



Environmental Impact Assessment Report

Strategic Housing Development at White Heather, South Circular Road, Dublin 8.

April 2022

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Chapter 1. Introduction

1 Introduction

This Environmental Impact Assessment Report (EIA) has been prepared on behalf of U+I (White Heather) Limited in relation to a Strategic Housing Development (SHD) planning application comprising a 1.535 ha site located at the White Heather Industrial Estate, South Circular Road, Dublin 8, 307/307a South Circular Road, Dublin 8 and 12a St. James's Terrace, Dublin 8. The subject application comprises of the demolition of all existing buildings on site except 307/307a South Circular Road including industrial storage warehouses and office buildings comprising a total of c. 6,604 sq. m. commercial floorspace, and the development of a mixed residential (Build to Rent) development with a total floorspace of c. 30,151sq. m.

This Chapter was prepared by Brian Maher, Heather McMeel and Noel Cronin of Avison Young, Town Planning Consultants. Brian Maher, Associate Director, holds accreditations in architectural technology and a Masters in Spatial Planning from Dublin Institute of Technology. Brian is a corporate member of the Irish Planning Institute. Brian specialises in town planning, urban design, masterplanning, regeneration, design intervention studies and heritage evaluation, and has over 40 years of experience of working in the planning, architectural and urban design sectors. Heather McMeel, Senior Planner, holds a B.A in Political Science and Geography from Trinity College Dublin and an MSc in Real Estate and Planning from Heriot Watt University. Heather is a member of the Royal Town Planning Institute and has over 5 years' experience in planning and development. Noel Cronin, Planner, holds a Bachelor of Social Science from University College Cork, as well as a Masters in Planning and Sustainable Development from University College Cork. Noel is a member of the Irish Planning Institute and has 4 years postgraduate experience in planning and development.

1.1 Purpose of the EIA

The EIA identifies the potential environmental effects, both positive and negative, that are predicted to arise due to the proposed development and outlines measures to address these where required. It is a methodical and detailed evaluation of the environment within which the development is proposed. The EIA provides the competent authority with the necessary information to enable an Environmental Impact Assessment to be carried out which shall identify, describe and assess in an appropriate manner, the effects of the proposed development on the environment.

The undertaking of an Environmental Impact Assessment is prescribed by the requirements codified by Directive 2014/52/EU. For the purposes of this application for permission, the relevant requirement of the EIA Directives are implemented into Irish law through the provisions of Part X of the Planning and Development Act 2000 (as amended) (hereafter ‘the 2000 Act’) and the regulations made thereunder.

1.2 Overview of the Proposed Development

The subject site comprises the White Heather Industrial Estate on the South Circular Road, as well as 307/307a South Circular Road and 12a St. James's Terrace. Under Variation No. 23 of the Dublin City Development Plan 2016–2022 adopted in March 2020, the White Heather Industrial Estate was rezoned from Zoning Objective Z6 – ‘to provide for the creation and protection of enterprise and facilitate opportunities for employment creation’ to Zoning Objective Z1 – ‘to protect, provide and improve residential amenities’ and Zoning Objective Z9 – ‘to preserve, provide and improve recreational amenity and open space and green networks’. The development site (c. 1.535 ha.) subject to the SHD application is predominantly zoned under Zoning Objective Z1 with a small section falling under Zoning Objective Z9. The Z9 area is being preserved as open space.

The proposed scheme will provide 335 no. Build to Rent residential units, including a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, duplexes and a terrace of 3-bedroom townhouse units, 2 no. cafés, 1 no. childcare facility, and ancillary residential facilities including a new linear canal-side park which will be publicly accessible. The proposed development at White Heather seeks to create and open up a new public space along the Grand Canal frontage, which is currently inaccessible. The site is in close proximity to extensive local amenities, transport links and several major employment centres and the proposed development will result in a sustainable high-density landscaped urban neighbourhood with a new public open space area and canal-side amenity.

It is considered that the proposed development at the White Heather Industrial Estate represents a unique opportunity to provide for a vibrant and diverse community, while delivering a connected residential neighbourhood which knits in to both the established and the emerging residential developments in the area, while benefitting from high-quality amenity space along the Grand Canal and access to high-quality transport linkages.

The proposed development is described in detail in Chapter 2 of this EIAR “Description of the Development” while the accompanying Cover Letter and Planning Report detail the full contents of the planning application. The EIAR is an important document forming part of

the overall application package that also includes, inter alia, an Architectural Design Statement and Engineering Reports for the proposed development.

1.3 Legislative Context

1.3.1 European Legislative Context

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from EIA Directive 85/337/EC (as amended by Council Directive 97/11/EC, Directive 2003/4/EC, Directive 2009/31/EC, Directive 2011/92/EU and recently Directive 2014/52/EU which amends EIA law in a number of respects by amending Directive 2011/92/EU). The EIA Directive is designed to ensure that projects likely to have significant effects on the environment are subject to a comprehensive assessment of environmental effects prior to development consent being given.

The Environmental Impact Assessment Directive ("the EIA Directive") requires that, before development consent is given, projects likely to have effects on the environment by virtue of their nature, size or location are made subject to a requirement for development consent and an assessment of their effects on the environment. This is referred to as an 'Environmental Impact Assessment' (EIA). Where an EIA is required, the developer must prepare an EiAR and the EIA Directive sets out minimum information which the EiAR must include.

The Department has prepared the August 2018 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' to provide practical guidance on procedural issues and the EIA process arising from the requirements of Directive 2014/52/EU and to assist with the achievement of a consistency of approach in the implementation of the Directive. The Guidelines replace Guidelines for Planning Authorities and An Bord Pleanála on carrying out environmental impact assessment issued by the Department of the Environment, Community and Local Government in March 2013.

EIA practice has evolved substantially since the introduction of the EIA Directive in 1985. Practice continues to evolve and takes into account the growing body of experience in carrying out EiARs in the development sector. Table 1.1 sets out the relevant key EIA Guidance which has been consulted in the preparation of the EiAR document. In addition, the individual chapters of this EiAR should be referred to for further information on the documents consulted by each individual consultant.

We would also note that the pre-application discussions with the Planning Authority informed the content of the EIAR.

Table 1.1 – EIA Guidelines Consulted as Part of the Preparation of this EIAR

Irish
Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, August 2018)
Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA Draft 2017)
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 (DHPCLG 2017)
Development Management Guidelines (DoEHLG, 2007)
Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003)
European Union (in addition to Directives referenced above)
Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017
EU Guidance on EIA Screening (DG Environment 2001)
Guidance on EIA Scoping (DG Environment 2001)
EIA Review Checklist (DG Environment 2001)
Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002)

The most recent guidelines are the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment published by the Department of Housing, Planning and Local Government in 2018. These guidelines provide practical guidance to planning authorities, An Bord Pleanála, and other relevant stakeholders, on procedural issues and the EIA process, and outline the key changes introduced by Directive 2014/52/EU. The key issues consultation paper published by the Department also provides useful guidance.

The 2017 EPA draft guidelines have been prepared to help practitioners interpret the amended EIA Directive and are likely to be updated and finalized following the updates to the 2000 Act and Planning and Development Regulations 2001 (as amended). They provide practical guidance to planning authorities, An Bord Pleanála, and other relevant stakeholders, on procedural issues and the EIA process, and outline the key changes introduced by Directive 2014/52/EU.

The content of this Environmental Impact Assessment Report has been prepared in accordance with the provisions of Article 5 (1) and Annex IV of Directive 2014/52/EU and Schedule 6, Article 94 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

1.3.2 Irish Legislative Context

The adoption of the 2000 Act consolidated the previous Planning Acts and the existing Environmental Impact Assessment Regulations at that time. The Planning and Development Regulations, 2001 (as amended, hereafter 'the 2001 Regulations') provide for the implementation of the 2000 Act as well as incorporating and updating the Local Government (Planning and Development Regulations) 1994-2001, and Regulations made to date under the Act itself. The 2001 Regulations outline the classes of projects subject to Environmental Impact Assessment and the statutory format and content for an EIAR. Schedule 5 of the 2001 Regulations sets out the categories of development for which an EIAR is required, while Schedule 6 outlines the information to be contained in an EIAR. Schedule 7 outlines the criteria for determining whether a development would or would not be likely to have significant effects on the environment.

While the proposed development consisting of 335 no. Build to Rent apartments does not fall under the categories of development for which an EIAR is required as per Schedule 5 of the 2001 Regulations, an EIAR has been prepared for this development in order to examine the likelihood of significant effects on the environment arising from the proposed development.

Nevertheless, the EIAR Chapters have been prepared following best practice described in the abovementioned documents from the EPA. In this regard, the content of this EIAR conforms to the current relevant Environmental Impact Assessment requirements.

1.4 Objectives of Environmental Impact Assessment

Environmental Impact Assessment (EIA) is a process for anticipating the impacts on the environment caused by a development. EIA is a process, involving inter alia; the preparation of an EIAR; statutory consultations; examination of information in the EIAR; the reasoned conclusion of the competent authority on the significant effects (if any) on the environment, taking into account the examination referred to; and the integration of the reasoned conclusions into the decision on the proposed development.

The aim of the approach is to identify and predict any impacts of significance for a given proposed development; to describe the means and extent by which they can be reduced or ameliorated; to interpret and communicate information about the potential impacts; and to provide an input into the decision-making and planning processes. Where effects are identified that are unacceptable, these can then be avoided or reduced during the design process.

As detailed above, the EPA provides guidance on the information to be contained in an EIA and advice notes on its preparation. Specifically, the environmental areas that may be impacted by the proposed development are: Population and Human Health; Transportation; Land, Soils, Geology and Hydrogeology; Hydrology; Biodiversity; Waste Management; Noise and Vibration; Air Quality and Climate; Micro Climate (Wind / Daylight / Sunlight); Landscape and Visual Impact Assessment; Archaeological and Architectural Heritage; Material Assets - Site Services and Risk Management.

This EIA addresses potential environmental impacts of the proposed development under these headings and having regard to a scoping exercise that was conducted as outlined below.

1.5 Informal Scoping

Scoping is an early stage in the EIA process and the purpose of scoping is to identify what information should be contained in an EIA and what methods should be used to gather and assess that information. It should provide focus for the EIA and ensure that all relevant issues are identified and addressed in the EIA.

An informal scoping exercise was conducted to establish the parameters of the issues to be addressed in the EIA. Existing activities on site were examined and assessed, as were other comparable developments and EIAs prepared for similar schemes. The informal scoping of the EIA also had regard to the following:

- Guidelines published by the European Union and Irish Institutes.
- The policy requirements of Dublin City Council as set out in the Dublin City Development Plan 2016-2022.
- The existing environment, including any vulnerable or sensitive features, including ecological features and items of archaeological significance.
- The likely and significant impacts of the proposal on the environment.
- Available methods of reducing or eliminating undesirable impacts.

The EIA covers both the construction and operation periods for the proposed development. It is anticipated that the construction period for the development will take c. 36 months. The scope of the operation phase is extended beyond the opening date to ensure account is taken of the longer-term nature of some impacts.

1.6 Contents of this EIAR

Environmental Impact Assessment is a systematic integrated evaluation of both direct and indirect potential impacts of a project on the natural environment, on beneficial uses of the environment, including man-made structures, amenities and facilities, and the socio-cultural environment.

This EIAR comprises 3 no. documents as follows:

- Non-Technical Summary;
- Environmental Impact Assessment Report; and
- Environmental Impact Assessment Report Appendices

This EIAR comprises the presentation of an extensive range of information and analysis from the EIAR Team. The content of this EIAR is split into the following Chapters:

- Chapter 1 Introduction
- Chapter 2 Description of Proposed Development
- Chapter 3 Planning and Development Context
- Chapter 4 Examination of Alternatives
- Chapter 5 Population and Human Health
- Chapter 6 Biodiversity
- Chapter 7 Land, Soils, Geology and Hydrogeology
- Chapter 8 Water & Hydrology
- Chapter 9 Material Assets - Built Services
- Chapter 10 Material Assets - Transportation
- Chapter 11 Material Assets - Waste Management
- Chapter 12 Air Quality and Climate
- Chapter 13 Noise and Vibration
- Chapter 14 Microclimate - Sunlight, Daylight, Shadow and Light Effluence
- Chapter 15 Microclimate - Wind
- Chapter 16 Landscape and Visual Impact Assessment
- Chapter 17 Cultural Heritage - Archaeology
- Chapter 18 Cultural Heritage - Architectural Heritage
- Chapter 19 Risk Management
- Chapter 20 Interactions and Cumulative Impacts

Each competent expert has prepared their relevant chapters which are primarily set out in the following format:

- Consultation;
- Methodology;
- Receiving Environment
- Characteristics of the Proposed Development;
- Potential Impact of the Proposed Development;
- Mitigation Measures;
- Predicted Impact of the Proposed Development;
- Monitoring;
- Reinstatement; and
- Interactions and Potential Cumulative Impacts.

In addition, the EIAR identifies measures where necessary to avoid, reduce and, if possible, offset any significant impacts on the environment arising from the proposed development. This EIAR addresses the potential environmental impacts of the proposed development under the above headings.

1.7 Consultation

In relation to the Environmental Impact Assessment process, the consultation undertaken focused on the following:

- Early consultation to inform and help define the scope of the EIAR in terms of what needed to be examined, including consultation with Dublin City Council.
- Consultation during the process to identify any emerging issues, to clarify any concerns and to ensure that all such issues were considered.
- Discussion with Dublin City Council Roads and Transportation Department to agree the methodology and scope of the Transport Study.

In addition to the above, consultation with various departments in Dublin City Council was undertaken that identified the environmental and community issues that needed to be taken into consideration in designing the proposed development and in assessing any of its potential effects.

1.8 The EIAR Team

This EIAR has been compiled by Avison Young with input from an experienced team of consultants. Details of each consultant are outlined in Table 1.2 below, while their expertise will also be included at the start of each relevant Chapter. Each consultant is appropriately qualified and competent in accordance with Article 5(3)(a) of the Directive and Section 172(1B) of the 2000 Act.

1.9 Describing the Effects

This EIAR follows the guidance set out in the EPA's Draft EIAR Guidelines (2017) in relation to describing accurately the full range of likely significant effects. Figure 1.1 is taken from the EPA's Draft EIAR Guidelines (2017) and provides a classification of significance of effects (or impacts).

The Draft EPA Guidelines (2017) outlines that the probability of impacts can be described as likely or unlikely and the duration of effects can range from momentary, brief, temporary, short-term, medium-term, long-term, permanent, reversible while the frequency describes how often the effects will occur (see Figure 1.2). The quality of effects can be described as positive, neutral or negative with varying degrees of significance (see Figure 1.3).

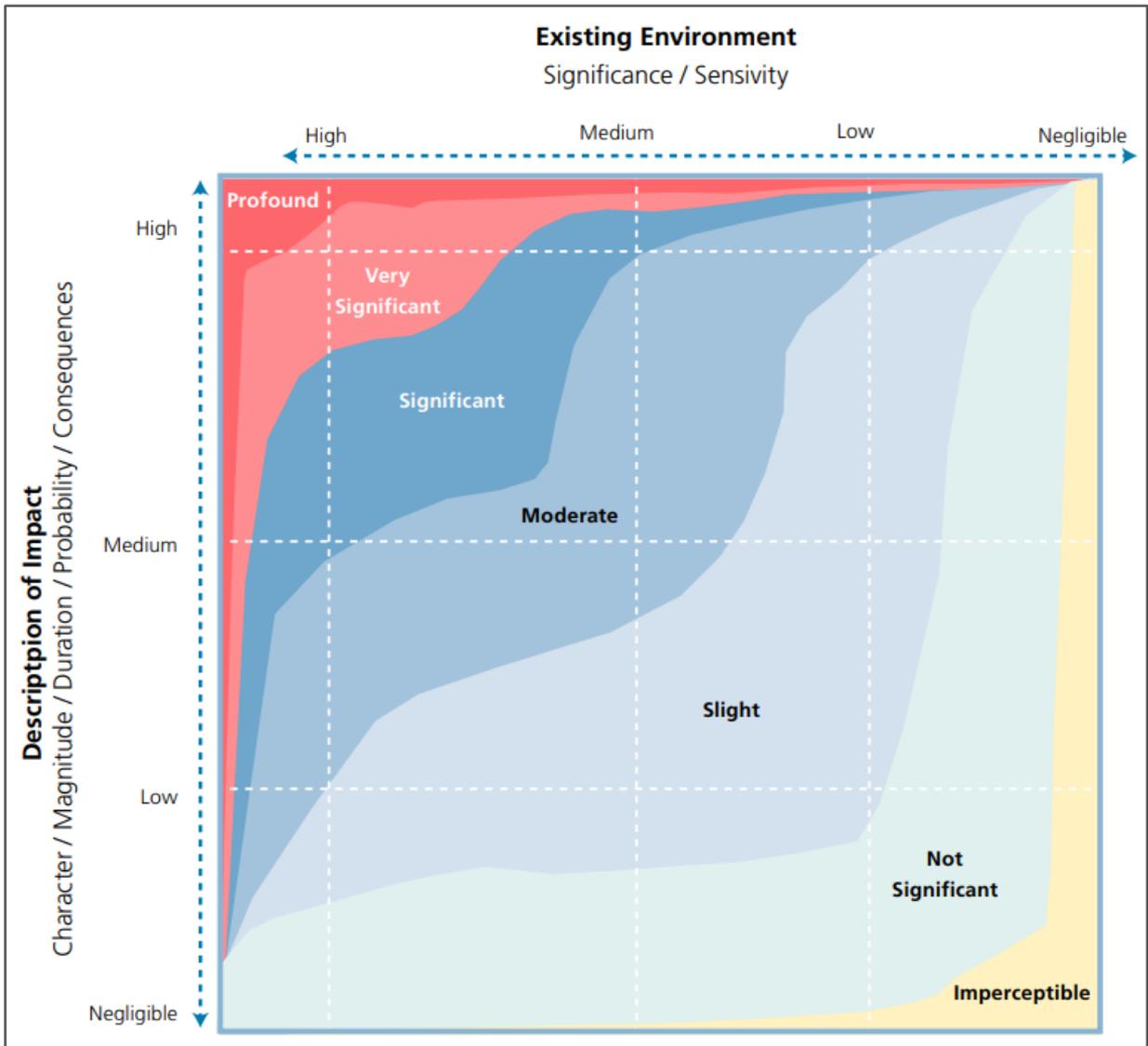


Figure 1.1: Classification of Significance of Effects, EPA Draft EIAR Guidelines

Source: (EPA Draft Guidelines 2017)

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

Figure 1.2: Probability and Duration

Source: (EPA Draft Guidelines 2017)

<p>Quality of Effects</p> <p>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral</p>	<p>Positive Effects</p> <p>A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).</p>
	<p>Neutral Effects</p> <p>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.</p>
	<p>Negative/adverse Effects</p> <p>A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).</p>
<p>Describing the Significance of Effects</p> <p>‘Significance’ is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see <i>Determining Significance</i> below.).</p>	<p>Imperceptible</p> <p>An effect capable of measurement but without significant consequences.</p>
	<p>Not significant</p> <p>An effect which causes noticeable² changes in the character of the environment but without significant consequences.</p>
	<p>Slight Effects</p> <p>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p>
	<p>Moderate Effects</p> <p>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.</p>
	<p>Significant Effects</p> <p>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
	<p>Very Significant</p> <p>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.</p>
	<p>Profound Effects</p> <p>An effect which obliterates sensitive characteristics</p>
<p>Describing the Extent and Context of Effects</p> <p>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.</p>	<p>Extent</p> <p>Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.</p>
	<p>Context</p> <p>Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)</p>

Figure 1.3: Description of Effects

Source: (EPA Draft Guidelines 2017)

Table 1.2 EIAR Structure and Competent Experts

CH.	Chapter Title	Consultant	Author
1-5	1. Introduction 2. Description of Proposed Development 3. Planning and Development Context 4. Examination of Alternatives 5. Population and Human Health	Avison Young	Brian Maher MSc, MIPI, MCIAT Heather McMeel B.A, MSc, MRTPI. Noel Cronin BA, MPLAN.
6	Biodiversity	Minogue Associates	Pat Doherty BSc., MSc, MCIEEM
7	Land, Soils, Geology and Hydrogeology	O'Connor Sutton Cronin Consulting Engineers	Glenda Barry Bsc, MSc Eleanor Burke BSc, MSc, DAS, CSci, MIEEnvSc
8	Water & Hydrology	O'Connor Sutton Cronin Consulting Engineers	Kate Santos , EnvEng, HDipCompSci Eleanor Burke BSc, MSc, DAS, CSci, MIEEnvSc
9	Material Assets - Built Services	O'Connor Sutton Cronin Consulting Engineers	Mark Killian CEng, BE (Civil), MSc (Civil Eng.), M.I.E.I.
10	Material Assets - Transportation	SYSTRA	Andrew Archer , BCE CEng Bridget Fleming , MA (Hons).
11	Material Assets - Waste Management	AWN Consulting	Chonail Bradley BSc in Environmental Science, CIWM
12	Air Quality and Climate	AWN Consulting	Avril Challoner BEng (Hons), HDip, PhD, CSci
13	Noise and Vibration	AWN Consulting	Leo Williams BAI MAI PgDip AMIOA
14	Microclimate – Daylight, Sunlight and Overshadowing	Avison Young	Mark Feighery BSc, BArch (Hons), MSc Sophie Probert-Hughes BA (Hons)
15	Microclimate - Wind	IN2	David Walshe CEng Eamonn Williams BEng (Hons)
16	Landscape and Visual Impact Assessment	ARC	Bill Hastings B. Arch FRIAI, RIAI Grade 1 accredited Conservation Architect
17	Cultural Heritage - Archaeology	IAC Archaeology	Faith Bailey BA, MA, member of the Chartered Institute of for Archaeologists, member of the Institute of Archaeologists of Ireland
18	Cultural Heritage - Architectural Heritage	ARC	Bill Hastings B. Arch FRIAI, RIAI Grade 1 accredited Conservation Architect
19	Risk Management	Avison Young	Brian Maher MSc, MIPI, MCIAT Heather McMeel B.A, MSc, MRTPI. Noel Cronin BA, MPLAN.
20	Interactions and Cumulative Impacts	Avison Young	Brian Maher MSc, MIPI, MCIAT Heather McMeel B.A, MSc, MRTPI. Noel Cronin BA, MPLAN.

1.10 Difficulties in Compiling Specified Information

No significant difficulties were experienced in compiling the necessary information for the proposed development. Where appropriate, surveys and references are provided.

1.11 Non-Technical Summary

A copy of the Non-Technical Summary of the EIAR is provided as a separate and self-contained document and is available to the public online and at the offices of the Planning Department of Dublin City Council. It is bound separately in order to assist in its dissemination to interested parties.



Chapter 2. Description of Proposed Development

2.0 Description of the Proposed Development

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIA) provides a description of the proposed development. This chapter has been informed by, and should be read in conjunction with, the planning application documents, including the Architects Design Statement and the Outline Construction and Environmental Management Plan, which accompany this application. In addition, the precise details of this proposal are covered in the public notices, plans, drawings, reports and all related particulars contained in the overall planning application package and this chapter should be read in conjunction with same. The chapter outlines the following in order:

- A description of the site and surroundings.
- An overview of the proposed development.
- A description of the various elements of the project.

This Chapter was prepared by Avison Young, Town Planning Consultants in accordance with Article 5, paragraph 1 of the EIA Directive which states that:

“Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. The information to be provided by the developer shall include at least:

(a) a description of the project comprising information on the site, design, size and other relevant features of the project;”

Further guidance is also provided in Annex IV, paragraph 1 of the EIA Directive which outlines the information required for the EIA including:

“Description of the project, including in particular:

(a) a description of the location of the project;

(b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;

(c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used.”

This Chapter was prepared by Brian Maher, Heather McMeel and Noel Cronin of Avison Young, Town Planning Consultants. Brian Maher, Associate Director, holds accreditations in architectural technology and a Masters in Spatial Planning from Dublin Institute of Technology. Brian is a corporate member of the Irish Planning Institute. Brian specialises in town planning, urban design, masterplanning, regeneration, design intervention studies and heritage evaluation, and has over 40 years of experience of working in the planning, architectural and urban design sectors. Heather McMeel, Senior Planner, holds a B.A in Political Science and Geography from Trinity College Dublin and an MSc in Real Estate and Planning from Heriot Watt University. Heather is a member of the Royal Town Planning Institute and has over 5 years' experience in planning and development. Noel Cronin, Planner, holds a Bachelor of Social Science from University College Cork, as well as a Masters in Planning and Sustainable Development from University College Cork. Noel is a member of the Irish Planning Institute and has 4 years postgraduate experience in planning and development.

2.2 Overview of the Proposed Development

The subject site comprises the White Heather Industrial Estate on the South Circular Road, as well as 307/307a South Circular Road and 12a St. James's Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

A new residential neighbourhood development of 335 no. Build to Rent (BTR) units is proposed to make efficient use of this residentially zoned site which benefits from high-quality amenity space along the Grand Canal and access to high-quality transport links. The site benefits from the opportunity to access the existing Dolphins Barn neighbourhood facilities, as well as enhancing the connectivity of the area for the Dublin 8 community as a whole. A core principle of the proposed residential scheme is to put residential amenity and recreation to the fore, opening up the site and the local area to the Grand Canal.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, duplex units as well as a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a shared workspace is also proposed.

2.3 Description of the Site and Surroundings

2.3.1 Site Context

The subject site comprises the White Heather Industrial Estate, acquired by the Applicant, U and I (White Heather) Limited. It consists of a small-scale industrial estate located off the South Circular Road. Additionally, the proposed development comprises No. 307/307a South Circular Road, a residential dwelling, and 12a St. James's Terrace, a vacant industrial unit. The subject site is of an irregular shape, with boundaries to the South Circular Road, the Grand Canal, St. James's Terrace, Priestfield Cottages and Our Lady of Dolour's Church.

The site comprises a number of industrial units and associated parking and storage areas. There is minimal existing landscaping on the site however, adjacent to the Grand Canal there is a strip of flat grass area running the length of the site. The existing structures on the site comprise industrial units (approx. two storeys in height). The existing units are generally located on the boundary lines of the site on all side, with the centre of the site remaining free from development and in use as ancillary parking for the industrial units.

2.4 Detailed Project Description

The development as described in the public notices is as follows:

The development will consist of:

- 1) *The demolition of all existing buildings on site except 307/307a South Circular Road including industrial storage warehouses and office buildings comprising a total of c. 6,604 sq. m. floorspace;*
- 2) *A mixed residential and commercial development with a total floorspace of c. 30,242 sq. m. Total proposed residential floorspace is c. 26,119 sq. m. and consists of a total of 335 no. Build to Rent residential units including Part V provision as follows:*
 - *A terrace of 7 no. 3-storey 3 bed townhouses,*
 - *Block B01 (5 storeys) comprising 24 no. units (14 no. 1 bed units and 10 no. 2 bed units),*
 - *Block B02 (5–7 storeys) including a link to Block B02A (5-storeys) comprising 84 no. units (56 no. 1 bed units and 28 no. 2 bed units),*
 - *Block B03 (5-10 storeys) including 77 no. units (48 no. 1 bed units and 29 no. 2 bed units) and Resident's Amenity (c. 1,001 sq.m) with main entrance hall, Concierge/Management Office at undercroft and ground floor, Gym, Events Suite and a 'Canal Café' at ground floor level, Co-Working/Lounge,*

- Cinema/Media Room, Dining/Kitchen area and access to an external roof terrace at fifth floor level (Level 05),*
- *Block B04 (5-7 storeys) comprising 72 no. units (48 no. 1 bed units and 24 no. 2 bed units),*
 - *Block B05 (5 storeys) comprising 10 no. units (6 no. 1 bed units and 4 no. 2 beds) with a café unit (c. 46 sq. m) at ground floor level,*
 - *Block B06 (2-5 storeys) comprising 29 no. units (2 no. studio units, 7 no. 1 bed units, 14 no. 2 bed units and 4 no. 2 bed duplex units and 2 no. 3 bed duplex units),*
 - *Block B07 (3-5 storeys) comprising 32 no. units (17 no. 1 bed units and 15 no. 2 bed units),*
- 3) *1 no. 2-storey Childcare Facility / Creche (c. 260 sq. m);*
 - 4) *A total of (c. 2,960 sq. m) Public Open Space landscaped and broken into 7 no. distinct character areas and linking through Canal Square, a Pedestrian Priority Street between Blocks B03 and B04 to a publicly accessible landscaped Linear Park along the Grand Canal within the Z9 Amenity/Open Space Lands;*
 - 5) *Communal Open Space of c. 2,160 sq. m made up of c. 1,560 sq. m at ground floor and c. 600 sq. m on roof terraces;*
 - 6) *The proposed Part V provision of 34 no. units and 10% of the total units are proposed to be provided at Block B01 and Block B05 as 20 no. 1 bed units and 14 no. 2 bed units;*
 - 7) *106 no. car parking spaces are provided with 41 no. car parking spaces at grade, including 5 no. parking spaces within the curtilage (carports) of townhouses, and 65 no. car parking spaces at undercroft area (c. 1,890 sq. m) with lobbies linking to Blocks B02 and B03 entrance lobbies, cycle parking storage areas, staff area, refuse store areas and plant areas;*
 - 8) *558 no. cycle spaces at surface (352 no. spaces) and undercroft level (206 no. spaces) of which 491 no. are secure bicycle spaces (3 no. of which are cargo spaces) and 67 no. are visitor spaces (5 no. of which are cargo spaces);*
 - 9) *Realignment and improvement works to the existing entrance junction on South Circular Road and the existing entrance to Priestfield Cottages to provide road markings, footways and formal uncontrolled crossing points;*
 - 10) *Works to surface treatments to provide pedestrian and cycle access only to the existing entrance at St James's Terrace;*
 - 11) *A change of use of the existing 2-storey residential units 307/307a South Circular Road from residential to shared workspace/office space (c. 165 sq. m);*
 - 12) *3 no. electricity sub-stations in blocks B02, B03 and B04; and*
 - 13) *All enabling and site development works, hard and soft landscaping, public realm works, public art, lighting, services and connections, waste management and all other ancillary works.*

The application contains a statement setting out how the proposal will be consistent with the objectives of the Dublin City Development Plan 2016-2022. The application also contains a statement (Material Contravention Statement) indicating why permission should be granted for the proposed development, having regard to a consideration specified in section 37(2)(b) of the Planning and Development Act 2000, notwithstanding that the proposed development materially contravenes the Dublin City Development Plan 2016-2022, other than in relation to the zoning of the land.

An Environmental Impact Assessment Report (EIAR) and an Appropriate Assessment Screening Report (AASR) have been prepared in respect of the proposed development.

2.4.1 Apartment Units

The proposed strategic housing development provides for 328 no. Build to Rent apartment Units across 7 no. blocks, ranging in height from 2 no. to 10 no. storeys. The apartment blocks have been designed to vary in height having regard to the site context and visual impact, with height tapering down from the centre of the site to the boundaries. The use of finger blocks arranged in a north-south direction enable the site to take advantage of southern aspect and allows for a physical and visual link to the Grand Canal. The point block building forms provide height at the centre of the scheme to minimise impact on the surrounding residents. They also generate a rhythm and legibility. Duplex units are proposed adjacent to Priestfield Cottages. The range of apartment units include a mix of studio, 1-bedroom, 2-bedroom, 2-bedroom duplex and 3-bedroom duplex.

2.4.2 Townhouses

The proposed development includes 7 no. 3-bedroom townhouses situated at the northwest portion of the subject site, backing on to the adjacent dwellings on St James's Terrace and south of Our Lady Dolour's Church. 5 no. townhouses include car ports for car parking, with the remaining 2 no. townhouses provided parking at surface level.

2.4.3 Open Space/Landscape Strategy

A comprehensive Landscape Design Rationale and associated drawings prepared by Bernard Seymour Landscape Architects accompany the SHD Application, while the Design Report also provides detailed information relating to the proposed Landscape and Open Space Strategy. The proposed development will deliver a landmark new urban neighbourhood in a distinctive landscaped canal-side park setting. Please refer to the Landscape Report submitted with this application for further detail.

2.4.4 Access and Movement

The primary access to the lands will be from the South Circular Road, the existing site entrance will be upgraded and enhanced. This access will provide for vehicular traffic. This existing access junction will be improved to provide a segregated bellmouth to the site and Priestfield Cottages. The proposed reconfiguration will improve access for both pedestrians and cyclists while also retaining the existing bus lanes on South Circular Road. A separate pedestrian only access is provided to the south-west of the site at St. James's Terrace.

106 no. car parking spaces will be provided at surface level and within a secure undercroft car park. A total of five spaces are provided as carports within the townhouses. The development proposals include for 5% provision of disabled parking spaces and a total of 20% of all car parking spaces will be fitted with electric charging points with the remainder future proofed for the provision of 100%. Seven spaces will be reserved for car club / GoCar with this number being increased should there be additional requirement. A set-down area is also provided for drop-offs to the crèche and taxis, with space for up to three vehicles.

The applicant is committed to encourage sustainable travel to and from the development and 558 no. cycle parking spaces have been provided within the development.

Please refer to the Mobility Management Plan submitted with this application for further detail.

2.4.5 Design Rationale

The proposed development is intended to provide for a vibrant and diverse community, while delivering a connected residential neighbourhood which knits in to both the established and the emerging residential developments in the area. High-quality landscaping and public realm, with a focus on the creation of distinctive character areas is proposed. A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south. Permeability is a key feature of the proposed pedestrian realm, including a mix of dedicated and shared surface areas through the site with a c. 190 m continuous amenity strip along the Grand Canal Linear Park. Please refer to the Design Statement submitted with this application for further detail.

2.4.6 Part V Provision

The proposed development will comply with Part V of the Planning and Development Act 2000 (as amended). It is intended to provide 34 no. apartment units for the purposes of complying with Part V of the Planning and Development Act. The 34 no. units subject to Part V comprise 20 no. 1 bed units and 14 no. 2 bed units within Block No. 1 and No. 5. Please refer to the Part V Report accompanying this application which provides further details on the units in accordance with Part V.

2.4.7 Services

OCSC have prepared a detailed Drainage and Watermains Planning Report which provides a detailed description of the proposed Foul Drainage, Surface Water Drainage Management (including SuDS) and Watermains serving for the proposed development. Hydrology is also addressed in Chapter 8 of this EIAR, while Chapter 11 of the EIAR addresses Waste Management

2.4.8 Built Heritage

A protected structure, Our Lady of Dolour's Church, is situated adjacent to the north-west of the site. The Architectural Heritage Impact Assessment Report prepared by ARC Consultants submitted with the application provides a detailed assessment of the architectural and historical significance of the Church and its relationship to the proposed development and subject site. Chapter 18 of this EIAR, prepared by ARC, also addresses Architectural Heritage.



Chapter 3. Planning and Development Context

3.0 Planning and Development Context

3.1 Introduction

This Chapter sets out a preliminary identification of the strategic and statutory context governing planning and development for the proposed strategic housing development at White Heather. A Planning Report and a Material Contravention Statement prepared by Avison Young are also submitted as part of this SHD application. The Planning Report also provides a planning policy assessment and acts as a reference to where information is located in the planning package. The Material Contravention Statement outlines why the proposed development should be granted, notwithstanding the fact that it materially contravenes the Dublin City Development Plan 2016-2022.

This Chapter was prepared by Brian Maher, Heather McMeel and Noel Cronin of Avison Young, Town Planning Consultants. Brian Maher, Associate Director, holds accreditations in architectural technology and town planning. Brian specialises in town planning, urban design, masterplanning, regeneration, design intervention studies and heritage evaluation, and has over 30 years of experience of working in the planning, architectural and urban design sectors. Heather McMeel, Senior Planner, holds a B.A in Political Science and Geography from Trinity College Dublin and an MSc in Real Estate and Planning from Heriot Watt University. Heather is a member of the Royal Town Planning Institute and has over 5 years' experience in planning and development. Noel Cronin, Planner, holds a Bachelor of Social Science from University College Cork, as well as a Masters in Planning and Sustainable Development from University College Cork. Noel is a member of the Irish Planning Institute and has 4 years postgraduate experience in planning and development.

3.2 Methodology

The Methodology for the Planning and Development Context Chapter of the EiAR involves the identification and setting out of the policy context for the proposed development at the national, regional and local level. This includes the statutory planning documents that form the policy framework against which planning decisions are made and also supplementary policy documents.

3.3 National Planning Context

3.3.1 National Planning Framework

The government published the National Planning Framework (hereafter the NPF) in February 2018 which projects a need for a minimum of 550,000 new homes by 2040, at least half of which are targeted for provision within the built-up area of Ireland's five cities. The NPF signals a shift in Government policy towards securing more compact and sustainable urban development, to enable people to live nearer to where jobs and services are located and by prioritising sustainable modes of transport. The objectives in the NPF that are of particular relevance to the proposed development are outlined in the both the Planning Report and the Material Contravention Statement and relate to Securing Compact Growth, Achieving Urban Infill, Healthy Communities, and Housing.

The subject site is located in Dolphin's Barn, a suburb situated c. 2.5km from the City Centre and within the existing built-up footprint of the City. The delivery of 335 no. residential units at this location is in accordance with National Policy Objectives 3a and 3b which seek to achieve compact and sustainable growth within the built-up footprint of existing settlements and also the delivery of 50% of new homes in the five cities of Dublin, Cork, Waterford, Limerick and Galway.

The proposed scheme will generate economic activity and place people close to existing services and employment within the existing footprint of Dublin City and Dolphin's Barn locality. The proposed scheme is consistent with National Policy Objective 11 which seeks to encourage more people and generate more jobs and activity within existing cities, towns and villages.

The proposed development will benefit from its location within proximity to the City Centre along with the available modes of sustainable transport which include Dublin Bus stops immediately adjacent to the site on South Circular Road and on Dolphin's Barn Street with the Fatima Luas stop situated approximately 800 metres to the north and Rialto Luas stop located approximately 1km to the northwest. The design of the proposed development, with pedestrian permeability and connections to public transport, will provide safe and convenient alternatives to the car in accordance with National Policy Objective 27, which seeks to promote healthy communities.

The subject proposal is consistent with National Policy Objectives 33 and 35 which seek to provide new homes in appropriate locations and higher densities through increased

building height in existing settlements and is in accordance with the requirement ‘to build inwards and upwards, rather than outwards’ as highlighted in the NPF.

3.3.2 Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)

The Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment were issued by Department of Housing, Planning and Local Government under Section 28 of the 2000 Act in August 2018. The Guidelines provide technical guidance for planning authorities and the Board (competent authorities) on legal and procedural issues and matters of interpretation arising from the amended Directive.

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

The Action Plan for Housing and Homelessness (APHH) was published under the Government’s *Rebuilding Ireland Initiative* and represents a response by the Government to address the current shortfall in housing provision by seeking to accelerate the delivery of housing units.

In providing an overview of the Action Plan, the acceleration of the delivery of housing for the private, social and rented sectors is a stated priority for the Government. The APHH sets ambitious targets to double the annual level of residential construction to 25,000 homes and deliver 47,000 units of social housing in the period to 2021.

Furthermore, the APHH notes that:

“Ensuring sufficient stable and sustained provision of housing that is affordable, in the right locations, meets people’s different needs, and is of lasting quality, is one of the greatest challenges facing the country at present.”

The Action Plan seeks to address existing issues of housing supply and homelessness in Ireland through five ‘Pillars’. Pillar Two involves accelerating social housing while Pillar Three involves building more homes. Doubling the output of private housing to 25,000 units per annum by 2021 is a ‘key action’ for Pillar three and delivering 47,000 social housing units by 2021 is a ‘key action’ under Pillar two.

The proposed development at the White Heather Industrial Estate responds to a recognised need at a national, regional and local level for additional high-quality housing. The proposal

will provide a total of 335 no. residential units in proximity to Dublin City Centre, including 34 no. Part V units, in compliance with Pillar Two and Pillar Three of the APHH.

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

The document 'Urban Development and Building Heights - Guidelines for Planning Authorities' (hereafter referred to as the 'Height Guidelines') was issued by the Minister in December 2018. It sets out new and updated national policy on building heights in relation to urban areas, consistent with the strategic policy framework set out in the NPF. These Height Guidelines form part of a suite of integrated measures intended to shift the current patterns and development trends for cities and towns to form more compact and integrated communities. It recognises the need to grow existing towns and cities upwards rather than outwards.

It is noted in the Height Guidelines that there is a presumption in favour of buildings of increased height in town/city cores and in other urban locations with good transport accessibility. Section 3 of the Height Guidelines outlines "*development management principles*" and "*development management criteria*" which the Planning Authority will consider in assessing development proposals for buildings taller than prevailing building height in urban areas. Please refer to the Planning Report and Statement of Consistency which outlines how the proposed development complies with the aforementioned criteria and principles.

Where the Board considers that the above criteria are appropriately incorporated into the proposed development, then it may approve such development, "*even where specific objectives of the relevant development plan or local area plan may indicate otherwise*".¹

The Material Contravention Statement provides a Building Height Strategy which outlines in detail how the proposed development has incorporated these development management criteria and principles and therefore Specific Planning Policy Requirement 3 should be applied by the Board, having regard to the national policy objectives of the NPF that the proposed development is consistent with.

¹ Urban Development and Building Heights - Guidelines for Planning Authorities, December 2018, pg 15

3.3.5 Sustainable Residential Development in Urban Areas – Guidelines for Planning Authorities (2009)

The 'Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas' (hereafter SRDUA) were issued in 2009 under Section 28 of the 2000 Act. General principles of these guidelines relate to prioritising walking, cycling and public transport over the use of cars, and to provide residents with a quality of life in terms of amenity, safety and convenience. For development in cities and larger towns it is noted that the objective should be "*the achievement of an efficient use of land appropriate to its context.*"²

Section 5.2 of the SRDUA provides a summary of the design criteria to be considered in the assessment of higher density residential development while detailed advice is provided in the accompanying Urban Design Manual. These factors include:

- Acceptable building heights;
- Avoidance of overlooking and overshadowing;
- Provision of adequate private and public open space, including landscaping where appropriate and safe play spaces;
- Adequate internal space standards in apartments;
- Suitable parking provision close to dwellings, and
- Provision of ancillary facilities, including child care.

Particular sensitivity is required where apartment blocks are higher than adjoining residential developments and it is recommended that they should taper down towards the boundaries of a site within an established residential area.

It is important that land use planning underpins the efficiency of public transport services and in this regard, higher densities are required on public transport corridors, i.e. within 500m walking distance of bus routes or within 1km walking distance of a light rail stop or rail station. It is stated that in general, minimum net densities of 50 dwellings per hectare, subject to design and amenity standards, should be applied within public transport corridors.

It is noted that the subject site is located on the South Circular Road which is identified as an Orbital Route under the BusConnects Scheme, while the D-Spine is proposed to run through Dolphin's Barn with a peak frequency of 4 mins between buses. The Dolphin's Bard Road is also identified as a Core Bus Corridor under the BusConnects Scheme. The Fatima

² Sustainable Residential Development in Urban Areas - Guidelines for Planning Authorities, pg 40

Luas stop is approx. 800m from the subject site, while the Rialto Luas stop is approx. 1km away. The proposed development is also located c. 2.5km from the City Centre, easily accessible by bike or on foot, as well as by public transport.

It is submitted that the subject site, due to its location on a public transport corridor and its proximity to local services, as well as cycle and pedestrian routes is consistent with the general principles of SRDUA and can cater for higher density development subject to the design criteria mentioned previously. The Planning Report and the Material Contravention Statement enclosed with the application outlines in detail the scheme's consistency with the SRDUA.

3.3.6 Urban Design Manual – A Best Practice Guide (2009)

The Urban Design Manual is used as a companion reference on best practice for the implementation of the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas. The two documents are intended to be read in conjunction with each other. The focus of the Urban Design Manual is on creating well-designed sustainable neighbourhoods that will “stand the test of time”.

The Urban Design Manual is based on 12 design criteria that encapsulate the range of design considerations for residential development. These criteria are sub-divided into three groups: Neighbourhood/Site/Home.

