION MEASURES

### 15.1 INTRODUCTION

#### 15.1.2 CHAPTER CONTEXT

The 2022 EPA Guidelines regarding the information to be contained in EIAR's identifies the following strategies for the mitigation of effects.

**Mitigation by Avoidance:** avoidance, usually referring to strategic issues – such as site selection, site configuration or selection of process technology - is generally the fastest, cheapest and most effective form of effect mitigation. In many cases mitigation by avoidance may also be considered as part of the “consideration of alternatives”.

**Mitigation by Prevention:** This usually refers to technical measures. Where a potential exists for unacceptable significant effects to occur (such as noise or emissions) then measures are put in place to limit the source of effects to a permissible and acceptable level.

**Mitigation by Reduction:** This is a very common strategy for dealing with effects which cannot be avoided. It tends to concentrate on the emissions and effects and seeks to limit the exposure of the receptor. This is regarded as a less sustainable, though still effective, approach. Strategies utilised are 'Reducing the Effect' or 'Reducing the Exposure to the Effects'.

**Offsetting:** This is a strategy used for dealing with adverse effects which cannot be avoided. It includes measures to compensate for adverse effects. Examples include restoration of buildings, walls or features to compensate for loss of similar features, planting of new vegetation elsewhere to replace unavoidable loss of similar vegetation and Provision of a new amenity area to replace amenity lost as a result of a project.

## 15.2 MITIGATION MEASURES PROPOSED

### 15.2.1 LANDSCAPE AND VISUAL

#### 15.2.1.1 Design Stage - Mitigation Measures

- The layout design has been landscape-led, based around the core principle of the of permeability in order to connect the proposed development to the surrounding built environment and to the wider River Lee/Lough Mahon Waterfront Greenway via Joe McHugh Park and the Passage West Greenway. The design and layout of the public realm is essential in the creation of a built environment for this scheme. The designed landscape amenity areas connected by a series of pedestrian and cycle linkages, mitigate for the loss of the existing underutilised and in places impenetrable open space. The proposed connectivity measures formalise the existing informal desire lines through the site by providing attractive and secure pedestrian and cycle routes.
- Building heights range across the scheme from 1 -8 storeys over lower ground and semi-basement podium levels. The northern blocks, adjacent to the N40 represents the tallest building with a maximum of 8 storey. This is considered appropriate as it presents a strong frontage to the N40 to highlight the entrance to Jacob's Island. It also represents a key noise mitigation measure which has been integrated into the proposed development. By positioning the less-sensitive commercial uses adjacent to the N40, these act as a noise barrier for the rest of the site and enhance the residential amenity. The design includes strong frontages all streetscapes, defining character and ensuring overlooking and activity within the public realm.
- Building forms have been designed so as to relate to the existing and permitted development, with playful, staggered blocks to the very north of the proposal echoing the language of development permitted under SHD ABP-301991-18 (amended by ABP- 310378-21).
- While vegetation and tree removal are required to accommodate the proposed development, the majority of this is scrubland and low value trees. Significant new high quality tree planting is proposed to compensate for this removal.
- Chapter 4 notes that the principal mitigation is inherent in the high-quality architecture, design and choice of materials.

#### 15.2.1.2 Construction Phase - Mitigation Measures

- During construction, site security fencing and solid hoarding will be used where appropriate to minimise noise pollution and restrict visibility into the site, minimising the temporary landscape and visual impacts.
- Trees to be retained shall be fenced off at the commencement of construction to avoid inadvertent felling or use of the ground under canopies for construction purposes.

The CEMP (Appendix 2.1) identifies the following landscaping mitigation measures to be implemented:

- Landscaping works will commence on the completion of the building facades. Landscaping works will be undertaken within the site perimeter, particularly to the north that is bounded by N40 South Ring Road.
- Where possible, excavated material will be reused on site for landscaping

### 15.2.1.3 Operations Phase - Mitigation Measures

The plants for the Proposed Development has been chosen based on their long-term suitability and aesthetic appeal including the following:

- Suitable for the Irish climate;
- Non-invasive;
- Collectively provide visual interest all year round;
- Enhancement of biodiversity and habitat creation; and
- Be disease resistant.

The resulting scheme will provide a design which includes a high-level amenity which is workable, aesthetically appealing, and robust within in a receiving environment that poses challenges as well as presenting opportunities.

## 15.2.2 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION

Mitigation Measures for the Proposed SHD Development include best practice mitigation measures for construction and standard maintenance practice measures during the operation and maintenance phase. The particular mitigation measures that should be met at a minimum are outlined in section below.

It should be noted that the projected opening year for elements of the development is 2025, by which point several mitigations measures close to the site will have been provided including the north-bound bus lane which will have been provided as part of the adjacent permitted scheme (ABP 301991-18) being delivered by the previous Montip Horizon Ltd developer. A more up-to-date census will have been undertaken, and it is expected that the mode share for private car for Jacob's Island will be a reduction in comparison to the 2016 census as a result of the impact of COVID-19 and working from home, as well as the outlined mitigation measures.

### 15.2.2.1 Construction Phase - Mitigation Measures

Chapter 5 of this EIAR proposes the following construction monitoring measure:

- Provision of sufficient on-site parking during the construction phase to ensure no potential overflow onto the local network;
- The site construction compound will be able to accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas;
- Wheel cleaning facilities will be provided to reduce the tracking of mud and dirt onto the local road network;
- Monitoring and control of construction traffic will be ongoing during construction works;
- Construction traffic will be minimised during peak hours; and
- Any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.