The 12 design criteria laid out in the Urban Design Manual, are as follows:

- *Context: How does the development respond to its surroundings?*
- *Connections: How well connected is the new development/ site/neighbourhood?*
- *Inclusivity: How easily can people use and access the development?*
- *Variety: How does the development promote a good mix of activities?*
- *Efficiency: How does the development make appropriate use of resources, including land?*
- *Distinctiveness: How do the proposals create a sense of place?*
- *Layout: How does the proposal create people-friendly streets and spaces?*
- *Public Realm: How safe, secure and enjoyable are the public areas?*
- *Adaptability: How will the buildings cope with change?*
- *Privacy and Amenity: How do the buildings provide a high quality amenity?*
- *Parking: How will the parking be secure and attractive?*
- *Detailed Design: How well thought through is the building and landscape design?*

The Design Statement prepared by OMP Architects provides an overview of how the design of the proposed development has had regard to the abovementioned criteria in the Urban Design Manual.

3.3.7 Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities (2020)

The 2020 Apartment Guidelines provide national guidance to Planning Authorities setting out standards for apartment development and contains several specific requirements with which compliance is mandatory for developments consisting of apartments.

The key aim of these Guidelines is to ensure that apartment living is an increasingly attractive and desirable housing option for a range of household types and tenures resulting in greater delivery of apartments in Ireland's cities and towns. It outlines the importance of "*building inwards and upwards rather than outwards*" due to on-going population growth (particularly in Ireland's cities), a long-term move towards smaller average household sizes, an ageing and more diverse population with greater labour mobility and a higher proportion of households in the rented sector.

Importantly, it reaffirms the move away from rigidly applied blanket planning standards signalled by the NPF, including building height and building separation distances and highlights that these blanket restrictions that may be specified in development plans, should be replaced by performance criteria, appropriate to location.

In relation to the above, it is noted that "*there is a need for greater flexibility in order to achieve significantly increased apartment development in Ireland's cities.*"³

It is outlined that in general, apartments are most appropriately suited within urban areas while the scale and extent of apartment development should increase in proximity to 'core urban centres' and 'other relevant factors'.

An assessment of the proposed development against the 2020 Apartment Guidelines is provided in the Planning Report and the Material Contravention Statement prepared by Avison Young, while the Technical Report prepared by OMP provides a breakdown of the proposed scheme in relation to the quantitative requirements of the aforementioned guidelines.

³ Sustainable Urban housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2020), pg 10.

3.3.8 Guidelines for Planning Authorities on Childcare Facilities (2001)

The Department of Housing, Planning and Local Government (formerly Department of Environment, Heritage and Local Government) Guidelines for Planning Authorities on Childcare Facilities (2001) (hereinafter 'Childcare Guidelines') provide a framework to guide Local Authorities in preparing development plans and assessing applications for planning permission, and to guide developers and childcare providers in formulating development proposals.

The Childcare Guidelines are based on the need to ensure a “*suitably high quality*” of childcare facilities are provided while recognising that “*quality childcare can benefit children, their parents, employers and communities in general*”⁴. It is also noted that access to quality childcare services contributes to the social, emotional and educational development of children and that there are “*clear economic benefits from the provision of childcare*” including the potential for employment in its own right.

In terms of determining appropriate locations for childcare facilities, the Childcare Guidelines outline that “*For new housing areas, an average of one childcare facility for each 75 dwellings would be appropriate*” and that “*authorities could consider requiring the provision of larger units catering for up to 30/40 children in areas of major residential development on the basis that such a large facility might be able to offer a variety of services – sessional/drop in/after-school, etc.*”⁵

The proposed development provides 335 no. Build to Rent units, while 1 no. crèche accommodating c. 74 children is also provided. It is submitted that the provision of 1 no. c. 260 sq. m childcare facility catering for c. 74 childcare spaces, is sufficient to cater for the expected demand for childcare generated by the proposed development and is consistent with the Childcare Guidelines.

The Planning Report prepared by Avison Young outlines the scheme's consistency with the Childcare Guidelines while the Community and Social Infrastructure Report prepared by Avison Young also includes details relating to the existing Childcare facilities in the vicinity of the proposed development. Additionally, as set out in the Planning Report submitted under separate cover, the size of the childcare facility is considered justified having regard to the likely demographics of the future residents and the geographical distribution of existing childcare facilities in the surrounding area.

⁴ Guidelines for Planning Authorities on Childcare Facilities (2001), pg 3.

⁵ Guidelines for Planning Authorities on Childcare Facilities (2001), pg 5.

3.3.9 Design Manual for Urban Roads and Streets (2013)

The Design Manual for Urban Roads and Streets (DMURS) was issued in 2013 under Section 28 of the 2000 Act and sets out design guidance and principles for the construction of new and retrofitting existing roads and streets in Ireland with a speed limit of 60km/h or less. It also outlines practical design measures to encourage more sustainable travel patterns in urban areas. DMURS seeks to compliment the policies on sustainable transportation proposed in *Smarter Travel (2009)* and the policies on sustainable living contained in SRDUA.

Section 1.2 of DMURS sets out a policy that street layouts should be interconnected to encourage walking and cycling and offer easy access to public transport. It is also noted in Section 1.2 that compact, denser, more interconnected layouts, particularly where served by good quality bus or rail services, will help to consolidate cities, towns and villages making them viable for reliable public transport.

Section 3.2 of DMURS outlines the hierarchy of streets with 'Local Streets' described as streets that provide access within communities and to Arterial and Link streets.⁶ Section 4.4.1 of DMURS states that the standard carriageway width on local streets should be 5-5.5m, or 4.8m where a shared surface is proposed. Further guidance is provided in relation to carriageway surfaces, junction design, forward visibility, visibility splays, on-street parking and loading.

A Transport Impact Assessment, prepared by Systra accompanies the application and outlines in detail how the proposed development is consistent with the policies and recommendations of DMURS. The TIA describes the existing environment, presents the accessibility of the site for pedestrians, cyclists, public transport users and private vehicles, estimates the future traffic generated by the proposed development and assesses the impact of the traffic on the transport networks in accordance with DMURS. Traffic and Transport is also addressed in Chapter 10 of this EIAR.

3.3.10 Architectural Heritage Protection – Guidelines for Planning Authorities (2011)

The Architectural Heritage Protection Guidelines were first issued in 2005, by the then Department of the Environment, Heritage and Local Government, under Sections 28 and 52 of the Planning and Development Act, 2000. The Guidelines were amended by the Department of Arts, Heritage and Gaeltacht in 2011 following the transfer of functions and change of titles.

⁶ Design Manual for Urban Roads and Streets, 2013 pg, 36.

Section 13.5 of the Heritage Protection Guidelines deals with development within the curtilage of a Protected Structure, while Section 13.8 deals with development affecting the setting of a Protected Structure.

There is 1 no. protected structure (Our Lady of Dolour's Church) located adjacent to the subject site to the north-west. The Architectural Heritage Impact Assessment prepared by ARC, submitted with this application provides a detailed assessment of the architectural and historical significance of the Church and its relationship to the proposed development. Chapter 18 of this EIAR, prepared by ARC, also addresses Architectural Heritage.

3.3.11 The Planning System and Flood Risk Management - Guidelines for Planning Authorities (2009)

The Minister issued 'The Planning System and Flood Risk Management: Guidelines for Planning Authorities' (hereinafter the 'Flooding Guidelines') in November 2009 which provide comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process. The associated Technical Appendices of the Guidelines for Planning Authorities on Flood Risk Management provide guidance on the identification and assessment of flood risk and addressing flood risk management in design of development.

A Site Specific Flood Risk Assessment has been carried out by OCSC in accordance with the Flooding Guidelines which identifies that the proposed site is not at risk of fluvial or tidal flooding and that groundwater flood risk to the site is low. Hydrology is also addressed in Chapter 8 of this EIAR.

3.4 Regional Planning Context

The NPF requires the Regional Assemblies to prepare Regional Spatial and Economic Strategies in accordance with the Framework set by the NPF. The subject site is located in the Eastern & Midland Region which has published a Regional Spatial and Economic Strategy (RSES) for the period 2019-2031. The RSES was adopted on the 3rd May 2019 and came into effect on the 28th June 2019 and replaces the Regional Planning Guidelines for the Greater Dublin Area 2010-2022 (RPGs).

3.4.1 Regional Spatial and Economic Strategy

The Strategic Vision of the RSES sets out 16 'Regional Strategic Outcomes' (RSOs). Of particular relevance to the proposed development are Regional Strategic Outcomes (RSO) 1, 2 and 6 which are outlined below:

- **RSO 1: Sustainable Settlement Patterns** - *"Better manage the sustainable and compact growth of Dublin as a city of international scale"*.
- **RSO 2: Compact Growth and Urban Regeneration** - *"Promote the regeneration of our cities, towns and villages by making better use of under-used land and buildings within the existing built-up urban footprint and to drive the delivery of quality housing and employment choice for the Region's citizens"*.
- **RSO 6: Integrated Transport and Land Use** - *"Promote best use of Transport Infrastructure, existing and planned, and promote sustainable and active modes of travel to ensure the proper integration of transportation and land use planning"*.

The Settlement Strategy of the RSES is informed by the NPF which predicts that the population of Dublin will increase from 1,347,500 in 2016, to between 1,489,000 - 1,517,500 in 2026 and to between 1,549,500 - 1,590,000 by 2031.⁷ The Settlement Strategy for Dublin City and Suburbs builds on the objectives of the NPF and recognises the need for compact growth.

The proposed development will contribute to the ongoing consolidation of Dublin City and Suburbs by creating a new urban neighbourhood within Dublin City in an area that is well served by public transport, local amenities and community infrastructure while supporting the integration of land use with high quality public transport provision. This is set out in the Planning Report and the Material Contravention Statement submitted under separate cover, which outlines in further details the proposed scheme's consistency with the RSES.

⁷ Eastern and Midlands Regional Assembly; Regional Spatial & Economic Strategy, pg 44.

3.5 Local Planning Context

The relevant statutory Development Plan for the subject site is the Dublin City Development Plan 2016-2022 (the Development Plan). It sets out the policy framework against which all applications for permission at this site will be assessed. There are a wide range of Development Plan policies and development management standards that apply to the proposed development. These are outlined in the Planning Report and Material Contravention Statement prepared by Avison Young and submitted under separate cover.



Chapter 4. Examination of Alternatives

4.0 Examination of Alternatives

4.1 Introduction

This Chapter was prepared by Brian Maher, Heather McMeel and Noel Cronin of Avison Young, Town Planning Consultants. Brian Maher, Associate Director, holds accreditations in architectural technology and town planning. Brian specialises in town planning, urban design, masterplanning, regeneration, design intervention studies and heritage evaluation, and has over 30 years of experience of working in the planning, architectural and urban design sectors. Heather McMeel, Senior Planner, holds a B.A in Political Science and Geography from Trinity College Dublin and an MSc in Real Estate and Planning from Heriot Watt University. Heather is a member of the Royal Town Planning Institute and has over 5 years' experience in planning and development. Noel Cronin, Planner, holds a Bachelor of Social Science from University College Cork, as well as a Masters in Planning and Sustainable Development from University College Cork. Noel has 4 years postgraduate experience in planning and development.

This Chapter provides an overview of the alternative locations, designs and concepts that have been considered prior to the selection of the current proposed Strategic Housing Development at White Heather Industrial Estate, Dolphins Barn, Dublin 8. It outlines how the decision to locate the Strategic Housing Development was informed by the examination of alternatives options having regard to the relevant perspectives i.e. strategic need, spatial planning, environmental considerations and site design.

This Chapter sets out the process that has culminated in the application as submitted to An Bord Pleanála. At a high level, this Chapter addresses the following:

- The legislative provisions surrounding the examination of alternatives.
- The policy framework that has set the context for the application.
- The background to and site selection process.
- The design process that resulted in the application as set before An Bord Pleanála.

As the proposed development is a Strategic Housing Development it is subject to Government legislation relating to this area. It is necessary to understand this context and the requirements relating to same as these have also informed the preparation of this planning application.

This Chapter commences by establishing the legislative context, both European and Irish, guiding the examination of alternatives in this EIA. Following this, an outline of the decision making process, which included the consideration of alternatives, that led to the current proposal is provided. This outline describes the stages at which environmental effects were

taken into account, providing the main alternatives studied and the reasons for this choice, having regard to environmental effects, where relevant.

4.2 Methodology

4.2.1 EU Legislation

Directive 2011/92/EU of the European Parliament and of the Council of 13th December 2011 (amended by Directive 2014/52/EU of the European Parliament and of the Council of 16th April 2014) on the assessment of the effects of certain public and private projects on the environment ('the EIA Directive') contains certain requirements in relation to the assessment of alternatives. It is noted that the information to be provided by the developer shall include:

“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.”¹

This is elaborated upon under Annex IV, subparagraph 2, as follows:

“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.”²

4.2.2 Irish Legislation and Guidance

Schedule 6 of the Planning and Development Regulations, 2001 (as amended) sets out the information which is to be contained in an EIAR and Part 1(d) of Schedule 6 states that the following shall be included:

“An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking into account the effects on the environment.”

The draft EPA Guidelines provides further guidance in relation to the examination of alternatives, stating that:

¹ Article (5) (d) of Directive 2014/52/EU of the European Parliament and of the Council of 16th April 2014.

² Annex IV, paragraph 2, of Directive 2014/52/EU of the European Parliament and of the Council of 16th April 2014.

“Impact avoidance is principally achieved by consideration of alternatives. Where significant adverse effects are identified then alternative options are identified and evaluated. The objective is to adopt the combination of options that presents the best balance between avoidance of adverse environmental effects and achievement of the objectives that drive the project.”³

and

“Alternatives that are available for consideration at the earlier stages in the evolution of a project often represent the greatest potential for avoidance of adverse effects...Assessment during the project design typically involves a process of repeated steps, each involving design and re-design to try to get the best fit with a wide range of environmental factors⁴.”

Having regard to the requirements of the amended EIA Directive in relation to the provision of “a description of the reasonable alternatives... relevant to the proposed project and its specific characteristics”, the draft EPA Guidelines state:

“Not all options (such as alternative sites) may be available for every project. The applicant is required to describe the reasonable alternatives examined during the design process with description of the environmental considerations that were taken into account⁵.”

4.2.3 Assessment

This Chapter assesses a range of factors including, *inter alia*, an expansion of the design rationale contained in the relevant reports, an examination of the land use and planning context and an explanation of the reasonable alternatives considered having regard to the environmental effects of the options considered.

The evolution of the project is outlined from the early design stage through a series of stages that take account of planning, land-use and environmental effects. The six levels recommended by the EPA Guidelines inform the consideration of alternatives, where applicable, as follows:

- ‘Do-Nothing’ Alternative – examination of trends currently occurring at the site;

³ EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports, 2017, pg 12.

⁴ EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports, 2017, pg. 12.

⁵ EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports, 2017, pg. 35.

- Alternative Processes – an outline of the different options as to how the processes of activities of the project are carried out;
- Alternative Layouts – an outline of the how different elements could be arranged on site;
- Alternative Locations – an outline of considerations relating to site suitability and the Brief;
- Alternative Designs – an outline of planning considerations, considerations about the site layout and building design considerations; and
- Alternative Mitigation Measures – description of the various mitigation options and the reasons for selecting a chosen option, including comparison of environmental effects.

It is noted in the Draft EPA Guidelines, however, that:

“Clearly in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant ‘alternative location’ for the upgrading of an existing road.”⁶

Having regard to the above, the relevant reasonable alternatives considered in relation to the proposed development can be categorised as follows:

- Alternative locations.
- Alternative layouts; and
- Alternative designs.

A comparison of the environmental effects was carried out throughout the design stage which informed the choices made for pursuing each option and a summary of these comparisons are provided for each alternative. A summary comparison table comprising the alternative designs is provided at the end of this Chapter.

⁶ EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports, 2017, pg 34

4.3 Receiving Environment

4.3.1 Site Location

The White Heather Industrial Estate is located on the South Circular Road at Dolphin's Barn, Dublin 8. The site is bound by residential properties situated on the South Circular Road to the north, Priestfield Cottages to the east and St. James's Terrace to the west. The Grand Canal runs parallel to the south of the site, with the application site bound by a linear strip of 'open space' along the length of the canal bank. Our Lady of Dolour's Church is situated to the north-west of the site, with local retail/commercial uses located to the south-west of the site.

The subject site currently has two access points: one from the South Circular Road accessing the majority of the White Heather Industrial Estate; and one of St James's Terrace providing access to one industrial unit (12a St. James's Terrace). There is currently no access to the site from the Grand Canal.

The subject site is situated just over 2km from Dublin City Centre. The site is approximately 2.3km from St. Stephen's Green, 0.5km from the Coombe Women's Hospital, 1.6km to St. James's Hospital, 1.9km to Heuston Station, 800m to Fatima Luas Stop and 2.2km to Christ Church Cathedral.

While the immediate surrounding land uses are generally residential, the wider vicinity provides local retail, commercial, medical, community and recreational uses. The locality is well served by sustainable modes of transport with frequent bus and Luas connections to the City Centre.

There are a number of Dublin Bus routes which serve the subject site including *inter alia* the 17, 17d, 27, 56a, 68, 68a, 77a, 77x, 122, and the 151. Additionally, the South Circular Road is identified as an Orbital Route under the proposed Bus Connects Scheme, while the D-Spine is proposed to run through Dolphin's Barn with a peak frequency of 4 mins between buses. The Dolphin's Barn Road is also identified as a Core Bus Corridor under the proposed Bus Connects Scheme. The Fatima Luas stop is approximately 800 metres to the north and Rialto Luas stop approximately 1km to the north-west of the subject site. Both stops are on the Luas Red Line with links Connolly Station/The Point to Tallaght Square/Saggart. The Red Line also links to the Luas Green Line at Abbey Street which connects Broombridge to Brides Glen. The nearest Dublin Bike Scheme Station to the subject site is approx. 1km away or a c. 15 min walk.

Figure 4.01: Aerial of subject site including surrounding context.



4.3.2 Site Description

The subject site comprises the White Heather Industrial Estate, acquired by the Applicant, U and I (White Heather) Limited. It consists of a small-scale industrial estate located off the South Circular Road. Additionally, the proposed development comprises No. 307/307a South Circular Road, a residential dwelling, and 12a St. James's Terrace, a vacant industrial unit. The subject site is of an irregular shape, with boundaries to the South Circular Road, the Grand Canal, St. James's Terrace, Priestfield Cottages and Our Lady of Dolour's Church.

The site comprises a number of industrial units and associated parking and storage areas. There is minimal existing landscaping on the site however, adjacent to the Grand Canal there is a strip of flat grass area running the length of the site. The existing structures on the site comprise industrial units (approx. two storeys in height). The existing units are generally located on the boundary lines of the site on all side, with the centre of the site remaining free from development and in use as ancillary parking for the industrial units.

4.3.3 Current Uses

The site currently comprises a number of small-scale industrial/warehouse units, with ancillary car parking and storage areas. Businesses occupying units within the Industrial Estate include: An Post Dublin 8 Delivery Office; BSS Dublin; and Storage World Self Storage. No. 307/307a South Circular Road is currently in residential use.

4.4 Characteristics of the Proposed Development

A detailed description of development is provided in Chapter 2 of this EIAR, however, a summary of the proposed development is provided here for clarity.

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

The project involves the demolition of the existing industrial buildings on the site. Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

4.5 'Do-Nothing' Alternative

This section considers the potential impacts arising on the receiving environment should the proposed development not take place. In a 'Do Nothing' scenario, the subject lands would remain undeveloped and the existing buildings on the subject site would be unused. The

status of the environmental receptors described throughout this EIAR would be likely to remain unchanged while the potential for any likely significant adverse environmental impacts arising from the proposed development would not arise.

Similarly, if the proposed development does not take place, the potential for any positive impacts from the construction and operation of the proposed development would also not arise.

A 'do nothing' scenario would result in the subject site, which is zoned Z1 Residential (General), along the north, east and west of the site remaining undeveloped and Z9 Amenity / Open Space Zoning along the south of the site proposed to be underutilised for this purpose, which would not be consistent with National, Regional and Local Planning Policy that seeks to achieve compact urban growth and the delivery of much needed residential accommodation.

4.6 Alternative Uses

The site is located within an area that is very accessible and within walking distance of local services, facilities and amenities, as well as being within proximity to a range of major employment centres/locations. The site is situated adjacent to an existing Quality Bus Corridor and proposed Core Bus Corridor (Dolphin's Barn Street) as part of the BusConnects scheme. Fatima Luas station on Red Line is located c. 800m to the north west of the site, and as such the site is well served by frequent sustainable transport services.

While cognisance was duly given to potential non-residential uses, the characteristics of the site lends itself to the delivery of a residential development as being the most appropriate and efficient use, and one that could suitably accommodate the height and density proposed in order to take advantage of proximity to local services, amenities, employment centres and sustainable transport options.

Under Variation No. 23 of the Dublin City Development Plan 2016–2022 adopted in March 2020, the White Heather Industrial Estate was rezoned from Zoning Objective Z6 to Z1 Residential and Z9 Open Space. The proposed development is not only a permitted in principle use but is fully compliant with and directly supported by the zoning objective of the site. Therefore, no alternative uses were examined

4.7 Alternative Locations

4.7.1 Land Use Zoning

The site comprises a mix of land use zoning, both Z1 Residential (General), along the north, east and west of the site and Z9 Amenity / Open Space Zoning along the south of the site.

Z1 zoned lands have the following land use zoning objective:

“To protect, provide and improve residential amenities”⁷.

Z9 zoned lands have the following land use zoning objective

‘to preserve, provide and improve recreational amenity and open space and green networks’.

The development site (c. 1. 535 ha.) subject to the SHD application is predominantly zoned under Zoning Objective Z1 (1.236 ha) with a small section (0.228 ha) under Zoning Objective Z9. There is no development proposed within the Z9 area and it is being preserved as open space.

The general objectives for primarily residential areas are to provide a protection from unsuitable new development that would be incompatible with the overall residential function of the area. The provision of residential accommodation within sustainable communities where residents are within easy reach of services, open space and facilities such as shops, education, leisure, community facilities and amenities, by bicycle or on foot and by public transport provides good access to employment, the city centre and the key district centres. Having regard to the fact that the zoning of the subject site expressly provides for residential development, it was not considered necessary to consider alternative locations in detail.

4.7.2 Core Strategy

The Core Strategy of the Development Plan emphasises the promotion of intensification and consolidation of Dublin City which is to be achieved in a variety of ways including infill, brownfield development and the encouragement of development at higher densities, especially in public transport catchments. It is noted in the Development Plan that these policies underpin the creation of a compact city with mixed-use environments, sustainable neighbourhoods and a strong policy emphasis on the delivery of quality homes.

The housing requirement for the Plan period amounts to c. 29,500 units, based on occupancy of 2 people per residential unit.⁸ The Core Strategy of the Development Plan quantifies the area of lands zoned available for residential development (4,466ha). This includes Z1 zonings and is based on an assumption of 100 units per hectare. The subject Z1 zoned lands are included in Core Strategy calculations for achieving sufficient zoned lands to cater for targeted population growth. The proposed development, comprising 335 no.

⁷ Dublin City Development Plan 2016-2022, pg.238

⁸ Dublin City Development Plan 2016-2022, pg 20

residential units will contribute towards meeting the housing targets during the Development Plan period.

It is submitted that the subject site is a suitable location for residential development as it will contribute to achieving the strategic planning policies and environmental objectives outlined in the Development Plan and therefore, no further detailed assessment of alternative locations was required.

4.8 Alternative Vacant Sites Within the Ownership of the Applicant

Although a full detailed assessment of alternative locations was not required due to the land use zoning objectives that apply to the subject site and the supporting planning policy context in relation to residential development, it is noted that the subject site was considered to be suitable to accommodate the scale, height and density proposed and is the only suitable site within the ownership of the Applicant. The applicant owns a site zoned Z6 for Enterprise and Employment in Dublin Industrial Estate which due to its size and location would be difficult to develop as a residential development within the constraints of that zoning objective.

4.9 Alternative Layouts

The layout and design of the proposed development involved an iterative process that evolved from the initial concept stage through masterplanning and alternative modelling studies. A range of different proposals with alternate layouts were considered at the early design stages. The Design Team assessed a number of arrangements for the subject site having regard to a range of environmental factors including, *inter alia*, Cultural Heritage, Population and Human Health, Transportation, Residential Amenity, Microclimate, Biodiversity, Open Space provision and Visual Impact.

The preliminary sketch proposals established early on an approach that was led by the following considerations;

- The protection of the residential amenity of the residential units at Priestfield Cottages to the east, South Circular Road to the north and St James's Cottages to the west;
- The primary pedestrian and vehicular entrance being predetermined by the existing location and the extent of the existing re-zoned White Heather Industrial Estate;
- The centrally located desire line for a linking publicly accessible route through the subject site to the Grand Canal and the creation of an amenity strip to the south;
- The arrangement of the site to optimise the orientation of blocks providing good daylight/sunlight amenity to future residents;

- The importance of opening up the Grand Canal amenity space as a new publicly accessible place.

The need to give regard to the adjacent residential amenity of units at St James's Terrace, South Circular Road and Priestfield Cottages dictated that the massing of the proposed residential development would have to be modulated to address the residential amenity of these existing dwellings. Accordingly the proposed building heights were scaled appropriately to take account of the existing adjacent context.

It was realised by the design team from early on that this approach would be supported by the principle that increased heights could be accommodated within the centre of the site and within the southerly facing elements generously separated by Parnell Road and The Grand Canal as well as the Z9 amenity strip along the Grand Canal to the south.

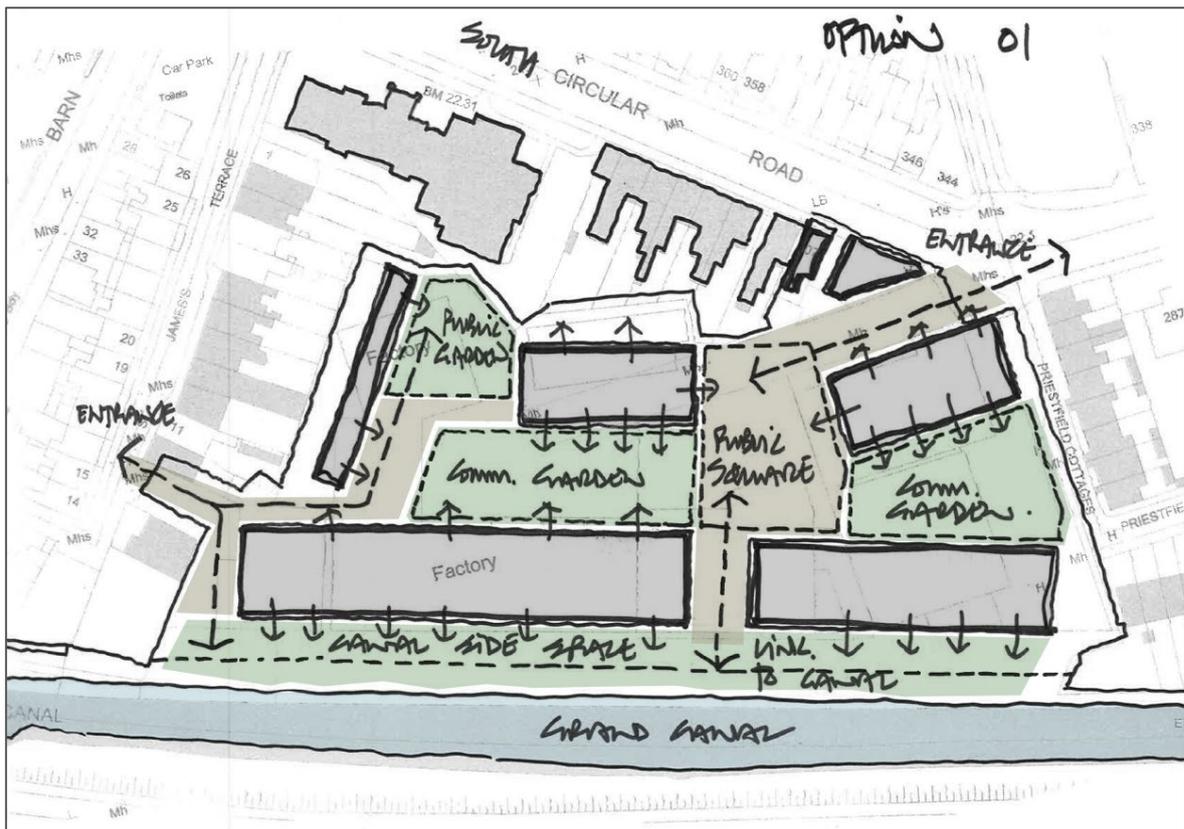
The general structure of the proposed scheme design emerged quite early on in the process based on the key fixed elements including the existing site entrance, the character and scale of the adjacent residential units and the linear amenity strip along the southern boundary. Accordingly the alternative layout and design options were tested against the following criteria;

- Daylight/Sunlight/Shadow;
- Massing/height;
- Built footprint and Public Open Space and amenity considerations;
- Unit type and mix;
- Potential impacts on close and distant views.

4.9.1 Alternative Layout Option 1

This initial option was predominantly arranged on an east-west axis to align broadly with the Grand Canal to the south and offset from the existing residential dwellings at both Priestfield Cottages to the east and St James's Terrace to the west. This option considered access and egress through both the existing South Circular Road as well as the St James's Terrace at the west of the site to Dolphins Barn.

Figure 4.02: Alternative Layout Option No. 1



This option was discounted due to the following planning and environmental assessment:

4.9.1.1 Description of Option 1

This layout option running east-west parallel to the canal was centred around a garden space with indirect linkage to the canal bank. However the option did not provide legibility from the access point at South Circular Road and due to the long linear block format provided poor quality of daylight amenity to both future residents and the adjoining residential neighbours.

While the option provided a strong building edge to canal and a mix of hard and soft landscaped public and communal spaces and possible linkage to canal as well as open edges to neighbouring residential properties

The layout creates closed/private relationship with canal side and the only linkage to canal is not a primary access route. The location of larger buildings to southern edge overshadows

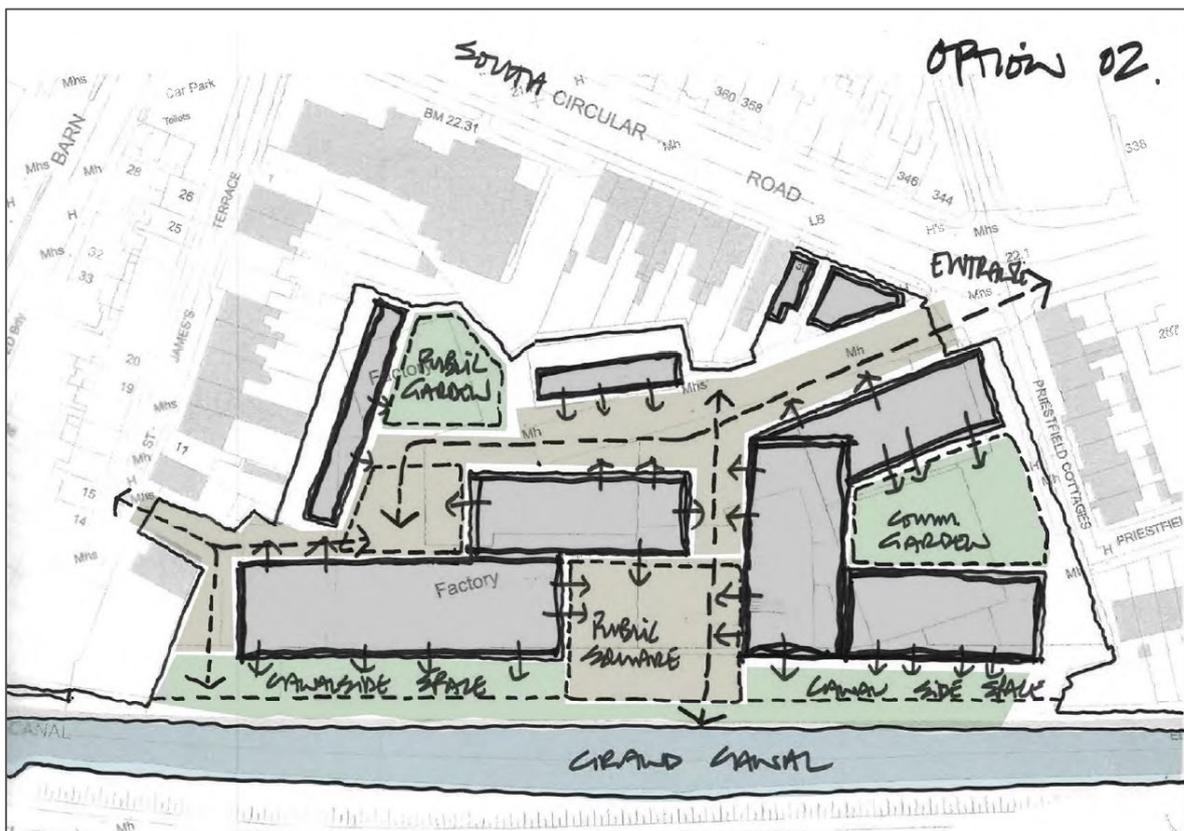
internal amenity/spaces and the layout generates extensive north facing facades and secondary rooms with poor light amenity.

The environmental disconnect between the proposed development and the prime amenity offered by the Grand Canal prevents a more open and legible link to both future residents and the wider public. The failure to allow the sunlight amenity from the south from the canal into the scheme and the shadow imposed by the east-west blocks would create a sense of interior to the gardens and courtyards, rather than sunlit amenity spaces.

4.9.2 Alternative Layout Option 2

The second option concentrated the block arrangement to the centre of the site and again ran on the east-west axis and the bank of the Grand Canal to the south. There was an emerging desire line linkage to a southern canalside amenity strip through the site dividing 2 no. conjoined main blocks.

Figure 4.03: Alternative Layout Option No. 2



This option was discounted due to the following planning and environmental assessment;

4.9.2.1 Layout Option 2

This option was predominantly oriented on the east-west axis along the bank of the Grand Canal with a public square roughly centred. However, the monolithic block configuration develops a building edge to the canal and creates a mix of hard and soft landscaped public and communal spaces which engage with canal while providing

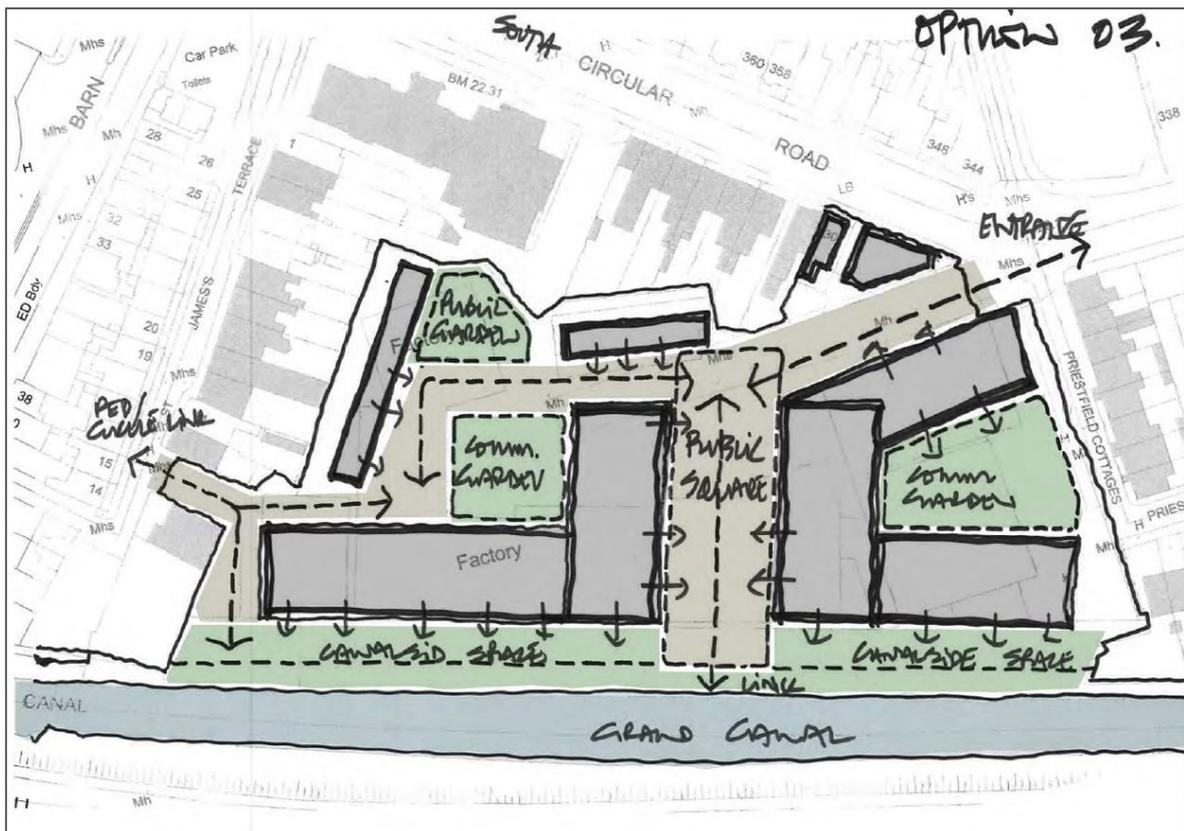
possible linkage to the canal amenity strip and develops edges to the neighbouring residential properties.

However, the layout retains a closed/private relationship with the canal bank for the majority of its length and fails to provide linkage to by way of a primary route. The location of the larger buildings to the southern edge overshadows the internal amenity/spaces and generates extensive north facing facades and secondary rooms in all blocks. The failure to engage positively with the canal bank and the shadows cast by the blocks create poor daylight amenity for future residents.

4.9.3 Alternative Layout Option 3

The third alternative layout established a clear desire line through the centre of the layout to provide a clear and legible link to the Grand Canal amenity strip to the south while aligning the main blocks to this east-west axis, 2 no. parallel blocks defining the route through the scheme to the Grand Canal amenity strip to the south.

Figure 4.04: Alternative Layout Option No. 3



The option was also discounted due to the following planning and environmental assessment;

4.9.3.1 Layout Option 3

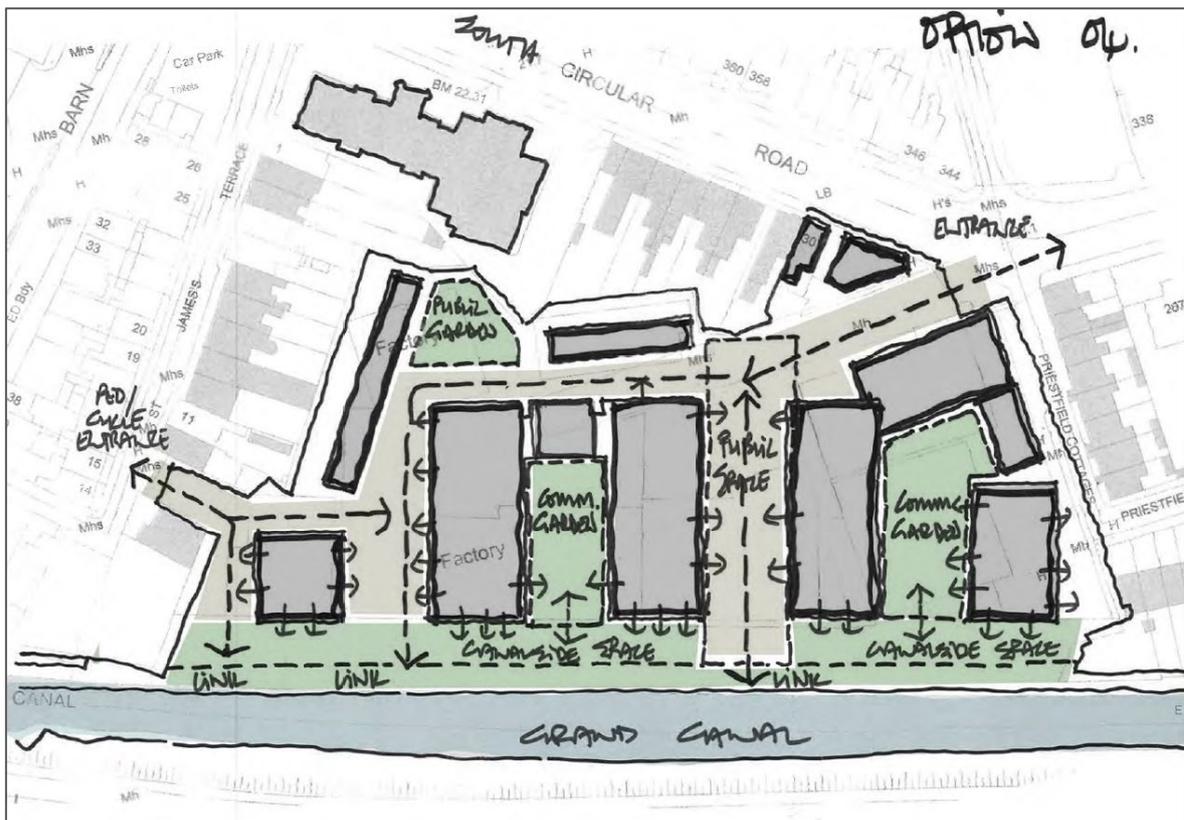
The proposed layout option similarly develops a building edge to canal. While the parallel blocks largely screen the canal there is a sense of more coherent linkage to the canal as major public space and route, and a clear pattern of public/private realm. The option develops edges to neighbouring residential properties as different responses and forms enclosure to the public square. The layout also creates a mix of hard and soft landscaped communal spaces within the development.

However, the layout retains significant parts of canal frontage as closed/private buildings instead of differentiating the requirement for the new public linear park. The location of large buildings to southern edge overshadows internal amenity/spaces and would not encourage green growth while also throwing shadow into both communal gardens. The layout generates extensive north facing facades and secondary rooms.

4.9.4 Alternative Layout Option No. 4

This option showed an opening up of a clear publicly accessible route through the subject site to the Grand Canal via a public square running north-south framed by 2 no. of a series of 4 no. parallel finger blocks.

Figure 4.05: Alternative Layout Option No. 4.



The Alternative Layout Option 4 was eventually used as the basis for the first design iteration developed to become the first design iteration presented to Dublin city Council. The following commentary was used to inform the development of the first design iteration which follows.

4.9.4.1 Layout Option 4

The layout option develops an open and permeable Building edge to canal bank. This allows for the development of a strong linkages to the canal as a major public space and route. This provides for a clear pattern of public/private realm differentiation with north-south finger blocks providing enclosure to a combination of public square primary link and communal gardens.

A mix of hard and soft landscaped communal spaces within the development with excellent aspect/access and good daylight distribution throughout the layout. The orientation of buildings minimises north facing facades and overshadowing as a result and develops edges to neighbouring residential properties as different responses.

However, the layout lacks internal points of reference or hierarchy of form. The treatment of buildings should be more sensitive/responsive to the established neighbouring properties and streets and is lacking in detail on character of streets and spaces as a response. The following section Alternative Designs sought to address these matters in a more site specific design response that addresses both layout and the essential relationship to the site context.

4.10 Alternative Designs

As with the examination of alternative layouts dealt with in the last section, the examination of alternative design options involved a robust process which amalgamated design, spatial planning and environmental considerations holistically. This was further informed by consultation with Dublin City Council. The final design which emerged represents what the Design Team considered as the most appropriate balance between a strong design response and the protection of and integration with the existing landscape and environment at White Heather.

4.10.1 Pre-application Process

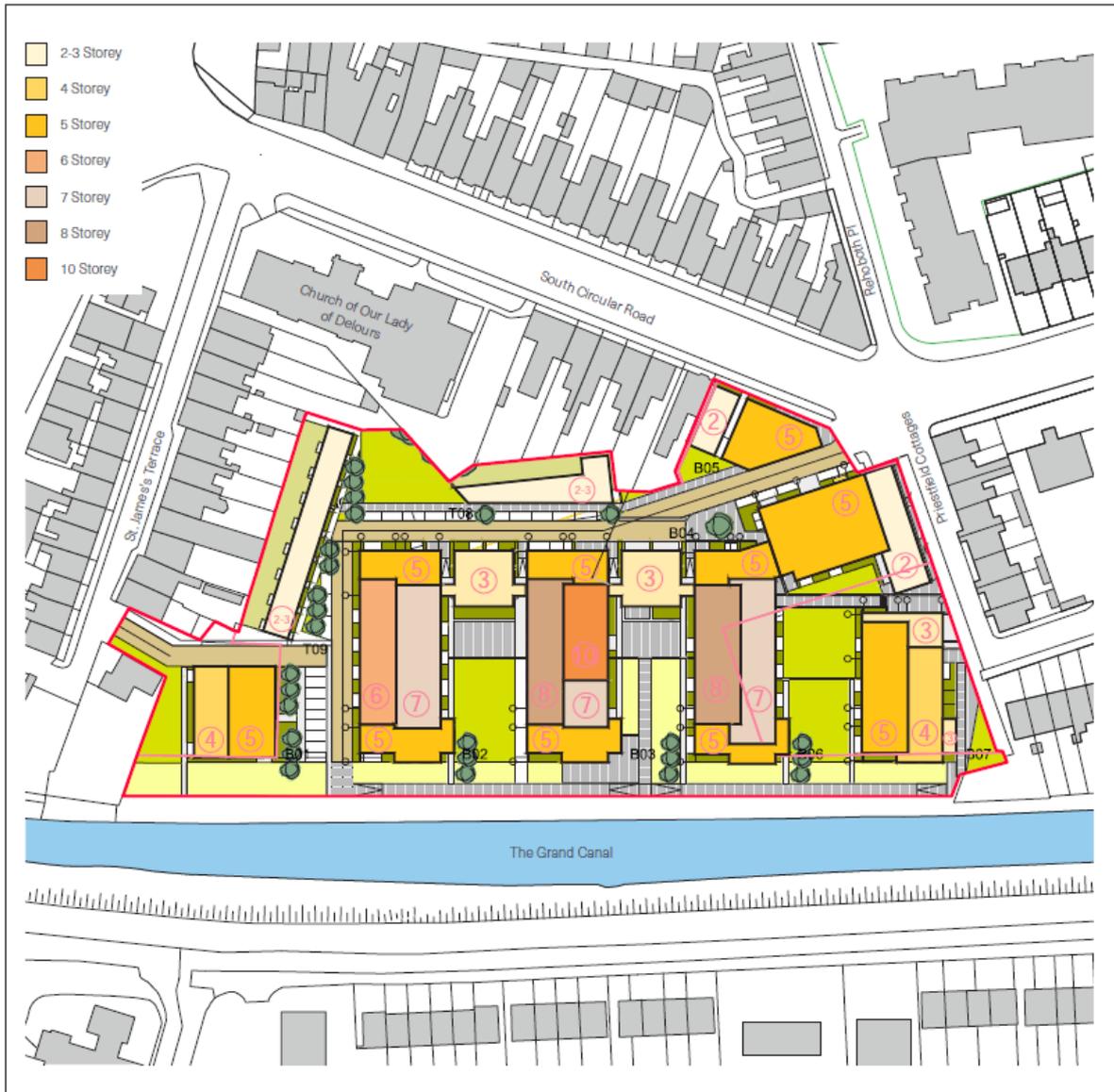
During the pre-application process The Applicant and Design Team held 4 no. pre-application consultation meetings with Dublin City Council (DCC) taking place under Section 247 of the Planning and Development Act on the following dates:

- Pre-application Meeting no. 1 - 19th October 2020;
- Pre-application Meeting no. 2 - 6th January 2021;
- Pre-application Meeting no. 3 - 1st March 2021; and
- Pre-application Meeting no. 4 - 20th May 2021.

4.10.2 Design Option 1 Pre-application Meeting no. 1 – 19th October 2020

The initial design iteration set out to provide a scheme option that provided 330 no. units of different types and sizes from own door townhouses to apartments ranging from studio to 3-bedroom units, including Part V units. The scheme design was structured as a series of 5 no. finger blocks running north south and a terrace of townhouses, a creche and 2. No. blocks framing the entrance at South Circular Road.

Figure 4.06: Design Option No. 1 to Pre-application Meeting no. 1 – 19th October 2020



The design and vision for the Build-to-Rent residential scheme sought to address the following considerations;

4.10.2.1 Residential Amenity / Overlooking

The proposed design option was intended to be a considerate response within the existing established residential context. The creation of a hierarchy of both public and communal open space was a clear goal as well as the modulation of the height and massing to address the low-rise adjacent building typologies.

The importance of modulating the Daylight/Sunlight/Shadow was accepted from inception and was used to provide good quality light amenity within the scheme while giving careful regard to the potential impacts on the adjacent residential amenity at St James's Terrace, South Circular Road and Priestfield Cottages. The scaling down of building height and repairing the edges of the scheme and the separation distances was central to reducing the potential for overlooking.

4.6.1.1 Open Space and Residential Amenity

The creation of a clear hierarchy of both public open space and residential amenity space was adopted from early in the design process. A clear legibility and establishment of desire lines for the pedestrian, cyclist and motorist was central to this structure as it emerged. The fixed points were already clearly defined in this regard in the primary access from South Circular Road was to become a front door for the proposed residential neighbourhood. The existing access from St James's Terrace had yet to be clearly defined at this stage.

The daylight and environmental quality of the public and communal space was beginning to emerge and was subject of much discussion in terms of separation distances, differentiation of the emerging character areas as well as the need to refine the type and use of the canalside linear strip and the public access route to that as a key public space.

4.6.1.1 Natural and Cultural Heritage

Our Lady of Dolour's Church sits on the north west corner of South Circular Road and St James's terrace and is allowed respite by the creation of a small public open space while providing for the potential for future pedestrian linkage in the future.

The Grand Canal provides a natural habitat as well as natural amenity buffer to the south of the site. The design option gives regard to the need to set back to provide separation and protection to this key natural asset. The design option while adjacent is to the north of this linear amenity strip which will become a new public realm space for public access to a natural amenity that has been up to now been inaccessible to the public.

The scheme design intends to provide ground floor activation through the provision of tenant amenity at ground floor, connective public realm and communal and public open space. The considerations of vehicular and pedestrian access through the scheme, car parking, architectural design rationale, landscaping and Daylight/Sunlight/Shadow assessment were also illustrated and discussed as part of the pre-planning meeting.

Table 4.01: Design Option 1 Summary of Environmental Considerations

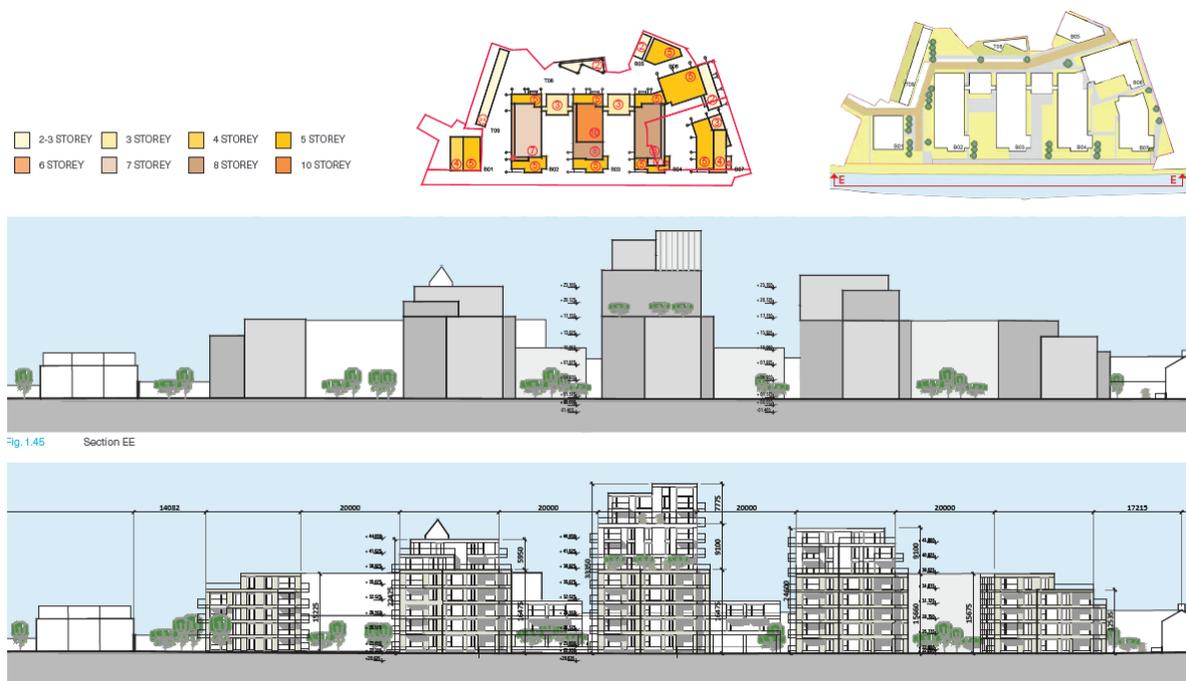
Environmental Factors	Sub-category	Final Design Option
Land	Land Use	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective is facilitates the Grand Canal linear amenity strip
	Land Take	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.
Landscape	Amenity	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity. The open space adjacent to the Grand Canal promotes linkages to natural Heritage. A clearer route through the scheme was necessary, however, in order to provide a clear hierarchy of the public spaces and to ensure clear access routes to and through the public open space would be provided as well as a more direct link to the Grand Canal Linear Park Amenity strip.
	Visual Impact	The height of Blocks B02, B03 and B04 required modulation and modification to sit comfortably in the context. A Landscape and Visual Impact Assessment report was required to address this issue.
	Ecology	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.
Population and Human Health	Sustainable communities	The provision of a high density development of 262 no. dwellings per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.
	Residential Amenity	Consideration was required to be given address potential impacts on the adjacent residential amenity in respect of overlooking, privacy and Daylight/Sunlight/Shadow as well as within the scheme design.
	Access for all	A Mobility Management Plan was required to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.
Material Assets	Transport (Roads and Services)	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road required and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.
Material Assets	Transport (Parking)	The exact quantum of car parking was not established at this stage and therefore a detailed assessment was not possible. It is noted, however, that the design would need to be updated to ensure an adequate level of parking was provided.

4.6.2 Design Option 2 Pre-application Meeting no. 2 – 6th January 2021

The second pre-application meeting included the presentation of a scheme Design Option No. 2 as development of the initial design tabled at the first pre-application meeting. The design development presented as Design Option 2 following on from the initial meeting included;

- Refinement of quantum of development and density;
- Consideration of dual aspect ratios;
- Clearer definition of the interface of Z1/Z9 land use zoning;
- Clarity that the central spine would provide access to the public through the scheme to and along the Grand Canal within the subject site;
- Confirmation of pedestrian access only to St James's Terrace;
- Refined open space provision, separation distances, quality and dimensions;
- Parking provision and emerging mobility strategy;
- Relationship of the proposed scheme to the Priestfield Cottages;
- Daylight / Sunlight / Shadow details continuing to be developed;
- Visual Impact Assessment was to be developed.

Figure 4.07: Design Option No. 2 to Pre-application Meeting no. 2 – 5th January 2021



4.6.2.1 Environmental Considerations

The careful consideration of the Grand Canal as an amenity strip and buffer to the protection of the asset was a central consideration to the scheme design evolution. The desire to provide public and residents access was carefully balanced with regards its required protection.

4.6.2.2 Population and Human Health

Population and Human Health will also be considered in the context of the environmental factors required under the EIA Directive through which impacts on population and Human Health may occur. Environmental hazards including, but not limited to, water contamination, air pollution, noise, accidents and disasters will be considered having regard to the relevant environmental factors addressed separately in this EIAR such as inter alia: air, water, soil, noise and traffic. The effects of these environmental factors on Population and Human Health will be assessed with reference to accepted international standards of safety in dose, exposure or risk, and/or source/pathway/receptor. Where other health and safety requirements are addressed in accordance with separate regulatory requirements, the results of such assessments will be referred to in the EIAR.

Table 4.02: Design Option 2 Summary of Environmental Considerations

Environmental Factors	Sub-category	Final Design Option
Land	Land Use	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective is facilitates the Grand Canal linear amenity strip
	Land Take	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan. plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.
Landscape	Amenity	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity. The open space adjacent to the Grand Canal promotes linkage to natural Heritage. A clearer route through the scheme was necessary, however, in order to provide a clear hierarchy of the public spaces and to ensure clear access routes to and through the public open space would be provided as well as a more direct link to the Grand Canal Linear Park Amenity strip.
	Visual Impact	The height of Blocks B02, B03 and B04 required modulation and modification to sit comfortably in the context. A Landscape and Visual Impact Assessment report was required to address this issue.
	Ecology	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.

Environmental Factors	Sub-category	Final Design Option
Population and Human Health	Sustainable communities	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.
	Residential Amenity	Consideration was required to be given address potential impacts on the adjacent residential amenity in respect of overlooking, privacy and Daylight/Sunlight/Shadow as well as within the scheme design.
	Access for all	A Mobility Management Plan was required to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.
Material Assets	Transport (Roads and Services)	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road required and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.
Material Assets	Transport (Parking)	The exact quantum of car parking was not established at this stage and therefore a detailed assessment was not possible. It is noted, however, that the design would need to be updated to ensure an adequate level of parking was provided.

4.6.3 Design Option 3 Pre-application Meeting no. 3 – 1st March 2021

Design Option No. 3 as presented to DCC in the third pre-application meeting on 1st March 2021 included a number of design and layout refinements to the previous Design Option No. 2 scheme design. The design evolution changes included the following;

- A link block between Block B03 and Block B04 removed to strengthen the pedestrian and legibility linkage to the Grand Canal;
- Increased definition of the public realm;
- Massing of Block B03 reduced;
- Refinements to the edges of the scheme;
- Separation distances to the rear of St James's Terrace to proposed 2/3-storey townhouses met as required;
- Established shoulder height of 5-storeys to the northern and southern ends of north-south finger blocks;
- Materials strategy clarified including red brick at edges to reflect existing established residential material palette.
- The proposed units stepped back facing Priestfield Cottages at north eastern corner of the scheme.

Figure 4.08: Design Option No. 3 to Pre-application Meeting no. 3 – 1st March 2021

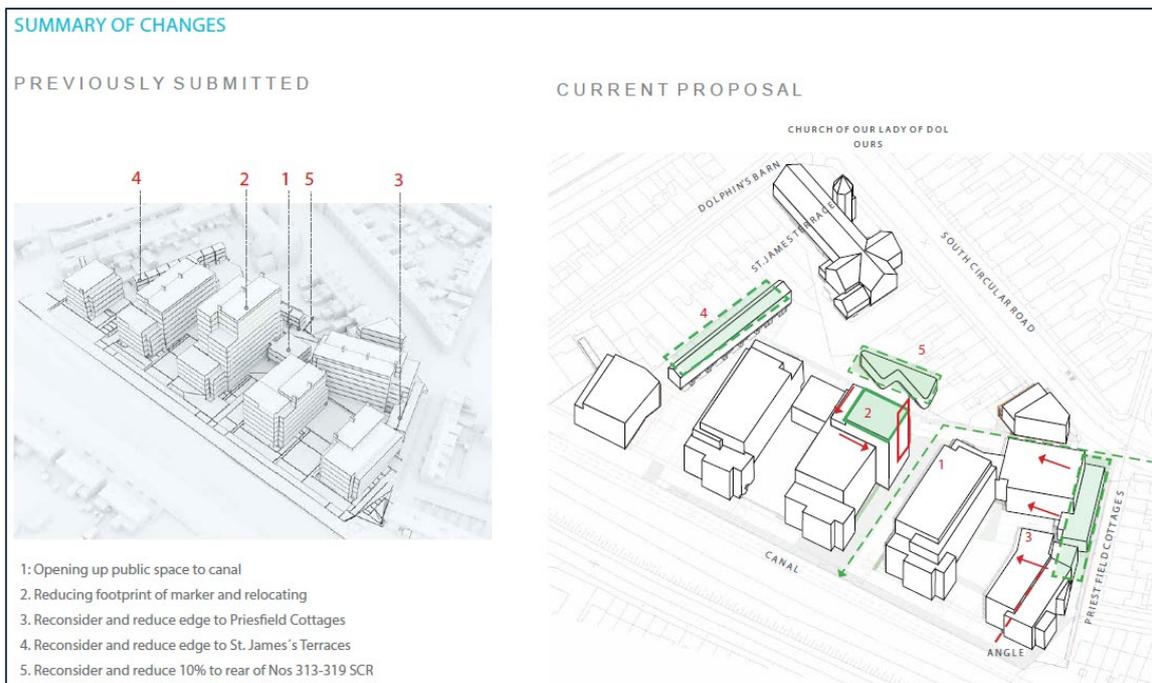


Figure 4.09: Design Option No. 3 to Pre-application Meeting no. 3 – 1st March 2021



As a next step a more comprehensive set of photomontages and landscape and visual impact assessment of the scheme design as well as responses to the daylight/sunlight/shadow impacts of the proposed scheme.

Table 4.03: Design Option 3 Summary of Environmental Considerations

Environmental Factors	Sub-category	Final Design Option
Land	Land Use	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective is facilitates the Grand Canal linear amenity strip While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan. plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.
	Land Take	
Landscape	Amenity	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity and amenity. The open space adjacent to the Grand Canal promotes the natural Heritage. A clearer route through the scheme was provided by the removal of a link block between Block B03 and B04 through the public square, and in providing a clear hierarchy of public and communal open spaces.
	Visual Impact	The height of Blocks B03 and B04 required modulation and modification to sit comfortably in the context. A Landscape and Visual Impact Assessment report was required to address this issue.
	Ecology	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.
Population and Human Health	Sustainable communities	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.
	Residential Amenity	Consideration was required to be given address potential impacts on the adjacent residential amenity in respect of overlooking, privacy and Daylight/Sunlight/Shadow as well as within the scheme design.
	Access for all	A Mobility Management Plan was required to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.
Material Assets	Transport (Roads and Services)	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road being progressed and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.
Material Assets	Transport (Parking)	The exact quantum of car parking was not established at this stage and therefore a detailed assessment was not possible. It is noted, however, that the design would need to be updated to ensure an adequate level of parking was provided. Discussions with DCC Transport Section begun.

4.6.4 Design Option 4 Pre-application Meeting no. 4 – 20th May 2021

The meeting was intended to consider the Landscape and Visual Impact Assessment Report by ARC and the related updated Photomontage Pack issued to Dublin City Council in advance of the meeting.

Figure 4.10: Design Option No. 4 axonometric view to Pre-application Meeting no. 4 – 20th May 2021



The meeting focused on the refinement of massing and height of Blocks B03 (10-storey) and Block B04 (8-storey) elements and the landscape and visual impact on both closer and longer views of the proposed development. It was agreed that a submission of additional and alternative photomontage views be forwarded to Dublin City Council. These were intended to provide greater clarity in relation to the potential visual impacts of the proposals.

4.6.5 Follow up to Pre-application Meeting no. 4

Following Pre-Application Meeting no. 4 a number of additional verified views were prepared to illustrate design progression and showing Block B04 reduced by 1 no. floor from 8-storey to 7-storey and a reduction in height and material change to the external frame to balconies on the east elevation of Block B03. The following amended views were forwarded to Dublin City Council on 25th June 2021;

- View 01: Crumlin Road at Rutland Avenue
- View 03: South Circular Road at Dolphin Avenue
- View 10: Dolphin's Barn Street/Cork Street at The Coombe Hospital
- View 14: Rathdrum Road

The baseline view as existing, the previously presented views to pre-planning meeting no. 4 as well as an amended option were included for each. The accompanying alternate axonometric views were also submitted showing these comparative changes.

4.6.5.1 Landscape and Visual Impact

The refinement of the design of the scheme took account of the potential visual impact within the adjacent established residential context. The spire Our Lady of Dolour's Church is seen to act in counterpoint to the taller element of Block B03.

4.6.5.2 Architectural Heritage

An Architectural Heritage Impact assessment is contained in Chapter 18 : Built Heritage of this EJAR as prepared by W. H. Hastings B. Arch FRIBA, RIBA Grade 1 accredited Conservation Architect and states that The proposed development will have no direct effect on the architectural heritage of protected structures in the surrounding area. The Church of Our Lady of Dolours is the nearest adjacent protected structure to the north east of the White Heather site.

Figure 4.11: Design Option No. 4b axonometric view forwarded post Pre-application Meeting no. 4– 26th June 2021

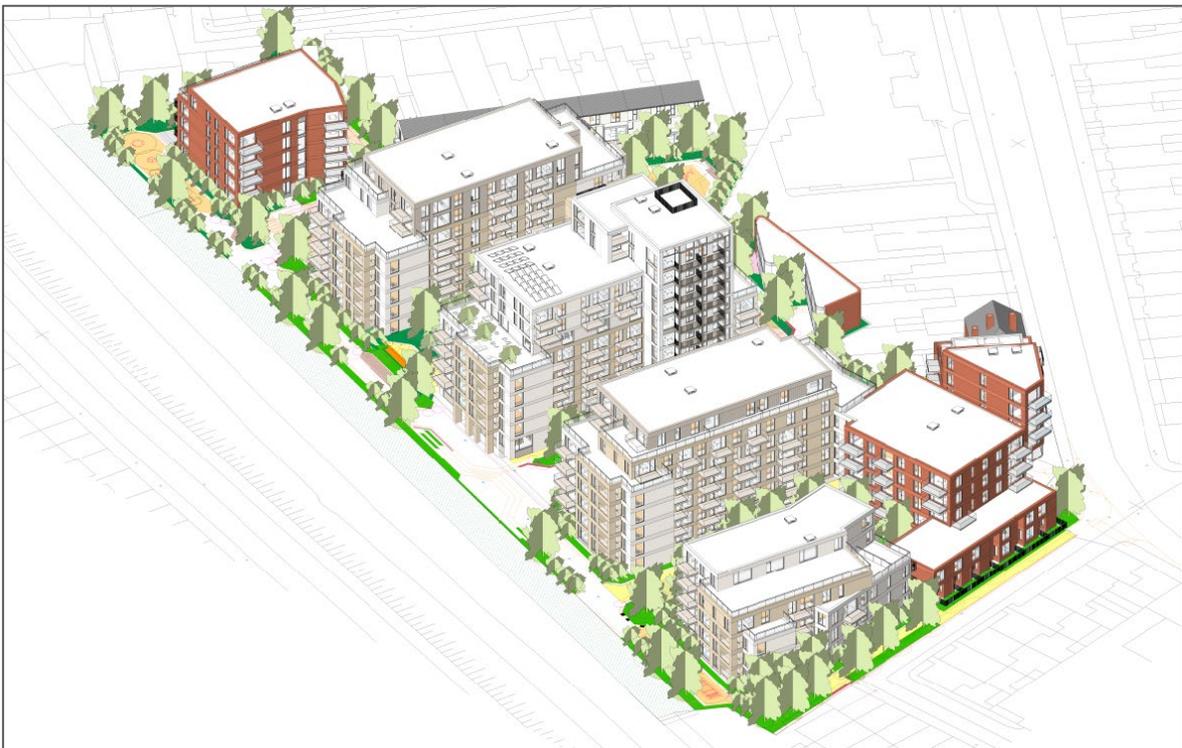


Table 4.03: Design Option 4b Summary of Environmental Considerations

Environmental Factors	Sub-category	Final Design Option
Land	Land Use	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective is facilitates the Grand Canal linear amenity strip
	Land Take	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan. plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.
Landscape	Amenity	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity and amenity. The open space adjacent to the Grand Canal promotes the natural Heritage. A clearer route through the scheme was provided by the removal of a link block between Block B03 and B04 through the public square, and in providing a clear hierarchy of public and communal open spaces.
	Visual Impact	Reductions to the height of Blocks B03 (Steel balcony frame) and B04 by a floor to 7-storeys and the increased setback to Block B02 at northern end at level 05
	Ecology	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.
Population and Human Health	Sustainable communities	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.
	Residential Amenity	Through modulation of massing and stepping down and back at the edges of the proposed design the Daylight/Sunlight/Shadow impacts on adjacent residential properties were reduced to an acceptable degree.
	Access for all	A Mobility Management Plan was prepared in order to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.
Material Assets	Transport (Roads and Services)	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road undertaken and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.
Material Assets	Transport (Parking)	A reduced quantum of car parking has been agreed with DCC transport. To encourage the use of sustainable modes and reduce the need for car ownership, a Mobility Management Plan accompanies this application. The overall aim of the MMP is to minimise the proportion of vehicle trips and address the forecast transport needs of the end-users of the site. This is through reducing the need to travel, particularly by car, and secondly ensuring viable sustainable travel options are available and actively promoted to residents and visitors to the site. These measures help reduce the need to use or indeed own a car. These measures include the on-site car club, personalised travel planning, on site services and sustainable travel incentives amongst others.

4.6.6 Pre-application Tripartite Meeting – 29th November 2021

The design iterations submitted to An Bord Pleanála for the Tripartite Meeting was proposed Design Option No. 4a and included an option 4b showing a reduction in height of the balcony frame height in Block B03 as well as the reduction in height of Block B04 from 8-storeys to 7-storeys and the increased setback to Block B02 at northern end at level 05 as shown in Figure 4.11 above.

The proposed scheme was informed by those changes that related to both visual impact and Daylight/Sunlight/Shadow analysis. The scheme presented was informed by a balance between reduced potential impacts on the Grand Canal to the south and the considerations of potential impacts on the adjoining residential amenity of the established residential amenity.

4.7 Summary of Alternative Designs

The design of the proposed development has undergone a significant number of alternative layout and design iterations in arriving at the Final Design Option which have been informed by the following considerations;

- The creation of a considerate residential neighbourhood which gives regard to the adjoining established residential context;
- The opening up of the Grand Canal linear park to future and existing residents in the neighbourhood through the extension of the public realm;
- The repairing of the edges of the former industrial estate nestled into the surrounding Victorian residential setting and the use of a similar red brick;
- The respectful stepping up away from the surrounding perimeter context;
- The generous public open space provision and communal open space provision as well as play facilities for all age groups;
- The provision of a broad range of residential unit types from one-bedroom to three-bedroom family sized townhouses;
- The high quality and quantum of managed residents amenity provision at ground and fifth floor levels to cater for all future residents;
- The provision of high quality Part V housing provision.

4.7.1 Final Scheme to be submitted to An Bord Pleanála

The final scheme design iteration to be issued to An Bord Pleanála as a Strategic Housing Development includes the following planning and environmental amendments to the scheme as submitted to the Pre-application meeting.

The main changes that were made to the scheme included massing changes to Blocks B02, B03 and B04 to include reduction of height of Block B04 from 8 to 7 storeys, retention of minor 10-storey element with reduction in frame height below roof level and treatment in Block B03 and an increased setback to Block B02 at northern end at level 05.

A reduction of east gable to Block 06, by setting back level 04 to improve transition to and potential impacts on Priestfield Cottages and a reduction of east elevation to Block 07, by setting back level 03 further southward to improve transition to and reduce potential impacts on Priestfield Cottages.

The reconfigured layout of Block 01, handing internal layout so primary fenestration and balconies are no longer west facing or adjacent to existing property/amenity of 13 St James Terrace or 1-3 Grand Canal View.

A realignment and set back to the southern edge of the proposed development (Blocks B01, B02, B03, B04 & B07) ensures that no development encroaches onto the Z9 zoned lands along the Canal edge and provided appropriate access points to facilitate future access and maintenance to the canal-bank.

An improvement of the development mix of units, by the inclusion of additional 3 Bed duplex type 'own door' units onto Priestfield Cottages provides more family sized units within the scheme.

A development of elevation and material strategy for facades and balconies throughout the development and development of massing and screening strategy on boundary conditions to reduce impacts and protect existing properties at St James Terrace (west), 309-319 South Circular Road (north) and Priestfield Cottages (east).

4.7.1.1 Environmental Considerations

The scheme to be submitted to An Bord Pleanála was intended to be refined to mitigate against potential negative impacts on the receiving environment. While the opening up of public access to the Grand Canal Linear Park was a key objective it is contended that this has been done without any detrimental impacts.

4.7.1.2 Landscape and Visual Impacts Considerations

A Landscape and Visual Impact Report considers a series of both close and distant photomontages showing the proposed White Heather SHD placed in photographic views from the following locations;

- Dolphin's Barn at South Circular Road
- South Circular Road at Dolphin Avenue
- Sally's bridge at Donore Avenue
- Sundrive Velodrome
- Crumlin Road
- Dolphin Park
- South Circular Road at Haroldville Avenue
- Reuben Street at Haroldville Avenue
- Dolphin's Barn St / Cork St at the Coombe Hospital
- Greenville Avenue at Wolseley Street
- South Circular Road at the National Stadium
- Emmet Bridge at Harold's Cross
- Rathdrum Road
- Dolphin's Barn Bridge
- Parnell Road at Aughavanagh Road
- South Circular Road at Donore Avenue
- South Circular Road at Rehoboth Place

These views have been assessed in relation to the degree of visual impact and vary between none and moderate as reported in Chapter 11 of this EIAR completed by W. H. Hastings B. Arch FRIAI, RIAI Grade 1 accredited Conservation Architect.

Figure 4.12: Final Design – Ground Floor Plan



Figure 4.13: Final Design – View of Model from North East



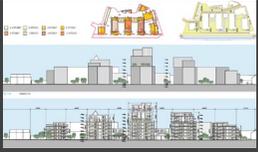
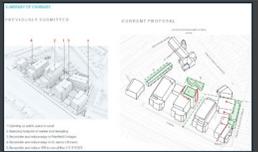
Table 4.04: Final Design Option Summary of Environmental Considerations

Environmental Factors	Sub-category	Final Design Option
Land	Land Use	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective is facilitates the Grand Canal linear amenity strip
	Land Take	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.
Landscape	Amenity	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity and amenity. The open space adjacent to the Grand Canal promotes the natural Heritage. A clearer route through the scheme was provided by the removal of a link block between Block B03 and B04 through the public square, and in providing a clear hierarchy of public and communal open spaces.
	Visual Impact	Reductions to the height of Blocks B03 (Steel balcony frame) and B04 by a floor to 7-storeys and the increased setback to Block B02 at northern end at level 05
	Ecology	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.
Population and Human Health	Sustainable communities	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.
	Residential Amenity	Through modulation of massing and stepping down and back at the edges of the proposed design the Daylight/Sunlight/Shadow impacts on adjacent residential properties were reduced to an acceptable degree.
	Access for all	A Mobility Management Plan was prepared in order to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.
Material Assets	Transport (Roads and Services)	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road undertaken and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.
Material Assets	Transport (Parking)	A reduced quantum of car parking has been discussed with DCC Transport. To encourage the use of sustainable modes and reduce the need for car ownership, a Mobility Management Plan accompanies this application. The overall aim of the MMP is to minimise the proportion of vehicle trips and address the forecast transport needs of the end-users of the site. This is through reducing the need to travel, particularly by car, and secondly ensuring viable sustainable travel options are available and actively promoted to residents and visitors to the site. These measures help reduce the need to use or indeed own a car. These measures include the on-site car club, personalised travel planning, on site services and sustainable travel incentives amongst others.

4.7.2 Conclusion

This chapter has described the reasonable alternative layouts and designs considered and the reasons for choosing the proposed scheme, having regard to the relevant environmental factors. The comparison of alternatives in relation to environmental factors is summarised throughout this Chapter and helped to inform the decision to select the proposed development subject of this Strategic Housing Development planning application.

It is clear from the information provided throughout this chapter that the proposed scheme is the most appropriate form of development for the subject site and represents an improvement in terms of environmental impact when compared to the other design options considered.

Environmental Factors	Sub-category	Design Option 1	Design Option 2	Design Option 3	Design Option 4a	Design Option 4b	Design Option 5 Final
							
Land	Land Use	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective facilitates the Grand Canal linear amenity strip	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective facilitates the Grand Canal linear amenity strip	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective facilitates the Grand Canal linear amenity strip	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective facilitates the Grand Canal linear amenity strip	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective facilitates the Grand Canal linear amenity strip	Residential development is permissible with the Z1 zoning objectives of the Development Plan. The Z9 land use zoning objective facilitates the Grand Canal linear amenity strip
	Land Take	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.	While the site coverage for the proposed development equates to 46.2% of the Z1 lands (c. 1.28 ha) which falls within the indicative site coverage parameters of 45%-60% for Z1 zoned lands as per the Development Plan, plot ratio of c. 4.2 for the development site which is above the plot ratio standard for Z1 zoned lands as per the Development Plan. It is submitted that the proposed development can support this plot ratio due to its strategic location and proximity to public transport.
Landscape	Amenity	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity. The open space adjacent to the Grand Canal promotes linkages to natural Heritage. A clearer route through the scheme was necessary, however, in order to provide a clear hierarchy of the public spaces and to ensure clear access routes to and through the public open space would be provided as well as a more direct link to the Grand Canal Linear Park Amenity strip.	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity. The open space adjacent to the Grand Canal promotes linkage to natural Heritage. A clearer route through the scheme was necessary, however, in order to provide a clear hierarchy of the public spaces and to ensure clear access routes to and through the public open space would be provided as well as a more direct link to the Grand Canal Linear Park Amenity strip.	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity and amenity. The open space adjacent to the Grand Canal promotes the natural Heritage. A clearer route through the scheme was provided by the removal of a link block between Block B03 and B04 through the public square, and in providing a clear hierarchy of public and communal open spaces.	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity and amenity. The open space adjacent to the Grand Canal promotes the natural Heritage. A clearer route through the scheme was provided by the removal of a link block between Block B03 and B04 through the public square, and in providing a clear hierarchy of public and communal open spaces.	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity and amenity. The open space adjacent to the Grand Canal promotes the natural Heritage. A clearer route through the scheme was provided by the removal of a link block between Block B03 and B04 through the public square, and in providing a clear hierarchy of public and communal open spaces.	This design option exceeds the open space requirements set out in the Development Plan and therefore provides a moderate, long term positive impact for future residents in terms of Landscape, Population and Human Health with associated benefits for Biodiversity and amenity. The open space adjacent to the Grand Canal promotes the natural Heritage. A clearer route through the scheme was provided by the removal of a link block between Block B03 and B04 through the public square, and in providing a clear hierarchy of public and communal open spaces.
	Visual Impact	The height of Blocks B02, B03 and B04 required modulation and modification to sit comfortably in the context. A Landscape and Visual Impact Assessment report was required to address this issue.	The height of Blocks B02, B03 and B04 required modulation and modification to sit comfortably in the context. A Landscape and Visual Impact Assessment report was required to address this issue.	The height of Blocks B03 and B04 required modulation and modification to sit comfortably in the context. A Landscape and Visual Impact Assessment report was required to address this issue.	The height of Blocks B03 and B04 required modulation and modification to sit comfortably in the context. A Landscape and Visual Impact Assessment report was prepared to address this issue.	Reductions to the height of Blocks B03 (Steel balcony frame) and B04 by a floor to 7-storeys and the increased setback to Block B02 at northern end at level 05	Reductions to the height of Blocks B03 (Steel balcony frame) and B04 by a floor to 7-storeys and the increased setback to Block B02 at northern end at level 05

Landscape	Ecology	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.	This design option exceeds the open space requirement set out in the Development Plan and allows for retention of trees where possible with new trees proposed with associated benefits for ecology.
Population and Human Health	Sustainable Communities	The provision of a high density development of 262 no. dwellings per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.	The provision of a high density development of 262 no. units per hectare is consistent with national, regional and local planning policy that seek sustainable urban densities throughout the city, and the development of under-utilised sites particularly in public transport corridors. The proposed scheme will place more people in close proximity to existing services including employment, preventing further pressure on urban sprawl and providing for shorter commuting distances compared to outer suburban sites. This option contributes to achieving compact urban growth through continued consolidation of the existing built up footprint of the City.
	Residential Amenity	Consideration was required to be given address potential impacts on the adjacent residential amenity in respect of overlooking, privacy and Daylight/Sunlight/Shadow as well as within the scheme design.	Consideration was required to be given address potential impacts on the adjacent residential amenity in respect of overlooking, privacy and Daylight/Sunlight/Shadow as well as within the scheme design.	Consideration was required to be given address potential impacts on the adjacent residential amenity in respect of overlooking, privacy and Daylight/Sunlight/Shadow as well as within the scheme design.	Consideration was required to be given address potential impacts on the adjacent residential amenity in respect of overlooking, privacy and Daylight/Sunlight/Shadow as well as within the scheme design.	Through modulation of massing and stepping down and back at the edges of the proposed design the Daylight/Sunlight/Shadow impacts on adjacent residential properties were reduced to an acceptable degree.	Through modulation of massing and stepping down and back at the edges of the proposed design the Daylight/Sunlight/Shadow impacts on adjacent residential properties were reduced to an acceptable degree.
	Access for All	A Mobility Management Plan was required to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.	A Mobility Management Plan was required to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.	A Mobility Management Plan was required to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.	A Mobility Management Plan was prepared in order to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.	A Mobility Management Plan was prepared in order to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.	A Mobility Management Plan was prepared in order to ensure permeability throughout for pedestrians / cyclist's links to bus / LUAS etc. Adequate covered and protected cycle spaces provided.
Material Assets	Transport (Roads and Services)	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road required and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road required and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road being progressed and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road undertaken and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road undertaken and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.	The proposed high density residential development would support the integration of land use planning and transport planning, contributing to the efficient use and investment in public transport infrastructure. Assessment of junction capacity at South Circular Road undertaken and will integrate with BusConnects. The access road from St James's Terrace provides pedestrian and cycle access only.
	Transport (Parking)	The exact quantum of car parking was not established at this stage and therefore a detailed assessment was not possible. It is noted, however, that the design would need to be updated to ensure an adequate level of parking was provided.	The exact quantum of car parking was not established at this stage and therefore a detailed assessment was not possible. It is noted, however, that the design would need to be updated to ensure an adequate level of parking was provided.	The exact quantum of car parking was not established at this stage and therefore a detailed assessment was not possible. It is noted, however, that the design would need to be updated to ensure an adequate level of parking was provided. Discussions with DCC Transport Section begun.	Discussions with DCC Transport Section ongoing to seek to reduce car parking provision and demand through measures identified in the Mobility Management Plan include identification of viable sustainable travel options to be available and actively promoted to residents and visitors to the site. These measures will help reduce the need to use or indeed own a car. These measures include the on-site car club, personalised travel planning, on site services and sustainable travel incentives amongst others.	A reduced quantum of car parking has been discussed with DCC transport. To encourage the use of sustainable modes and reduce the need for car ownership, a Mobility Management Plan accompanies this application. The overall aim of the MMP is to minimise the proportion of vehicle trips and address the forecast transport needs of the end-users of the site. This is through reducing the need to travel, particularly by car, and secondly ensuring viable sustainable travel options are available and actively promoted to residents and visitors to the site. These measures help reduce the need to use or indeed own a car. These measures include the on-site car club, personalised travel planning, on site services and sustainable travel incentives amongst others.	A reduced quantum of car parking has been discussed with DCC transport. To encourage the use of sustainable modes and reduce the need for car ownership, a Mobility Management Plan accompanies this application. The overall aim of the MMP is to minimise the proportion of vehicle trips and address the forecast transport needs of the end-users of the site. This is through reducing the need to travel, particularly by car, and secondly ensuring viable sustainable travel options are available and actively promoted to residents and visitors to the site. These measures help reduce the need to use or indeed own a car. These measures include the on-site car club, personalised travel planning, on site services and sustainable travel incentives amongst others.



Chapter 5. Population and Human Health

5.0 Population and Human Health

5.1 Introduction

This Section provides an assessment of the potential significant impacts that the proposed development at White Heather Industrial Estate may have on the human environment in the vicinity of the subject site in terms of land use, demographics, employment activity, social and community infrastructure, and Human Health.

This Chapter was prepared by Brian Maher, Heather McMeel and Noel Cronin of Avison Young, Town Planning Consultants. Brian Maher, Associate Director, holds accreditations in architectural technology and town planning. Brian specialises in town planning, urban design, masterplanning, regeneration, design intervention studies and heritage evaluation, and has over 30 years of experience of working in the planning, architectural and urban design sectors. Heather McMeel, Senior Planner, holds a B.A in Political Science and Geography from Trinity College Dublin and an MSc in Real Estate and Planning from Heriot Watt University. Heather is a member of the Royal Town Planning Institute and has over 5 years' experience in planning and development. Noel Cronin, Planner, holds a Bachelor of Social Science from University College Cork, as well as a Masters in Planning and Sustainable Development from University College Cork. Noel has 4 years postgraduate experience in planning and development.

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIA and has replaced 'Human Beings' with 'Population and Human Health'. This is described in further detail below.

5.2 Consultation

4 no. pre-application meetings took place with Dublin City Council and 1 no. pre-application consultation meeting took place with An Board Pleanála prior to preparing this EIA. These meetings informed the design of the proposed scheme and the scope of the environmental impact assessment.

5.3 Methodology

The methodology for the 'Population and Human Health' Chapter of the EIA involves the compilation, examination and analysis of relevant baseline population and socio-economic data with reference to the most appropriate guidance documents, outlined below. The assessment will examine the impact of the proposed development on Population and Human Health from national, regional and local levels. Additionally, it will be noted where ameliorative/mitigation measures are required to minimise impacts.

The guidance documents considered and consulted in the preparation of this Chapter include the following:

- ‘Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment’, Department of Housing, Planning and Local Government 2018;
- ‘Guidance on the Preparation of the Environmental Impact Assessment Report’, European Commission 2017; and
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA 2017.

Two types of socio-economic impacts can typically arise; **direct** and **indirect** impacts. Direct impacts typically occur at a local level, through changes in the immediate environment that arise as a result of the physical works during construction phase. This level of assessment will be undertaken through the identification of a catchment/study area. The criteria for identifying this catchment area will include, *inter alia*: impacts on residential amenity; construction related impacts; and traffic related impacts. Indirect impacts typically arise outside the immediate area where the physical works take place. They generally relate to changes in population and economic patterns that will arise as a result of the proposed development.

Population and Human Health will also be considered in the context of the environmental factors required under the EIA Directive through which impacts on population and Human Health may occur. Environmental hazards including, but not limited to, water contamination, air pollution, noise, accidents and disasters will be considered having regard to the relevant environmental factors addressed separately in this EIAR such as *inter alia*: air, water, soil, noise and traffic. The effects of these environmental factors on Population and Human Health will be assessed with reference to accepted international standards of safety in dose, exposure or risk, and/or source/pathway/receptor. Where other health and safety requirements are addressed in accordance with separate regulatory requirements, the results of such assessments will be referred to in the EIAR.

It is noted in the Department of Housing, Planning, Community and Local Government Key Issues Paper on the Transposition of the 2014 EIA Directive in relation to Population and Human Health that:

“It is intended that the consideration of the effects on populations and on Human Health should focus on health issues and environmental hazards arising from the other environmental factors, for example water contamination, air pollution, noise,

accidents, disasters, and not requiring a wider consideration of Human Health effects which do not relate to the factors identified in the Directive.”¹

And that:

“It is not considered this should be understood as requiring consideration of social and/or economic impacts.”²

5.3.1 Describing the Effects

The impact assessment of this Chapter follows the guidance set out in the EPA's Draft EIAR Guidelines (2017) in relation to describing accurately the full range of likely significant effects, as outlined in further detail in Chapter 2. The following publications and data sources were consulted in the preparation of this Chapter:

- National Planning Framework, Project Ireland 2040;
- Eastern & Midland Regional Assembly, Regional Spatial & Economic Strategy 2019-2031;
- An Bord Pleanála, Online Planning Portal
- Dublin City Development Plan 2016-2022;
- Dublin City Council, Online Planning Portal
- Census 2016, Central Statistics Office;
- Google Earth imagery;

The methodology for describing the effects to the proposed development is in accordance with the Draft EPA Guidelines (2017) and is outlined in Figure 5.1, Figure 5.2 and Figure 5.3 below.