### 15.2.2.2 Construction Phase - Monitoring

During the construction stage, the following monitoring exercises are proposed:

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and External road conditions; and
- Timings of construction activities in terms of start / finish times.

### 15.2.2.3 Operational Phase – Mitigation Measures

Chapter 5 of this EIAR proposes the following operational mitigation measures:

- With the objective of mitigating the potential impact of the proposed development during its operational stage, the following initiatives have been identified and subsequently form an integral part of the subject development proposals.
- It is recommended to undertake discussions with the Council in advance of the full masterplan development to perform a review of the signal operations of the Mahon Interchange and Retail Park signalised junctions. It is likely that the increase in queue length on the Mahon Link highlighted in Section 5.7.2 could be reduced by linking the 2 signalised junctions, or by improving the stages or run time.
- The design of the proposed development has sought to maximise the ability to provide attractive connections to the surrounding pedestrian and cycling network. Internally, dedicated pedestrian and cycling infrastructures will be provided and will connect with the existing / future pedestrian and cycling facilities in the local public road network thereby facilitating excellent pedestrian permeability.
- Cycle parking has been provided at a higher rate to that proposed within the development management standards. Accordingly, this provision of cycle parking will help ensure cycling is a viable alternative mode of transport to private car travel thereby helping minimise private car trips generated by future residents.
- A Mobility Management Plan (MMP) is to be compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development.

### 15.2.2.4 Operational Phase – Monitoring

As part of the Mobility Management Plan (MMP) process, it is proposed that further transport surveys be undertaken on Jacobs Island to continue to understand how the island is operating. An initial evaluation of the operation of the plan will take place once the proposed development is approximately 50% occupancy and then annually into its operation. The plan will be appropriately adjusted at that stage based on the results. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.

### 15.2.3 MATERIAL ASSETS – SERVICES, INFRASTRUCTURE & UTILITIES

#### 15.2.3.1 Construction Phase - Mitigation Measures

Chapter 6 of this EIAR sets out the following mitigation measures which are designed to protect the existing utilities and ensure minimum to no disruption to the existing services:

- In order to prevent the release of hazardous materials (fuels, paints, cleaning agents, etc) during construction site activity, all hazardous materials should be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks should be used on the site during the construction phase of the project. Safe material handling of all potentially hazardous materials should be emphasized to all construction personnel. The roads surrounding the site shall undergo regular cleaning to remove any spoil spilt during excavation and removal off-site.

#### 15.2.3.2 Construction Phase - Monitoring

An environmental consultant should be retained on the project team to conduct periodic inspections of the construction site to ensure that any hazardous materials stored on the construction site are stored within appropriate secondary containment and that any surface water discharged off site during the construction is free from excessive sediment. The monitoring and maintaining cleanliness of exits from site and adjacent roads should also be conducted.

#### 15.2.3.3 Operational Phase – Mitigation Measures

Chapter 6 of this EIAR includes the following operational mitigation measures:

##### **Surface Water**

The surface water drainage system for the entire site was installed and taken in charge of by Cork City Council in 2013. From the surface water modelling exercise undertaken at the time it was confirmed that the main network was more than adequate to cater for full storm discharge from the Jacobs Island present development.

In accordance with the current Storm Water Management Guidelines & following consultation with Greater Dublin Strategic Drainage Study (GDSDS) Vol. 2 Section E2.1, it is intended to design this new development in accordance with SuDS. Therefore, the following measures will be considered.

- Open green areas and podium landscaping which will provide interception storage for between 5-10mm of rainfall and provide treatment by filtration through the planter soils. These planted areas will also provide a medium for removal of pollutants and will improve the quality of surface run-off discharging into the surface water drainage system.
- Petrol and Oil (Hydrocarbon) interceptors will be provided at all surface water discharge points of the development to the existing surface water drain. This is intended to prevent any deterioration of water quality in downstream watercourses. These interceptors will also include silt collection and storage capacity to prevent silt discharge from the development to the receiving environment.
- Non-return valves will be provided prior to the connection to the existing drainage network.
- In addition, tree pits, swales, soakaways, and another SuDS measure will be considered following an onsite infiltration test.

No other amelioration, remedial or reductive measures are considered necessary, apart from good practice in the hydraulics and engineering design of the surface water drainage system.

##### **Foul Water**

No other ameliorative, remedial or reductive measures are considered necessary, apart from good practice in the hydraulics and engineering design of the foul water drainage system.

Given the use of appropriate secondary containment for the storage of fuel oils, paints and other potentially hazardous materials on the site during the construction phase, the risk of accidental release of these compounds to the environment will be greatly reduced.

##### **Water Supply**

From previous discussion with Irish Water, it is considered that the current infrastructure should be sufficient to meet the development demands.

##### **Electricity**

Provision of electrical supply will be carried out in accordance with the recommendations of ESB and Cork City Council (for public lighting).

##### **Telecoms**

##### **EIR**

Provision of telecommunications supply will be carried out in accordance with the recommendations/specification of EIR.

##### **Virgin Media**

According to Virgin Media records/website there is currently no Virgin Media services in the area. Having engaged with Virgin Media they expressed their willingness to extend their network to the proposed SHD.

##### **Natural Gas**

The existing gas distribution pipework provided for the development seems to be adequately sized for 100% gas usage for the whole development. Given that the actual (if any) use of the gas will be used just for cover peak / backup up heat outputs, there is no risk of starving other consumers or distribution pipework of gas supply.