¹ Department of Housing, Planning, Community and Local Government Key Issues Paper on the Transposition of the 2014 EIA Directive, pg 12

² Department of Housing, Planning, Community and Local Government Key Issues Paper on the Transposition of the 2014 EIA Directive, pg 12

Figure 5.1: Description of Effects

<p>Quality of Effects</p> <p>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral</p>	<p>Positive Effects</p> <p>A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).</p>
	<p>Neutral Effects</p> <p>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.</p>
	<p>Negative/adverse Effects</p> <p>A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).</p>
<p>Describing the Significance of Effects</p> <p>“Significance’ is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see <i>Determining Significance</i> below.).</p>	<p>Imperceptible</p> <p>An effect capable of measurement but without significant consequences.</p>
	<p>Not significant</p> <p>An effect which causes noticeable² changes in the character of the environment but without significant consequences.</p>
	<p>Slight Effects</p> <p>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p>
	<p>Moderate Effects</p> <p>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.</p>
	<p>Significant Effects</p> <p>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
	<p>Very Significant</p> <p>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.</p>
	<p>Profound Effects</p> <p>An effect which obliterates sensitive characteristics</p>
	<p>Extent</p> <p>Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.</p>
<p>Context</p> <p>Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)</p>	
<p>Describing the Extent and Context of Effects</p> <p>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.</p>	

Source: (EPA Draft Guidelines 2017)

Figure 5.2: Probability and Duration

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

Source: (EPA Draft Guidelines 2017)

Figure 5.3: Type of Effects

Describing the Types of Effects	<p>Indirect Effects (a.k.a. Secondary Effects) Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.</p>
	<p>Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.</p>
	<p>‘Do-Nothing Effects’ The environment as it would be in the future should the subject project not be carried out.</p>
	<p>‘Worst case’ Effects The effects arising from a project in the case where mitigation measures substantially fail.</p>
	<p>Indeterminable Effects When the full consequences of a change in the environment cannot be described.</p>
	<p>Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.</p>
	<p>Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.</p>
	<p>Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).</p>

Source: (EPA Draft Guidelines 2017)

5.4 Receiving Environment (Baseline)

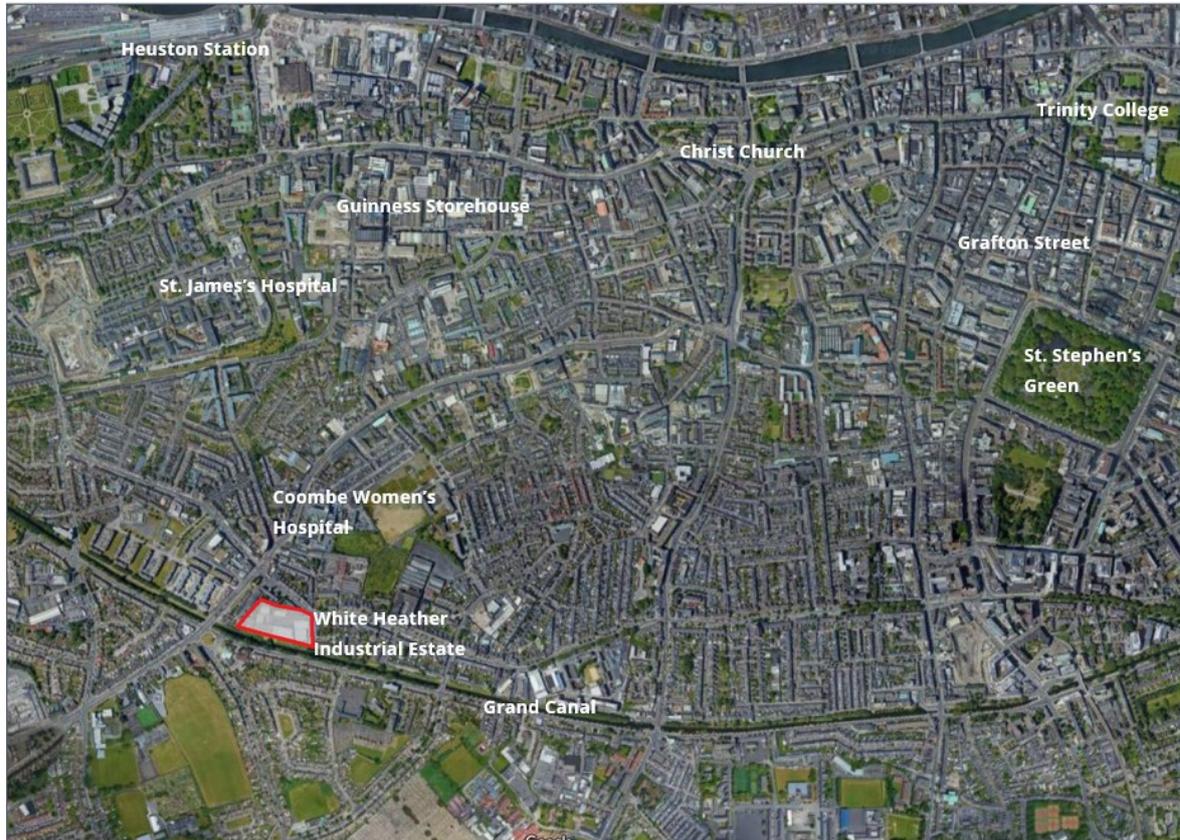
5.4.1 Site Location

The subject site is situated on the South Circular Road, Dublin 8 and is located within the Dolphin’s Barn area of the city. The locality is an established inner-city residential suburb with the site situated a distance of approximately 2.5 km south west of the city centre (see Figure 5.4 below).

While the immediate surrounding land uses are generally residential, the wider vicinity provides local retail, commercial, medical, community and recreational uses. The locality is well served by sustainable modes of transport with frequent bus and Luas connections to the City Centre. Dublin Bus stops are situated immediately adjacent to the site on South Circular Road and on Dolphin’s Barn Street with Fatima Luas stop approximately 800 metres to the north and Rialto Luas stop approximately 1km to the north west.

The site is approximately 2.3km from St. Stephen's Green, 0.5km from Coombe Women's Hospital, 1.6km to St. James's Hospital, 1.9km to Heuston Station, 800m to Fatima Luas Stop and 2.2km to Christ Church Cathedral.

Figure 5.4: Site Location



5.4.2 White Heather Catchment

A catchment area comprising a c. 1km radius extending outwards from the development site was used for the purpose of analysing the demographic profile of the catchment surrounding White Heather. The 1km radius was considered a reasonable distance to travel on foot (c. 10-15 minutes) and therefore any services therein could reasonably be considered local. This approach is consistent with the 2018 Apartment Guidelines which outlines 'Central and/or Accessible Urban Locations' as being suitable for higher density apartment development, which include:

*"Sites within walking distance (i.e. up to 15 minutes or 1,000- 1,500m), of principal city centres, or significant employment locations, that may include hospitals and third-level institutions"*³ **(emphasis added).**

³ Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, pg 5 (Department of Housing, Planning and Local Government, 2018)

This catchment is therefore considered to be of an appropriate scale and provides the 'local' geographic context for which analysis throughout this Chapter is based. The local catchment is compared and contrasted with the Regional (Dublin) and National context where relevant.

The catchment area has been derived from establishing the Small Areas population statistics located within an approximate 1km radius of the subject site. Figure 5.5 below provides a visual representation of the catchment area and Figure 5.6 shows the selected Small Areas therein. All Small Areas that are either within or partly within the identified catchment have been included in the catchment area.

Figure 5.5: 1 Km Catchment Area for Subject Site. Base image source: Google Maps.

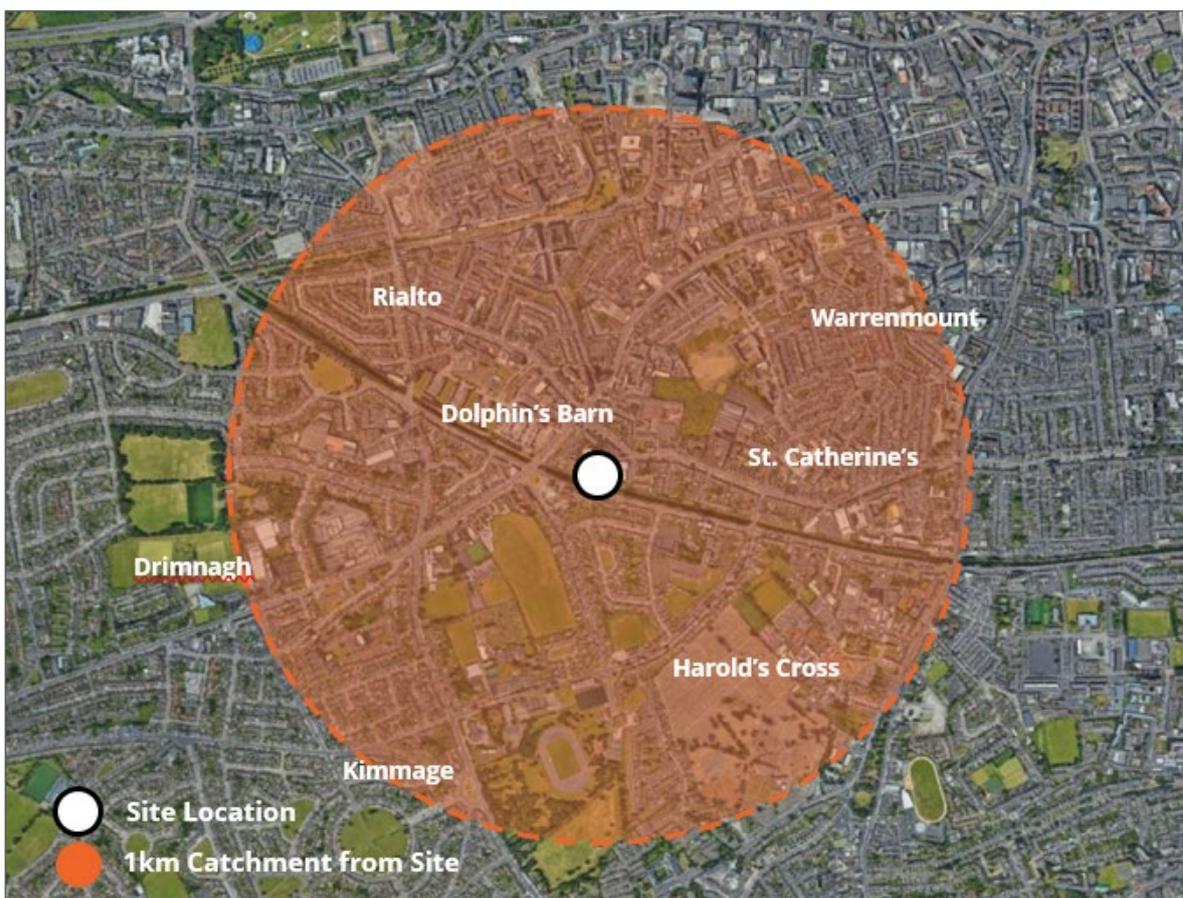
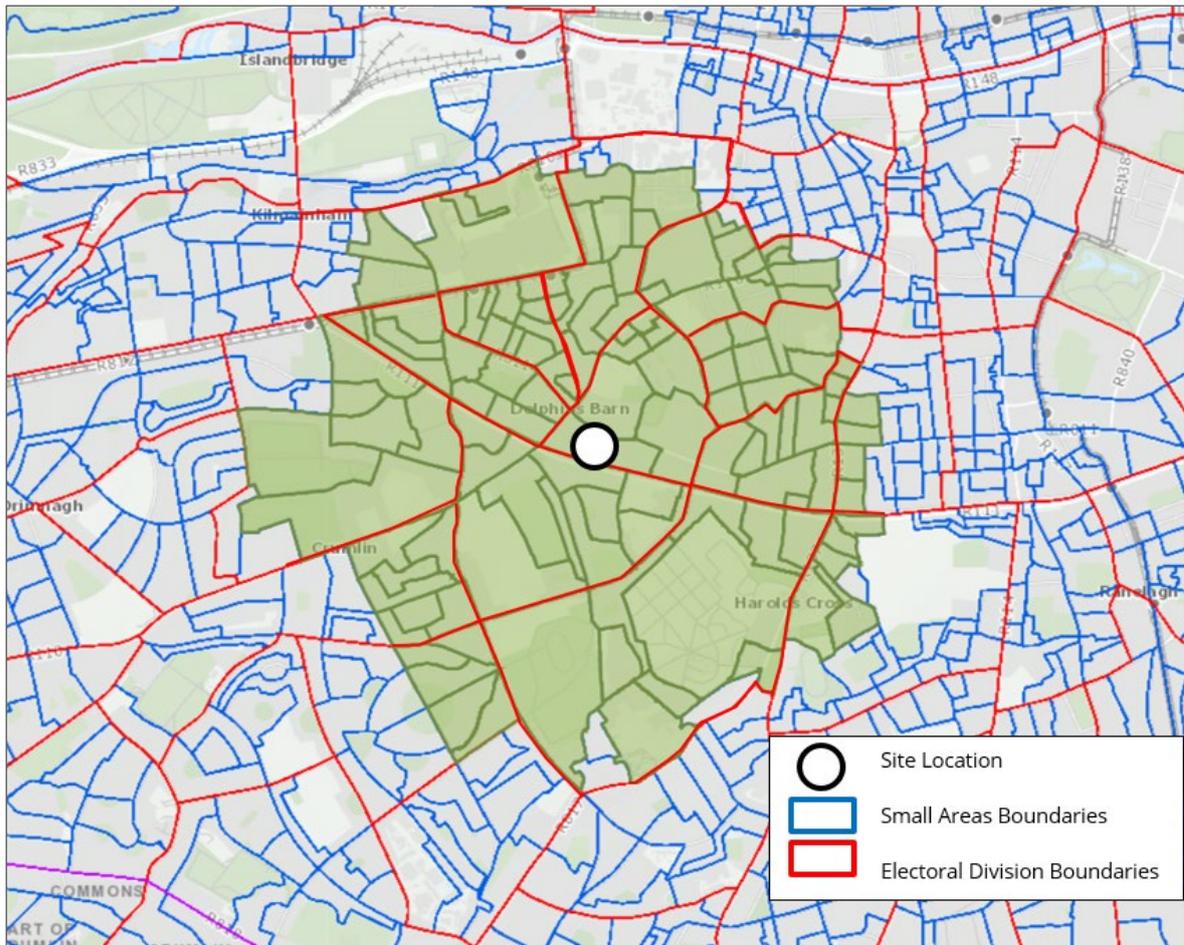


Figure 5.6: Small Areas and Electoral Divisions within the 1 Km Catchment Area. Source: CSO Ireland.



In this regard, approximately 29,049 people were living within the catchment area (c. 1km) of the subject site at the time of the 2016 Census. This figure represents the total population of each of the individual Small Areas identified in the catchment area.

5.4.3 Land Use

5.4.3.1 Land Use Zoning

The zoning of the application site was subject to a variation (No. 23) to the Development Plan in March 2020 that amended the zoning from Z6 (Employment/Enterprise) to Z1 (Sustainable Residential Neighbourhoods). The purpose of the variation was to enable the more efficient use of these urban lands to reflect the wider residential nature of the area (see Variation Zoning Map at Figure 5.7).

Figure 5.7: Land Use Zoning Map Extract



Z1 zoned lands have the following land use objective: *"To protect, provide and improve residential amenities"*⁴. While the vision for Z1 zoned land is as follows:

*"The vision for residential development in the city is one where a wide range of accommodation is available within sustainable communities where residents are within easy reach of services, open space and facilities such as shops, education, leisure, community facilities and amenities, on foot and by public transport and where adequate public transport provides good access to employment, the city centre and the key district centres"*⁴.

Permissible Uses within the Z1 Zoning Objective include residential, childcare facility and shop (local) and as such, the proposed development accords within the Z1 zoning as contained within the Development Plan.

⁴ Dublin City Development Plan, 2016-2022, pg 238

5.4.3.2 Housing

It is noted that the Economic and Social Research Institute (ESRI) projects that the population of Ireland will increase by around one million people or by 20% over 2016 levels, to almost 5.7 million people by 2040 while 660,000 new jobs are also projected. The population aged over 65 will more than double to 1.3 million, or to 23% of the total by 2040. The National Planning Framework (NPF) projects a need for a minimum of 550,000 new homes by 2040 at least half of which are targeted for provision within the built up area of Ireland's five cities.

The NPF outlines that apartments made up c. 12% of all occupied households in Ireland and 35% of occupied households in the Dublin City Council area in 2016 (Census data). It is noted however, that this is a long way behind European averages in terms of the numbers and proportion of households living in apartments, especially in our cities and larger towns. It is noted that in many European countries, it is normal to see 40%-60% of households living in apartments.

The NPF states that between 2018 and 2040, an average annual output of at least 25,000 new homes will be needed with increased housing output required into the 2020s to deal with a deficit that has built up since 2010. Annual housing output will need to increase to 30,000 to 35,000 homes per annum in the years to 2027 to meet projected population and economic growth.⁵ It is also noted that the national average household size of 2.75 is expected to decline to 2.5 people per household by 2040 while household sizes in urban areas tend to be smaller.⁶

The Central Statistics Office (CSO) New Dwelling Completions Report states that there were 21,241 no. new dwellings completed in 2019, up 18.3% from 17,952 in 2018. The number of apartments completed in 2019 has risen from 2,283 in 2018 to 3,644, an increase of 59.6%. It is noted that the new dwelling completions for 2019 remains below the average output required in the NPF of 25,000 units annually.

⁵ Project Ireland 2040 | National Planning Framework, pg 94.

⁶ Project Ireland 2040 | National Planning Framework, pg 95.

5.4.4 Demographic Profile

5.4.4.1 Age Profile

The majority of the catchment area population were within the 20-64 age cohort which comprised 69% of the total population. This figure was a 10% increase on the national average and a c.6% increase on the figure for County Dublin. The population aged 65 years and over accounted for c.12% which is similar to the national figure (c.13%).

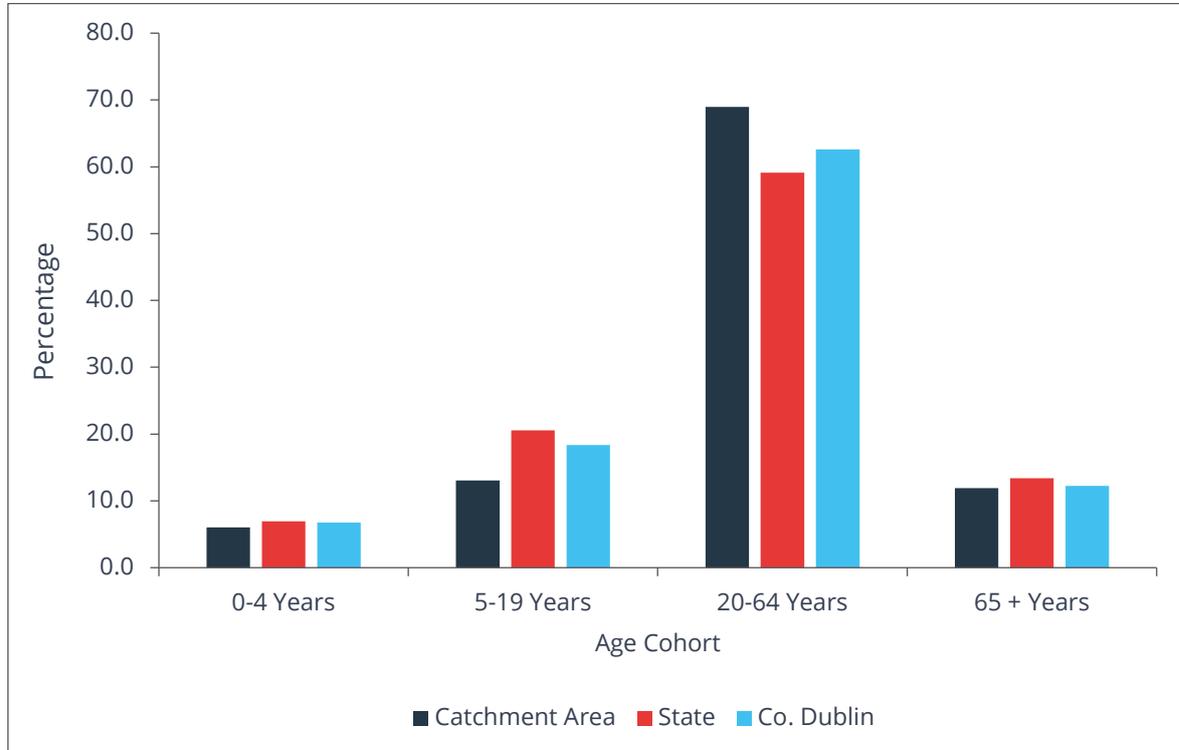
Age Cohort	Catchment Area Population (%)	State Population (%)	Co. Dublin Population (%)
0-4 Years	6%	7%	6.8%
5-9 Years	4.6%	7.5%	6.7%
10-14 Years	3.8%	6.7%	5.8%
15-19 Years	4.7%	6.4%	5.8%
20-24 Years	9.3%	5.7%	6.8%
25-29 Years	11.7%	6.2%	8.3%
30-34 Years	11.6%	7.6%	9.2%
35-39 Years	9.6%	8.2%	8.9%
40-44 Years	7.1%	7.5%	7.4%
45-49 Years	6%	6.8%	6.4%
50-54 Years	5.1%	6.3%	5.8%
55-59 Years	4.7%	5.7%	5.2%
60-64 Years	4%	5%	4.5%
65-69 Years	3.5%	4.4%	3.9%
70-74 Years	2.7%	3.4%	3%
75-79 Years	2.3%	2.4%	2.3%
80-84 Years	1.9%	1.7%	1.6%
85 + Years	1.6%	1.4%	1.4%

Table 5.1: Age Cohort Population (%) and Comparison with the State and Co. Dublin (2016). Source: CSO Ireland.

The percentage of the catchment area population aged 0-4 years (6%) was again similar to the State, however there was an 8% difference between the catchment area (c.13%) and the State (c.21%) in terms of the 5-19 age range. The portion of the population within the catchment area who were in their 20s and 30s was c.9% above the national average. It is therefore submitted that the catchment was characterised by a low-level of younger

people when compared with the State. A comparative breakdown of age cohorts for the catchment area, State and County Dublin populations (as at 2016) are provided in Table 5.1 and Figure 5.8 below and overleaf.

Figure 5.8: Age Cohort Population (%) and Comparison with the State and Co. Dublin (2016). Source: CSO Ireland.



5.4.5 Social and Community Infrastructure

A Community and Social Infrastructure Audit has also been prepared by Avison Young and is submitted with this planning application package. Overall, the subject site is well served by social and community infrastructure including schools, medical facilities, childcare facilities, employment centres, third level education as well as shops, bars and restaurants. Table 5.2 below outlines the existing community infrastructure serving the existing residents of this area and the future residents of the proposed residential development.

Table 5.2: Existing Social and Community Infrastructure in the Catchment Area.

Category	Existing Infrastructure
Retail Services	<p><u>Supermarkets:</u> Tesco Express; Lidl; Dunnes Stores.</p> <p><u>General Retail/Take-away:</u> Centra; Spar; Londis; Subway; Camile Thai; New Curry And Grill; Bulgarian Food Store; Pen Tower Chinese & Thai Take-Away; Ginos Take Away; Bimdoc African Food Store; Danube Shop; Original Ex-Yu Food; To Tu; Forte Takeaway Foods; Marlowe & Co; Happy News & Booze; St.James Hospital Stores; Park Shopping Mall; B-Q; Applegreen Service Station; Maxol Filling Station.</p> <p><u>Public Houses/Cafes:</u> Lam Inn; Lowes Pub; The Barn House Pub; Cafe du Jour; Morrissey's Pub; Phoenix Café; Sunflower Café; Crumlin College Café; Amber Grill; The Other Hand;</p>

	Daddy's Café; Coke Lane Pizza; Rose Garden; The Bird Flanagan.
Creche / Childcare	Loreto Preschool Crumlin; Kiddies Korner; Creative Kids and Co; Stepping Stones; Pearse College Community Nursery; Marist Creche; Sherpa Kids Griffith Barracks Multi Denominational School; Dolphin House Homework Club; Children's Centre/Rialto Community Drug Team; SICCDA Afterschool-Warrenmount PPS; Child's Play; Tir na nOg Early Childhood Development Service; St Joseph's ECDS; Mery Family Centre LTD; Fatima Homework Club; Le Cheile Sophia Nurturing Centre Cork Street; Whitefriars Preschool and Afterschool.
Education	Presentation Secondary School; St Catherine's National School; Scoil Treasa Naofa; Leinster School of Music and Drama; Griffith College; Marist National School; Pearse College of Further Education; St. Kevin's College; Mater Dei National School; Loreto College Crumlin; St. James' Primary School; Christian Brothers Secondary School; Canal Way Educate Together National School; Liffey College; Crumlin College of Further Education; Scoil Iosagain.
Healthcare / Social Services	Coombe Women's Hospital; Brú Chaoimhín; Our Lady's Hospice; Bellvilla Community Unit for Older Persons; St. James's Hospital; Eldon Family Practice; South Circular Road GP Clinic; Kilmainham Medical Centre; Thomas Court Medical Centre; Sundrive Medical Centre; St. Glady's Nursing Home.
Community	Our Lady of Dolour's Church; Rialto Parish Roman Catholic Church; St. Teresa's Church; Dublin Mosque; Donore Youth and Community Centre; ICRM Redeemer Church Dublin; Liberty Church; Luke's Church; Mount Argus Church; St. Bernadette's Church; Crumlin Community Development Project; Fr. Lar Redmond Community Centre; The Universal Church; Dolphin House Community Centre; South Circular Road Scout Centre.
Cultural	Guinness Storehouse St. James' Gate; Teeling Whiskey Distillery.
Open Space / Recreation	The National Stadium (Boxing); St Teresa's Park; Oscar Square; Argus Park; Mount Jerome; Sundrive Velodrome; Eamonn Ceannt Park & Playground; Lourdes Celtic F.C.; Clogher Road Sports Centre; Brickfield Park; Liberty Saints Rugby Club; Herberton Leisure; Fatima Boxing Club; Flanagan's Fields Community Garden; St. Catherine's Community & Sports Centres; Templeogue Synge St GAA Grounds; Kevin's GAA Club; St John Bosco FC; St James Gaels; Grand Canal.

The local community infrastructure surrounding the subject site can be summarised in the following points:

- The subject site is located proximate to numerous high frequency public transport links including Dublin Bus and Luas.
- The site is well served by primary and secondary schools in the catchment area. There are a number of childcare facilities located in the immediate catchment site providing a range of childcare services, while a proposed childcare facility is included in the subject application.
- There are a number of sports clubs and recreational amenities in the surrounding area including the Grand Canal.
- There is a range of shops, bars, restaurants and other local services located nearby in Dolphin's Barn and within walking distance of the subject site.

5.4.6 Human Health

The World Health Organisation (WHO) defines health as “*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*”.⁷

⁷ Preamble to the Constitution of WHO as adopted by the International Health Conference, New York, 19 June - 22 July 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of WHO, no. 2, p. 100) and entered into force on 7 April 1948.

The Health Ireland Framework, 2013-2035 provides further description of health as:

“everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing”

5.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour’s Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James’s Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children’s play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James’s Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

The full detail of the nature and extent of the proposed development is set out in Chapter 2 of this EIA.

5.6 Potential Impact of the Proposed Development

This section describes the likely direct and indirect impacts that the proposed development may have during the construction and operation stages in the absence of mitigation.

In accordance with the Guidance documents issued by the EPA and the Department of Housing, Planning and Local Government, the assessment of the potential impacts on Population and Human Health focuses on health issues and environmental hazards as they relate to the other prescribed environmental factors, and does not include a wider consideration of Human Health effects that do not relate to the factors outlined in the EIA Directive.

The potential impacts at construction and operation stages are considered under the following headings:

- Land Use;
- Demographics;
- Employment;
- Social and Community Infrastructure; and
- Human Health

5.6.1 Construction Phase

5.6.1.1 Land Use

The construction stage of the proposed development has the potential to impact adversely and result in a temporary negative visual impact on the local environment. The landscape and visual impacts that arise as a result of the proposed development are assessed in greater detail in Chapter 16 Landscape and Visual Impact Assessment.

5.6.1.2 Demographics

The construction stage of the proposed development may result in a marginally increased population in the wider area due to increased construction employment as a result of the proposed development. This impact, however, is likely to be temporary and imperceptible.

5.6.1.3 Employment

The construction stage of the proposed development will have a temporary positive impact in relation to generating economic activity and employment on a local and regional scale. It is estimated that between c. 300-400 no. construction personnel will be directly employed

on site during the construction stage at peak production with an average workforce of c. 100-200. The construction phase is expected to last c. 36 months.

In addition to the direct employment, there will also be significant indirect economic activity generated during construction stage of the proposed development associated with the supply of materials, the provision of services and the increased demand for local goods and services. The increased demand for local goods and services will result in increased revenue generated by local retailers with associated economic benefits.

The impact of the construction stage will extend county wide in relation to the supply of labour, goods and services and the effects will be temporary, positive, and moderate on a local and regional scale.

5.6.1.4 Social and Community Infrastructure

The construction stage of the proposed development is unlikely to have any impact on the availability of the local amenities outlined in Section 5.4.5. Furthermore, it is noted that some of these facilities will likely be strengthened as a result of the increased visiting population during construction with associated benefits in terms of improved viability. It is submitted, therefore, that the effects on the social and community infrastructure in the local catchment during construction stage are considered to be temporary and neutral or slightly positive.

5.6.1.5 Human Health

Air Quality

As outlined in further detail in Chapter 12 Air Quality and Climate, there is a potential impact on surrounding settlements as a result of nuisance dust as a during the construction stage of the proposed development. This has a potential impact on population and Human Health. Emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on Human Health.

Noise

As outlined in Chapter 13 Noise and Vibration, a variety of items of plant will be in use for the purposes of demolition, site clearance and construction. There will be vehicular movements to and from the site that will make use of existing roads. Due to the nature of these activities, there is potential for generation of high levels of noise during the construction stage of the proposed development.

Having regard to the above, the construction stage will result in a potential impact to the surrounding area as a result of noise, dust and construction traffic. This impact is likely to be

negative, temporary, significant and localised, in the absence of mitigation measures.

5.6.2 Operational Phase

5.6.2.1 Land Use

The operational stage of the proposed development will see the introduction of a residential land use, with ancillary commercial use, to the subject site and the provision of 335 no. much needed residential units for the growing population of the local catchment and Dublin in general. The proposed development will create new links within the site and through the site, increasing permeability with the wider area.

Development of the subject site for residential use is consistent with the land use zoning objectives of the Development Plan and is in accordance with the objectives of the NPF that seek to achieve compact growth within the built up footprint of urban areas, including higher densities along public transport corridors.

The provision of 335 no. apartments will positively contribute to achieving the required housing output targets of at least 25,000 annually as stated in the NPF. The proposed development also includes 34 no. social units to be transferred to Dublin City Council in accordance with Part V of the Planning and Development Act 2000 (as amended).

Having regard to the above, it is submitted that the proposed development will have a permanent, significant, and positive effect that will contribute to achieving local, regional and national land use planning and housing objectives.

5.6.2.2 Demographics

The changing demographic profile arising from the operational stage of the proposed development is likely to facilitate a balanced age profile within the local area which is currently characterised by a population consisting mainly of working age individuals. The proposed development will have a slight positive effect in terms of changing profile that will be long term in duration and moderate in significance.

The proposed residential units will contribute to the overall supply and types of accommodation available to the population of the local catchment and also to the wider Dublin region. It is submitted that the proposed development comprises residential units that are suitable to young families, therefore having a long term, significant positive impact in terms of the supply of suitable housing for the local demographic.

5.6.2.3 Employment

A moderate level of employment will be generated during the operational phase of the proposed development through the café, childcare facility/creche, the facilities management and the ongoing maintenance of the proposed scheme. The potential impact in terms of employment is considered to be moderate, positive and long term.

The increased population as a result of the proposed development will also lead to an increased demand for goods and services in the local area, supporting local jobs and increased revenue for local businesses. The potential impacts in terms of economic activity are considered to be moderate, positive and long term.

5.6.2.4 Social and Community Infrastructure

As mentioned previously, the proposed development is unlikely to have any impact on the availability of the local amenities outlined in Section 5.4.5. Furthermore, it is noted that some of these facilities will likely be strengthened as a result of the increased permanent population during operation stage of the proposed development with associated benefits in terms of improved viability. It is submitted, therefore, that the potential effects on the social and community infrastructure in the local catchment during operation stage are considered to be long term, slight and positive.

5.6.2.5 Human Health

Air Quality

As outlined in Chapter 12, traffic related air emissions will have the potential to impact on Human Health if not compliant with the requisite standards. While there is no potential for significant impacts, the potential impact on Human Health during the operational phase is expected to be neutral, local, long-term and imperceptible.

Noise

In terms of the operational phase impacts, Chapter 13 outlines that the proposed development will have the potential to impact Human Health by way of building services plant noise and additional traffic, however, the potential impacts will be negative, imperceptible and permanent.

5.6.3 'Do Nothing' Scenario

This section considers the potential impacts arising on the receiving environment should the proposed development not take place.

In a 'Do Nothing' scenario, the subject lands would not be developed and the existing buildings on the subject site would be unused. The status of the environmental receptors

described throughout this EIAR would be likely to remain unchanged while the potential for any likely significant adverse environmental impacts arising from the proposed development would not occur.

Similarly, if the proposed development were not to take place, the potential for any significant positive impacts from the construction and operation of the proposed development would also not arise.

A 'do nothing' scenario on zoned Z1 Sustainable Residential Neighbourhoods would result in a prime residential site remaining undeveloped which would not be consistent National, Regional and Local Planning Policy.

5.7 Mitigation Measures

5.7.1 Construction Phase

5.7.1.1 Land Use

OCSC have prepared an Outline Construction Management Plan (OCMP) and a Resource Waste Management Plan (RWMP) which accompany this application under separate cover. The Construction Management Plan will be further updated by the contractor and agreed with the Planning Authority prior to commencement of development.

The OCMP incorporates the construction-related mitigation measures proposed throughout this EIAR in order to ensure that the impacts arising from construction of the proposed development are managed and minimised as appropriate.

5.7.1.2 Demographics

The potential impacts on the local demographics at construction stage are considered to be temporary, neutral and imperceptible, and therefore, no mitigation measures are proposed.

5.7.1.3 Employment

No potential negative impacts have been identified in relation to employment activity at construction stage of the proposed development, and therefore, no mitigation measures are required in this regard.

5.7.1.4 Social and Community Infrastructure

No potential negative impacts have been identified in relation to social and community infrastructure at construction stage of the proposed development, and therefore, no

mitigation measures are required in this regard.

5.7.1.5 Human Health

The OCMP incorporates the construction-related mitigation measures proposed throughout this EIAR in order to ensure that the impacts arising from construction of the proposed development are managed and minimised as appropriate.

As per Chapter 12 Air Quality and Climate, best practice mitigation measures associated with a high level of dust control are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. Appendix 12.2 of this EIAR contains a Dust Management Plan (DMP) which outlines these measures and which will be incorporated in the Contractor's Construction Management Plan.

The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of Human Health.

With regard to noise, mitigation measures outlined in Chapter 13 relate to the different construction activities such as the use of plant and machinery. The measures proposed have been identified to reduce the impact of these activities on the sensitive noise receptors within and surrounding the subject site.

5.7.2 Operational Phase

The potential impacts on Population and Human Health arising from the operational phase of the proposed development are considered to be positive, arising from the provision of additional residential units, high quality landscaped public open spaces and associated amenities to cater for the associated population increase. No mitigation measures relating population and Human Health are therefore proposed during the operational phase of the proposed development.

5.8 Predicted Impact of the Proposed Development

This section outlines the predicted impacts of the proposed development following the implementation of any mitigation measures, where relevant.

5.8.1 Construction Phase

5.8.1.1 Land Use

The construction phase of the proposed development will result in a temporary negative

impact on the local environment following the implementation of the mitigation measures outlined previously with regard to the OCMP and RWMP.

5.8.1.2 Demographics

The predicted impact on the demographic profile of the local catchment during the construction stage is considered to be temporary, neutral and imperceptible.

5.8.1.3 Employment

The predicted impact in relation to employment activity during the construction stage is considered to be temporary, moderate and positive.

5.8.1.4 Social and Community Infrastructure

The predicted impacts of the proposed development during the construction stage on the local social and community infrastructure are considered to be temporary and neutral.

5.8.1.5 Human Health

As mentioned previously and set out in Chapter 12 Air Quality and Climate, the mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of Human Health.

Subject to the implementation of the mitigation measures outlined in the OCMP, the impact of the proposed development during the construction stage is likely to be short term and imperceptible with respect to Human Health.

5.8.2 Operational Phase

5.8.2.1 Land Use

The predicted impacts on the local landscape, as outlined in Chapter 16, indicates that the visibility of the proposed development is likely to be largely restricted to locations relatively close to the application site. While the existence of the proposed development is likely to result in a significant change to the visual environment from some nearby viewpoints, having regard scale and the pattern of development that has taken place in the area, proposed changes on the White Heather lands are likely to be considered by many observers to be consistent with existing and emerging trends for development in the area.

5.8.2.2 Demographics

The changing demographic profile arising from the operational stage of the proposed development is likely to facilitate a balanced age profile within the local area which is currently characterised by a working age population. The proposed development is predicted to have a slight positive effect in terms of changing profile that will be long term in duration and moderate in significance.

The proposed residential units will contribute to the overall supply and types of accommodation available to the population of the local catchment and also to the wider Dublin region. It is submitted that the proposed development comprises residential units that are suitable to young families, therefore having a long term, significant positive impact in terms of the supply of suitable housing for the local population.

5.8.2.3 Employment

As outlined in Section 5.6, no potential negative impacts on socio-economic and employment activity have been identified for the operational phase of the proposed development. The predicted impacts for the operational phase of the proposed development in relation socio-economic and employment activity at a local scale are considered to be moderate, positive and long term, through the generation of direct employment and the increased demand for local goods and services.

5.8.2.4 Social and Community Infrastructure

The predicted impacts on population and Human Health arising from the operational phase of the proposed development are considered to be positive, arising from the provision of additional residential units, high quality landscaped public open spaces and associated amenities to cater for the associated population increase. A childcare facility is also provided as part of the proposed scheme, contributing to the community facilities in the local area. The proposed development also comprises residential amenities including a gym, business hub, cultural/events space, residents lounge and a concierge. The predicted impact at operational stage of the proposed development in relation to social infrastructure is therefore considered to be long term, slight and positive.

5.8.2.5 Human Health

The predicted impacts on Human Health during the operational phase are predicted to be neutral, long-term and imperceptible.

5.8.3 'Do Nothing' Scenario

In a 'Do Nothing' scenario, the subject lands would not be developed and the existing buildings on the subject site would be unused. The status of the environmental receptors

described throughout this EIAR would be likely to remain unchanged while the potential for any likely significant adverse environmental impacts arising from the proposed development would not occur.

Similarly, if the proposed development were not to take place, the potential for any significant positive impacts from the construction and operation of the proposed development would also not arise.

A 'do nothing' scenario on zoned Z1 Sustainable Residential Neighbourhoods would result in a prime residential site remaining undeveloped which would not be consistent National, Regional and Local Planning Policy.

5.9 Monitoring

Measures to avoid significant negative impacts on Population and Human Health have been incorporated into the OCMP which will be implemented by the contractor at construction stage.

Furthermore, measures to avoid negative impacts on Population and Human Health have been incorporated into the design of the proposed scheme at an early stage in the design process. Compliance with the design of the scheme will be a requirement of any permission for development. Further monitoring will be undertaken as part of the compliance with other conditions as well as during the Building Regulations Certification process.

Monitoring of in relation to Health and Safety requirements will be undertaken at construction stage by the Project Supervisor and as part of the Construction Management Plan.

5.10 Reinstatement

There are no specific reinstatement works proposed relating to Population and Human Health.

5.11 Interactions and Potential Cumulative Impacts

5.11.1 Interactions

There are several inter-related environmental factors described throughout this EIAR which interact with Population and Human Health. During the construction and operational stages, Air Quality and Climate, Noise and Vibration, Landscape and Visual Impacts, Waste Management and Wind Microclimate are the main environmental factors which may impact on Population and Human Health.

5.11.1.1 Air Quality and Climate

The potential for interaction between Population and Human Health and Air Quality and Climate occurs primarily during the construction phase of development. The implementation of mitigation measures will be required where construction and demolition related activities have the potential to impact on human health. Adherence to these measures will ensure that the impacts on human health will be short-term, negative and imperceptible during the construction phase, and long-term, neutral and imperceptible during the operational phase

5.11.1.2 Noise and Vibration

The interaction with Noise and Vibration occurs primarily in the construction phase where measures have been outlined to mitigate against the possibility of significant impacts on human health. Adherence to these measures will result in impacts which are short-term, slight to moderate and negative in nature.

5.11.1.3 Landscape and Visual Impact

Population and Human Health interacts with Landscape and Visual Impact as the introduction of a new residential component to the city, providing 335 no. new homes, a crèche, a cafe, and public open space, would have a positive impact for the future residents. The high architectural and landscape quality of the development would also have a positive impact on the surrounding townscape.

5.11.1.4 Waste Management

The Waste Management Chapter notes the potential impact on Population and Health during the construction and operational stages, however adherence to the mitigation measures outlined in Chapter 11 will result in a long-term, imperceptible and neutral impact.

5.11.1.5 Wind Microclimate

The Wind Microclimate Chapter notes that the proposed development is predicted to have a positive impact on Population and Human Health due to the increase in area determined to be 'suitable for sitting' and also the increase in the quantity and quality of amenity space which will be suitable for long term seated use.

5.11.2 Potential Cumulative Impacts

A number of extant permissions and live applications for development in close proximity to the subject site were identified for the purposes of assessing the potential cumulative

impacts in relation to Population and Human Health. These applications are summarised in Table 5.3 below.

In a worst case scenario, where all, or a significant portion of the above developments undertake construction at the same time, there could be a cumulative impact on Population and Human Health resulting from increased levels of dust, noise and construction traffic. Subject to the implementation of the mitigation measures in the OCMP, the impacts of the proposed development in relation to dust and noise are expected to be slight, neutral and localised in scale.

There are no significant negative impacts envisaged in relation to Population and Human Health as a result of the proposed development in combination with other existing or planned projects in the local or wider area.

Table 5.3: Applications for Development in Proximity to the Subject Site

Reg. Ref.	Location	Brief Description	Decision
ABP Ref. No. 307221	Former Bailey Gibson Site, 326-328 South Circular Road, Dublin 8.	Strategic Housing Development Application. Demolition of all structures, construction of 416 no. residential units (4 no. houses, 412 no. apartments) and associated site works.	ABP Granted Permission on 14/09/2020.
ABP Ref. No. 308917	Former Player Wills site and undeveloped Land in Ownership of Dublin City Council, South Circular Road, Dublin 8.	Strategic Housing Development Application. Demolition of all buildings excluding the original fabric of the former Player Wills Factory, construction of 492 no. Build to Rent apartments, 240 no. Build to Rent shared accommodation along, creche and associated site works.	ABP Granted Permission on 15/04/2021

5.12 References

- Central Statistics Office, 2016 – Small Area Population Maps
- Project Ireland 2040, National Planning Framework, Government of Ireland
- National Standards for Residential Care Settings for Older People in Ireland 2016, Health Information and Quality Authority
- Regional Spatial and Economic Strategy for the Eastern and Midlands Region 2019-2031, Eastern and Midland Regional Assembly
- An Bord Pleanála, Online Planning Portal
- Dublin City Development Plan 2016-2022, Dublin City Council



Chapter 6. Biodiversity

6.0 Biodiversity

6.1 Introduction

This chapter assesses the potential impacts of the proposed residential development on the biodiversity of the site and surrounding area. This assessment has been undertaken by Minogue Environmental Consultants (MEC) Ltd. on behalf of U and I (White Heather) Limited (the Applicant) and examines the potential biodiversity impacts of the proposed development. The purpose of this assessment is to:

- Establish and evaluate the baseline ecological environment, as relevant to the proposed development
- Identify, describe, and assess all potentially significant ecological impacts associated with the proposed development
- Set out the mitigation measures required to address any potentially significant ecological impacts and ensure compliance with relevant nature conservation legislation
- Provide an assessment of the significance of any residual ecological impacts
- Identify any appropriate monitoring requirements

A separate, stand-alone Appropriate Assessment Screening Statement [AASS](Doherty Environmental, 2022) has been prepared and is being submitted as part of the planning application documentation. The AASS contains information relevant to the competent authority's assessment of potential impacts that may arise from the proposed development on any European site.

The scope of the following assessment follows the guidance outlined in the *CIEEM's Guidelines for Ecological Impact Assessment (2006 & 2018)*, *European Commission's Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013)*, the draft *EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Report (2017)* Guidelines and the Department's *Guidance for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment (2018)*.

The following impact assessment is based upon a review of existing desktop information and the results of on-site field surveys outlined below.

6.1.1 Statement of Authority

This biodiversity chapter has been prepared by Mr. Pat Doherty BSc., MSc, MCIEEM, of DEC Ltd. Mr. Doherty is a consultant ecologist with over 18 years' experience in completing ecological impact assessments and environmental impact assessments. Pat has been involved in the completion of assessment reports for proposed developments and land use

activities under the EIA Directive and Article 6 of the Habitats Directive since 2003. He has extensive experience completing such reporting for projects located in a variety of environments and has a thorough understanding to the biodiversity issues that may arise from proposed land use activities. Pat has completed focused certified professional development training in a range of ecological survey techniques and assessment processes. Training has been completed for National Vegetation Classification (NVC) and Irish Vegetation Classification (IVC) surveying, bryophyte survey for habitat assessment and identification, professional bat survey and assessment training, mammal surveying and specific training for bird and bat survey techniques. Ongoing training has been completed by approved training providers such as CIEEM, British Trust for Ornithology, the Botanic Gardens and the Field Studies Council.

Ruth Minogue, BscSci, MA, MCIEEM assisted in the preparation of this biodiversity chapter. Ruth has over twenty years in the field of environmental assessment and has been involved in the completion of environmental and ecological impact assessments since 2002. She is a full member of the Chartered Institute of Ecology and Environmental Management, holds a diploma in Field Ecology (UCC), Advanced Diploma in Planning and Environmental Law (Kings Inn) and undertakes ongoing CDP through CIEEM.

6.2 Consultation

Consultation between MEC Ltd. and other members of the planning/design team was made in order to obtain information required to assess the potential construction and operational phase impacts on biodiversity.

6.3 Methodology

6.3.1 Desk Study

A desktop assessment was carried out to collate available information on the biodiversity baseline of the proposed land-holding and surrounding area. The following baseline data was gathered during the desk study:

- A review of the National Biodiversity Database was completed to identify the presence or otherwise of protected species occurring within close proximity to the proposed site. Species lists reported for the 1km grid square 01332 (in which the project site is located) were downloaded from www.biodiversityireland.ie and reviewed.
- A review of the NPWS online database to identify the presence or otherwise of designated conservation areas (i.e. SPAs, SACs, NHAs and pNHAs);
- A review of spatial mapping information for Annex 1 habitat and Annex 2 species as published by the NPWS for the Article 17 2019 reporting under the Habitats Directive;
- Review of aerial photography and satellite imagery for the proposed site;
- Review of historical maps for the project site and review of satellite imagery for the project site published between 1995 and 2022;

- A review of the bat landscape classification was also completed. A landscape conservation guide for Irish bat species was published in 2011 (Lundy et al., 2011). This study identified core areas of favourable habitat for bat species in Ireland. The publication was reviewed to identify whether the project site occurs within the core area for any bat species.
- Review of Dublin City Council Planning Portal for any other information pertaining to the biodiversity in the wider area surrounding the project site.
- Review of the Bird Atlas for Wintering and Breeding birds.

6.3.2 Site Investigations

6.3.2.1 Habitat Surveys

A Habitat survey was carried out in May and July 2021 to identify, describe, map and evaluate habitats and to verify information gathered at the desk study stage. Another site visit was undertaken in February 2022.

The basis of the Habitat Survey was an Extended Phase 1 Habitat Survey. The habitat survey was undertaken in accordance with the Heritage Council's Draft Best Practice Guidance for Habitat Survey and Mapping. Habitats were classified using Fossitt's Guide to Habitats in Ireland (2000) which classifies habitats according to a hierarchical framework with Level 1 habitats representing broad habitat groups, Level 2 representing habitat sub-groups and Level 3 representing individual habitats. The field survey focused on identifying Level 3 habitats.

In this report, scientific and common names for higher plants follow those in the Botanical Society of the British Isles (BSBI) standard list, published on its website www.bsbi.org.uk. Scientific and common names for bryophytes follow Smith (2004). Scientific and common names of mammals follow Whilde (1993).

6.3.2.2 Bird Surveys

All birds seen and heard on site during the Phase 1 Habitat Survey in June and July 2021 and February 2022 were recorded.

6.3.2.3 Bat Surveys

Prior to undertaking activity surveys the status of habitats occurring at the site was classified in terms of their potential to function as bat foraging habitat. The classification follows the approach outlined by Bat Conservation Trust (2012) to assessing the value of potential development sites for bats, based on the occurrence of habitat features within the landscape, and the likelihood of bats being present. The classifications range from low to high.

Manual bat surveys were completed by walking a continuous transect through the site to record bat foraging activity. The bat survey was completed using an Echo-Meter Touch Pro bat detector, Batlogger M2 and a high-powered LED head torch. The bat surveys were completed on the following dates:

Table 6-1 Bat Surveys and weather conditions.

Date	Weather Conditions
10 th May 2021	10C dropping to 8 C, cool with slight wind
3 rd August 2021	18C warm, no breeze

A static bat detector was installed along the Grand Canal for 8 nights from 26th July to 2nd August 2021. These nights were largely dry, calm and warm with optimal foraging conditions.

During the initial appraisal of the proposed development an assessment was made of on-site features that have the potential to support roosting bats. These features include built structures and trees along and adjacent to the project site. The roost potential of these structures was assessed with reference to features that are typically associated with bat roosts in buildings (see Kelleher and Marnell, 2006; Collins, 2016).

Built structures occurring within and adjacent to the proposed development were assessed for their potential to support roosting bats. All structures (all commercial/industrial units) inspected for their potential to support roosting bats are shown in Figure 1.1. An internal inspection survey of the commercial/industrial structures were undertaken. It is also noted that residential dwellings located to the north of the development at its eastern end were appraised from the car park within the industrial estate and no detailed close up inspection was carried out for these structures.

External and inspection surveys were carried out during the daytime of structures and involved inspecting the structure for:

- obvious exit/egress points for bats such as missing roof tiles, opening to the roof spaces, wall crevices, open windows & doors etc.; and
- field signs associated with bat activity such as faecal droppings, scratch marks, staining on walls etc.

Other structural features such as roof material, aspect and roof shape were also recorded.

6.3.2.4 Tree Roost Potential

The bat roost potential of trees follows the guidelines outlined in Chapter 6 of the Bat Conservation Trust's Bat Surveys for Professional Ecologists (2016). The trees occurring within the immature woodland were visually inspected on site for the signs of preferred roost

features (PRFs). PRFs include holes, cracks and splits in stems or branches; loose or platy bark; knot holes, cankers in which cavities have developed; detached ivy with stem diameters in excess of 50mm; existing bat or bird boxes.

A daytime inspection of tree roost potential was undertaken on the 16th February 2022. The daytime inspection involving visually inspecting the trees occurring within the area of the project site where vegetation is to be removed and trees are to be felled for the PRFs listed above.

6.3.2.5 Mammal Surveys

The project site and surrounding area was searched for the evidence indicating the presence of mammals. Particularly attention was given to identifying the presence or otherwise of otters along the canal bank adjacent to the development site.

A survey for field signs indicating the presence of otters was undertaken on 15th February 2022. This survey was undertaken during the daytime and particular attention was given to habitat features normally associated with otters along the Grand Canal immediately adjacent to the project site and the southern bank. Any mammal field signs typical of otter activity were recorded during the surveys. These field signs include:

- holts,
- couches,
- slides
- or spraints.

6.3.3 Evaluation of Biodiversity Baseline

The nature conservation value of habitats and ecological sites occurring within the proposed site are based upon an established geographic hierarchy of importance as outlined by the National Roads Authorities (NRA, 2009). The outline of this geographic hierarchy is provided below and this has been used to determine ecological value in line with the ecological valuation examples provided by the NRA (see NRA, 2009). The geographic evaluation hierarchy is as follows:

- International Sites (Rating A);
- National Importance (Rating B);
- County Importance (Rating C);
- Local Importance (higher value) (Rating D); and
- Local Importance (lower value) (Rating E)

The evaluation of birds within the project site is based on the methods outlined by Percival (2003).

6.3.3.1 Impact Magnitude

Impact magnitude refers to changes in the extent and integrity of an ecological receptor. The IEEM (2006) defines integrity of designated conservation areas as “the coherence of the ecological structure and function across the area that enables it to sustain the complex of habitat and/or the levels of populations of the species for which it was classified”. For non-designated sites this can be amended to: “the coherence of ecological structure and function, that enables it (the site or population's supported by the site) to be maintained in its present condition’. For the purposes of this assessment the impact magnitude is influenced by the intensity, duration, frequency and reversibility of a potential impact and is categorised as follows:

High magnitude impact: that which results in harmful effects to the conservation status of a site, habitat or species and is likely to threaten the long-term integrity of the system.

Moderate magnitude impact: that which results in harmful effects to the conservation status of a site, habitat or species, but does not have an adverse impact on the integrity of the system.

Low magnitude impact: that which has a noticeable effect but is either sufficiently small or of short duration to cause no harm to the conservation status of the site, habitat or species.

Imperceptible: that which has no perceptible impact.

Positive: that which has a net positive impact for the conservation status of a site, habitat or species.

6.3.3.2 Impact Significance

The significance of impacts is determined by evaluating the nature conservation value of the site, habitat or species concerned together with the magnitude of the impacts affecting the system. The more ecologically valuable a receptor and the greater the magnitude of the impact, the higher the significance of that impact is likely to be. Table 6.1 outlines the levels of impact significance to be used during the assessment of impacts. The probability of an impact occurring will also be outlined when defining the significance of impacts.

Nature Conservation Value	Magnitude of Potential Impact			
	High	Moderate	Low	Imperceptible
International	Severe	Major	Moderate	Minor
National	Severe	Major	Moderate	Minor
County	Major	Moderate	Minor	Minor

Local	Moderate	Minor	Minor	Negligible
Low	Minor	Negligible	Negligible	Negligible

Table 9.6-2: Levels of Impact Significance

Impacts to bird species recorded breeding within the project site is based on the methods outlined in Percival (2003).

6.4 Receiving Environment

6.4.1 Overview of the Project Site

The project site is approximately 1.443ha and is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west. It is located within the urban footprint of Dublin City and is representative of a brownfield site which was a former laundry and industrial /commercial estate. The existing ground levels across the overall site are typically quite flat, with typical high points in the order of 22.7 m AOD adjacent to the canal and a low point of 22.0 m AOD at the northern boundary adjacent at the South Circular Road.

The White Heather Industrial Estate occupies part of the site of a former canal dock, which was used for the maintenance of barges and canal boats and also as a turning spot mid-way along the long cutting of the Grand Canal Circular Line. The dock was located on the Dolphin's Barn side of the canal, as the path used by horses to tow the boats (the tow-path) was on the Crumlin side¹. The White Heather Laundry was founded in 1899.

A review of satellite imagery from 1995 indicates that the eastern portion of the site that is currently represented by hardstanding accommodated open habitat, indicated by trees and grassland. The remainder of the site comprises industrial units. Subsequent satellite imagery shows the expansion of the industrial units and car parking space, that infills the former habitat in the eastern part of the site.

Google Earth aerial images of the site from 2003 to July 2008 show the western and southeast portions of the site developed to approximately its current configuration. Greenspace was located on the central portion of the site, and a large warehouse type building was located on the northeastern portion of the site. By September 2008 this warehouse had been demolished and the greenspace cleared. By May 2009 these areas had been redeveloped with two new warehouse type buildings and associated parking and access space. The site layout remained largely unchanged from that time until the 2021 aerial photograph which

¹ THE WHITE HEATHER South Circular Road, Dolphin's Barn, Dublin 8. Cathy Scuffil Historian In Residence, Dublin South Central, Dublin South East 11 October, 2020

shows site conditions similar to those at present. Currently, the site is occupied by up to 10 No. industrial warehouse units and ancillary office structures. Some of the occupiers of the industrial units comprise An Post Dublin 8 Delivery Office, Building Staff Solutions Dublin, and Storage World Self Storage.

The subject lands are located within the Liffey Catchment under the Water Framework Directive (WFD) and the Dodder sub-catchment (SC 010). The nearest water feature is the Grand Canal which forms the southern boundary of the site. A distance of approximately 8m separates the development boundary from the Grand Canal corridor. There are no surface watercourses occurring within the project site.

The Grand Canal enters the Liffey at the Grand Canal dock which is classified as moderate status under the WFD but improves to Good status again when draining out to the Liffey Estuary lower at the main channel of the river. The Q-rating status data is available from 2019 for the Camac River at an EPA monitoring point approximately 2097m north west of the proposed development site. Water quality at this monitoring point in 2019 had a Q-score of 3 which indicates "poor" water quality. The River Camac flows underneath the Grand Canal at this location. The Camac drains to the Liffey which flows into Dublin Bay. The River Poddle is approximately 836m to the east, however the Poddle is culverted for much of its length in the city centre and there is no connection between the proposed development area and this watercourse.

The Liffey has a "good" status under the Water Framework Directive 2013-2018 programme but is "at risk" of not achieving good status by 2027.

The primary Groundwater Body (GWB) in the region is the Dublin Urban GWB, which is the Calp Limestone bedrock aquifer. The Dublin Urban GWB comprises:

- LI: Locally important aquifer, moderately productive only in local zones, and
- PI: Poor aquifer, generally unproductive except for local zones.

The Lucan Formation, located in the vicinity of the Dolphins Barn site, is classified by the GSI as a Locally Important (LI) aquifer which is moderately productive only in local zones. In general, permeability in the Lucan Formation is low (1-10m²/day). Fracture flow dominates, and there is a distinct reduction in permeability with depth. Packer tests show permeabilities reduce an order of magnitude for each five metres of depth in the limestone (Aspinwall & Company, 1979). The majority of flow is in the upper weathered bedrock and is common within fractures and fissures at depths of up to 50m below ground level (mBGL). Regional groundwater flow is towards Dublin Bay and the Irish Sea to the east. The overlying Dublin Boulder Clay is not considered as an aquifer due to its low permeability properties. The Boulder Clay transmits very little water and also acts as a barrier to the recharge of the limestone bedrock aquifer.

The groundwater vulnerability beneath the proposed site is Moderate. Vulnerability ratings are related to a function of overburden thickness and permeability which might offer a degree of protection and/or attenuation to the underlying aquifer from surface activities and pollution. At their nearest points, areas of high groundwater vulnerability are located adjoining the southwest corner of the site and 0.17km east of the site. The closest area of extreme groundwater vulnerability is located 0.22km east of the proposed site. There are no karst landforms identified in the vicinity of the site.

Due to the generally low permeability of the aquifers within the Dublin Urban GWB, a high proportion of the recharge will run off and discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing further the available groundwater recharge to the aquifer. A significant amount of recharge also occurs from leaking sewers, mains, and storm drains in Dublin where non-revenue water is estimated to be around 40%.

Based on the GSI website, the effective rainfall in the vicinity of the White Heather site is 275.300 – 285.200 mm/year.

An assessment carried out under the Water Framework Directive has concluded that the groundwater within the Dublin Urban GWB is presently of “Good status”. The objective is to protect the “Good status” while recognising that the quality of the groundwater in the Dublin Urban GWB is “Not at risk. Please see Chapter 8 Water and Hydrology.

The GSI Quaternary Sediments map provides subsoil mapping for the site. The subsoil has been classified as Limestone Till (Carboniferous). According to the Teagasc Soil Information System, the topsoil and subsoil beneath the site has been classified into one main category, made ground. This is expected given the urban nature of the site. The topsoil of the surrounding area is also made ground.

Previous site investigations (Please see Chapter 08 Land and Soil of this EIA) in nearby SI locations of which the adjacent An Post Whiteheather Estate Report (2010) is most relevant. Five additional site investigation records are listed for the nearby areas. The results of these investigations generally indicated the presence of fill materials ranging from 0.7 to 2.8m thick underlain by brown gravelly clay with possible sands or silts. Some deeper investigations also encountered grey gravelly clays underlying these. The presence of bedrock was confirmed at a depth of 20.73mOD on the Dolphin's Barn bridge site. Shallow groundwater ingress was encountered during a number of the investigations. Investigations for soil contamination were not noted in the reports except at the Players Mills site where low levels of polycyclic aromatic hydrocarbon and lead contamination were encountered in the fill material by limited environmental testing.

Figure 6-1 Site boundary on aerial imagery



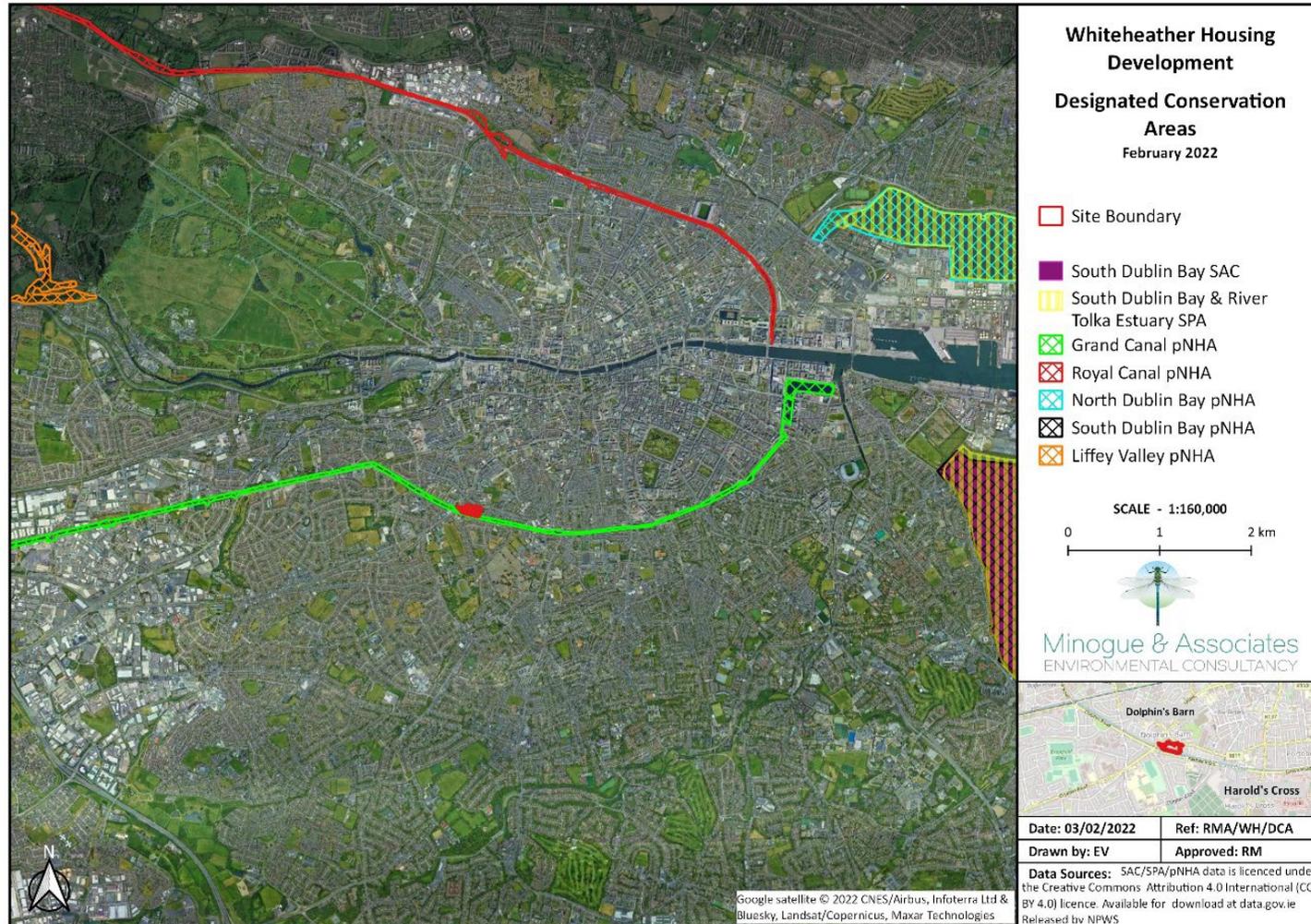
6.4.2 Designated Conservation Areas

The boundary of the pNHA include the lands at the White Heather Industrial Estate. However, the 2021 site visits and survey works confirm the habitats within the site are Built Land and Artificial Surfaces (BL3) with Amenity Grassland (GA1) confirms that none of the qualifying interests or habitats identified for the pNHA are present within the subject lands as the summary below in Section 6.4.3 shows.

6.4.2.1 Designated sites

The nearest European Site, the South Dublin Bay SAC and the South Dublin Bay and River Tolka Estuary SPA are located approximately 5km (as the crow flies) overland to the east. An Appropriate Assessment Screening Statement prepared by Doherty Environmental Ltd accompanies this report.

Figure 6-2 Designated Conservation Sites



The Grand Canal proposed Natural Heritage Area [pNHA] (site code 002104) is an extensive and highly important east-west ecological corridor. The boundary of the pNHA is located on the White Heather Industrial Estate. A summary of the Grand Canal pNHA is provided below:

6.4.3 Grand Canal pNHA (site code 002104)

The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. The Grand Canal proposed Natural Heritage Area (pNHA) comprises the canal channel and the banks on either side of it. The canal system is made up of a number of branches - the Main Line from Dublin to the Shannon, the Barrow Line from Lowtown to Athy, the Edenderry Branch, the Naas and Corbally Branch and the Milltown Feeder. The Kilbeggan Branch is dry at present, but it is hoped to restore it in the near future. Water is fed into the summit level of the canal at Lowtown from Pollardstown Fen, itself an NHA.

A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The hedgerow, although diverse, is dominated by Hawthorn (*Crataegus monogyna*). On the limestone soils of the midlands Spindle (*Euonymus europaeus*) and Guelder-rose (*Viburnum opulus*) are present. The vegetation of the towpath is usually dominated by grass species. Where the canal was built through a bog, soil (usually calcareous) was brought in to make the banks. The contrast between the calcicolous species of the towpath and the calcifuge species of the bog is very striking.

The diversity of the water channel is particularly high in the eastern section of the Main Line - between the Summit level at Lowtown and Inchicore. Arrowhead (*Sagittaria sagittifolia*) and Watercress (*Nasturtium officinale*) are more common in this stretch than on the rest of the system. All sites for Hemlock Water-dropwort (*Oenanthe crocata*) on the Grand Canal system are within this stretch. The aquatic flora of the Corbally Extension of the Naas Branch of the canal is also very diverse, with a similar range of species to the eastern Main Line. Otter spraints are found along the towpath, particularly where the canal passes over a river or stream. The Common Newt breeds in the ponds on the bank at Gollierstown in Co. Dublin. The Rare and legally protected Opposite-leaved Pondweed (*Groenlandia densa*) (Flora Protection Order 1987) is present at a number of sites in the eastern section of the Main Line, between Lowtown and Ringsend Basin in Dublin.

The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.

The boundary of the pNHA include the lands at the White Heather Industrial Estate. However, the 2021 site visits and survey works confirm the habitats within the site are Built Land and Artificial Surfaces (BL3) with Amenity Grassland (GA1) and individual trees confirms that none of the qualifying interests or habitats identified for the pNHA are present within the subject lands as the summary below shows.

6.4.4 Habitats

The following Sub-Sections describe the habitats occurring at the project site. Each habitat described below has been identified to Level 3 of Fossit's Guide to Habitats in Ireland. The alpha-numeric code for each habitat is also provided alongside the habitat name (e.g. Treeline WL2). The locations and extent of each habitat described below are illustrated in Figure 11.3: Habitat Map. Appendix 1 provides plates detailing a photographic record of the project site and surrounding area.

The nature conservation value of each of the habitats occurring within the project site is also outlined in the following sub-sections. The nature conservation value of habitats has been determined with reference to the methods outlined in Section 11.3.3 above.

6.4.4.1 Built Land and Artificial Surfaces(BL3 and BL1)

The subject lands comprise primarily Built Land and Artificial Surfaces (BL3) including tarmac surfaces, and warehouse style buildings and office space, of modern construction type with a small area of Amenity Grassland present adjacent to the Grand Canal. An older cutstone wall forms part of the boundary fronting South Circular Road (BL1).

Nature Conservation Value

The buildings and artificial surfaces within and surrounding the project site are predominantly of recent origin and are devoid of vegetation. They offer negligible habitat for wildlife and are of low ecological value (Rating E).

6.4.4.2 Grassland (GA2)

The Grand Canal is located adjacent to the site with an area of amenity grassland currently providing the boundary between the fencing and the industrial estate and the water course. This covers an area of approximately 1947 m²(0.19 ha). Other species present include dandelion (*Taraxacum spp.*), creeping buttercup (*Ranunculus repens*), clovers (*Trifolium spp.*) and plantains (*Plantago spp.*). In the eastern boundary, an area of approximately 94.4m² is unmown and supports rough grass with ruderal species.

Nature Conservation Value

The grassland habitat occurring within the project site supports a restricted range of commonly occurring amenity grassland ruderal species. This habitat is of low ecological value (Rating E).

6.4.4.3 Trees

Woodland habitats are not present on site but a number of mature trees, notably lime trees adjoin the site boundary to the north west of the site. Within the amenity grassland, there is a single self seeded sycamore tree. A multistem Blackthorn (*Prunus spinosa*) is growing through the railings at the site boundary and the Post Office buildings. Three Birch *Betula utilis* are present within this location.

Outside the site boundary on the banks of the Grand Canal sycamore and elm (*Elm Ulmus procera*) overhang the Grand Canal. A stand of butterfly bush (*Buddlei davidii*) is present at the bank of the Grand Canal and the amenity grassland verge. The southern towpath of the Grand Canal supports a denser riparian zone as shown in the habitat map and these will not be affected or removed as part of the proposed development.

The adjoining residential lands (Cherry, *Prunus serrulate*) and within the boundary of Our Lady of Delour's church 2x Lime trees (*Tilia x europaea*)

Other trees within the site boundary are largely self seeded sycamore or landscape planting such as the three birch trees and individual multistem blackthorn.

Nature Conservation Value

The trees adjacent to the Grand Canal on the canal bank (outside the site boundary) and mature lime trees within the boundary of the church grounds provide some woodland habitat for fauna. They provide some woodland habitat for fauna and are considered to be of local importance (higher value, Rating D).

6.4.4.4 Protected Flora

A search of the National Biodiversity Centre Database was carried out on the immediate project area. No plant species protected under the Flora Protection Order (2015) are identified within this area. Two such species Meadow Barley (*Hordeum secalinum*) and Opposite-leaved Pondweed (*Groenlandia densa*) have been recorded from the Grand Canal in the wider vicinity of the project site.



Figure 6-3 Habitat Map

6.4.5 Protected Species Records

A search of the National Biodiversity Data Centre (NBDC) for records of rare and/or threatened species previously identified in the vicinity of the project site was completed in January 2022. Information for the 1km² grid square O1332 (in which the project site is located) was downloaded.

The rare, threatened and protected species identified as occurring within this 1km grid square are listed in Table 6.2 below and a comment on the project site's potential to support these species is also provided. It is noted that the majority of bird species in Ireland are afforded protection under the Wildlife Acts as amended. However only those species that have been identified as rare, threatened (i.e. Amber or Red listed species on the Birds of Conservation Concern in Ireland) and protected under EU legislation are listed in Table 11.3 below.

Table 6-3 Protected Species records from 1km² grid square O1332 (National Biodiversity Data Centre)

Species Group	Species name	Date of last record	Designation	Potential for the project site to support the species
Terrestrial mammal	Otter (Lutra lutra)	10/8/2014	Protected Species: Wildlife Acts	There are no habitats occurring within the project site that are suitable for otters. The Grand Canal south of the project site provides commuting and resting habitat for otters. However, the urban character, and presence of humans and frequently dogs on the southern towpath reduces the overall attractiveness of this section of the Grand Canal for otter. Furthermore, as outlined in Section 6.4.6.1 below no evidence indicating the presence of otters was recorded along the stretch of the canal to the south of the project site.
bird	Barn Swallow (Hirundo rustica)	29/04/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	The buildings within the project site provide some nesting opportunities for swallows. However as outlined in section 6.4.6.3 below no breeding swallows or evidence of past breeding in the form of old nests were recorded within these buildings during field surveys.

Species Group	Species name	Date of last record	Designation	Potential for the project site to support the species
bird	Black-headed Gull (Larus ridibundus)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	No suitable habitat occurs within the project site. The Grand Canal does provide suitable habitat for this species.
bird	Brent Goose (Branta bernicla)	06/12/2015	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal does not provide suitable habitat for this species.

Species Group	Species name	Date of last record	Designation	Potential for the project site to support the species
bird	Common Coot (Fulica atra)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.
bird	Great Black-backed Gull (Larus marinus)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.

Species Group	Species name	Date of last record	Designation	Potential for the project site to support the species
bird	Great Cormorant (Phalacrocorax carbo)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.
bird	Herring Gull (Larus argentatus)	12/06/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.
bird	House Sparrow (Passer domesticus)	16/05/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal does provide suitable habitat for this species.

Species Group	Species name	Date of last record	Designation	Potential for the project site to support the species
bird	Lesser Black-backed Gull (Larus fuscus)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.
bird	Little Grebe (Tachybaptus ruficollis)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.
bird	Mallard (Anas platyrhynchos)	22/05/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.

Species Group	Species name	Date of last record	Designation	Potential for the project site to support the species
bird	Mew Gull (Larus canus)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.
bird	Mute Swan (Cygnus olor)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.

Species Group	Species name	Date of last record	Designation	Potential for the project site to support the species
bird	Tufted Duck (Aythya fuligula)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	No suitable habitat occurs within the project site. The Grand Canal provides suitable habitat for this species.

6.4.6 Fauna

6.4.6.1 Non-Volant Mammals

A survey of the project site for the presence of non-volant mammals was completed during May and July 2021 and February 2022. The project site does not support any resting or breeding sites for protected non-volant mammals. A hole in the fencing accompanied by a mammal track was recorded at the fencing adjacent to the Grand Canal at the eastern boundary. This is approximately 45cm x 60xcm and no evidence of mammal hair was recorded by a mammal such as an otter fitting through this hole.

No field signs at this indicated otter. No field signs indicating the presence of otters was identified within the project site or along the Grand Canal immediately adjacent to the project site. The nearest evidence of otter activity (spraints, holts) are northwest of the project site at the River Camac approximately 1847m northeast; otter activity identified at River Poddle which is culverted for much of its length is identified in Tymon Park, approximately 4.5km southwest of the project siteⁱ.

Nature Conservation Value

The site is not relied upon by non-volant mammals and does not provide suitable habitat for protected non-volant mammal species. The site is considered to be of low value (Rating E) for protected non-volant mammals and they have not been identified as a key biodiversity receptor within the project site.

6.4.6.2 Volant Mammals – Bats

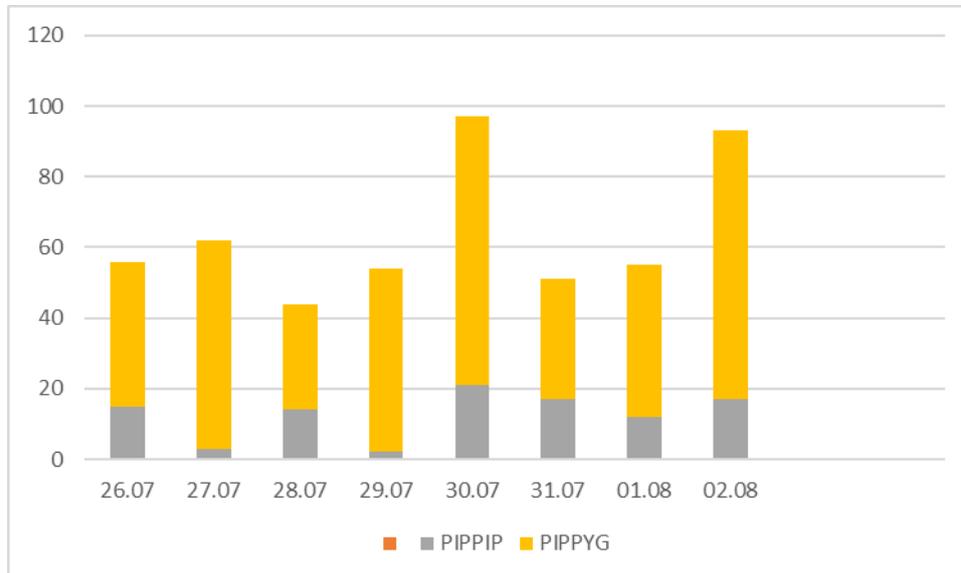
The Bat Landscape Map (see biodiversityireland.ie) indicates that the site is located in an area that has been assigned a suitability index of 18.33 for all bat species. This is representative of an area of low habitat potential for bats. The Grand Canal and its banks with vegetation provide foraging and commuting habitats for bat species habituated to urban environments. There are no structures on site that have the potential to function as bat roosts. The early mature sycamore tree that straddles the eastern site boundary does not support features that could support roosting bats.

Three species of bats were recorded foraging at the site during bat surveys. These species included Common pipistrelle, Soprano pipistrelle and Leisler's Bat. Soprano pipistrelle was the dominant species recorded at the site during bat surveys, while Common pipistrelle was recorded and very occasionally Leisler's bat were also recorded occasionally throughout the bat surveys. The highest levels of bat activities recorded during the bat surveys was on the 3rd August when approximately 2 soprano pipistrelle were observed foraging along the sycamore and across the Grand Canal waterway. The foraging at this location lasted for a brief period of time (circa 9 minutes) after which the bats dispersed. During both activity surveys bat activity was concentrated exclusively along the Grand Canal itself with visual

confirmation of bats commuting over and adjacent to the water and along the treeline vegetation.

A static bat detector was erected on the Elm tree outside the project site that is to be retained. The results of the static detector are presented below in Table 6.4

Table 6-4 Static Bat Detector Results



Soprano pipistrelle, Common pipistrelle and Leisler's bat are all widespread and abundantly occurring in Ireland and are typically encountered during bat surveys. All three species have been assessed to be at favourable conservation status at a national range in Ireland (NPWS, 2019).

Nature Conservation Value

The bat surveys completed at the project site indicate that the project site is used by low numbers of Soprano and Common pipistrelle that are likely to opportunistically forage and commute along the Grand Canal corridor, as recorded during the August 2021 bat survey. Leisler's bat were recorded in very low numbers during the survey. All three species are widespread and abundantly occurring in Ireland and are typically encountered during bat surveys. The three species recorded flying over the project site have been assessed to be at favourable conservation status at a national range in Ireland (NPWS, 2019). Based on the results of the surveys and the widespread populations of these species, the project site is considered to be of Local importance (lower value) (Rating E) for populations of these species.

6.4.6.3 Birds

Given the urban made ground habitats dominating the site, it provides very limited suitable foraging habitat for bird species. No evidence of bird nesting or signs of previous nesting within buildings on site was recorded during field surveys. The bird fauna was typical of urban habitats with the Grand Canal providing the most significant habitat for species. Species

recorded during site visits included: Woodpigeon, rook, jackdaw, common gull and magpie were the larger species seen while the hedges support blackbird, and blue tit. No red listed bird species such as yellowhammer were heard or seen during the habitat surveys.

No wetland birds such as mallard or mute swan were recorded during site visits however the Grand Canal outside the project site does provide suitable habitat to support such species. No such habitat is present on site to support these wetland bird species.

Nature Conservation Value

The project site is assessed as being of low sensitivity for birds.

6.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.443ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal.

A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances. A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south

6.6 Potential Impact of the Proposed Development

6.6.1 Construction Phase

6.6.1.1 Designated Conservation Areas

The potential for the project to result in negative impacts to the South Dublin Bay SAC and the South Dublin Bay and River Tolka Estuary SPA has been assessed as part of a Screening for Appropriate Assessment for the project. The Screening Statement for Appropriate Assessment is submitted with the planning application documentation under separate cover.

The South Dublin Bay pNHA is located downstream of the project site along the tidal stretch of the River Tolka. Given the distance of approximately 8km between the project site and this pNHA; being drained by the river between the project site and the pNHA; and the tidal influence on the waters of the pNHA, it is considered that any emissions from the project site to the River Tolka will be entirely attenuated, diluted and dispersed prior to draining to this pNHA. As such the hydrological pathway connecting the project site to this pNHA will not have the potential to function as an impact pathway and undermine the status of this pNHA.

The site of the proposed development is included within the Grand Canal pNHA, however, the subject lands do not support species or habitats that have been identified as forming part of the Grand Canal pNHA, as those lands comprise built and artificial surfaces, in addition to linear area of amenity grassland with occasional individual trees that provide a buffer between the project site and the Grand Canal itself. No features of interest for the Grand Canal pNHA as described in Section 11.4.3 of this Chapter are present within the project site.

Notwithstanding the absence of features of interest within the project site, in the absence of the design measures detailed in relevant sections of the EIAR, and summarised in Section 11.7 below construction phase and operation phase elements of the project that have the potential to result in the emission of pollutants to the Grand Canal.

6.6.1.2 Habitat Loss

The habitat loss associated with the project will consist of the loss of Built Land and Artificial Surfaces (BL3). This habitat has been evaluated as being of low nature conservation importance (Rating E) and the loss of this habitat to the footprint of the project will represent a high magnitude impact to these habitats. A high magnitude impact to these habitats of negligible nature conservation value will represent an impact of minor negative significance.

Of the 14 trees identified within the site boundary, seven are proposed for removal. These are all classified as category C trees in the accompanying arborist report. The birch tree and blackthorn within the site boundary as well as the elm trees on the canal bank, and sycamore tree on the eastern boundary are to be retained, as well as the Lime and Cherry at the northern and western boundary. The loss of these trees represent a high impact on individual tree level. However, the retention of the mature lime trees and in particular the trees associated with the riparian zone of the Grand Canal are of higher ecological value and their retention represents a positive impact.

The majority of the project site outside the footprint of landscaped areas will be representative of Buildings and artificial surfaces. The provision of landscaping within the project site, in accordance with the proposed landscape masterplan will result in the conversion of the existing buildings and artificial surfaces habitat to soft landscaping in the form of buffer planting, and a mixture of green (sedum) and biodiverse roofs on the upper roof space. A Canal linear park is proposed in the site boundary adjacent to the Grand Canal that will be comprise biodiverse ground planting and tree canopy providing a buffer between the Grand Canal and buildings. Key principles and further details are provided in the accompanying Landscape Plans and reports. The implementation of the landscape masterplan will have the potential to increase and enhance habitat occurring within the site for invertebrates, including pollinators and enhance the foraging resource for other insect-predating species such as birds and bats. Such an effect will be representative of a positive impact for the local biodiversity.

6.6.1.3 Impacts to Aquatic Habitats

There are no aquatic habitats occurring within the project site and there will be no loss of such habitat or other potential direct impacts to freshwater aquatic habitats.

The project will result in the discharge of surface water runoff from the project site during both the construction phase and operation phase. The potential implications of such discharges to the South Dublin Bay and the SAC and SPA downstream have been examined in detailed in the Appropriate Assessment Screening report that accompanies the planning application for the project.

The development will require the demolition and excavation of quantities of hardstanding areas and underlying soil. As a result of the construction works, surface water runoff may contain increased silt levels or become polluted during construction activities. Waterborne silt, cementitious material and other debris can arise from dewatering excavations, exposed ground, stockpiles, and site roads. In addition, construction materials such as concrete and cement are alkaline and corrosive and can cause pollution in watercourses. That presents a residual risk that untreated surface water runoff from the construction site to the public network and the Canal following into the Liffey Estuary.

Residues from construction works could potentially cause deoxygenation of water in the receiving watercourses, the gills of fish to become obstructed with waterborne silt, and aquatic plants and invertebrates to be smothered by settled silt, limiting exposure to sunlight and oxygen. In addition, there is potential for contamination of the surface water runoff with soil particles and debris when discharging to the public network. Heavy siltation or grit in the surface water runoff would lead to maintenance issues for the receiving gravity sewerage network on the South Circular Road. The combined sewerage network flows to the Ringsend Wastewater Treatment Works.

During the construction of the new water utilities infrastructure systems, there is the potential for unattenuated and untreated surface water to be discharged to the existing public wastewater sewer /water supply systems due to pipes and manholes being left open.

There is a risk of groundwater/watercourses/surface water network pollution by accidental spillage of wastewater effluent when making connections to live sewers.

Pollution of groundwater/watercourses/soils by accidental spillage of oils/diesel from temporary storage areas, or where construction equipment is maintained, with particular risk to the adjacent Grand Canal.

There will be no potential for wastewater generated at the project site to be discharged to the Grand Canal. It is proposed that all wastewater generated during the operation phase will be directed to the Irish Water sewer network and will be conveyed to the Ringsend wastewater treatment plant where it will be treated prior to release to the receiving environment.

In the absence of mitigation measures, these potential impacts could result in moderate to high magnitude impacts to local waterbodies such as the Grand Canal, which is of national nature conservation value. Impacts of such magnitude to this receptor will have the potential to result in major to severe negative impacts to this habitat over a temporary duration. However, the implementation of the proposed surface water management design features and mitigation measures for surface water discharge to the Grand Canal for the project will effectively mitigate potential risks. Further consideration of these elements is provided in Section 6.7 below.

The project will not have the potential to result in the discharge of wastewater generated on site during the construction phase to. All wastewater generated at the project site will be contained within bunded tanks and will be regularly collected for disposal offsite at a licence wastewater treatment plant.

6.6.1.4 Disturbance to/Loss of Habitat for Terrestrial Fauna

The construction phase of the project will not have the potential to result in significant disturbance to non-volant terrestrial mammals as no breeding sites or resting places for protected terrestrial non-volant mammals such as badgers or otters occur within or immediately adjacent to the project site.

6.6.1.5 Impacts to Bats

There will be no potential for the project to result in direct impacts (such as damage to roost sites or fatalities) to bats given the absence of roost sites at the project site.

Overall the levels of bat foraging activity occurring within the project site were low with one bout of foraging activity recorded along the Grand Canal corridor (outside the project site) and overall low levels of commuting activity during the May and August Surveys, as supported by the results of the static detector survey.

The activity on site was dominated by Soprano and Common pipistrelle, which are widespread species of low conservation concern. The three species recorded at the project site are all widespread and of low conservation concern and are typically encountered during bat surveys (NPWS, 2019).

The seven trees to be removed as part of the project works do not provide potential roosting habitat for bats. In light of the above, the loss of the seven trees within the boundary will represent an impact of imperceptible magnitude to this receptor of local (Rating D) nature conservation value. An imperceptible magnitude impact to this receptor will result in negligible impacts to the local bat population. The retention of the more mature trees on site and adjacent to the site boundary, particularly the elms and sycamore associated with the Grand Canal, retain a habitat feature of moderate significance to the local bat population.

It is noted that replacement tree and shrub planting will be provided as part of the landscape masterplan for the project and that the provision of this planting, once matured will provide additional habitat for bats. Further information on these landscape mitigation measures are provided in Section 11.7.2.2 below.

6.6.1.6 Impacts to Birds

There will be loss of potential nest habitat for bird species due to the removal of the 7 trees within the site. Given these are individual trees and are adjacent to existing urban habitat, the loss of these trees is of minor significance to birds. The retention of the older trees provides more suitable nesting habitat for birds within and adjacent to the project area.

The potential will exist for disturbance to nests and fatalities of chicks in the event that tree vegetation, supporting nests, is removed from the project site during the breeding bird season.

Noise will be generated during the construction phase and will have the potential to result in a significant increase in noise levels in the immediate vicinity of the project site. As noted in Chapter 13 of this EIA the impact of noise generated during the construction phase (where noise levels are at or above 70 dB $L_{Aeq,1hr}$) will be limited to the immediate area (i.e. within 20m) surrounding the project site. Given the low sensitivity of the project site for birds and the restricted area that will be subject to elevated noise levels at an one time during the construction phase, noise emissions as a result of construction works will represent, at most, a minor negative impact to birds occurring at the project site. The potential for the project to result in disturbance to special conservation interest bird species of the South Dublin Bay and Tolka Estuary SPA is further examined as part of the Appropriate Assessment Screening Report for the project which is provided under separate cover.

6.6.1.7 Spread of Invasive Species

A number of non-native invasive plant species occur within and adjacent to the project site. This includes Butterfly bush (*Buddleja davidi*) and Winter Heliotrope (*Petasites pyrenaicus*) listed as a moderate impact invasive species. In the absence of mitigation measures there

is potential for the project to result in spread of these invasive species which will have the potential to result in negative impacts to areas that are subject to infestations.