#### 15.2.3.4 Operational Phase – Monitoring

Periodic inspections, emptying and maintenance of the hydrocarbon interceptors and foul network by a licensed waste disposal contractor will be undertaken. Smart water meters will be installed to monitor consumption within the development.

## 15.2.4 LAND, SOILS & GEOLOGY

The following mitigation measures as set out in Chapter 7 are designed to protect the existing environment and ensure minimum to no impact to the local geology. The mitigations are described below for the construction and operational phases.

### 15.2.4.1 Construction Phase - Mitigation Measures

- The excavation works generate a great volume of material to be kept on site for future use. This material will require to be stockpiled locally on site, in a protected area, to avoid this material to become a source of dust pollution.
- As highlighted in section 7.4.2.3, during the excavation works, there is a slight possibility to reach groundwater in localised areas. In order to control any possible groundwater in the areas being excavated, the contractor will require to isolate the area by digging trenches to the perimeter of the foundation area with suitable falls and sumps. The perimeter drain in an open excavation such as a basement, should include French drains.
- Discharge of ground water should be via silting ponds where suspended solids can be removed, and the water quality can be monitored.
- At the delivery and wash down point it is important that good measures are employed to prevent spillages from concrete delivery trucks contaminating the ground.
- A designated fuel transfer area should be provided on site, and this is typical good practice on well managed construction sites. The contractor will be required to install an impermeable paved and bunded area that is capable of handling and intercepting a fuel spillage. All tanks should be fully bunded and placed on a firm and secure foundation.
- Concrete should always be placed in a controlled method to prevent spillages as is good construction practice. Where possible concrete should be placed using a concrete pump. As noted above it is important that the machinery is well maintained.
- If the mitigation measures are put in place and a risk assessment is carried out in advance of and during the works, the significance of these impacts will reduce to imperceptible.

### 15.2.4.2 Construction Phase - Monitoring

A resident engineering consultant will be retained on the site to monitor the construction. If the suggested mitigation and control measures are put in place and a risk assessment is carried out in advance of and during the works, the significance of the noted impacts will reduce to imperceptible.

### 15.2.4.3 Operational Phase - Mitigation Measures

- No significant effects are highlighted during the operational phase.

## 15.2.5 WATER (HYDROLOGY & HYDROGEOLOGY)

Chapter 8 sets out the following mitigation measures for the site for the Proposed SHD Development which include best practice mitigation measures for construction and standard maintenance practice measures during the operation and maintenance phase. The particular mitigation measures that should be met at a minimum are outlined below.

### 15.2.5.1 Construction Phase - Mitigation Measures

This site is unique in that the existing circulatory access road to the south of the Proposed SHD Development forms a natural barrier for the surface water running off the site and will also allow the deposition of sediment. This will prevent the mobilising of any pollutants reaching the environmentally protected areas downslope of the site. The breach points in this natural defence will be the haul routes into the site, new entrances into the site and the turning head on the existing road to the southeast of the site. The CEMP sets out the proposed mitigation measures for the construction of this development. Best practice mitigation is proposed on site during construction, implementing the following as a minimum:

- A wheel wash will be provided at all entrances and exits from the site.
- Drainage trenches will be constructed in short lengths and backfilled as the construction progresses to ensure that the drainage trenches do not become a conveyance route for silt laden run-off.
- Materials brought on site will be suitably covered where there is a risk of wind-blown sediments escaping from imported or exported material.
- Parking of vehicles will be kept to a designated area.
- Any fuels or oils stored on site will be bunded.
- Portaloo's or holding tanks will be used for foul drainage from the site facilities during construction. These will be emptied on a regular basis by a licenced contractor. As discussed in Section 8.4.4 and Section 8.7.3.2 the site is not suitable for a septic tank.
- De-watering of excavations will be undertaken into lined lagoons, where the water will be allowed to settle before controlled discharge from the site.
- Any stock piled material will be covered and surrounded with silt fencing.
- All works areas will be surrounded with silt fencing and potential surface water pathways to low-lying areas banked up. The silt fencing will be monitored and replaced where this is found to be sagging or clogged with material.
- The condition of haul routes will be managed. Public roads at the entrance to the site will be maintained where any material has been deposited from vehicles entering or leaving the site. The haul routes and trafficked access routes will be monitored to ensure that there are no potholes developing that would collect rainwater and new stone will be applied to haul routes where this is observed to be breaking down from trafficking and encouraging the accumulation of silt.
- Vehicles that have broken down on site will not be left on site for long periods. They will be removed to avoid any seepage of fuels or oils from the vehicle infiltrating the ground.
- Only concrete chutes will be permitted to be cleaned on site in designated lined wash out areas. The residue will be later removed from the site.
- All construction materials such as concrete blocks will be stored on purpose built hardcore areas above the existing ground to avoid surface water run-off from rainfall mobilising the fine particles from these products into the ground.

With the above mitigation the potential impact during the construction phase for hydrology and hydrogeology is reduced to neutral for quality, not significant and of brief duration.

### 15.2.5.2 Construction Phase - Monitoring

The water quality will be monitored for the duration of the construction of the site at pre-agreed locations on the shoreline with Cork City Council. Baseline samples will be taken in advance of the works on the site.