6.6.2 Operational Phase

6.6.2.1 Designated Conservation Areas

Wastewater will be generated during the construction phase and operation phase of the project. Wastewater generated during both phases of the project will be directed to the existing combined sewerage network that services the project site and will convey wastewater to the municipal wastewater treatment plant at Ringsend. A pre-connection enquiry has been submitted to Irish Water, which in turn has confirmed the feasibility of a connection to the Irish Water network at the project site without the need for any network upgrades. Following treatment of wastewater at Ringsend, treated effluent will be discharged to Dublin Bay. Given the proposed wastewater treatment pathway and discharge location, the potential for this to function as a pathway between the project site and European Sites is examined as part of the Appropriate Assessment Screening report provided under separate cover.

6.6.2.2 Habitat Loss

The operation phase of the development will not result in any further habitat loss within the project site.

6.6.2.3 Impacts to Aquatic Habitats

The potential for indirect negative impacts to water quality and sensitive aquatic habitats and species supported by the Grand Canal will arise during the operation phase as a result of the discharge of surface water from the project site to this waterbody

No adverse impact regarding flooding downstream is anticipated, as flows are to be restricted to a maximum rate of 2 l/s/ha that is less than the greenfield runoff rate and significantly less than the pre-development – i.e., existing - conditions. A worst-case scenario is that minimal flooding may occur within site for a very intense rainfall event while volumes drain down. The time of year has a major bearing on the quality of stormwater runoff - in particular, the first rains after a prolonged dry period where accumulated deposits of rubber, particulates, oils, etc., are washed away. However, the impact from such runoff is likely to be slight due to the provision of intercepting devices and a fuel interceptor and the large volume of rainwater necessary to mobilise pollutants and runoff.

The existing volume of the wastewater drainage systems will increase the wastewater discharge rate from the site to the existing public combined sewer system. This rate rise on the public infrastructure has already been assessed by Irish Water as part of the Pre-

Commencement Enquiry process and confirmed as feasible without the requirement of upgrade works. i.e., no adverse impact.

There is the remote possibility that new wastewater sewers would leak, allowing wastewater to leak out of the sewers, potentially causing contamination of groundwater and surface waters in the area. In the absence of mitigation measures, these impacts are considered to be adverse, significant, and permanent. However, all pipes will be tested prior to allowing wastewater effluent to discharge to them, in accordance with the requirements of Irish Water.

There may also be the remote possibility of surface water ingress into the wastewater drainage system, which would increase the load on the existing sewers. However, all pipes will be tested and surveyed, in accordance with the Irish Water Code of Practice for Wastewater Infrastructure, prior to allowing wastewater effluent to discharge through the pipes.

The proposed development will result in an increase in water demand on the public water distribution network. The additional demand on the public water infrastructure has already been assessed by Irish Water as part of the Pre-Commencement Enquiry process and confirmed as feasible without the requirement of upgrade works.

As the existing site is currently predominantly in hardstand, the proposed development will result in no significant increase in surface water runoff volume or runoff rates. The primary land use of the existing site is surface car-parking, with a resultant risk of surface water runoff containing elevated hydrocarbons. There is potential for fuel or oil spillages and contaminants from vehicles to pollute surface water generated along hard surfaces within the project site. Run-off from these areas and car parking spaces can be impacted with residual hydrocarbon contaminants from fuel emission and tyres, sediment and trace contaminants like metals and organics and therefore represent a potential source of contamination that will have a pathway to the Grand Canal through the storm water drainage system. The proposed change from the existing scenario to the proposed development provides an inherent improvement for surface water.

The impacts on surface water discharge from the site are considered to be positive, significant, and permanent.

Further examination of the potential adverse impacts of the discharge of polluted surface water from the project site to European Sites is presented in the Appropriate Assessment Screening Report, provided under separate cover.

6.6.2.4 Disturbance to/Loss of Habitat for Terrestrial Fauna

The operation phase of the project will not have the potential to result in significant disturbance to non-volant terrestrial mammals. However, it is noted that no breeding sites or resting places of protected terrestrial non-volant mammals such as badgers or otters were noted within or immediately adjacent to the project site.

6.6.2.5 Impacts to Birds

The operation phase of the project is not predicted to have the potential to result disturbance to protected terrestrial non-volant mammals or bird species.

6.6.2.6 Impacts to Bats

Public lighting will be provided as part of the operation phase of the project. The proposed lighting design for the project has been reviewed with particular attention being given to the Grand Canal to the south of the project site, which represents moderate quality bat foraging habitat. Following this review it is noted that the project will not result in changes to the existing night time light conditions in adjacent areas, and particularly the Grand Canal.

The outdoor lighting plan for the project (prepared by JIN2) is provided under separate cover with the planning application documentation. The lighting plan shows that the 1 lux contour around lighting at the south of the site will be located within the project site. This indicates that the current light conditions will be maintained to the south of the existing southern boundary. As such the lighting design for the project will not have the potential to result in significant negative disturbance to bat species.

6.6.2.7 Spread of Invasive Species

For reasons outlined in Section 11.6.1.17 below there will be no risk of the project resulting in the spread of non-native invasive plant species during the operation phase.

6.7 Mitigation Measures

The effective implementation of mitigation measures outlined in the following sections shall ensure that a best practice approach to minimising ecological disturbance during the construction phase is achieved and that the design of the project avoids significant effects to surrounding biodiversity receptors.

6.7.1 Demolition Phase

In all cases, the most efficient and environmentally sensitive methodologies will be used in the demolition process. The main demolition works will comprise removal of the 10 No. existing industrial warehouse units and all associated ancillary structures and walls. The site

will also be cleared of all organic material along with all existing hardstanding for internal paths and roads. The industrial units are predominately single storey steel frame buildings, and it is expected that these will be demolished using plant machinery from ground level to avoid personnel working near, or within, the building during the demolition process. The removal of certain parts of the structure during demolition will be implemented in a manner that does not compromise the structural stability of the remaining structure, which could otherwise create a health and safety hazard. Waste materials will be grouped and segregated for removal off site to an approved licenced disposal/recycling facility. In this respect, reference is made to OCSC's Outline Resource Waste Management Plan (RWMP) prepared and submitted as part of this planning application. All measures set out in the RWMP, as well as additional measures required as a result of planning conditions imposed by the Board, will be contained in the final CDWMP. The demolition will include the soft strip out and removal of any hazardous material.

Habitat disturbance during construction work will be confined strictly to within the direct land-take of the proposed scheme.

Construction machinery will be restricted to site compound and the footprint of the proposed scheme. The bulk of all material required for the construction phase will be stored at the proposed construction compound which will be situated on existing made ground that is serviced by existing surface water drainage network. The contractor is to place site compound and storage areas as far as reasonable away from the canal corridor to minimise interaction and mitigate the risk of any potential pollutants entering the canal.

6.7.1.1 Measures to Minimise impacts to breeding birds

Where possible vegetation to be cleared onsite will be completed outside the nesting bird season between 1st March and 31st August inclusive. Where it is not possible to time such works outside these months then a survey of tree vegetation for the presence of nesting birds should be completed prior to the commencement of the construction phase by an experienced ecologist. In the event that nests are identified in tree vegetation their clearance/removal will be postponed until the after the nest sites are abandoned. In the event that it is not possible to postpone such works, then they will only be allowed to proceed following consultation with the NPWS, and where required, upon receipt of a licence from the Department/NPWS permitting the destruction of the nests.

Measures will be implemented to minimise noise emissions and disturbance to birds during the construction phase. Chapter 13 of this EIAR outlines the measures to be implemented to minimise noise emissions during construction.

6.7.1.2 Measures to Manage Surface Water Runoff

Measures required to manage surface water runoff from the project site during the construction phase and to thereby avoid the potential for pollution to watercourses in the wider surrounding area have been detailed in Chapter 8 of this EIAR. These measures are also reflected in the Draft Construction Environmental Management Plan (CEMP) that has been prepared for the project. Provided all these measures are implemented the project will not result in the release of polluted surface water to watercourses in the wider surrounding area.

6.7.1.3 Avoid the Spread of Non-Native Invasive Plant Species

A Non-native invasive plant species management plan has been prepared for the project, and is provided under separate cover as part of the planning application documentation. All elements of this plan will be implemented during the pre-construction and construction phase of the project. Provided all measures outlined in this plan are implemented all non-native invasive plant species will be eradicated from the project site and the construction phase of the project not have the potential to result in spread of these species.

6.7.2 Operational Phase

6.7.2.1 Landscaping & Habitat Replacement

Enhancement tree planting will be undertaken as part of the proposed landscaping within the project site.

- Nature: Biodiverse ground planting and Tree canopy providing green buffer between canal and buildings
- Feature trees / mounds at key urban nodes

The planting proposal is a mix of 60% natives and 40% non-natives (the latter for seasonal interest and extended nectar seasonality).

The trees will include *Prunus avium* & *Quercus petraea* as well as *Quercus coccinea*, *Tetradium danielli* / *Heptacodium miconiodes* (for provision of late season nectar). The understorey will have a mix of grasses and ferns with Helleborus, Primula (including Primula versis and P.officinalis) Rosmarinus, Rosa moyesii, Rosa canina, & Fruhlingsmorgen, Rodgersia, Iris sibirica, Digitalis, Delphinium, Lupinus & Hosta. Many of the non-natives here will be pollinator friendly.

There will be smaller spot plantings of *Magnolia*, *Amelanchier*, *Syringa*, *Philadelphus*, *Caryopteris* and *Ceratostigma* as well as some bigger ornamental clumps herbaceous clumps of *Cynara*, *Inula*, *Filipendula*. Figure 6.4 below shows the landscape plan for the development.

Wildflower and sedum roofs are also proposed as part of the development, please see Figure below for roofs proposed for these treatments. The total area of biodiverse roof is 2572.211m². The areas proposed for wildflower planting mix is 1934.772m² and the area proposed for sedum planting is 637.439m².

Figure 6-4 Roof plan showing sedum and biodiverse roofs



Ecological enhancement measures including bird boxes, bat boxes, insect hotels and leaf litter piles will be provided within the landscaping areas surrounding development and on the biodiverse roofs. Location and specification of bird nesting and bat boxes will be confirmed at the detailed design stage.

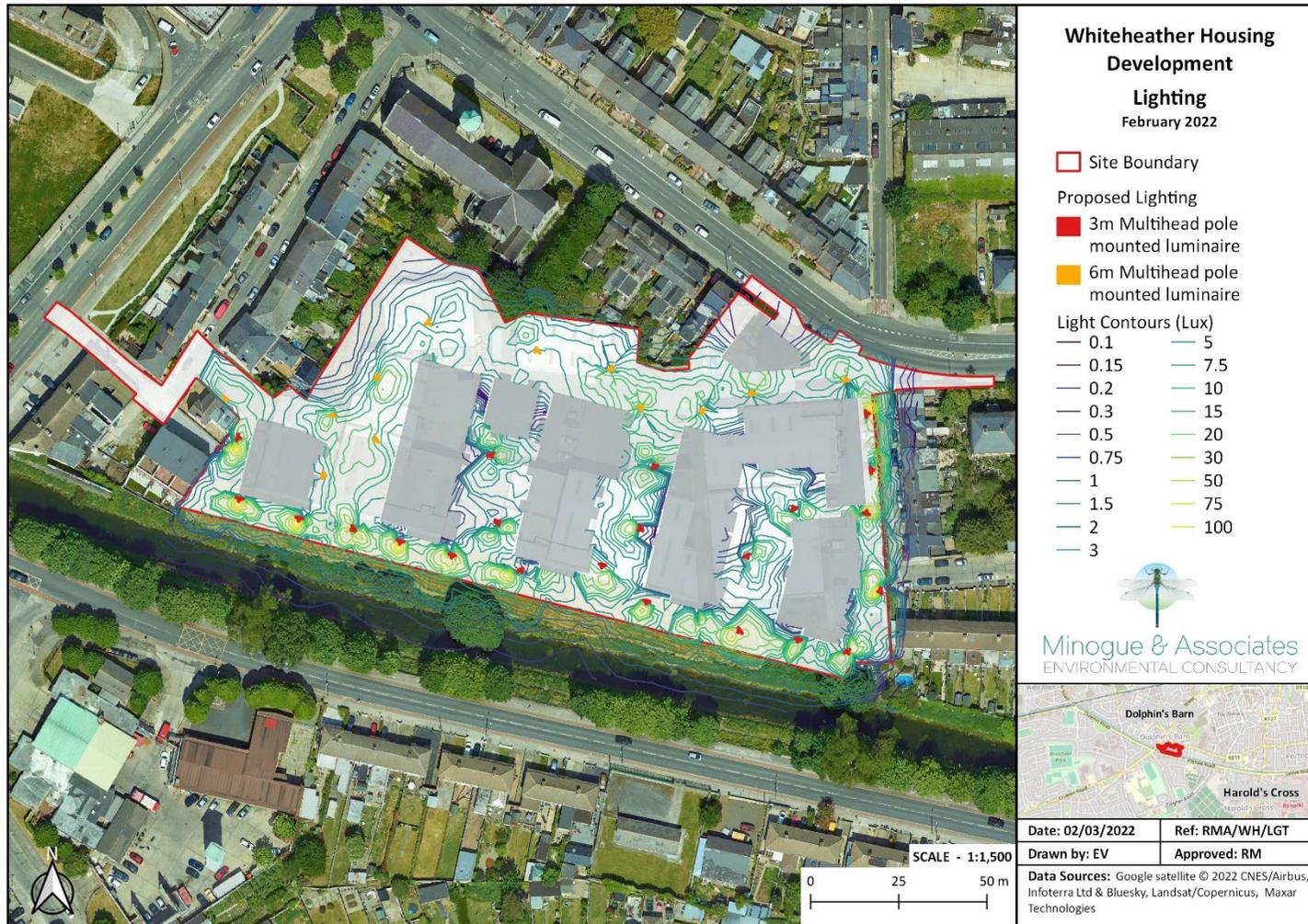
It is further recommended that to increase biodiversity benefits of the sedum and biodiverse roofs, additional species be included in the mix. These can include native sedum species and provide for small mounds for insects. The Moy Materials Irish Native Biodiverse Extensive Green Roof System may be most appropriate in this regard.

6.7.2.2 Measures to Minimise impacts to Bats

The lighting design in the vicinity of habitat features that offer suitable foraging bats, such as the Grand Canal south of the project site has been prepared in line with best practice measures for minimising the impacts of artificial lighting to bats, as detailed in the Institute of Public Lighting 2018 guidance document Bats and Artificial Lighting in the UK. Any light spill affecting the use of habitats outside of the proposed development site by bats will be avoided, particularly along the Grand Canal.

This lighting plan aims to limit lighting and light spill on to these habitats to ensure that optimum foraging conditions, that include unlit and low artificial light spill over the Grand Canal are provided for bats such as Soprano pipistrelle, Common pipistrelle and Leisler's bat. The Lighting Plan has been reviewed by the ecological team and confirms the lux levels along the Grand Canal corridor range from 0.1lux at the water corridor to 3 lux at the development plan boundary. Within the development boundary, lighting shall be installed only where necessary for public safety, with directional illumination and to the minimum lux level consistent with this need.

Figure 6-5 Lighting map – updated map to be prepared this pm (1/3/2022)



6.7.2.3 Measures to Manage Surface Water Runoff

A surface water management design has been prepared for the project and will be implemented for the operation phase. The network has been designed in accordance with the GDSDS and incorporates onsite attenuation, full hydrocarbon and silt interceptors, hydrobrakes and the discharge of surface water from the project site at green field runoff rates.

Filter Drains, pervious paving, green roofs, SuDS Tree Pits, intensive landscaping, will assist in reducing runoff volume and improving water quality.

Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.

All surface water drains and sewers/ wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to groundwater on the site.

The use of Class 1 fuel separators will reduce the amount of silt and grits present in the undercroft car park wash before discharge to the wastewater network and any contaminating pollutants, such as hydrocarbons, oils and grease.

Table 6-6 Summary of Mitigation Measures

Mitigation Measures
Demolition and Construction Phase
Measures to Minimize Impacts to Breeding Birds
Measures to Manage Surface Water Run Off
Measures to Avoid the Spread of Non Native Invasive Species
Operational Phase
Landscaping and Habitat Replacement
Measures to Minimize Impacts to Bats
Measures to Manage Surface Water Run off

6.8 Predicted Residual Impact of the Proposed Development

6.8.1 Construction Phase

During the construction phase of the project there will be some potential for negative

impacts biodiversity as a result of habitat loss, disturbance and the potential for emission of polluted surface water from the project site to the Grand Canal as well as dust and noise emissions.

The implementation of the mitigation measures outlined in this chapter as well as in Chapter 8, 9 and 11 of this EIAR and the accompanying Draft CEMP will ensure that the impacts are minimised and will not result in significant adverse impacts to biodiversity receptors.

The residual impact from construction is as follows. The implementation of the measures outlined in the Non-native Invasive Plant Species Management Plan will result in the eradication of invasive plant species infestations at the project site which will represent a positive impact for biodiversity

Table 11.3: Construction Phase Residual Biodiversity Impacts

Quality	Significance	Duration
Negative to Positive	Minor	Short-term

6.8.2 Operational Phase

The development is being designed to a high standard with:

Landscape

- Nature-based solutions for surface water management being incorporated into the surface water management design that include SuDS tree pits, green roofs and biodiverse roofs which will provide pockets of habitat for invertebrates and pollinators;
- A SuDS-based surface water management design that includes attenuation, hydrocarbon and silt interception, hydrobrakes and greenfield runoff rates; and
- A lighting design that minimising light spill and avoids light spill in sensitive habitats to the north of the project site.
- With the implementation of these design measures and all mitigation measures anticipated residual impact from the operational phase of the development is summarised as follows.(TBC)

Table 9.4: Operational Phase Biodiversity Impacts

Quality	Significance	Duration
Negative	Not Significant	Permanent

6.8.3 'Do Nothing' Scenario

The existing biodiversity at the project site will remain unchanged in the short term. Under the Do Nothing scenario the existing principal habitats of built land and artificial surfaces would continue to exist. The grassland habitat adjacent to the Grand Canal will be mown under the current management regime. If not mown the grassland may become increasingly rank over time. Scrub will establish over time subject to no management regime and the stand of *Buddleja davidii* will continue to spread adjacent to the site boundary at the bank of the Grand Canal pNHA and throughout the site. The unmanaged area of grassland at the eastern boundary may transition to scrub over the medium to long term.

6.9 Monitoring

6.9.1 Construction Phase

Surface water monitoring is proposed during construction of the development. Regular sampling of the Grand Canal shall be carried out from the same upstream and downstream locations during the construction period. Weekly sampling is proposed as well as additional sampling following an event such as heavy rainfall or an accidental spillage.

Analysis for total suspended solids, pH and total petroleum hydrocarbons would allow for the detection of sediment loading, concrete pollution or spillages of hydrocarbons.

Qualitative and quantitative monitoring will be carried out of any water to be discharged to the combined sewerage during the construction and operation phases. This will include any flow monitoring and regular sampling and analysis programme as required under any Discharge Licence. Further details are provided in Chapter 8 of this EIAR.

Monitoring of dust and noise shall also be carried out as proposed in the relevant chapters of this EIAR.

On-site pre-treatment of groundwater prior to discharge to sewer may be required dependent on groundwater chemistry results. Any water discharged to the public sewer will be monitored frequently to ensure it meets the limits stipulated by the discharge licence.

Record keeping and monitoring of the import and export of soils shall be carried out in accordance with the Waste Management Acts. All waste hauliers and receiving facilities shall be required to hold valid permits in accordance with the Waste Management Acts and regulations made thereunder.

A project ecologist or other person experienced in implementing invasive species management plans shall oversee the implementation of these measures during the treatment and removal of these species from the project site.

6.9.2 Operational Phase

A landscaping contractor will be appointed to monitor and maintain the landscaping on site during the operation phase.

Monitoring of pollinator species in the proposed development site in years 1, 3 and 5 post-completion.

Monitoring of bat activity along the Grand Canal in years 1 and 3 post completion.

6.10 Reinstatement

The landscape masterplan has identified additional tree and hedgerow planting throughout the project site.

6.11 Interactions

During the construction phase, the following aspects would interact with biodiversity, in the absence of mitigation, may give rise to likely significant effects;

- Land & Soils: works during the construction phase have the potential to impact the water resources with risk of surface water run off, suspended solids and potential effects on the habitats and species associated with the Grand Canal adjacent to the project site.
- Noise and Air: works during the construction phase have the potential to give rise to increases in noise and air emissions with impacts on air quality, water quality and disturbance to species during daytime hours.

The potential significant impacts on biodiversity arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

6.12 Potential Cumulative Impacts

6.12.1.1 Construction Phase

The phasing/commencement of any other permitted developments in the locality could potentially result in the scenario where a number of other construction sites are in operation at the same time as the proposed development. The location of any other nearby construction sites in relation to each other and to nearby biodiversity receptors including fauna such as birds and mammals and freshwater habitats supported by the Grand Canal, will have the potential to combine to result in a cumulative risk of impacts due to cumulative loading of noise disturbance to fauna or sediment and wet concrete in surface water runoff to the river. There is a general low risk of cumulative impacts resulting in significant negative noise disturbance effects to fauna in the area.

The potential for cumulative impacts to the Grand Canal and the freshwater habitats and species supported by it have been examined. It is concluded that Dublin Bay is not at risk of likely significant effects from the project due to:

-
- the low volumes of water runoff discharging to the receiving Grand Canal from the project site which will facilitate dilution of any potentially polluting surface water runoff locally within canal;
 - the minor fraction of freshwater flows that the Grand Canal contribute to the overall freshwater flows to the Liffey Estuary and Dublin Bay. This minor ratio will facilitate thorough dilution of any potentially polluting surface water entering the Grand Canal and the Liffey Estuary downstream at Dublin Bay; and the known potential for freshwaters inputs to the Liffey Estuary to rapidly mix and assimilate pollutants such that there is no perceptible impact to the water quality of the outer estuary and Dublin Bay.

The examination also found that the discharge of wastewater from the project site during its construction phase and operation phase will not have the potential to negatively affect the water quality of the transitional/coastal waters. As such the wastewater pathway to Dublin Bay does not have the potential to function as an impact pathway and the discharge of wastewater from the project site will not result in likely significant effects to Dublin Bay.

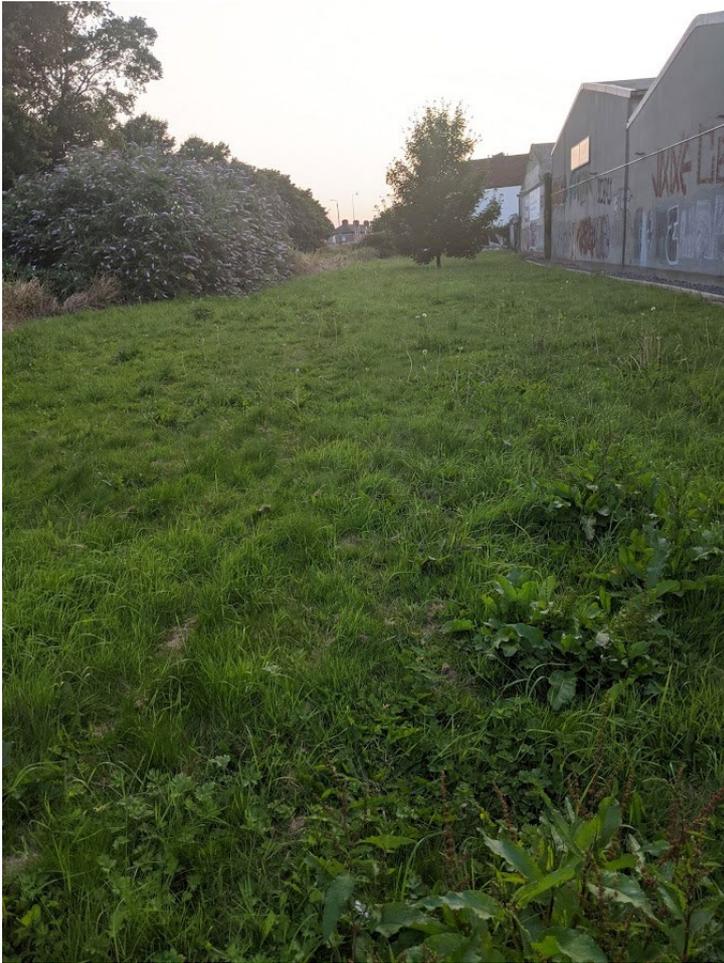
6.12.2 Operational Phase

The operational phase of the project will not have the potential to result in significant noise emissions and as such there will be no potential for this phase of the development to result in cumulative negative impacts to biodiversity receptors as a result of noise emissions.

The lighting design for the project has been prepared to ensure that light spill in sensitive locations to the south of the project site along Grand Canal is avoided. In light of this the project will not have the potential to combine with other projects to result in cumulative light pollution in these areas to the north of the project site.

The surface water management design for the project will ensure that the project will not have the potential to result in the discharge of contaminated surface water to the Grand Canal and this will eliminate the potential for the project to combine with other sources of surface water pollution to the Grand Canal.

View West along industrial estate boundary and Grand Canal. Note presence of *Buddlia davidii*



View south showing elm growing on canal bank



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Chapter 7. Land & Soils

7. Land & Soils

7.1 Introduction

This Chapter was completed by O'Connor Sutton Cronin and Associates Limited and assesses the likely and significant impacts associated with the proposed mixed-use development on the geological and hydrogeological environment.

The following topics will be assessed in this chapter of the EIAR:

- Subsoil and Bedrock
- Hydrogeology

This chapter provides a description of the project (in connection with soils, geology, and hydrogeology); the baseline soils, geology, and hydrogeology for the project site; and a statement of the likely significant impacts associated with both the construction and operational phases of the development. A 'do nothing' scenario has also been considered. Mitigation measures are proposed in the form of avoidance, prevention, reduction, offsetting, and reinstatement or remedial measures, and recommendations for monitoring are included where appropriate predicted residual effects are described.

Assessments for the Site are detailed in this Chapter with relevant technical information included in the following standalone reports:

- OCSC (2022) Outline Resource Waste Management Plan
- OCSC (2022) Outline Construction Management Plan

7.1.1 Author Information

The primary author, Glenda Barry has a Bachelors Degree in Geosciences and a Masters in Environmental Marine Science with over 30 years experience in environmental consultancy. The secondary author Eleanor Burke, has a Bachelor of Science in Environmental Science and Master's in Environmental Sciences with over 20 years' experience in ground and contaminated land investigations in Ireland and the UK.

Example projects include:

- An Post Sorting Depot, Cardiff Lane & Hanover Street East, Dublin 2: development of a brownfield site permitted under planning Reg. Ref. DSDZ2457/16 'the parent permission'.
- 20-24, Sir John Rogerson's Quay (A Protected Structure), 25-27 Sir John Rogerson's Quay, 1-5 & 12-13 Lime Street, Lime Court & Hanover Street East, Dublin 2: development of a brownfield site permitted under planning Reg. Ref. DSDZ2607/16.
- Connolly Station: Blocks A, E and D3 (Reg. Ref. 2723/20), to create a new urban quarter beside Connolly Station in Dublin 1.

The authors have also completed numerous Land and Soils Chapters for similar residential and commercial schemes and is therefore suitably qualified and experienced to undertake this assessment.

7.2 Consultation

Proposed Development

This application relates to a proposed primarily residential development on a 1.443ha site located in Dolphins Barn, Dublin 8 as shown in Figure 7.1. A full description of the proposed development is set out in Chapter 2 of Volume II of this EIAR.

Figure 7-1 Site Location



Source: Ordnance Survey Ireland

Permission is sought by U and I (White Heather) Limited for a Strategic Housing Development at the White Heather Industrial Estate, South Circular Road, Dolphin's Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James's Terrace. The 1.443ha site is bounded by the Grand Canal to the south; Our Lady of Dolours Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west. Permeability is a key feature of the proposed pedestrian realm, including a mix of dedicated and shared surface areas through the Site with a c. 190 m continuous amenity strip along the Grand Canal Linear Park.

The new residential neighbourhood development will be comprised of 7 no. blocks with 335 no. proposed units including a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, a terrace of 3-bedroom townhouse units, and a change of use of an existing residential building at 307/307a South Circular Road for use as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys. The proposed site layout is shown in Figure 7.2.

Figure 7-2 The proposed development overview (OMP)



Source: OCSC Engineer Services Report

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the Site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

Ancillary development works include decommissioning existing telecommunication, electrical and gas supply infrastructure, plant rooms, waste storage areas, drainage, landscaping, and lighting.

7.2.1 Aspects relevant to this Chapter

The activities associated with the project which have the potential for impact are detailed in Table 7.1.

Phase	Activity	Description
Construction	Discharge to Ground	Run-off percolating to ground at the construction site.
	Earthworks: Excavation of Superficial Deposits	Limited excavation will take place at the Site for the provision of building foundations and the installation of piles with additional excavation required for the one storey covered carpark under blocks B02 and B03.
	Storage of Hazardous Material	Fuel for re-fuelling on-site machines and chemical storage (such as for concrete curing) during the construction phase.
	Import/Export of Materials	All suitable surplus subsoil, if any exists, will be exported for reuse off Site to a reuse site subject to the requirements under the Waste Management Act (e.g. Article 27 or 28). Where material cannot be reused, it will be recovered or disposed of in accordance with the Waste Hierarchy and Waste Management Act. Limited excavation will take place at the Site for the provision of building foundations and for the installation of piles. Additional excavation will be required for the one-storey covered carpark under blocks B02 and B03. Total Volume anticipated from this element is in the region of 10,000 tonnes. Aggregates will be required for sub-base under roads and buildings. All sub-base materials must meet the relevant engineering specifications. The use of recycled or secondary aggregates should be considered as a replacement for primary aggregates.
Construction and Operation	Construction of sub-surface structures	Excavations will be in the region of 2meters below ground level (mbGL) to facilitate the construction of the undercroft carpark. Local excavations may extend deeper. It is not considered that the construction at this depth will impede groundwater flow.
	Infilling	A degree of fill will be required during the works which will include the importation of concrete and stone. Construction materials which contain recycled/recovered content should be considered as part of the procurement stage.
Operation /Unplanned Events	Drainage Works	Altering of groundwater/surface water regime by drainage, increasing hard standing area and an underground carpark.
	Storage of hazardous Material	No fuel oil storage required for operational phase. All heating will be provided by natural gas systems.

Table 7.1 Site Activities Summary

As outlined in Table 7.1, the Construction Phase holds the highest number of activities which could potentially impact on the geological and hydrogeological environment. These activities primarily pertain to the excavation and infilling activities required to construct the undercroft carpark. The operational phase of the project has very few if no activities which would constitute a risk to the soil, geological, and/or hydrogeological environment.

7.3 Methodology

7.3.1 Scoping

The assessment has been carried out generally in accordance with the following guidelines:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports DRAFT (EPA, August 2017);
- Advice Notes for preparing Environmental Impact Statements DRAFT (EPA, September 2015);
- Guidelines on information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003);
- Guidelines for the preparation of Soils, Geology, and Hydrogeology chapters of Environmental Impact Statements (IGI, 2013);
- Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology, and Hydrogeology for National Road Schemes (NRA 2009);
- Control of Water Pollution from Construction Sites (CIRIA, 2001); and
- Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000).

The assessment followed a phased approach as outlined in Chapter 4.4 of the Advice Note (EPA, 2015) and the Institute of Geologists of Ireland (IGI) Guidelines (IGI 2013). A Conceptual Site Model (CSM) was developed to identify any likely Source-Pathway-Receptor linkages relating to the Site and the proposed development. The phases of assessment are outlined below.

7.3.2 Detailed Methodology

7.3.2.1 Phase 1: Initial Assessment

An initial assessment was carried out which defined the project in terms of location, type, and scale; established the baseline conditions; established the type of soil/geological

environment; established the activities associated with the project; and determined potential impacts.

These objectives were achieved by way of a geological desk study and baseline data collection. A full list of sources for the desk study together with relevant legislation are included in Section 7.12 and are briefly listed below:

- Ordnance Survey of Ireland maps;
- Geological Survey of Ireland Groundwater and Geotechnical mapviewer;
- Environmental Protection Agency Envision Maps; and
- National Monuments Service maps.

Additional information has been compiled through consultation and feedback from the project/EIAR Team.

The information obtained from the above listed sources were utilised to establish the baseline conditions for the Site, and all available information was compiled into a preliminary CSM. The CSM is based on the accepted Source-Pathway-Receptor model for assessing environmental impacts. The CSM went through iterative reviews and was updated with site specific data obtained through site investigations and studies.

7.3.2.2 Phase 2: Historic Site Investigations and Studies

Two site investigations are known to have been undertaken on the Site: one conducted by IGSL in September to November, 2007 and one conducted by IGSL in June, 2010. The 2010 investigation was undertaken on behalf of An Post and, therefore, only focused on the eastern site boundary and the southeast corner of the Site. Although more extensive works were undertaken during the 2007 investigation, a figure showing investigation locations was not included with the report.

The 2007 Phase 2 intrusive investigation included the following:

1. 3 No. cable percussion boreholes;
2. 2 No. air rotary boreholes;
3. 4 No. trial pits;
4. 3 No. soil samples collected and analysed for chemical properties;
5. Logging and sampling of borehole arisings;
6. Analysis of a selection of samples for geotechnical.

The report also references the undertaking of standard penetration tests and installation of standpipes in the air rotary boreholes and the subsequent monitoring of gases, the results of which were to be issued in a subsequent report. However, OCSC did not have access to this additional information.

The 2010 Phase 2 intrusive investigation included the following:

1. 1 No. cable percussion boreholes;

2. 2 No. trial pits;
3. 2 No. standard penetration tests;
4. 1 No. percolation test; and
5. Logging and sampling of borehole arisings.

7.3.2.3 Phase 2: Refinement of the Conceptual Site Model

Throughout the desk-based study, the CSM was continually updated, tested, and refined. The outcome is presented in this Chapter along with associated figures.

7.3.2.4 Phase 2: Detailed Assessment and Impact Determination

A Detailed Assessment and Impact Determination was carried out which incorporates the full range of site investigations and studies, the refined CSM, and a full assessment of any potential impacts.

The approach adopted is as per the IGI Guidelines (IGI, 2013), and each potential effect of the White Heather application has been described in terms of Quality, Significance, Extent, Probability, and Duration. The classification of impacts/effects in this chapter follows the definitions provided in the Draft Guidelines (EPA, 2017).

Additional guidance and EIA definitions are contained in NRA Guidelines (NRA, 2009). These guidelines provide useful matrices outlining how additional assessment criteria based on the importance of a feature to be protected and the magnitude of the potential impact. This approach has been adopted where appropriate.

Where the Initial Impact Determination concluded that the level of potential impact is capable of measurable and noticeable consequences, it is carried into the next assessment phase.

7.3.2.5 Phase 3: Mitigation, Residual, and Final Impact Assessment

Phase 3 builds on the outcome of the initial assessment and detailed site assessments by identifying mitigation measures to address the identified impacts. Mitigation measures which are known to be effective have been built into the project design and have been considered in this process. The development, including all identified mitigation measures (assumed implemented), is then subject to impact assessment to identify any residual impacts.

The Final Impact Assessment presented in this Chapter incorporates the outputs from the Detailed Assessment and Impact Determination, Mitigation Measures, and Residual Impact Assessment.

7.3.2.6 Phase 4: Completion of the EIAR Section

The final phase of work was the completion of this EIAR Section with associated Figures and Appendices. The format follows the EPA Guidance Note and Design Team Template.

7.3.2.7 Assumptions and Limitations

The description of existing conditions is based on the available desk study information supplied by the design team.

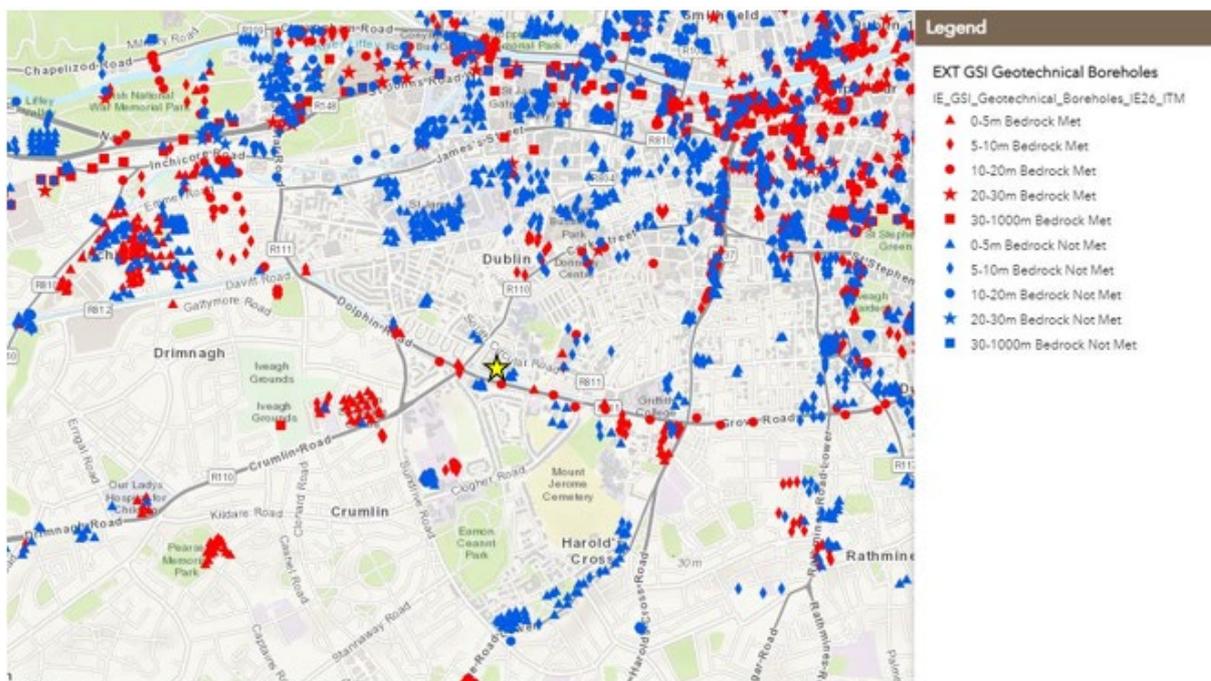
7.4 Receiving Environment

The receiving environment is discussed in terms of geomorphology, superficial and solid geology, contamination, and hydrogeology. This section and the accompanying Figures can be considered as the geo-environmental CSM for the project site.

7.4.1 Sourcing Baseline Information

The Site is in Dublin city centre which has been well studied with regards to geology, including the properties and characteristics of the soil, subsoil, and bedrock. There are also a number of case histories available for subsurface development/structures in the general area (Looby & Long, 2007; Long et al., 2012). See Figure 7.3 for geo-environmental site investigation locations within the Dublin area region.

Figure 7-3 Site Investigation Locations



Source: GSI Database

Additional sources of information were databases held by the Geological Survey of Ireland (GSI), Environmental Protection Agency (EPA), Ordnance Survey of Ireland (OSI), and National Parks and Wildlife Service (NPWS).

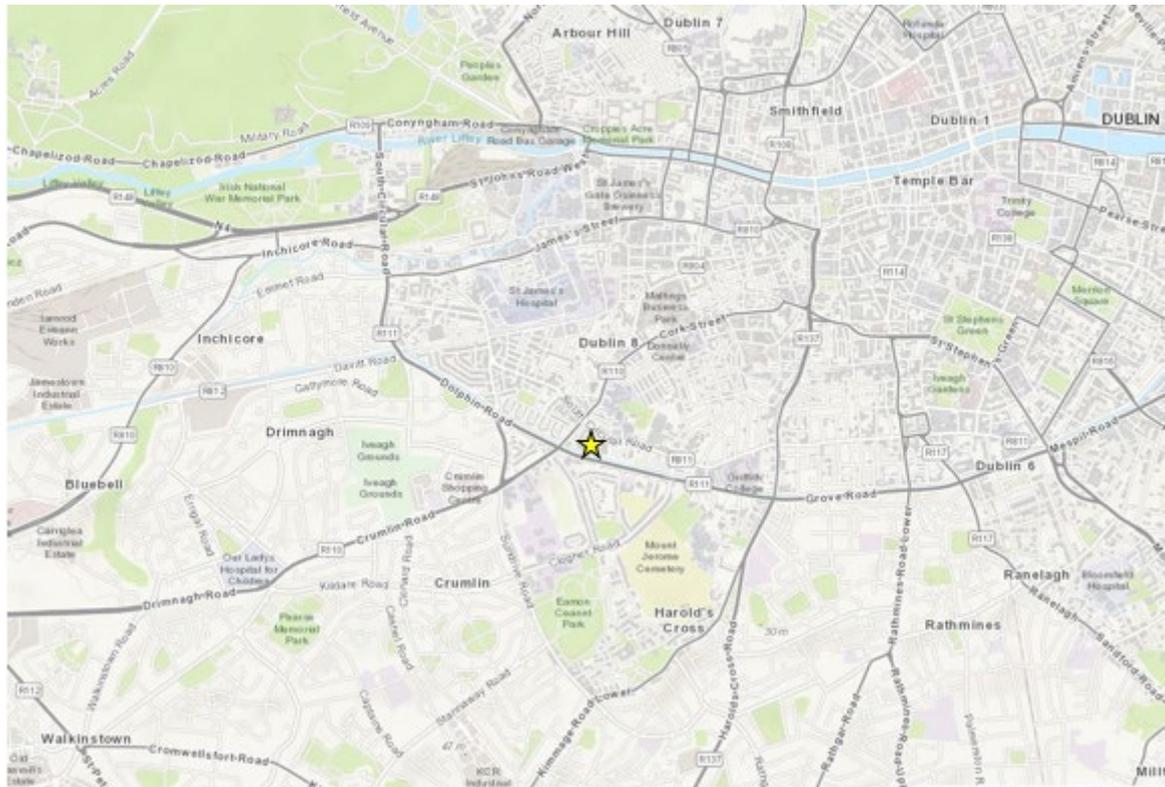
A full list of references is included in Section 7.12 of this Chapter.

7.4.2 Topography & Setting

The regional topography of the area is generally flat and urban.

According to DCC's Development Plan 2016-2022, the Site is located in the Local Authority Zone of Z6 – Enterprise/Employment, central area site. The Local Authority Zone description for the Site is 'To provide for the creation and protection of enterprise and facilitate opportunities for employment creation'. The regional site location is illustrated in Figure 7.4.

Figure 7-4 Regional Site Location



Source: GSI Database, 2022

As shown in Figure 7.4, the Site is located within an urban area which development is becoming increasingly suburban with residential and light industrial areas to the south and west. The Site is bordered by the South Circular Road, houses, and Our Lady of Dolours Church to the north; houses, the Barn House pub, St. James's Terrace, and the R110 to the west; the Grand Canal and Parnell Road to the south; and Priestfield Cottages, Priestfield Drive, and a vacant industrial site to the east. The adjacent land uses are listed in Table 7.2 below.

Boundary	Land use
North	Residential properties, a church, and the South Circular Road
South	The Grand Canal and Parnell Road
East	Residential properties and Priestfield Drive
West	Residential properties, a pub, and the R110

Table 7-2 Adjacent Land Uses

7.4.3 Areas of Geological Interest & Historic Land-Use

The Geological Survey of Ireland (GSI) online mapping service was consulted regarding areas of geological interest near the Site. The nearest area of geological heritage is the 'River Poddle' which is located approximately 0.9km east of the Site at its nearest point. The River Poddle is classified as a County Geological Site (site code DC011) and flows northwards through Dublin to where it joins the River Liffey. The majority of its course within the city is diverted underground including in the section nearest to the Site where it flows beneath Clanbrassil Street Lower. This feature is important historically due to its subsurface channelisation, making it very unusual in Ireland, but due to the derivation of the Dublin placename and in the lore associated with the Poddle. A large, dark pool once existed at the confluence of the rivers Poddle and Liffey. This pool was described in Irish as dubh linn, which means dark pool or black pool. The city name, Dublin, is an anglicisation of this Irish phrase.

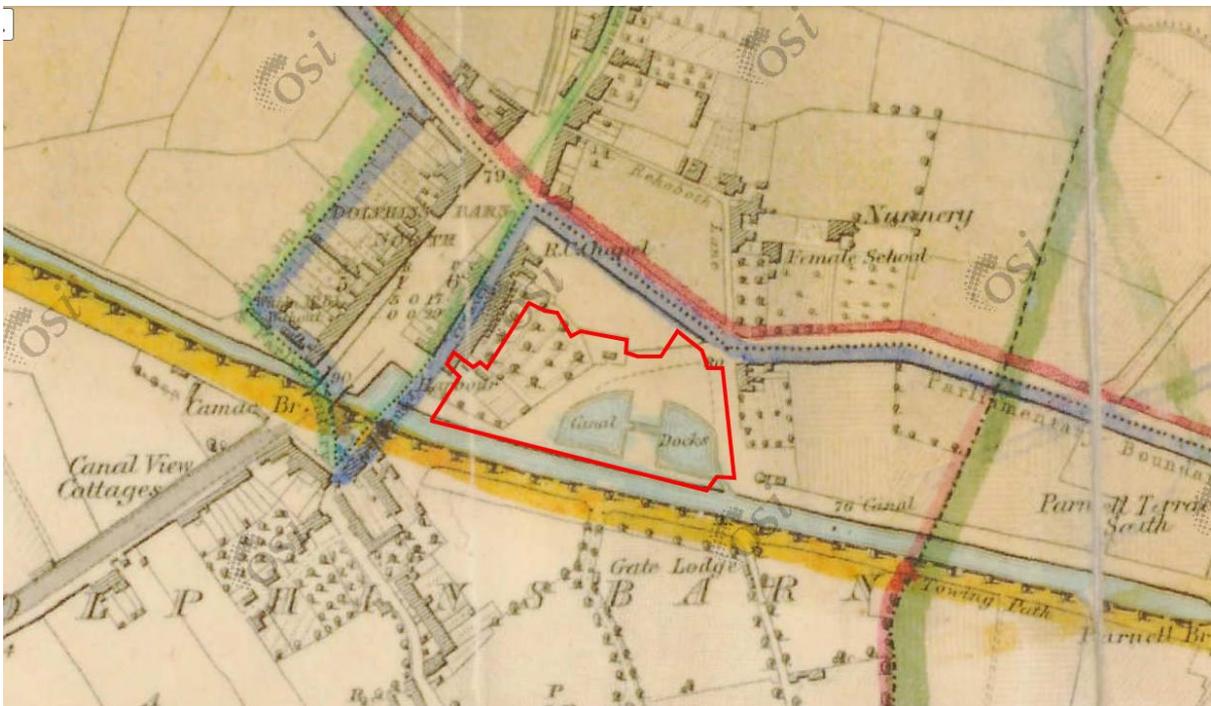
The assessment of impacts on the cultural heritage from the proposed development is detailed in built heritage, chapter 14. Given the distance from the Site to the River Poddle and its channelisation at its nearest point, it is considered to be outside of the zone of influence of the proposed development in relation to land and soils.

Google Earth aerial images of the Site from 2003 to July 2008 show the western and southeast portions of the Site developed to approximately its current configuration. Greenspace was located on the central portion of the Site, and a large warehouse type building was located on the northeastern portion of the Site. By September 2008 this warehouse had been demolished and the greenspace cleared. By May 2009 these areas had been redeveloped with two new warehouse type buildings and associated parking and access space. The site layout remained largely unchanged from that time until the 2021 aerial photograph which shows site conditions similar to those at present. Currently, the Site is occupied by up to 10 No. industrial warehouse units and ancillary office structures. Some of the occupiers of the industrial units comprise An Post Dublin 8 Delivery Office, Building Staff Solutions Dublin, and Storage World Self Storage.

The internal hardstanding area of the Site measures approximately 4800m² and is predominantly used for car parking. There is very little to no soft landscape areas on the existing Site except for the Grand Canal embankment along the southern site boundary.

The OSI 6" historical map (1837-1842) shows an inlet from the canal at the southeast corner of the Site. This led to two basins and canal docks which were located on the central and eastern portions of the Site. The western portion of the Site appeared to be occupied by gardens. To the north of the Site were a Roman Catholic chapel, a female school and nunnery, residences, and open space. To the south were the Grand Canal and towpath, residences, and open space. To the west were residences, and to the east were limited residential areas and open space as shown on Figure 7.5.

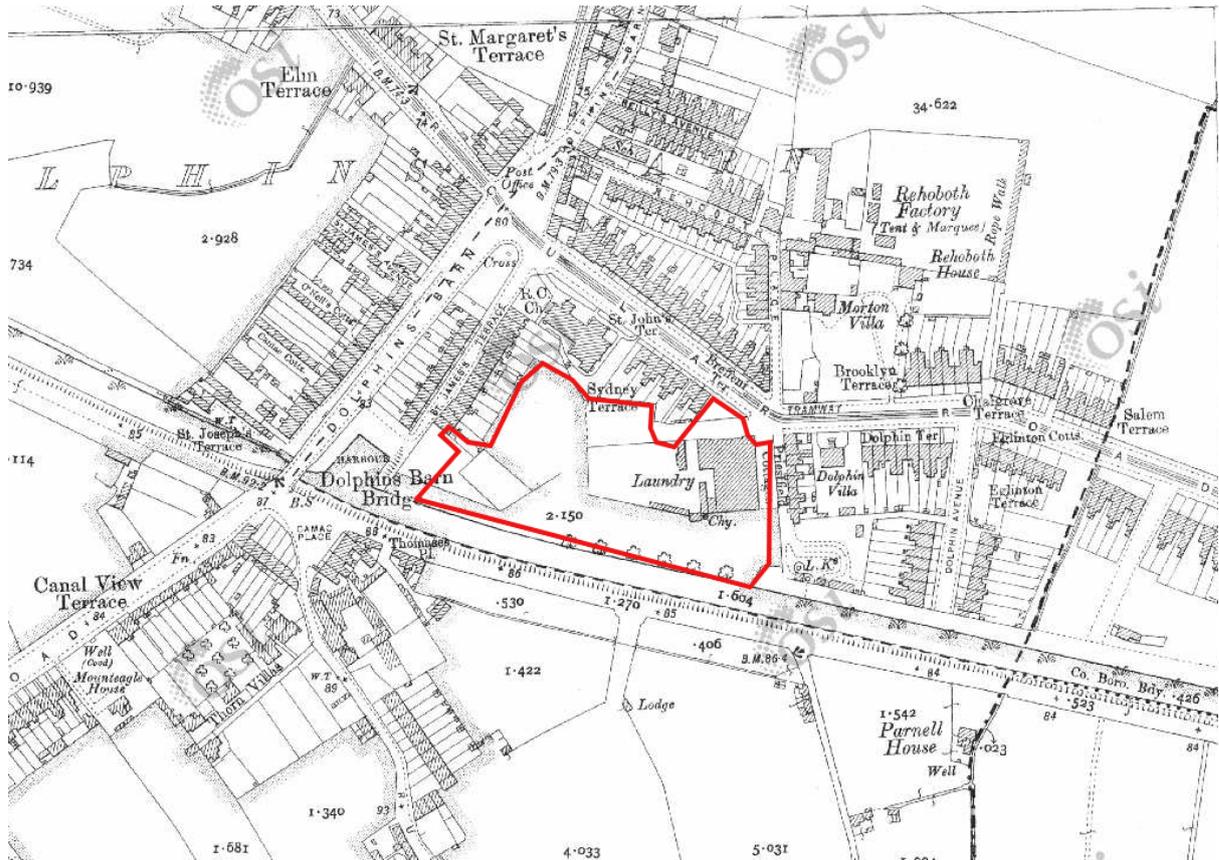
Figure 7-5 Location of the proposed development on Historic 6 Inch (1837-1842) OSI Map



Source: Ordnance Survey Ireland

The historic 25-Inch Map (1888-1913) indicates that the canal basins had been infilled and the Site developed with one large and several smaller buildings on the eastern portion of the Site. These buildings were in use as a laundry. Extensive residential development of land had occurred to the east, north, and southwest of the Site along with construction of Our Lady of Dolours church to the north. Construction of Rehoboth Factory (Tents & Marquees) have occurred to the northeast as shown on Figure 7.6.

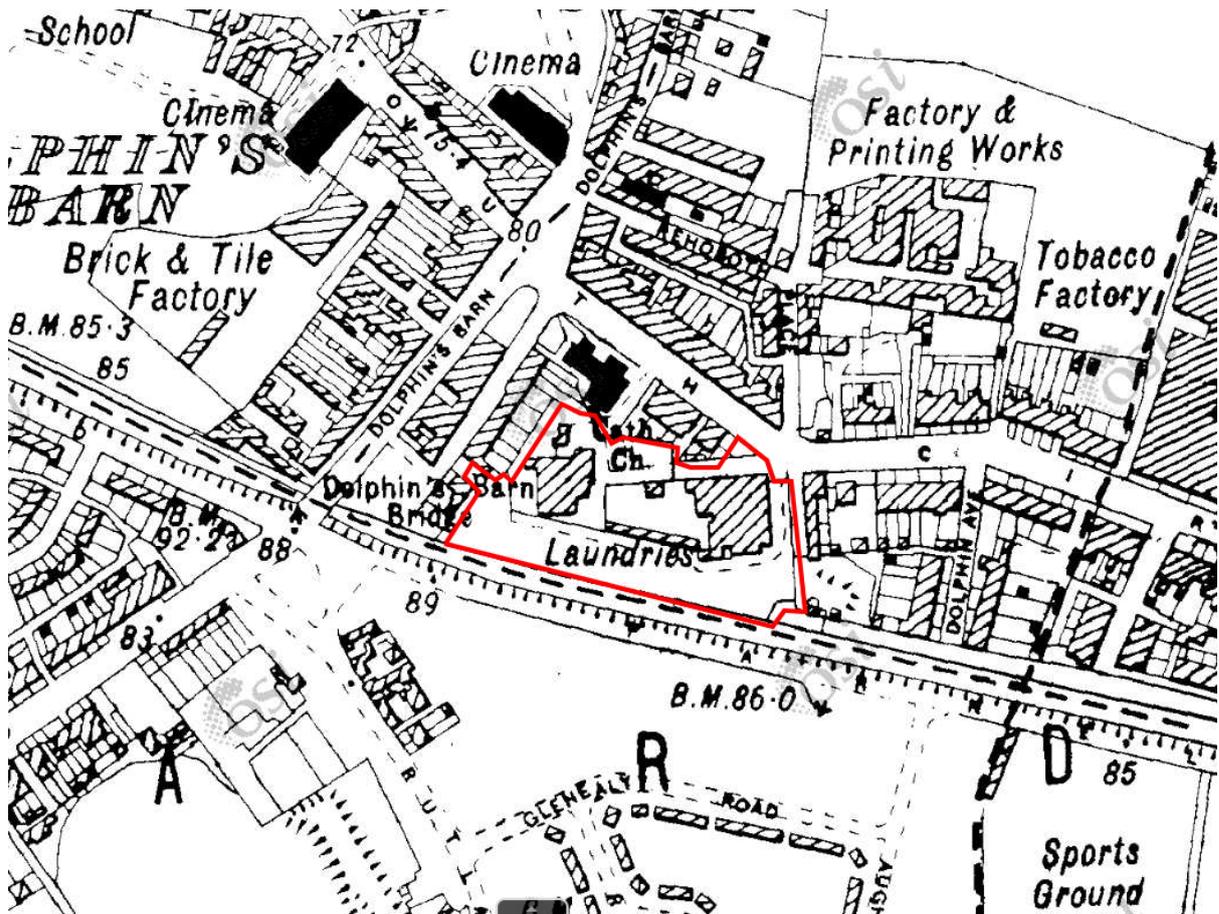
Figure 7-6 Location of the proposed development on 1888-1913 25 Inch OS Map



Source: Ordnance Survey Ireland

The 6-inch Cassini Map (1830s to 1930s) indicates further construction and expansion of buildings associated with the laundries on the Site. The former Rehoboth Factory to the northeast was expanded and listed as a Factory & Printing Works. A tobacco factory and a school had also been constructed to the northeast. Residential construction had occurred to the south and southwest. A sports ground and a Jewish burial ground were located to the southeast, and a brick and tile factory had been constructed to the west as shown on Figure 7.7.

Figure 7-7 Location of the proposed development on Cassini OS Map (1830 - 1930)



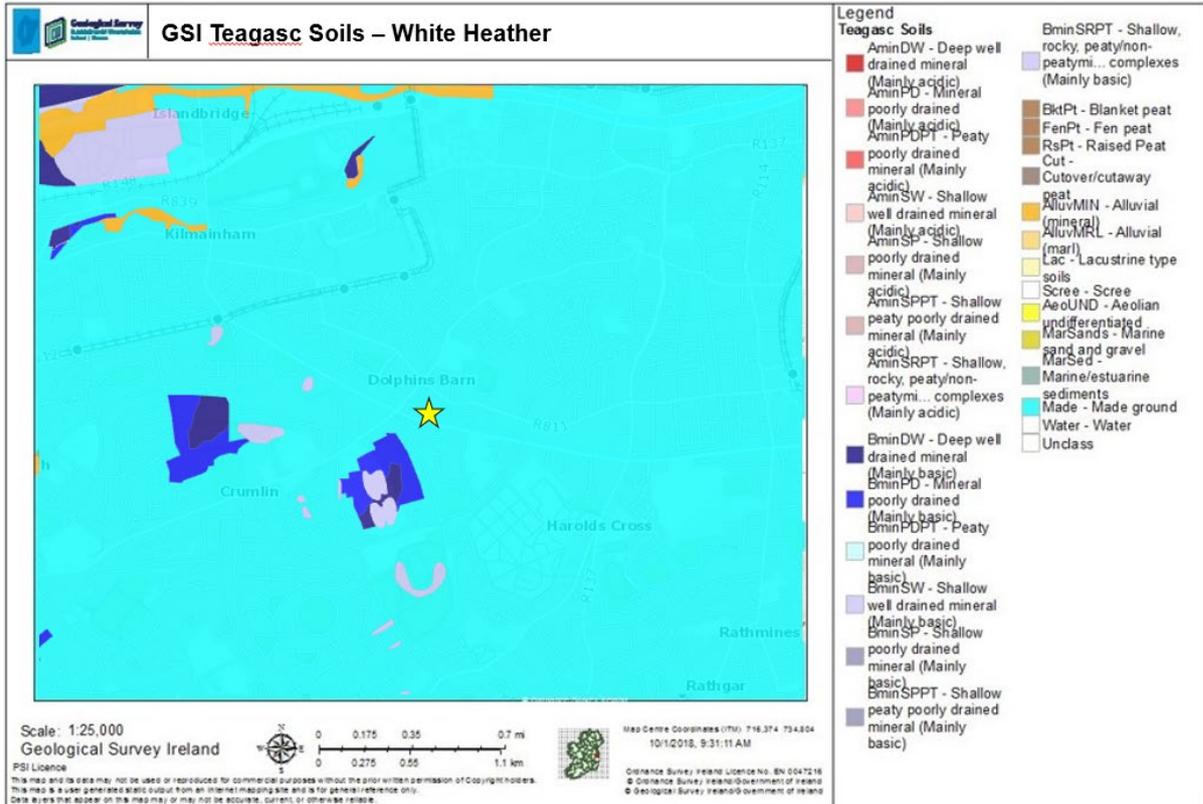
Source: Ordnance Survey Ireland

7.4.4 Regional Soils

Concrete, tarmac, and buildings cover the majority of the Dublin area as a result of development with made ground being present throughout almost all of the city centre and stretching out to the suburbs.

According to the Teagasc Soil Information System, the topsoil and subsoil beneath the Site has been classified into one main category, made ground. This is expected given the urban nature of the Site. The topsoil of the surrounding area is also made ground. Refer to Figure 7.8 from the GSI online mapping for further information.

Figure 7-8 Teagasc Topsoils – site location indicated by the yellow star



Source: GSI, 2022

The subsoil has been classified as Limestone Till (Carboniferous). This is the dominant subsoil type in the region and is a glacial deposit which is known as Dublin Boulder Clay. This till resulted from glaciations which covered the region during the Pleistocene and Quaternary periods. It is known that the ice thickness in Dublin was c. 1km. The grinding action of this ice sheet as it eroded the underlying limestone and shale, together with the loading effect, resulted in the formation of a very dense, low-permeability deposits with pockets of coarse gravel (Long et al., 2012). The gravel lenses are generally less than 2m wide and less than 0.5m thick. They are generally self-draining within 24hrs and have poor interconnectivity.

Local withdrawal and recession of the ice sheet led to the formation of fluvoglacial sediments (gravel and sand lenses) and glaciomarine sediments (stiff/firm laminated clays, silts, and sands). The glacial deposits can exhibit significant lateral and vertical variations in grain size distribution over short distances.

Dublin Boulder Clay has been extensively studied, and there are many publications describing its properties. Additionally, there are numerous examples of deep excavations (up to 25m) and constructions within Dublin Boulder Clay (e.g. Dublin Port Tunnel, Trinity College Library, and Leinster House). Data and case history from these sites have shown that the walls in Dublin Boulder Clay are very rigid due to the inherent natural strength and

stiffness of the material and the slow dissipation of excavation-induced depressed pore pressure or suctions (Long et al., 2012).

The recent construction of the Dublin Port Tunnel has allowed extensive study of Dublin Boulder Clay, and four distinct formations within the clay have been identified, namely the upper brown boulder clay (UBrBC), the upper black boulder clay (UBkBC), the lower brown boulder clay (LBrBC) and the lower black boulder clay (LBkBC) (Skipper, et al., 2005). The two uppermost units are those most commonly encountered in excavations and hence are the most important from the point of view of retaining structures.

Boulder clays generally exhibit very low permeability in the order of 1×10^{-7} to 1×10^{-9} m/s or lower. The glacial boulder clay will tend to act as an aquitard between the other more permeable formations, namely the overlying made ground and the sands and gravels.

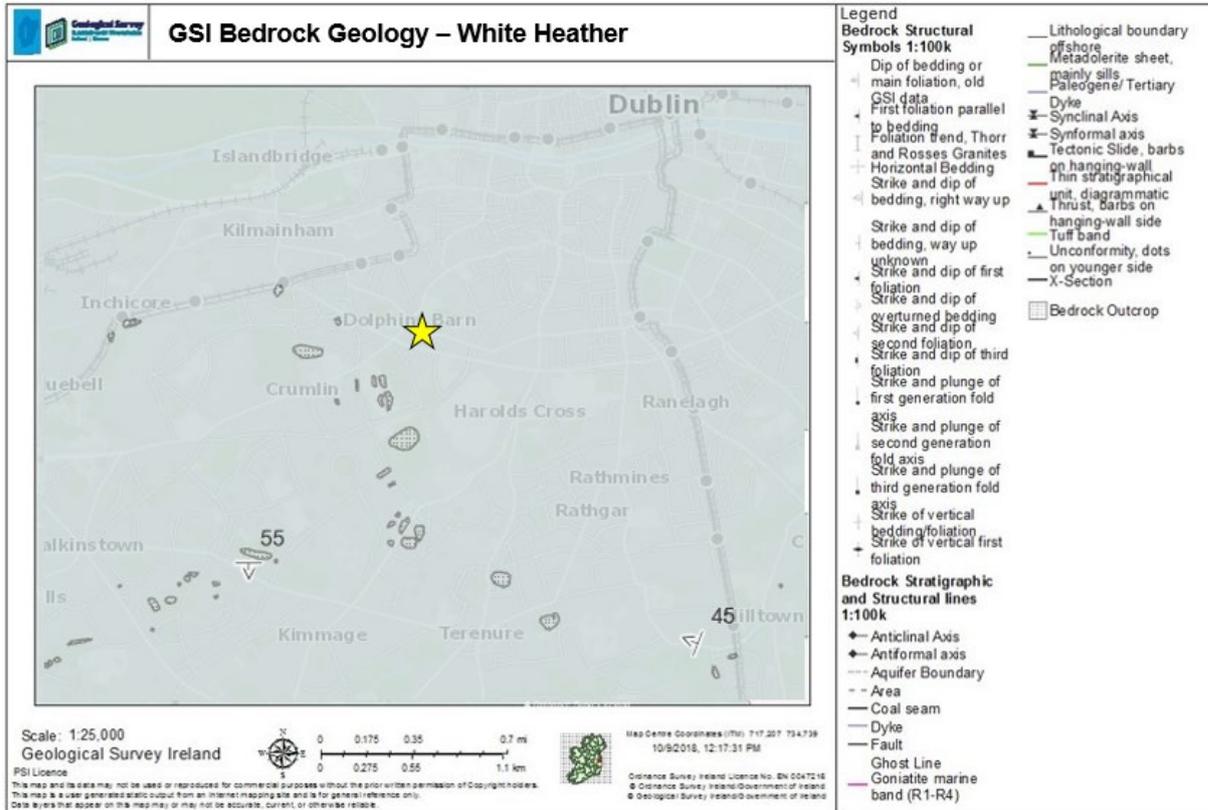
7.4.5 Regional Geology

The bedrock of the greater Dublin region consists of Dinantian Upper Impure Limestone which is part of the Lucan Formation. The limestone is colloquially known as Calp and is estimated to be up to 800m thick. The homogeneous sequence has been described as dark grey to black limestone and shale consisting of dark grey, massive limestones; shaley limestones; and massive mudstones. The average bed thickness is less than 1m, but these normally thin-bedded lithologies can reach thicknesses of 2m or more.

The Calp is almost completely obscured across central Dublin under the Dublin Boulder Clay, although a number of outcrops are recorded across Dublin. There are no major faults mapped in the vicinity of the Site.

The local bedrock geology mapped by the GSI is illustrated on Figure 7.9.

Figure 7-9 Local Bedrock Geology– site location indicated by the yellow star



Source: GSI, 2022

7.4.6 Regional Hydrogeology

The primary Groundwater Body (GWB) in the region is the Dublin Urban GWB, which is the Calp Limestone bedrock aquifer. The Dublin Urban GWB covers some 470km², includes most of Dublin City to the eastern seaboard, and extends west to include parts of Kildare and Meath. In addition to the Carboniferous limestones and shales, there are also some sandstones present within this GWB. The bedrock aquifer is a fracture system, i.e. it is dominated by secondary (fracture or fissure) flow with very little to no flow within the matrix making it largely impermeable. The limestone aquifer has low storage capacity in the order of 1 – 2%.

The Dublin Urban GWB comprises:

- LI: Locally important aquifer, moderately productive only in local zones, and
- PI: Poor aquifer, generally unproductive except for local zones.

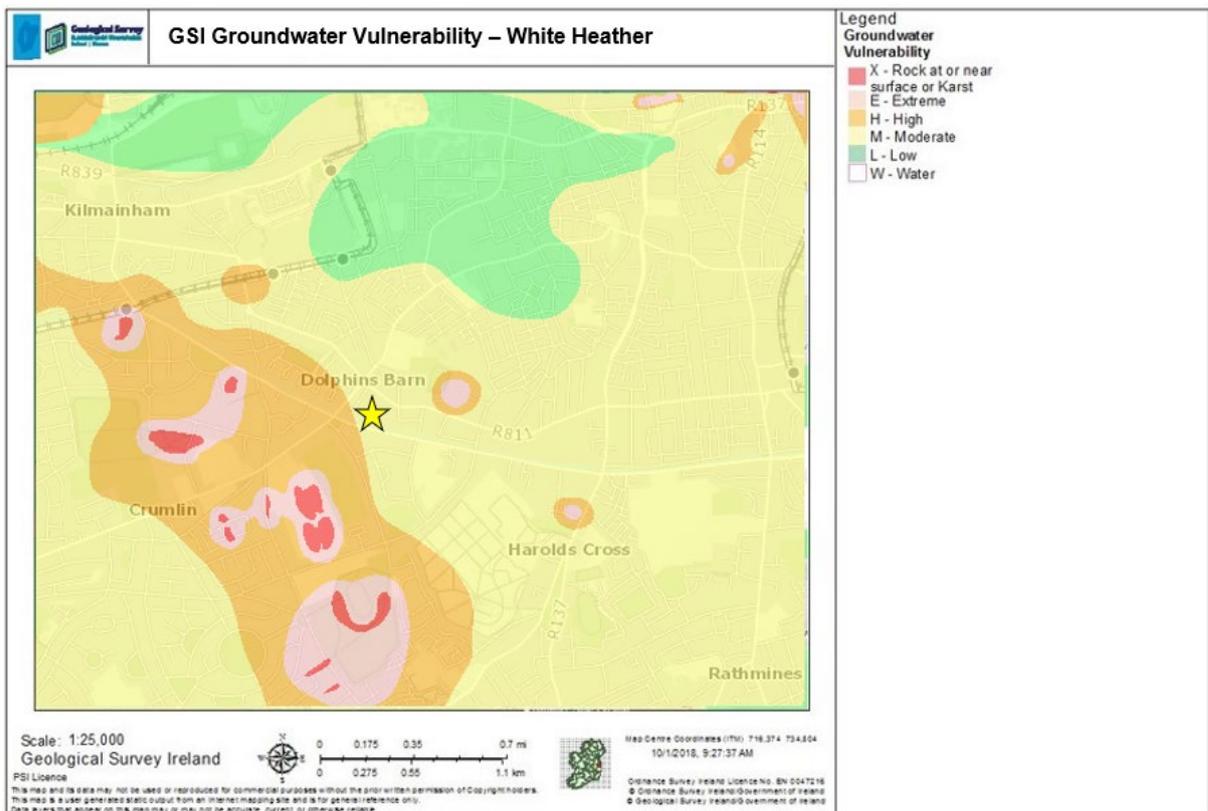
The Lucan Formation, located in the vicinity of the Dolphins Barn site, is classified by the GSI as a Locally Important (LI) aquifer which is moderately productive only in local zones. In general, permeability in the Lucan Formation is low (1-10m²/day). Fracture flow dominates, and there is a distinct reduction in permeability with depth. Packer tests show permeabilities reduce an order of magnitude for each five metres of depth in the

limestone (Aspinwall & Company, 1979). The majority of flow is in the upper weathered bedrock and is common within fractures and fissures at depths of up to 50m below ground level (mBGL). Regional groundwater flow is towards Dublin Bay and the Irish Sea to the east. The overlying Dublin Boulder Clay is not considered as an aquifer due to its low permeability properties. The Boulder Clay transmits very little water and also acts as a barrier to the recharge of the limestone bedrock aquifer.

7.4.7 Groundwater Vulnerability

The groundwater vulnerability beneath the proposed Site is Moderate (see Figure 7.10). Vulnerability ratings are related to a function of overburden thickness and permeability which might offer a degree of protection and/or attenuation to the underlying aquifer from surface activities and pollution. At their nearest points, areas of high groundwater vulnerability are located adjoining the southwest corner of the Site and 0.17km east of the Site. The closest area of extreme groundwater vulnerability is located 0.22km east of the proposed Site. There are no karst landforms identified in the vicinity of the Site.

Figure 7-10 Aquifer Vulnerability - site location indicated by the yellow star



Source: GSI, 2022

7.4.8 Groundwater Status

An assessment carried out under the Water Framework Directive has concluded that the groundwater within the Dublin Urban GWB is presently of "Good status". The objective is to protect the "Good status" while recognising that the quality of the groundwater in the Dublin Urban GWB is "Not at risk".

7.4.9 Groundwater Recharge

The Dublin urban area is generally made up of a concrete and tarmacadamed impermeable cap which limits recharge to the bedrock. The only open areas where recharge may occur are in parks and gardens. It is conservatively estimated that 10% of the city is available for recharge. Elsewhere diffuse recharge will occur via rainfall percolating through the subsoil. The proportion of the effective rainfall that recharges the aquifer is largely determined by the thickness and permeability of the soil and subsoil, and by the slope. Due to the generally low permeability of the aquifers within the Dublin Urban GWB, a high proportion of the recharge will run off and discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing further the available groundwater recharge to the aquifer. A significant amount of recharge also occurs from leaking sewers, mains, and storm drains in Dublin where non-revenue water is estimated to be around 40%.

Based on the GSI website, the effective rainfall in the vicinity of the White Heather site is 275.300 – 285.200 mm/year. Recharge to the aquifer can only occur where rainfall can percolate through any subsoil to the aquifer. However, given the thickness of low permeability boulder clay, any water which percolates through the subsoil is likely to be perched on the significant thickness of Dublin Boulder Clay. Consequently, it is likely that recharge to the Lucan Formation is minimal to insignificant in the area surrounding the Site. The GSI have designated the recharge coefficient in the immediate area of the Site as 20% due to lenses of sand and gravels within the boulder clay. Based on the GSI's Recharge Model, the total recharge would be equivalent to approximately 55-57mm/year.

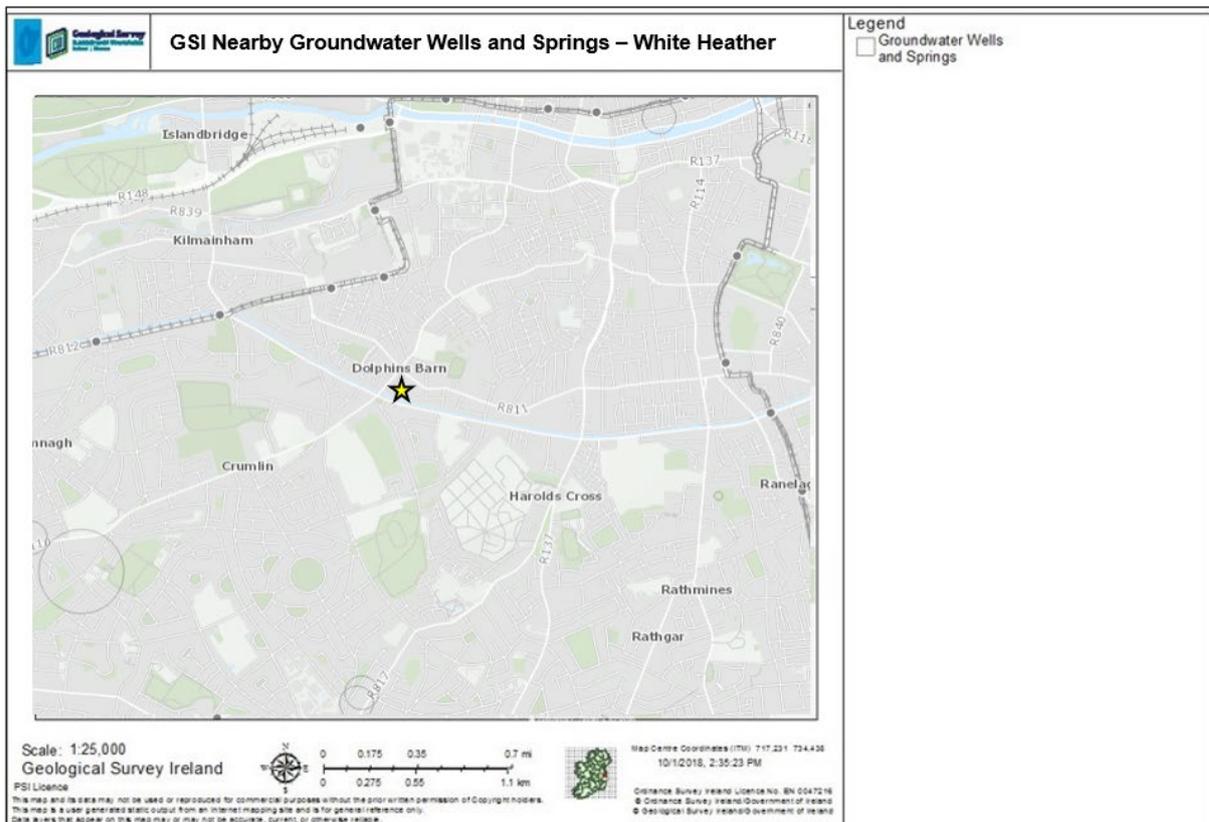
7.4.10 Groundwater Abstractions

A search of the GSI groundwater well database was conducted to identify registered wells in the surrounding area. There are 4 No. wells identified within 2km of the Site. Two of the wells (ID 2923SEW039 and ID 2923SEW040) are located near Kimmage Road Lower and were drilled in 1992 for industrial use. These wells were drilled to 144.8mbGL and 152mbGL, have yields of 45 m³/day and 818 m³/day, and are located approximately 1.7km and 1.8k south of the Site, respectively. The third well (ID 2923SEW031) is located approximately 1.9km southwest of the Site near St. Mary's Road. This well was drilled in 1949 to a depth of

41.1mbGL for industrial use and has a reported yield of 109m³/day. The fourth well (ID 2923SEW015) is located approximately 1.97km north of the Site near Brunswick Street North. This well was drilled in 1899 to a depth of 30.4mbGL for industrial use and has a reported yield of 393m³/day.

Mapped wells and springs in the general vicinity of the Site identified by the GSI are illustrated on Figure 7.11.

Figure 7-11 Wells and Springs - site location indicated by the yellow star



Source: GSI, 2022

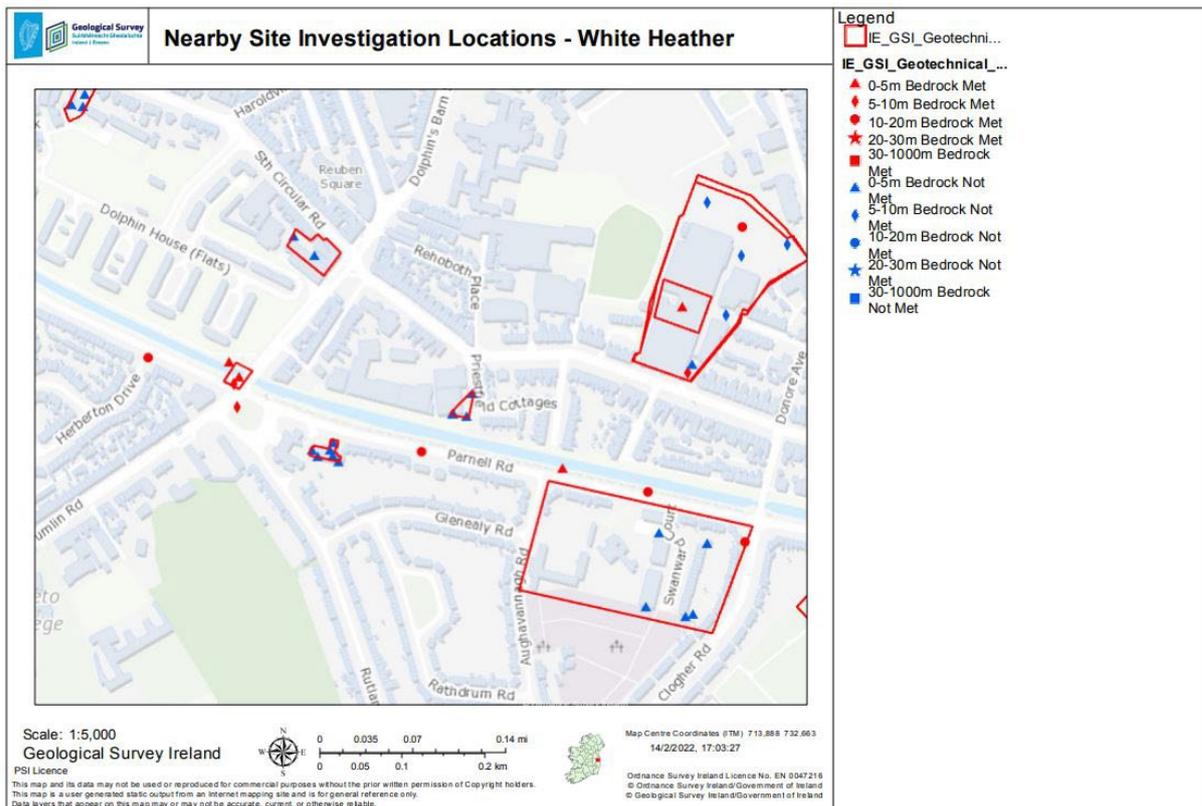
The GSI also provides a framework for the protection of groundwater source zones (e.g. areas of contribution to water supply bores). There are no reported source protection zones (SPZs) within a 2km radius of the proposed Site.

7.4.11 Nearby Site Investigations

The GSI have compiled a database from site investigations previously carried out in Ireland. As indicated by this database, the Site is located in a well investigated area within Dublin City. Figure 7.12 below shows the nearby SI locations. The most relevant GSI report is for work undertaken for An Post, White Heather Estate in 2010 (Report ID 7.297). This investigation is discussed further in Section 7.4.13.

Five additional site investigation records are listed for the nearby areas. These include works for the proposed Dolphin's Barn Library to the south of the Site (ID 490); the Dolphin's Barn bridge extension to the southwest in 1981 (ID 966); a development on the South Circular Road to the west in 2005 (ID 6159); a proposed housing development on Parnell Road to the southeast in 1996 (ID 2958); and the redevelopment of the Players Mills factory to the northeast in 2003 (ID 5110). The results of these investigations generally indicated the presence of fill materials ranging from 0.7 to 2.8m thick underlain by brown gravelly clay with possible sands or silts. Some deeper investigations also encountered grey gravelly clays underlying these. The presence of bedrock was confirmed at a depth of 20.73mOD on the Dolphin's Barn bridge site. Shallow groundwater ingress was encountered during a number of the investigations. Investigations for soil contamination were not noted in the reports except at the Players Mills site where low levels of polycyclic aromatic hydrocarbon and lead contamination were encountered in the fill material by limited environmental testing.

Figure 7-12 Nearby Site Investigations



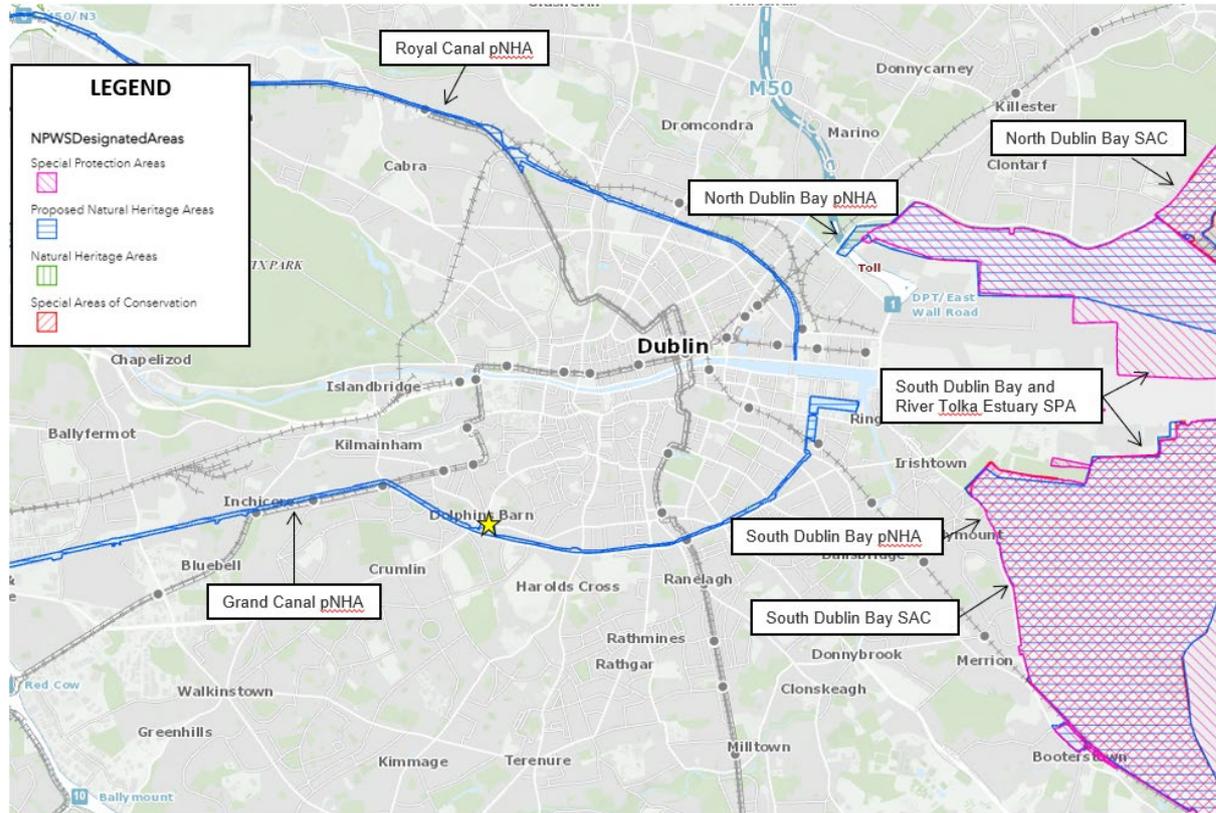
Source: GSI, 2022

7.4.12 Designated Area of Conservation

The nearest designated area of conservation is the Grand Canal proposed Natural Heritage Area (pNHA) located directly south of the Site (Site Code 002104) and encompasses the majority of the Site. The Royal Canal pNHA (Site Code 002103) is located approximately 3.6km northeast of the Site on the opposite side of the River Liffey. The South

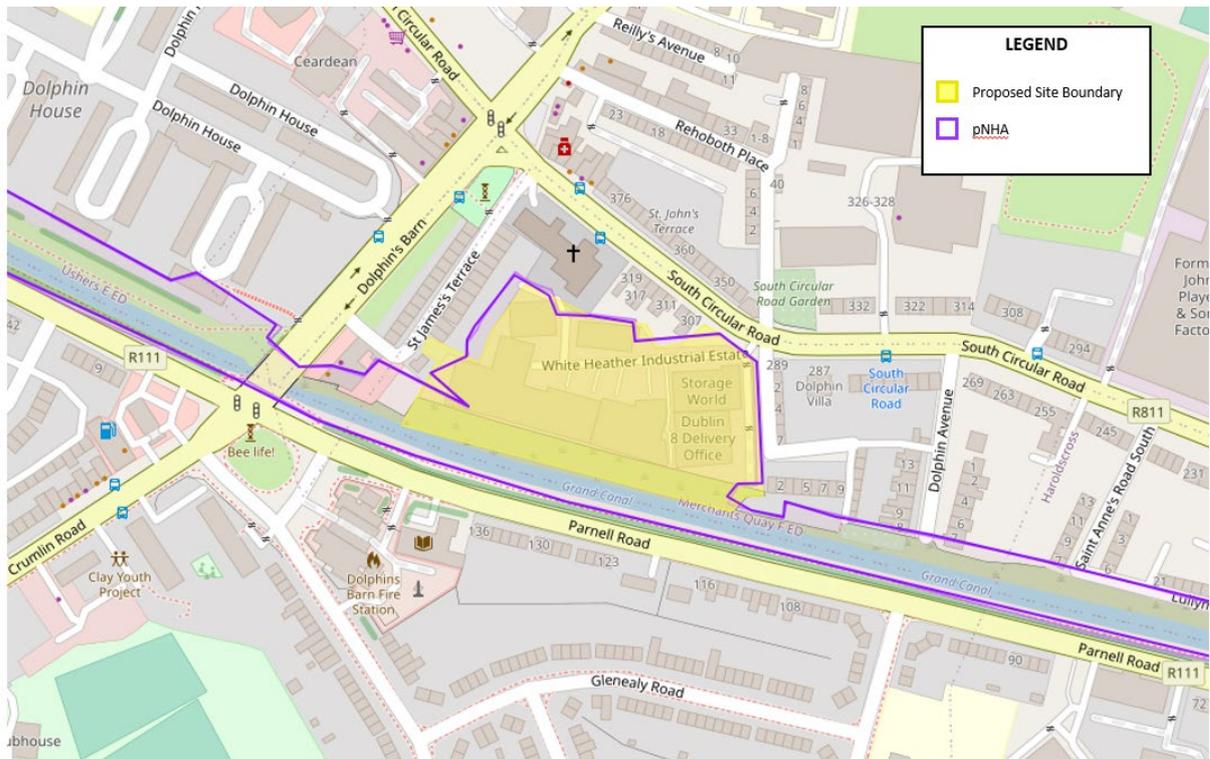
Dublin Bay pNHA (Site Code 000210) is located 5km east of the Site. The nearest Special Protection Area (SPA) is the South Dublin Bay and River Tolka SPA (Site Code 004024) located approximately 5.2km east of the Site. The South Dublin Bay SAC (Site Code 000210) is located approximately 5km east of the Site (NPWS, 2018). See Figures 7.13 and 7.14 below.