### 15.2.5.3 Operational Phase – Mitigation Measures

- It is expected that the management of the site for the Proposed SHD Development will be managed by a dedicated management company and that the drainage may be taken in charge by Cork City Council. On that basis it is expected that the drainage system will be monitored for blockages, leakages and repaired in a timely fashion.
- With the above mitigation the potential impact during the operational phase for hydrology and hydrogeology is reduced to neutral for quality, with imperceptible significance and of momentary duration.

### 15.2.5.3 Operational Phase – Monitoring

It is expected that standard management company/Cork City Council (when drainage is taken in charge) monitoring for leaks in storm and foul sewers will be undertaken and repairs carried out in a timely manner.

## 15.2.6 BIODIVERSITY

### 15.2.6.1 Construction Phase – Mitigation Measures

Chapter 8 notes that a detailed Construction and Environmental Management Plan (ref Appendix 2.1) has been appended to the EIAR. For ease of reference, the general pollution prevention measures which will be implemented during the construction phase are outlined below.

#### Mitigation of habitat loss/damage during construction

Landscaping works will commence on the completion of the building facades. Landscaping works will be undertaken within the site perimeter, particularly to the north that is bounded by N40 South Ring Road. Measures will be implemented to ensure that trees or vegetation being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around trees and vegetation being retained and this will enclose their Root Protection Areas (RPAs). To mitigate against the loss of scrub and a small area of woodland, substantial planting will be undertaken on the site. Large areas of open space will be maintained on the site. This will reduce the impact of the proposed development upon habitats in the area and there will be no significant operational impact upon habitats due to the provision of substantial native and pollinator friendly habitats proposed for the site. Landscaping proposals are set out in Chapter 4.0: Landscape and Visual Impact Assessment.

#### Flora & Fauna

Loss of commuting and foraging habitat at the site will be mitigated by the landscaping proposals, which include measures along the N40, as well as extensive planting through the site. Trees or vegetation to be retained will be protected from any accidental damage during construction through use of measures such as fencing. Measures will be implemented to ensure that trees and vegetation being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around trees and hedge vegetation being retained and this

will enclose their Root Protection Areas (RPAs). The fencing will be at least 2.3m. Similarly, a buffer is to be maintained between site and neighbouring stream and riparian margin.

The planting schemes shall ensure connectivity to habitats in the wider landscape. Trees that are being retained at the site shall be protected during clearance and construction works in line with current guidelines e.g. British Standard 5837:2012 and National Roads Authority 2006a.

To minimise disturbance to bats and other fauna that are roosting/resting or active at night, construction operations during the hours of darkness will be kept to a minimum. If construction lighting is required during the bat activity period (April to September), lighting shall be directed away from areas of semi-natural habitat to be retained. This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby countryside) to prevent overspill. This shall be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

Lighting within the proposed development site shall be installed with sensitivity for local wildlife while still providing the necessary lighting for human usage.

#### Construction and Environmental Management Plan

The following measures are a combination of measures proposed in the accompanying CEMP (ref Appendix 2.1) and environmental good practice.

The control measures for the construction stage of the proposed development will follow the following current best practice guidelines: -

- H. Masters-Williams et al. (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;
- IFI (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin;
- Murnane et al. (2002). Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156; and
- Murphy, D. (2004). Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.

#### Construction Sequence

The proposed works will be constructed in the following sequence.

- Site clearance and reduced levels. It is envisaged that the works will require the excavation to formation level resulting in approximately 18,000m<sup>3</sup> of excavated material, which is proposed to be kept onsite to be reutilized during ground works and landscaping in this development.
- Piled foundations and perimeter retaining walls.
- Construction basement slab and associated water proofing.
- Erection of concrete stairs and lift cores to roof level.
- Construction of concrete columns and intermediate upper basement and ground floor concrete slabs.
- Erection of structural frame super structure and floor slabs.
- Construction of glazing and solid facades in accordance with the architect's drawings.

- Roof completions.
- Internal completions and fitout works.
- External works.

### Tower Crane

The construction works will require the erection of at least 4 no. tower cranes within the development site. The tower crane will be required for the erection of the building frame and super structure. It is noted that the location and operation of the tower cranes will be co-ordinated by the main contractor but are likely to be located centrally in each site phase.

### Piling

All buildings structures will be supported on piled foundations, subject to further detailed design. Formation levels across the site will vary and they are anticipated to the various areas as 5.65m OD (Block 11), 7.0m OD (Block 12), 6.85m OD (Block 13), 6.8m OD (Block 14), 7.5m OD (Block 15).

It is proposed that the piling methodology will be continuous flight auger type piles (CFA Piles) so as to limit noise and vibration to the adjoining residential area.

During the piling installation works an independent specialist will be employed to monitor the noise levels at the site perimeter and vibration levels at specified locations.

### Basement

Block 15 is proposed to have a basement car parking area and as outlined above, the foundations for the building will likely consist of piled foundations. All basement drainage will be located beneath this slab and will be tanked to prevent future water ingress. The drainage will then connect to the main network in the public road by gravity.

The suspended podium slab will be formed in a concrete frame. This structure will also provide horizontal restraint to the perimeter retaining sheet piled walls and will facilitate the sequenced removal of any temporary propping as required.

The basement structure will require large concrete pour volumes, which will likely require works outside of normal construction hours to be agreed with Cork City Council in advance.

### Super structure construction

The buildings will likely be constructed as a concrete framed flat slab type structure with columns in rectangular shapes to suit the party wall layouts and required sound resistance. The stair core walls will be reinforced concrete or precast concrete.

### Building Façades

The building façades will vary depending on the building use. Where possibly an emphasis will be placed on off-site construction including modular unitised facades and precast panels. This will facilitate a swift form of construction and will also reduce site waste.

### Fit out works

The internal fitout out of each building will be on a phased basis and will be subject to final tenant requirements. The fitout works will include mechanical and electrical works, partitions, and finishes. The emphasis will be on lean construction to ensure minimal construction waste.

### Landscaping works

Landscaping works will commence on the completion of the building facades. Landscaping works will be undertaken within the site perimeter, particularly to the north that is bounded by N40 South Ring Road.

### Construction Traffic Volumes

Heavy goods vehicle truck movements into and out of the site are expected to peak during the basement excavation works and large concrete pours. Excavated material will be relocated internal within the site and will not necessitate external vehicular movements. Large concrete pours will be concentrated to within an individual 24-hour period.

People movement (in and out) and associated car trips during each construction stage will be circa 20 no. during basement excavation stage and rising to circa 50 during construction with an increase to 60 no. as the frame is being progressed. The numbers on site will maintain at this level during the façade construction but will increase to between 60-70 during internal M&E installation.

Typically, the trips to and from the site will be by private car and vans accommodating 1-2 workers. Some sub-contractors will use minibus transport when in larger crews, such as concrete contractors, M&E, and facades. Public transportation will also be availed of by individual workers. Typically, construction workers will remain on site from between morning start to evening time

### Site Compound

It is anticipated that the site compound will be located to the middle portion of the site, located in the proposed green open space within the development. (Please refer to the CEMP for relevant Drawings).

### Hours of Work

7:30 am to 6 pm Monday to Friday, 7.30 am to 4 pm on Saturdays, or as directed by Cork City Council or An Bord Pleanála. It is proposed that hours of work outside of these times will be by agreement with the local authority.

### Dust & Noise

Dust minimisation and dust monitoring is set out in Section 7 Dust Minimisation of the accompanying CEMP; while Noise and Vibration is addressed under Section 8.1 and 8.2 of the CEMP.

### Waste Management

Section 9 of Construction Waste Management of the accompanying CEMP (ref appendix 2.1) outlines the waste management proposals to be implemented.

## Fuel & Oil Management Procedure

### Refuelling

Refuelling will take place in the proposed site compound (as set out in the accompanying CEMP).

- Refuelling will be carried out using 110% capacity double bunded mobile bowser. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using.
- Plant nappies or absorbent mats will be placed under refuelling points during all refuelling to absorb drips.
- Mobile bowser, tanks and drums shall be stored in secure, impermeable storage area, away from drains and open water.
- To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required from the main contractor.
- Potential leaks from delivery vehicles will be reduced by visually inspecting all vehicles for major leaks.
- In the unlikely event of an oil leak or spill, the leak or spill will be contained immediately using oil spill kits; the nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility.
- The Environmental Manager will be immediately informed of the oil leak/spill and will assess the cause and the management of the clean-up of the leak or spill. The Environmental Manager will inspect nearby drains for the presence of oil and initiate the clean-up if necessary.
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound, and also in site vehicles and machinery.
- Correct action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction.
- In the extremely unlikely event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.

### Oil storage

Oil storage will take place in the proposed site compound (as set out in the accompanying CEMP).

- Fuel containers will be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Leakages of oil from oil stores will be prevented by storing these oils in bunded tanks which have a capacity of 110% of the total volume of the stored oil. Ancillary equipment such as hoses and pipes will be contained within the bunded storage container. Taps, nozzles or valves will be fitted with a lock system.
- The volume of leakages will be prevented through monitoring oil storage tanks/drums for leaks and signs of damage. This will be carried out daily by the Environmental Manager.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.

### Cement

Concrete should always be placed in a controlled method to prevent spillages as is good construction practice. Where possible concrete should be placed using a concrete pump. It is important that the machinery is well maintained.

At the delivery and wash down point it is important that measures are employed to prevent spillages from concrete delivery trucks contaminating the ground.

### Environmental Controls

Environmental control measures will be stored in the proposed site compound (as set out in the accompanying CEMP).

- Mobile bowser, tanks and drums will be stored in secure, impermeable storage area, away from drains and open water.
- Fuel containers will be stored within a Secondary Containment System, e.g. bund for static tanks or a drip tray for mobile stores.
- Ancillary equipment such as hoses, pipes shall be contained within the bund.
- Taps, nozzles or valves must be fitted with a Lock System.
- Fuel and Oil Stores including tanks and drums shall be regularly inspected for leaks and signs of damage.
- Only designated Trained Operators who are authorized to refuel plant on site and emergency spill kits will be present at equipment for all refuelling events.
- Procedures and contingency plans will be set up to deal with emergency accidents or spills.
- Suitable spill response materials and emergency instruction shall be available on site and staff shall have been adequately trained.

Other measures such as Dust (Chapter 7.0), Noise (Chapter 8.0) and Waste (Chapter 9.0) management are presented in the CEMP (MMOS, 2021a).

### Site Environmental Training & Awareness

- Environmental awareness and training shall be achieved by:
  - Site induction, including relevant environmental issues.
  - Environmental posters and site notices.
  - Method statement and risk assessment briefings.
  - Toolbox talks, including instruction on incident response procedures.
  - Key project specific environmental issues briefings.
- All managers and supervisors will be briefed on the content and effective implementation of the measures identified in the CEMP.
- Method Statements will be prepared for specific activities prior to the works commencing and will include all environmental protection and mitigation measures identified in the planning application documentation and emergency preparedness appropriate to the activity covered. The Construction Environmental Manager will review key Method Statements prior to their issue.
- Method Statement briefings will be given before personnel carry out key activities for the first time.
- Environmental Training Records are to be retained in the Site Office.

Environmental Controls: Site staff shall be competent to perform tasks that have the potential to cause a significant environmental impact. Competence is defined in terms of appropriate education, training and experience.

The finalised CEMP will also be required to incorporate i) Environmental Emergency Response Plan; ii) set out a Monitoring and Auditing Procedure; iii) present a mechanism for recording Environmental Accidents, Incidents & Corrective Action Procedures and iv) establish an Environmental Complaints Procedure. This should also include Lighting Pollution Control measures.

### Surface Water Management and Runoff Control Measures

#### Sources of Water on the Construction Site

The following are the sources of water that are likely or that may be encountered during the construction works.

- **Rainwater:** The primary source of water to the site is rainwater. The anticipated average annual rainfall at the site is anticipated to be in the region of between 800 and 1200 mm annually. The rainfall amounts vary by the season and can be as much as 50 mm over a 24-hour duration. Heavy rainfall can have a significant effect on the site and can cause flooding and the overwhelming of site drainage systems. Flooding can have an effect on stored site materials that would not normally pose a risk. The contractor will be required to ensure that materials are therefore properly stored on site and to plan site activities to ensure that works such as heavy excavation, drainage and foundation works are postponed during adverse weather conditions.
- **Surface Water:** Surface waters tend to include watercourses and waterbodies. In the case of the proposed development site, the large waterbody adjacent to the site is the adjacent Lough Mahon Estuary. Whilst the construction works do not require any works within the Lough Mahon estuary the works will be taking place in close proximity to the estuary and the contractor will need to have regard for this during the construction works.
- **Groundwater:** Construction works will include the construction of a basement under blocks 15-16. The basement floor level of 8 1 m OD is set above known ground water levels and therefore should not have a significant effect on ground water. The contractor will be required, in advance of and during site establishment, to undertake a series of trial holes to establish the ground water levels.
- **Mains Potable Water:** Jacobs Island is served by a large truck public water main from 2 locations, at the entrance bridge and also at a point directly opposite the Mahon Shopping Centre, as identified on MMOS services drawings. The main infrastructure is complete, and each site is served by a branch of this public water main. The contractor will be required to specifically identify each of these mains and ensure that they are protected during the works.

#### Potential Sources of Water Pollution

The following are a list of potential water pollutions that could arise on the construction site.

- **Suspended Solids:** The contractor is to employ measures to ensure that water pollution does not arise as a result of suspended solid pollution. Sources of suspended solid pollution include, excavation, earth stockpiles, plant and wheel washing, build-up of mud on site roads. Good practice construction measures are proposed in the following sections that the contractor will be required to employ to ensure that suspended sediments from the above potential sources do not enter the watercourse.
- **Oils and Hydrocarbons:** Oils are a potential source of pollutants on a construction site. Diesel, lubricating oil, fuel, petrol, and hydraulic fluids are used quite readily on construction sites for various types of machinery and refuelling and maintenance are required regularly on sites. The contractor will need to employ good practice measures to prevent these potential pollutants entering the water course. These measures will

include bunded areas for the storage of fuels, regular maintenance of machinery to ensure that no leakages occur, measures to protect the site from vandalism and the provision of a designated refuelling area on site or refuelling off site.

- **Concrete and Cement Products:** It is important the cement products are carefully stored to withstand various weather conditions such as heavy rainfall and high winds to prevent run off and dust pollution. Concrete products can cause contamination during wash down of the trucks which can cause a large volume of uncontrolled runoff. Good practice measures can be employed on site to prevent such uncontrolled runoff by the use of a special impermeable bunded slab with a collection point and siltation for such operations.

Potential pollution from the site will be managed in accordance with the principals as set out in CIRIA guide C532 Control of Water Pollution from Construction Sites – Guidance for consultants and contractors. The site is in close proximity to the Lough Mahon Estuary and construction works will require to be controlled, in particular, controlled surface water runoff procedures implemented. This will include best practice standards and environmental guideline to safeguard qualifying interests.

Specific details will be provided by the contractor on development of the detailed Construction Management Plan at construction stage; these will be agreed in full with the Council's Environmental Department where necessary. The contractor will be required to submit proposed methods for managing surface water runoff from the site during the construction operations. The CEMP (MMOS, 2021a) outlines the operations which will require particular attention.

- Implement erosion control to prevent runoff flowing across exposed ground and become polluted by sediments.
- Intercept and divert clean water runoff away from construction site runoff to avoid cross-contamination of clean water with soiled water.
- Implement the erosion and sediment controls before starting site clearance/construction works.
- Minimise area of exposed ground by maintaining existing vegetation that would otherwise be subject to erosion in the vicinity of the development and keeping excavated areas to a minimum.
- Install a series of silt fences or other appropriate silt retention measure where there is a risk of erosion runoff to watercourses from construction related activity particularly if working during prolonged wet weather period or if working during intense rainfall event.
- Implement sediment control measures that includes for the prevention of runoff from adjacent intact ground that is for the separation of clean and 'dirty' water.
- Install appropriate silt control measures such as silt-traps, check dams and sedimentation ponds.
- Washout from concrete trucks and plant will not be permitted on site.
- Provide recommendations for public road cleaning where needed particularly in the vicinity of drains.

Controls need to be regularly inspected and maintained otherwise a failure may result, such as a build-up of silt or tear in a fence, which will lead to water pollution so controls must work well until the vegetation has re-established; inspection and maintenance is critical after prolonged or intense rainfall.

Develop checklists for weekly Site Audits, which must be finalised by the Appointed Contractor and the relevant Personnel informed of their duties.

#### Biosecurity Protocols

As it was recorded a presence of high impact invasive species, such as Japanese knotweed and Bohemian knotweed, within the masterplan site area. O'Donovan Agri Environmental has been employed to carry out treatment of these



invasive plants on site.

Biosecurity protocols shall be implemented during the proposed project to prevent the introduction of invasive species, in particular those listed on the third schedule of the 2011 Regulations, to site and the further spread of diseases. The following measures will be adopted:

- Machinery or plant to be inspected upon arrival and departure from site and cleaned when necessary.
- All equipment intended to be used at the site shall be: -
- power steam washed at a suitably high temperature or at least 65 degrees, or
- disinfected with an approved disinfectant, e.g. Virkon or an iodine-based product. The manufacturer's instructions shall be followed and if required, the correct contact times allowed for during the disinfection process. Items that are difficult to soak shall be sprayed or wiped down with disinfectant.
- During the duration of the proposed development, if equipment is removed off-site to be used elsewhere, the said equipment shall be cleaned and disinfected prior to being brought back to the works area.
- Appropriate facilities shall be used for the containment, collection and disposal of material and/or water resulting from washing facilities of vehicles, equipment and personnel.
- Importation of materials shall comply with Regulation 49 of the EC (Birds and Natural Habitats) Regulations 2011.
- Adequate site hygiene signage should be erected in relation to the management of non-native invasive species material.

A number of medium impact plants such as Butterfly Bush were observed within the present site. These plants shall be grubbed and either chipped or removed from site. The site will be monitored for re-growth and any saplings will be pulled and disposed of appropriately or treated by an application of a suitable herbicide.

In the event that further invasive species are identified an Invasive Species Management Plan shall be prepared and implemented by the Contractor. This shall include plant specific control measures for any invasive species identified.

#### **Potential Disturbance of Faunal Species Mitigation**

##### **Birds**

Removal of vegetation such as grassland, woodland and hedgerow will be carried out outside the breeding bird season from 1<sup>st</sup> March to 31<sup>st</sup> August inclusive.

##### **Mammals**

No mitigation is necessary for terrestrial mammals using the site.

#### **15.2.6.2 Construction Phase – Monitoring**

Monitoring will be carried out in accordance with the methodologies set out in the CEMP (Ref. Appendix 2.1). During construction, the application of pollution prevention measures as set out within the CEMP will be checked regularly. The mitigation measures to protect hedgerows during construction shall be monitored to ensure its effectiveness

#### **15.2.6.3 Operational Phase – Mitigation Measures**

##### **Bats**

It is recommended that two Schwegler 1FF bat boxes are mounted on the mature sycamore and two on the mature beech tree on the northern boundary of the site.

#### **15.2.6.4 Operational Phase – Monitoring**

Once operational, the implementation of the landscape plan and additional habitat (such as wild flower meadows and additional planting) shall be inspected to ensure effective implementation.

### **15.2.7 NOISE & VIBRATION**

#### **15.2.7.1 Construction Phase – Mitigation Measures**

Chapter 10 of this EAIR sets out mitigation measures that will be employed in order to control construction noise at its source include the following:

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. Whilst construction noise and vibration effects are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure effects at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening;
- liaison with the public, and;
- monitoring.

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

##### **Selection of Quiet Plant**

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

### Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control “at source”. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

Referring to the potential noise generating sources for the works under consideration, the following best practice mitigation measures should be considered:

- Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant should be switched off when not in use and not left idling.
- For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

### Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be erected around the site boundaries as standard. The hoarding will be constructed of a material with a mass per unit of surface area greater than 7 kg/m<sup>2</sup> to provide adequate sound attenuation.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

### Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

### Monitoring

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

### Project Programme

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. During excavation/ piling or other high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

### Construction Phase – Vibration

The vibration from construction activities will be limited to the values set out in Section 10.2.2. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Limit values have been provided for soundly constructed residential and commercial properties.

### 15.2.7.2 Operational Phase – Mitigation Measures

#### Mechanical Services Plant

Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria are achieved within the development it is expected that there will be no negative effect at sensitive receivers off site, and therefore no further mitigation required.

#### Additional Traffic on Adjacent Roads

During the operational phase of the development, noise mitigation measures with respect to the outward effect of traffic from the development are not deemed necessary.

#### Inward Noise

An assessment of inward noise and recommended mitigation measures is included in Appendix 10.1.

## 15.2.8 AIR QUALITY & CLIMATE

### 15.2.8.1 Construction Phase – Mitigation Measures

#### Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 11.2. These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site.

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

#### Climate

Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO<sub>2</sub> emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

### 15.2.8.2 Construction Phase – Monitoring

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m<sup>2</sup>\*day) during the monitoring period between 28 - 32 days.

### 15.2.8.3 Operational Phase – Mitigation Measures

The impact of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

The proposed development has been designed to minimise the impact to climate where possible during operation. Details of the measures to be incorporated into the design of the development are outlined in the Lifecycle Report (Appendix 11.3) prepared in support of this planning application.

### 15.2.8.4 Operational Phase – Monitoring

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

## 15.2.9 CULTURAL HERITAGE

Chapter 12 outlines that discussions were held with Ciara Brett, Cork City Archaeologist, on the 25th of November 2021 during the compilation of this report. It was agreed that the cellar (8.6m NE-SW x 6.6m NW-SE externally) will be preserved in situ within a 10m buffer zone within a green open space within the proposed development.

A site inspection of the cellar location in November 2021 revealed it to be situated in an area of rough ground which is completely overgrown with impenetrable dense vegetation. The entrance to the subterranean structure was backfilled following archaeological testing in 2003 and the site is not accessible from the surface.

### 15.2.9.1 Construction Phase – Mitigation Measures

During construction, the following mitigation measures to be overseen by an archaeologist will apply:

- The site of the cellar will be cleared of vegetation and a buffer zone of 10m will be placed around the site;
- There will be no ground disturbance work within the area of the buffer zone which will be securely fenced during the construction process and will remain in place until all elements of construction are completed;
- The site of the cellar and a 10m buffer zone will be levelled/graded, re-topsoiled and reseeded with grass to form part of a green open space to the southwest of Apartment Block 12 at the north-western end of the development site. This work will be carried out under archaeological supervision.

### 15.2.9.2 Construction Phase – Monitoring

Archaeological monitoring of groundworks will be carried out elsewhere during construction. In the event of features associated with the Lakeland demesne being identified, such features will be removed and a written and photographic record will be made. In the event of archaeological material being uncovered such material will be preserved in situ, where possible or preserved by record. Preservation in situ will require the relocation of the element of the development beyond the area of archaeological sensitivity. Preservation by record will require the excavation of the archaeological material and such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands). This work will be funded by the developer.

### 15.2.9.3 Operational Phase – Mitigation Measures

Following construction, an information plaque/board will be erected at a suitable location with relevant information relating to the cellar and its association with the former Lakeland Demesne. The style, design and content of the plaque will be agreed in advance with Cork City Council.

The implementation of mitigation measures will preserve the cellar in situ and will provide information and acknowledge its presence in the landscape. The overall effect on the cellar, following mitigation, will be positive.

## 15.2.10 POPULATION & HUMAN HEALTH

### 15.2.10.1 Construction Phase – Mitigation Measures

The potential impacts on the human environment relate to other environmental aspects such as air quality, noise and vibration, water quality and traffic and where required, the related mitigation measures are dealt with in the corresponding chapters of this EIAR. Full details of all mitigation and monitoring procedures during construction phase are described in the CEMP (Appendix 2-1) prepared by MMOS. The CEMP has been specifically designed and will be monitored to ensure that any negative impacts arising from the construction phase of the development on neighbouring properties or surrounding areas are minimised through mitigation measures which include.

- A Dust Minimisation Plan will be implemented. Nearby public roads, the site access and internal hard surfaces will be regularly cleaned and areas with potential to give rise to fugitive dust will be regularly watered when weather conditions require. Environmentally significant raw materials will be stored appropriately, vehicles delivering or removing material with dust potential will be covered, and mesh netting will be erected around the site scaffolding if necessary.
- In relation to the management of potential noise generation, noise levels as set out by the Council will be adhered to. In addition, communication will be established between the contractor/developer, local authority, and residents; with a site representative responsible for matters relating to noise. Selection of plant type and location will be appropriate to the sensitivities and constraints of the site.
- Vibration, typically due to piling and lorry movement on uneven surfaces will be closely monitored and maintained below agreed levels.
- The principles of CIRIA guide C532 Control of Water Pollution from Construction Sites – Guidance for consultants and contractors will be adhered to. The contractor will ensure materials are properly stored and that site activities such as heavy excavation, drainage and foundation works are postponed during adverse weather conditions. The contractor will have regard to the proximity of Lough Mahon Estuary during construction works. A series of trial holes will be undertaken to establish ground water levels. Existing water

mains will be identified and protected during works.

- Surface water management techniques will be implemented to prevent potential water pollution in relation to suspended solids, oils and hydrocarbons and concrete and cement products.
- A construction stage traffic management plan will be prepared in advance of works, providing details in relation to construction access, delivery routes and times of delivery.
- Site hoarding and barriers will prevent undue visual impacts and restrict unauthorised access to the each works area.
- A monitoring regime will be put in place to protect neighbours & neighbouring properties with a full and detailed vibration, noise, dust, and groundwater monitoring regime put in place for the duration of the works.

### 15.2.10.2 Operational Phase – Mitigation Measures

The proposed layout responds to the site's location within the evolving development context of Mahon. The proposed landscape and planting strategy will mitigate the loss of areas of scrub and a small area of woodland, with substantial planting proposed on the site, resulting in a series of enhanced public amenity spaces. The loss of existing informal movement desire lines through the site will be mitigated by their replacement with formal pedestrian/cyclist routes through the site, which will result in significant positive and permanent impacts to pedestrian and cyclist mobility in the wider Mahon neighbourhood.

By promoting the usage of walking, cycling and public transport as a viable means of commuting to nearby District Centre and other employment and education destinations, the proposed development will result in a positive impact on the private car based inward commuter flows into Mahon identified in the 2016 Census. The proposed public open spaces and creche will all significantly positively and permanently contribute to the communal and public facilities in Mahon.