Figure 7-13 NPWS Designated Areas - site location indicated by the yellow star



Source: NPWS, 2022

Figure 7-14 NPWS proposed Natural Heritage Area overlap with site boundary



Source: NPWS, 2022

7.4.13 Local Soils & Geology

A soils investigation was undertaken by IGSL in the White Heather Estate in September to November 2007. The investigation comprised the following:

- Drilling of 3 No. boreholes using cable percussion tool techniques to depths ranging from 3.0 to 6.4mbGL;
- Excavation of 4 No. trial pits to depth ranging from 2.8 to 3.5mbGL;
- Drilling of 2 No. boreholes using air rotary drilling to 8.8 to 14.1mbGL;
- Collection and laboratory analysis of 3 No. soil samples; and
- Standard penetration tests the details and results of which were not contained in the report.

The investigation indicated the presence of made ground (clay, roots, tar, blocks, brick, wood fragments, etc.) extending to a maximum depth of 3.80 metres. Underlying this in one trial pit was a 0.2m thick layer of soft, grey, sandy silt. Underlying the made ground and silt was a layer of firm to stiff, brown, gravelly clay extending to a maximum depth of 2.9m. Below this was weathered limestone and clay and limestone bedrock which was confirmed by rotary drilling at depths of 3.0 and 9.0mbGL. The bedrock was described as dark grey limestone interbedded with thin and medium beds of calcareous mudstone in places and slightly to moderately weathered.

Ground water was not observed in one trial pit, but water ingress in the other trial pits and cable percussion borehole locations at depths ranging from 1.0 to 2.7mbGL. Within the

boreholes the base of water ingress was noted near the top of the clay layer or near the top of possible bedrock indicating that this was likely perched water.

Results of soil sampling are discussed in Section 7.4.15. The investigation locations are unknown as a site plan was not included in the report.

A second soils investigation was undertaken by IGSL in the White Heather Estate in June 2010 as part of structural modifications to be undertaken to an existing unit occupied by An Post. The investigation comprised the following:

- Drilling of 1 No. borehole using cable percussion tool techniques to between 7.1m depth;
- Excavation of 2 No. trial pits to 1.9 and 2.5m depth;
- 1 No. Percolation test (BRE Digest 365); and
- 2 No. plate bearing tests.

The investigation indicated the presence of made ground (clay, rubble, brick, timber, etc.) extending to 1.80 metres within the borehole. Underlying this was soft, grey, organic, silty clay with traces of dark brown peat extending to 3.10 metres. Firm, grey, gravelly, silty clay extended from 3.10 to 4.50 metres where medium dense, sandy gravel was encountered. Borehole refusal occurred after a period of chiselling from 6.80 to 7.10 metres. The final refusal depth may represent either boulders or the local limestone bedrock. Proof coring of rock was not carried out to confirm this. Ground water was noted in the gravel stratum at 4.50 metres in BH 1. Water rose to a final standing level of 1.90 metres BGL.

The trial pits contained made ground from the surface to 1.30 and 0.90 metres. Fill was underlain by firm, brown, sandy, gravelly clay from 1.30 to 1.90 metres in TP1. This clay was dry and stable. Soft, sandy, organic silty clay is encountered in TP2 from 0.9 to the base of the excavation at 2.50 metres.

It should be noted that the borehole containing the organic silty clay was located within the area of the former canal basin shown on the 6 inch historic map, and the trial pit containing this material (TP2) was located near the inlet from the canal to the canal basins on the Site.

The geology of the Site from the intrusive investigations can be summarised as follows:

- Made Ground comprising 'a mixture of clay, rubble, brick, timber, etc'. The Made Ground varied in thickness from 0.9m to 3.4m. Standard Penetration Test (SPT) N values from the 2010 investigation ranged between 7 to 11 in this layer.
- A discontinuous layer of soft, organic silty CLAY was encountered in 2 No. SI locations near the southeast corner of the Site. The thickness of this layer varied between 1.3 and 1.4m and reached a maximum confirmed depth

of 3.1m. (SPT) N values from the 2010 investigation ranged between 2 to 5 in this layer.

- A thick layer of made ground and organic clay is expected in areas of the Site containing historic canal basins which were later infilled.
- A glacial till layer of 'firm, grey, gravelly, silty CLAY' and 'firm, brown, sandy, gravelly CLAY' was encountered at thicknesses from 0.6 to 2.7m. SPT N values from the 2010 investigation ranged from 9 to 13.
- A 2.3m thick layer of water bearing 'medium dense, sandy GRAVEL' was encountered in one location during the 2010 investigation extending to a maximum depth of 6.8mbGL. SPT N values for this layer ranged from 26 to 30.
- During the 2007 investigation, water ingress into trail pits and boreholes was first observed at depths of 1.0 to 2.7mbGL. However, the base of the perched water was encountered in the boreholes at depths ranging from 2.8 to 3.8mbGL.
- Depth to bedrock was confirmed during the 2007 investigation at depths of 3.0 and 9.0mbGL. Bedrock was described as slightly to moderately weathered black limestone with bands of calcareous mudstone.

7.4.14 The Impact of subsurface structures on the Local Hydrogeology

Although the 2007 and 2010 site investigations discussed in Section 1.4.13 site did not target groundwater, the results referenced water within the fill and upper clay layer extending from a minimum of 1.0mbGL to a maximum of 3.8mbGL. Due to the presence of fill materials, gravelly clays, and gravels, it is possible that water bearing lenses may create a discontinuous perched water table on the Site. Depth to the water table was not determined during the investigations but is assumed to be less than 15m due to the low-lying elevation of the Site.

The proposed works will require relatively shallow excavation to approximately 2.0mbGL to allow for undercroft construction on the Site with localised excavation of an additional meter to allow for construction of lift sumps, manholes, etc. at undercroft level. Based on the results of earlier site investigations, it is anticipated that the dig will occur primarily or completely within dry soils or the perched water table and, therefore, will not affect local hydrogeology. Furthermore, studies of deep excavations on groundwater flow carried out on behalf of An Bord Pleanála on the potential impact of its proposed underground station boxes on surrounding groundwater flow and/or levels associated with the proposed Metro North rail line indicated that where basements are founded in low permeability tills such as sandy gravelly clay (Dublin boulder clay), there are no impacts on groundwater regime since it is evident that there is very little water flow in these low permeability horizons regardless of their porosity.

7.4.15 Soils Contamination Assessment

The Site is a brownfield site with historic potential contamination sources including those associated with the use and infill of the former canal basins, the subsequent use of the Site as a laundry, and for later commercial and light industrial uses. A detailed assessment of potential soil contamination and a waste classification have not been carried out for the Site. However, laboratory analysis of three soil samples from the 2007 site investigation discussed in Section 1.4.13 indicated that two of the three samples contained diesel range organic (DRO) and polycyclic aromatic hydrocarbon (PAH) contamination. The highest levels were detected in a sample collected within fill material at 1.0mbGL. Lower levels of these contaminants were identified in a sample collected at 2.0mbGL within the clay layer at the base of the fill material from another location. The sample with the higher levels of PAHs and DROs also contained elevated levels of total organic carbon (TOC). The locations of these samples are unknown as a site plan was not included in the report.

Based on this limited information, there is a potential risk associated with past site use to future residential or commercial receptors following site development. However, it is anticipated that a number of the pathways of concern such as direct contact from with potential soil contaminants will be broken due to the redevelopment, i.e. the removal of some material as a result of design measures and breaking the pathway by the use of concrete and other surface materials.

Prior to development of the Site, a detailed soil investigation will be undertaken to determine the risk to human or environmental receptors from potential contaminants on Site and incorporated within a Waste Soil Assessment. There are a number of mechanism addressing waste materials generated during construction in Ireland including those outlined in Table 7.3 in addition to Article 27 Declaration (by-product) and recovery solutions.

Table 7-1 Soil Waste Categories

Waste Category	Title	Classification Category	Potential Outlet
Heading	Text/Data	Text/Data	Text/Data
Category A	Inert Waste Criteria	Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant	Potentially suitable for reuse or recovery subject to Planning and/or Waste Permissions and acceptance criteria.

		to Article 16 and Annex II of Directive 1999/31/EC (2002). Results found to be non-hazardous using the HazWasteOnline application.	
Category B	Inert (with elevated PAHs)	Acceptance Criteria as laid out in Waste Licence W0129-02 and W0254-01. Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) with the exception of PAHs (Total 17 <100mg/kg). Results found to be non-hazardous using the HazWasteOnline application.	Disposal at for example, Integrated Material Solutions or Walshestown Restoration
Category C1	Non-Haz Criteria	Analytical results greater than Category A criteria but less than non-hazardous waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) no limit for TOC. Results found to be non-hazardous using the HazWasteOnline application.	Disposal/Recovery at licensed landfill (Ballynagran, Knockharley, Drehid). Material can be sent for recovery as engineering material rather than disposed of (no landfill tax)
Category C2	Non-Haz Criteria but with trace asbestos	Results as per C1 but with trace asbestos	Material will need to be disposed of at a licensed

			landfill if trace asbestos is confirmed. If asbestos level is quantifiable then it may have to be disposed in N. Ireland or further abroad.
Category D	Hazardous	Analytical results found to be hazardous using the HazWasteOnline application.	None in Ireland (export) with the exception of Envva in Portlaoise.

7.4.16 Groundwater Contamination Assessment

The Site is a brownfield site with historic potential contamination sources including those associated with the use and infill of the former canal basins, the subsequent use of the Site as a laundry, and for later commercial and light industrial uses. An assessment of potential groundwater contamination has not been carried out for the Site. Therefore, any risk associated with past site use to future residential or commercial receptors following site development cannot be quantified at this time.

7.4.17 Gas Assessment

Gas Monitoring was not undertaken on the Site during the 2010 site investigation. Therefore, any risk associated with past site use to future residential or commercial receptors following site development cannot be quantified at this time.

7.4.18 Potential Pollutant Linkages

A critical element of the risk assessment process is the establishment of a Conceptual Site Model (CSM) for the Site. A CSM describes the potential sources of contamination at a site, the migration pathways it may follow, and the receptors it could impact. If complete source-pathway-receptor scenarios exist, then there is a potential pollutant linkage that needs to be characterised and assessed (via formal risk assessment). All three elements need to be present for a viable risk to exist (e.g. if a source and receptor exist but no pathway is present, there is no pollutant linkage and hence no risk).

A. Sources

- The potential contamination sources identified on Site are primarily those associated with the use and infill of the former canal basins, the subsequent use of the Site as a laundry, and for later commercial and light industrial uses;
- The potential contamination from nearby properties relate to those industrial facilities historically used as a print works and a tobacco factory.
- There will be a source of potential contamination present on Site during the construction phase (e.g. machinery oils, fuel, cement, etc.).

- The presence and concentrations of any soil contaminants will require assessment prior to the commencement of construction works.
- Run-off from construction sites can contain minor levels of pollutants (e.g. mineral oils) with high concentrations of suspended solids.
- To keep excavations dry, dewatering will likely be required to lower the water table. Groundwater sampling will be required to determine the viability of discharging to the public sewer system during dewatering.
- Lowering the water table could impact on nearby buildings, creating void space which would allow soil particles to compress and settlement to occur;
- Any piling in contaminated ground has the potential to transfer material from the upper layers of the ground to the deeper layers; therefore, a risk assessment for the piling should be carried out prior to commencement of works;
- There will be no significant sources of potential contamination present on Site during the operational phase of the development.

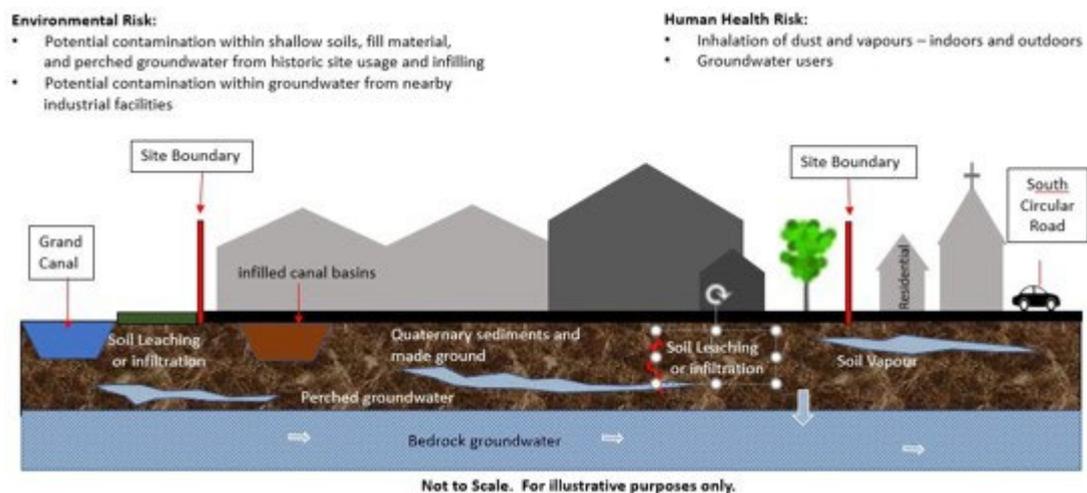
B. Receptors

- The bedrock aquifer constitutes a potential receptor;
- The surface water bodies in the area surrounding the Site constitute receptors; and
- The surrounding land (buildings), soils, and geology constitute receptors.

C. Pathways

- Migration of contaminants from surface spills to land, soils, geology, groundwater, or surface water constitutes a potential pathway; and
- Migration of contaminated run-off (e.g. during construction phase or operational phase) to groundwater, surface water, or surrounding geology constitutes a potential pathway.

Figure 7-15 Conceptual Site Model (CSM) based on existing site conditions



7.4.19 Potential Pollutant Linkages

An environmental risk is only present when a pathway links a source with a receptor. The potential pollutant linkage CSM for the White Heather development is summarised in Table 7.3:

Table 7-2 Conceptual Site Model (CSM) Pollutant Linkages Geology and Groundwater

Source	Pathway	Receptor	Potential Pollutant Linkage (Y/N)	Discussion
Deleterious materials stored on Site during construction	Migration of surface spills/contaminated run-off	Surrounding Land/Soils or Groundwater in the bedrock aquifer	N	All materials stored on Site will be subject to strict control measures and local containment measures (e.g. bunded tanks and wood pallets). The historic site investigation completed identified variable bedrock depth. It is expected that the bedrock aquifer will likely be protected by the dense clay which is and will remain in place following construction given the shallow nature of the undercroft excavation.
Contaminated run-off from construction activities			N	Generation of contaminated run-off will be reduced through the Construction Management Plan and control measures implemented during the construction phase. The historic site investigation completed identified variable bedrock depth. It is expected that the bedrock aquifer will likely be protected by the dense clay which is and will remain in place following construction given the shallow nature of the undercroft excavation.
Deleterious materials stored on Site during construction	Migration of surface spills/contaminated run-off	Nearby waterbodies: The Grand Canal adjacent to the Site to the south, the Camac River circa 1.15 km northwest of the Site, The River Liffey circa 1.6km north of the	N	All materials stored on Site will be subject to strict control measures and local containment measures (e.g. bunded tanks and pallets). There are roads and other infrastructure between the Site and the river water receptors. Appropriate set back and protection measures will to be implemented to ensure no direct discharge to waterbodies including the Grand Canal except where regulated under a Discharge Licence from the Regulating Authority.

Contaminated run-off from construction activities		Site.	N	Generation of contaminated run-off will be reduced through the Construction Management Plan and control measures implemented during the construction phase. Appropriate set back and protection measures to be implemented to ensure no direct discharge to water courses except where regulated under a Discharge Licence from the Regulating Authority.
Potentially contaminated groundwater from the groundwater dewatering scheme	Discharge into the public sewer	Nearby public sewers	N	The appointed dewatering contractor will be supplied with the lab analysis of the groundwater samples to facilitate the design of a pre-treatment system, if necessary. Hence, only groundwater which meets the discharge licence conditions will be discharged into the public sewer. Weekly sampling will be carried out and will be audited by the client's environmental consultant.
Lowering of the water table	Pumping of groundwater through dewatering wells and/or pits	Nearby buildings and/or water bodies	N	A detailed dewatering strategy will be developed for the Site to ensure to impacts beyond the site boundary.
Piling through potentially contaminated ground	Migration of potential contamination from the upper soils to the lower 'clean' soils and/or bedrock	Limestone Bedrock	N	The Continuous Flight Auger (CFA) method would be an appropriate method for this Site. The use of CFA will reduce this risk of contaminated soils migrating to the cleaner soils. With CFA pile installation, material is forced up the auger as the auger penetrates the ground thereby preventing a plug of contaminated material from being driven into the aquifer below.

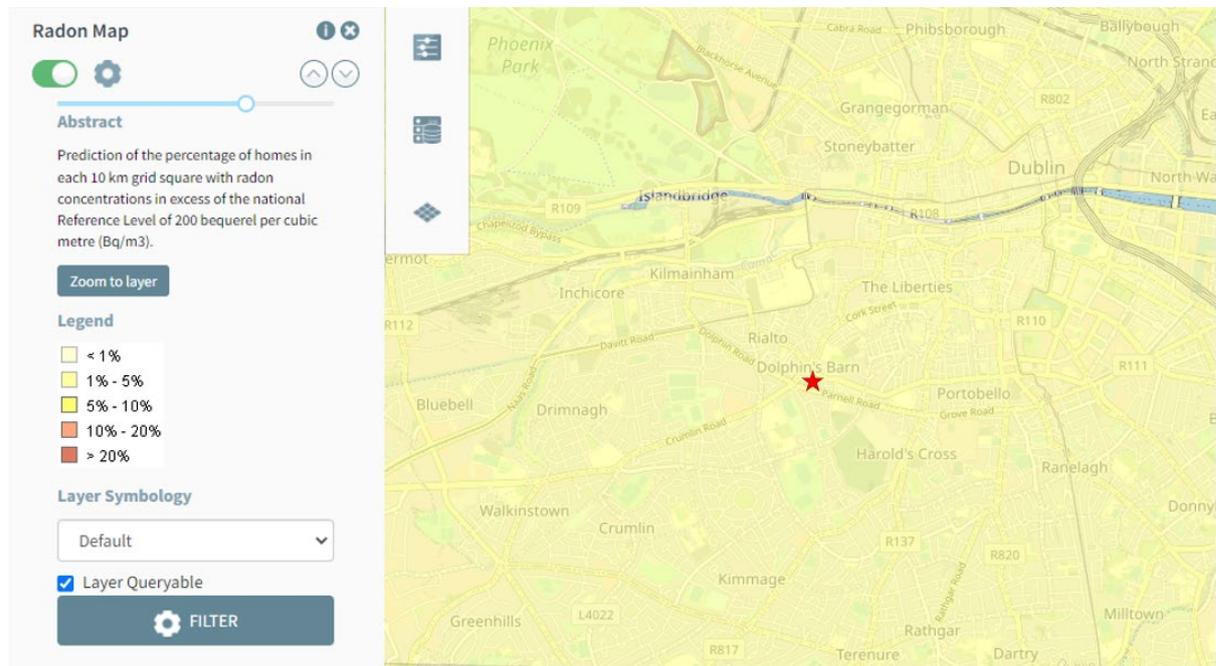
The mitigation measures set out in Table 7.4 are discussed in further detail in later sections.

7.4.20 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland), between one and five per cent of the homes within the White Heater development area are estimated to have radon concentrations in excess of the national Reference Level of 200 bequerel per cubic metre (Bq/m³) as shown in Figure 7.16. This is the second lowest classification; the lowest classification is for below one per cent of homes to be estimated

to be above the Reference Level. A High Radon Area is any area where it is predicted that 10% or more of homes will exceed the Reference Level.

Figure 7-16 Radon Map



Source: EPA, 2022

7.4.21 Summary & Type of Geological/Hydrogeological Environment

Based on the regional and site-specific information available, the type of geological and/or hydrogeological environment as per the Institute of Geologists of Ireland (IGI) Guidelines is Type A – Passive geological and/or hydrogeological environment.

A summary of the site geology based on limited site investigation conducted by others in 2007 and 2010 is outlined thus:

- The White Heather development site is a brownfield site with previous and current commercial and light industrial site use.
- Potential contamination sources on site fill material associated with infilling of 2 No. former canal basins and subsequent commercial and industrial site use.
- There are no expected potential pollutant linkages associated with the construction or operation phases of the Site provided the mitigation measures in Table 7.4 are implemented.
- Made Ground was identified on the Site at thicknesses ranging from 0.9m to 3.4m.
- Soft, organic silty clay was encountered in 2 No. SI locations near the southeast corner of the Site. The thickness of this layer varied between 1.3 and 1.4m and reached a maximum confirmed depth of 3.1m. These

materials were encountered in areas of the Site containing historic canal basins which were later infilled.

- A glacial till layer of 'firm, grey, gravelly, silty clay' and 'firm, brown, sandy, gravelly clay' was encountered at thicknesses from 0.6 to 2.7m.
- A 2.3m thick layer of water bearing 'medium dense, sandy gravel' was encountered in one location during the 2010 investigation extending to a maximum depth of 6.8mbGL.
- During the 2007 investigation, water ingress into trail pits and boreholes was first observed at depths of 1.0 to 2.7mbGL. However, the base of the perched water was encountered in the boreholes at depths ranging from 2.8 to 3.8mbGL.
- Depth to bedrock was confirmed during the 2007 investigation at depths of 3.0 and 9.0mbGL and consisted of slightly to moderately weathered, dark grey limestone interbedded with thin and medium beds of calcareous mudstone.
- Further characterisation of site geology and hydrogeology will be undertaken prior to commencement of bulk excavations on the Site, particularly of the one-storey underground carpark. See section 7.2 for the proposed development description.
- The appointed dewatering contractor will utilise groundwater analytical results in the design of the system to ensure that no contaminated groundwater will be discharged into the public sewer and that all conditions stipulated by the discharge licence are met.

7.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square

will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

7.6 Potential Impact of the Proposed Development

There are a number of effects on the geological and hydrogeological environments that will occur due to the proposed development, namely:

- Land take – change of use from light industrial to residential/commercial;
- Soil excavation – removal of soil for construction of the undercroft on the Site as well as limited excavation associated with lift sums, manholes, underground services, etc. Based on the limited investigations conducted on the Site to date, the proposed excavations may remove primarily fill material and may remove some of the contaminated load identified in this material.

Piling works, accidental spills, contaminated run-off, and/or contaminated groundwater discharged to sewer during the construction phase also have the potential to have an impact on the geology and hydrogeology of the Site and nearby land.

7.6.1 Construction Phase

In line with EIA guidance, each potential impact for the development should be described in terms of its Quality, Significance, Extent, Probability, and Duration. The potential impacts, mitigation measures, and resulting residual impacts have been combined in a Detailed Assessment Table in Table 7.5. The potential impacts are summarised below, and mitigation measures are presented in detail in Section 7.7. These impacts also relate to and interact with other chapters within the EIAR, specifically:

- Chapter 5 Population and Human Health
- Chapter 6 Biodiversity

- Chapter 8 Hydrology
- Chapter 9 Material Assets: Built Services
- Chapter 10 Material Assets: Transportation
- Chapter 12 Air Quality & Climate
- Chapter 13 Noise and Vibration
- Chapter 17 Archaeology
- Chapter 18 Architectural Heritage

Specific interactions are listed below, and further detail is provided in the relevant chapters and in Chapter 20, Interaction.

Potential impacts expected to be encountered throughout the construction stage are as follows:

- Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction phase. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled. This can lead to run-off with high suspended solid content which can impact on water bodies. The potential risk from this indirect impact to water bodies and/or habitats from contaminated water would depend on the magnitude and duration of any water quality impact.
- There is a potential for dust from excavations or stockpiles to impact on air quality. This is discussed further in Chapter 12 Air Quality and Climate.
- Construction phase dewatering may be required for the development and to maintain dry working conditions in the excavation (due to rainfall and potential groundwater ingress). Pumped water will require discharge offsite (discharge to sewer).
- Noise and vibration will be generated through the construction phase particularly during excavation work. Given that no rock excavation is required, it is anticipated that conventional excavation techniques (i.e. hard digging) will suffice. Noise and vibration impacts are considered in detail in Chapter 11, Noise and Vibration.
- The construction phase and any import or export of material to the Site (as part of excavation or infilling works) will have implications for traffic in the surrounding road network. These impacts are considered further in Chapter 10, Material Assets: Traffic.
- A number of areas of archaeological interest in the form of protected structures have been identified within the vicinity of the Site. These include the Church of Our Lady of Dolours adjoining the Site to the northwest; a house to the east, several residential and commercial premises to the north, a former bank to the northwest, and the canal bridge to the southwest. These features are discussed in detail in Chapter 18 Architectural Heritage
- .

- The Site lies nearly entirely within the boundary of the Grand Canal proposed Natural Heritage Area (pNHA) which extends east and west from the southern site boundary. The implications of Site works in relation to this pNHA are discussed in detail in Chapter 6 Biodiversity
- As with all construction projects, there is potential for water (surface water and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed to percolate to the aquifer. The potential main contaminants include:
 - Suspended solids (muddy water with increased turbidity) – arising from excavation and ground disturbance;
 - Cement/concrete (increased turbidity and pH) – arising from construction materials;
 - Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage and contaminated groundwater within the Site from previous site activities; and
 - Wastewater (nutrient and microbial rich) – arising from poor on-site toilet and washroom facilities.

The risk to human health due to changes in the geological and/or hydrogeological environment resulting from this project shall be quantitatively evaluated following a detailed site investigation and detailed in a 'Generic Quantitative Risk Assessment (GQRA)' prior to commencement of site excavations and construction work.

7.6.2 Operational Phase

During the Operational Phase of the White Heather development there will be limited impact on the geological environment of the area, mainly associated with the excavation and construction of the undercroft carpark which will likely be founded within made ground. There is no requirement for any fuel oil stores as all heating will be fuelled by mains gas.

7.6.3 Do Nothing Scenario

In the 'Do Nothing' scenario, if the construction of the development at the White Heather site does not take place, the existing baseline conditions will remain within the subject site and there would be no resulting additional impacts on land and soils.

7.7 Mitigation Measures

This section describes a range of recommendations and mitigation measures designed to avoid, reduce, or offset any potential adverse geological impacts identified.

7.7.1 Construction Phase Mitigation

To reduce the impacts on the soils, geology, and the hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on Site.

The measures will address the main activities of potential impact which include:

- Control of Soil Excavation and Export from Site;
- Sources of fill and aggregates for the project;
- Fuel and chemical handling, transport, and storage; and
- Control of water during construction.

7.7.1.1 Control of Soil Excavation

Topsoil and subsoil will be excavated to facilitate the development, the construction of new sewer and water mains connections, roadways, and all other associated services. The project will incorporate the 'reduce, reuse, and recycle' approach in terms of soil excavations on Site. The construction will be carefully planned to ensure only material required to be excavated will be excavated with as much material left in situ as possible. All excavation arisings will be reused on Site where possible/if suitable.

Soil stripping, earthworks, and stockpiling of soil will be carried out during the works. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the excavation and there will be no direct link or pathway from this area to any surface water body. It is anticipated that only local/low level of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off Site or will be reused in other areas of the Site as fill.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment is free of nuisance dust and dirt on roads.

7.7.1.2 Export of material from Site

Where material cannot be reused off Site, it will be sent for recovery/disposal at an appropriately permitted/licenced site. This will be discussed further in the Construction and Demolition Waste Management Plan.

Site investigations have not been undertaken to determine if there is contamination present onsite. A detailed Waste Soil Classification assessment will be completed for the Site to determine the presence of inert, non-hazardous, and/or hazardous materials prior to any required off-site disposal during the construction phase. All material will be

managed according to the applicable Waste Management Acts and subsequent regulations. Nonetheless, material which is exported from Site, if not correctly managed or handled, could negatively impact human beings as well as water and soil environments. Further details are included in the Construction Management Plan and the Construction and Demolition Waste Management Plan.

7.7.1.3 Sources of Fill and Aggregates

All fill and aggregate for the project will be sourced from reputable suppliers as per the project Contract and Procurement Procedures. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the project;
- Environmental management status; and
- Regulatory and legal compliance status.

The use of fill and aggregate containing recycled or recovered materials shall be considered.

7.7.1.4 Fuel and Chemical Handling

The following mitigation measures will be taken at the construction site to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of bunded refuelling areas on the Site (if required);
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowzers are used, the following measures will be taken:
- Any flexible pipe, pump, tap, or valve will be fitted with a lock and will be secured when not in use;
- All bowser units to carry a spill kit and operatives must have spill response training; and
- Portable generators or similar static-operation, fuel containing equipment will be placed on suitable drip trays.
- In the case of drummed fuel or other potentially polluting substances being used during construction, the following measures will be adopted:
- Secure storage of all containers of potentially polluting substances in a dedicated, internally-bunded chemical storage unit or inside concrete bunded areas;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they should be done so secured and on spill pallets; and

- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

The aforementioned list of measures is non-exhaustive and will be included in the Construction Management Plan.

7.7.1.5 Control of Water during Construction

Run-off from excavations/earthworks cannot be prevented entirely and is largely a function of the prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls, and profile to control run-off and prevent ponding and flowing. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All runoff will be prevented from directly entering any water courses.

During excavation, possible water ingress is possible. Pumping of this water would be required to keep the excavation dry. The discharge of water to the foul sewer during the construction phase will be regulated under a Discharge Licence obtained from the Regulator (Irish Water) and issued under the Water Pollution Act. Attenuation, pre-treatment, and monitoring of discharge water will likely be required under any Discharge Licence (Section 16 Licence). Pre-treatment and silt reduction measures on Site will include a combination of silt fencing, settlement measures (silt traps, silt sacks, and settlement tanks) and hydrocarbon interceptors. Active treatment systems such as Siltbusters or similar may be required depending on turbidity levels and discharge limits. Qualitative and quantitative monitoring will be implemented as per the Conditions of any Discharge Licence. The client's environmental consultant will audit the sampling and analysis results as required to ensure conformance to the discharge licence limits and testing frequency requirements.

7.7.1.6 Construction Management Plan

In advance of commencement of Site works, the works Contractor will provide a Construction Methodology document detailing their proposed construction methods and any additional requirements of the Design Team or Planning Regulator. The Contractor will also prepare a Construction Management Plan (CMP) and Environmental Plan. The CMP sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor with the oversight of the Developer. The CMP is a living document and will go through a number of iterations before works commence and during the construction phase itself. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures in the EIAR and any subsequent conditions relevant to the project.

7.7.2 Operational Phase Mitigation

During the operational phase of the White Heathers development any excavations have the potential for unavoidable impact on the geological environment of the area. The proposed scheme will have a heating system which will be fuelled by mains gas. Therefore, there is no requirement for fuel oil storage thus removing any potential source.

Table 7-3: Mitigation Measures

Mitigation Measures
Excavation depths will be optimised to keep the excavations to a minimum and diminish the amount of soils to be moved off-site and in the Site. It is proposed that the closest feasible facility will be chosen to reduce the transport-associated carbon footprint where soils are exported off-site.
The construction phase will follow a Construction and Demolition Waste Management Plan containing clear instructions on the best environmental approach on Control of Soil Excavation and Export from Site, Reliable Sources of fill and aggregates for the project, Appropriate Fuel and chemical handling, transport, and storage and Control of water during construction.
The 'reduce, reuse, and recycle' principles will guide the approach on Site during all times, especially on feasible reusable soils.

7.8 Predicted Impact of the Proposed Development

The predicted residual impacts of the proposal are outlined in the Detailed Assessment in Table 7.5.

7.8.1 Construction Phase

The predicted impacts of the construction phase are described in Table 7.5 in terms of quality, significance, extent, likelihood, and duration. The relevant mitigation measures are detailed, and the residual impacts are determined, taking into account the mitigation measures.

The primary residual impacts from the construction phase are the land take/change of use and the removal of soil to facilitate the development. These impacts are unavoidable given the nature, requirement, and design of the proposed development. The construction impact is assessed to be a slight, negative, short-term impact.

7.8.2 Operational Phase

During the Operational Phase of the White Heathers development there will be an impact on the geological environment of the area due to the undercroft which will likely be founded in the made ground. There is no requirement for any fuel oil stores as all heating will be fuelled by mains gas. The residual impact is assessed to be a negative, imperceptible, permanent impact.

7.8.3 'Do Nothing' Scenario

In the event that the development does not progress, there would be no resulting additional impacts on the geological/hydrogeological environment in the area of the project site.

7.9 Monitoring

Monitoring shall be carried out as specified in any water Discharge Licence associated with the construction phase of the project. Monitoring of dust and noise shall also be carried out as specified in the planning permission should the development be allowed to proceed.

There is no requirement for monitoring during the operational phase.

Table 7-4: Monitoring Proposals

Monitoring Proposals
On-site pre-treatment of groundwater prior to discharge to sewer might be required dependent on groundwater chemistry results. This will be confirmed by the appointed dewatering contractor.
Any water discharged to the public sewer will be monitored frequently to ensure it meets the limits stipulated by the discharge licence.
Record keeping and monitoring of the import and export of soils shall be carried out in accordance with the Waste Management Act. All waste hauliers and receiving facilities shall have valid permits in accordance with the Waste Management Acts and Planning Conditions.

7.10 Reinstatement

No reinstatement required.

7.11 Interactions

During the construction phase, the following aspects would interact with land & soils and, in the absence of mitigation, may give rise to likely significant effects;

- Site preparatory works (i.e. site clearance, re-profiling, etc.) during the construction stage can potentially impact the land & soils due to the risk of accidental spills, cross-contamination due to incorrect waste soils management, use of contaminated material as fill etc.

During the operational phase, the potential interactions are;

- Accidental Leaking of sewage, oil, fuel, etc

The potential significant impacts on land & soils arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required.

With mitigation measures in place, no significant permanent residual negative impacts will occur.

7.12 Potential Cumulative Impacts

The cumulative impacts take into account the combined effects of the proposed development and other proposed projects in the surrounding area. Cumulative impacts occur as a result of actions taking place in the same area and within the same timeframe as the proposed development.

This cumulative assessment assumes that the following extant planning permissions will be completed:

- (DCC reg. ref. SHD0031/20) for a mixed-use Build to Rent Strategic Housing Development at the former 'Player Wills' Site under section 37(2)(b) of the Planning and Development Act, 2000, situated approximately 205m north at its closest point to the current application site
- (DCC reg. ref. SHD0009/20) for a Build to Rent Strategic Housing Development at the former 'Bailey Gibson' Site under section 37(2)(b) of the Planning and Development Act, 2000, situated approximately 58m northeast at its closest point to the current application site
- (DCC reg. ref. 3537/21) for a development at the Coombe Women and Infants University Hospital situated approximately 58m north at its closest point to the current application site

The permitted development at the former Player Wills site comprises the demolition of all buildings excluding the former factory building. The building will undergo a change of use, refurbishment, modifications, and alterations which include the addition of two additional storeys. The permitted development at the former Bailey Gibson site comprises the demolition of all buildings and structures on Site and the construction of 5 no. blocks housing 416 residential units. The permitted development at the Coombe Hospital site comprises a new access gate to the boundary of the Coombe with Margaret Kennedy Road with all associated site works and development at the Coombe Women and Infants University Hospital.

The residual impact from these developments on land and soils was determined to be negative, imperceptible, and permanent. The construction phase impacts are described at table 7.5 – Impact determination – construction phase.

Table 7-5 Impact determination at construction phase

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Earthworks	Site Clearance Excavation Construction	Excavation of made ground and natural soils for redevelopment, services, etc.	Negative	Moderate	Local	Certain	Permanent	The minimum amount of space to construct the project has been designed for. Material will be reused on site where possible.	Moderate Negative
Earthworks	Excavation	Soil erosion causing airborne dust and/or nuisance dust on public roads and neighbouring properties	Negative	Slight	Local	Unlikely	Short-term	Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted throughout the excavation period. Vehicle wheel wash facilities will be installed at site exits, and a road sweeping programme will be implemented.	Imperceptible negative
Earthworks Altering Groundwater/Su rface water	Excavation Construction	Imported fill and aggregates will be required during the works	Negative	Slight - Moderate	Local (maybe a number of quarry sites)	Likely	Permanent	Contract and Procurement Procedures will ensure that all aggregates and fill material required for the construction are sourced from reputable suppliers. Declarations of conformity/ compliance	Imperceptible negative

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
								certificates will be required to ensure all aggregates meet the engineering specifications.	
Earthworks	Excavation	Excavation of a significant volume of made ground within site	Positive	Slight	Local	Likely	Permanent	Chemical contamination has been identified within made ground. Any such material which will be removed will be disposed of at a suitable facility. Where soil is classified as suitably inert, it will be reused were possible on site.	Slightly Positive
Altering Groundwater/Surface water	Excavation Construction	Altering existing local groundwater regime	Negative	Slight	Local	Likely	Permanent	The one-storey underground carpark will be founded within the made ground and/or silt and clay layers depending on location. Therefore, while a slight rise in groundwater level surrounding the site may occur upgradient of the pile wall. However, this is expected to be within the seasonal variation of	Slightly negative

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
								groundwater levels within this layer.	
Dewatering/ Lowering the water table	Excavation Construction	Discharge of potentially contaminated groundwater to sewer; possible settlement of buildings as a result of dewatering	Negative	Slight	Local - maybe a number of nearby buildings	Likely	Short-term	The appointed dewatering contractor will be supplied with the 2008 and any subsequent groundwater analytical results. The contractor will design an on-site pre-treatment system based on the results.	Imperceptible negative
Storage of potentially polluting materials	Site Clearance, Excavation, and General Construction	Potential leak or spillage from construction- related liquids on site	Negative	Significant	Local	Unlikely	Short-term	Good housekeeping and proper handling, storage, and disposal of any potentially polluting substances can prevent soil and/or water contamination. Designated and bunded storage areas will be maintained.	Imperceptible negative
Discharge to	Excavation and	Potentially	Negative	Significant	Local	Unlikely	Short-term	There will be no direct	Imperceptible

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Groundwater	General Construction	contaminated run-off percolating to ground and the underlying aquifer						discharge to groundwater during construction. Indirect discharges to the underlying bedrock aquifer may occur increasing the aquifer vulnerability as subsoil is removed from site. Protection of groundwater from potentially polluting substances will be dealt with through measures including correct handling and storage of potentially polluting substances.	negative

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Chapter 8. Hydrology

8. Water & Hydrology

8.1 Introduction

This chapter was completed by O'Connor Sutton Cronin and Associates Limited (OCSC). It evaluated the potential impacts of the proposed development on water and hydrological aspects of the site and surrounding area during the construction and operational phases.

The chapter was prepared following the EPA guidance documents, "Advice notes on current practice (in the preparation of Environmental Impact Statements)" and "Guidelines in the information to be contained in Environmental Impact Statements.

This chapter was prepared by co-authored by Kate Santos, EnvEng, HDipCompSci and Eleanor Burke (BSc, MSc, DAS, CSci, MEnvSc), OCSC Environmental Division Manager, a Chartered Scientist and Member of the Institution of Environmental Sciences with a combined experience of over 25years. This chapter deals with mitigation, monitoring and cumulative impacts.

8.2 Consultation

This chapter was prepared in coordination with the details outlined in Chapter 6 – Biodiversity; Chapter 7 – Land, Soils, Geology and Hydrology; and Chapter 9 – Material Assets.

OCSC engaged with Irish Water to prepare the application through the Pre-Connection Enquiry process. As a result, Irish Water has provided a Confirmation of Feasibility for the proposed development, included in the Engineering Services Report, accompanying this application as a standalone report.

The Drainage Division conditions of the recent approved mix-use residential development on the site (DCC Planning Register Reference: CDS20006559) were also reviewed in preparing this application.

8.3 Methodology

8.3.1 Scoping

An initial assessment was carried out, which defined the project in terms of location, type, and scale, established the baseline conditions, established the hydrological environment, established the activities associated with the project and initial assessment and impact determination. These objectives were achieved by way of a desk study. Additional

information has been compiled through consultation and feedback from stakeholders and the Design Team.

Under the Water Framework Directive (WFD) and corresponding Regulations, the water quality of Ireland's surface and groundwater is assessed biologically, physically, and chemically. Assessments are conducted by the EPA and Local Authorities and have been compiled and presented in a standardised manner for River Basin Districts. Baseline information on the local and regional surface water bodies, their status and threats were obtained from a range of documents and online sources, including the EPA's Water Quality database, Ireland's Water Framework Directive "Water Matters" online resource and the Eastern River Basin District (ERBD) website and reports.

8.3.2 Detailed Methodology

8.3.2.1 Water Infrastructure Services

Assessment of existing and proposed infrastructure for wastewater drainage, water supply and surface water drainage was conducted in accordance with I.S. EN752: 2017 'Drain & Sewer Systems outside Buildings', 'The Greater Dublin Region Code of Practice for Drainage Works' (GDR COP), 'Irish Water's Code of Practice for Wastewater Infrastructure', Irish Water's IW-CDS-5030-03 Revision 2, the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS) and the 'Institute of Hydrology Report 124 (IH 124) method'.

The OCSC ESR estimates the wastewater drainage effluent and the water demand calculated using Irish Water's Code of Practice for Wastewater Infrastructure and the Irish Water's Code of Practice for Water Infrastructure. In addition, the OCSC ESR report contains existing record drawings for the combined drainage network and water supply network for the area surrounding the subject lands obtained from Dublin City Council, Irish Water, and online GIS mapping from Geological Survey Ireland (GSI).

Allowable surface water runoff from the development site has been calculated using the 'CIRIA C753 – The SuDS Manual' and the 'Greater Dublin Strategic Drainage Study' (GDSDS) in accordance with Dublin City Council Development Plan requirements to estimate existing Greenfield runoff rates (OCSC ESR Report).

A Pre-Commencement Enquiry Form was submitted to Irish Water to assess the potential impact of the proposed development on the existing public wastewater infrastructure and water supply based on estimated occupancy as per their guidance documents.

OCSC has prepared a Site-Specific Flood Risk Assessment (FRA) submitted with this application under separate cover. This assessment considered flood risk to the proposed development from all potential sources and its possible impact on flood risk during the

critical 1 in 10, 100 and 1,000-year storm events. Relevant sources/mechanisms of flooding include tidal/coastal, fluvial, pluvial, existing drainage and water infrastructure, proposed drainage and water infrastructure and groundwater.

The flood risk assessment was conducted following the Planning System and Flood Risk Management Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government and the Office of Public Works), C624 Development and Flood Risk (Construction Industry Research and Information Association, CIRIA). This assessment was aligned with Dublin City Development Plan 2011-2017, Draft Dublin City Development Plan 2022-2028. In addition, record information on the existing infrastructure were obtained from Dublin City Council; and Irish Water.

Information on all services was obtained from the topographical site survey, site inspections and Ordnance Survey Ireland mapping. These are discussed in chapter 9 Material Assets – Water Services, and the OCSC Engineering Services Report (ESR), which accompanies this application.

8.4 Receiving Environment

The development site (1.44ha) is an urban brownfield site with several industrial warehouse units to be demolished. The site is located in the northeastern vicinities of Dublin South Central and is immediately bound by Priestfield Cottages to the east; South Circular Road, to the northeast; Existing residential units and a church, to the north; St. James Terrace residential units, to the west; and Grand Canal to the south. The Grand Canal banks formed the southern site boundary.

The existing site comprises c.0.56ha concrete yard area, c.0.66ha roof area and c.0.22ha of Grand Canal bank area, summing up c.1.44ha of developable area. It is predominantly located within the lands zoned as "Z6: Employment/Enterprise Zones" Dublin City Council with the lands adjacent to the Grand Canal zoned "Z9: Amenity/Open Space Lands/Green Network".

8.4.1.1 Regional Hydrology

The site lies within the Eastern River Basin District (ERBD). The ERBD covers a large area (c. 6,300 km²) extending from parts of Co. Cavan in the north to south Wicklow and from parts of Co. Westmeath to the Irish Sea. The main river catchments in the RBD are the Boyne, the Nanny/Delvin, the Liffey and the Avoca/Vartry.

The district is further divided into Hydrometric Areas (H.A.), and the site lies within HA09, which is the catchment draining to Dublin Bay. Hydrometric Area 09 is the most densely populated in Ireland and contains a relatively large urbanised land area (c. 21%), with

agricultural land comprising over 60% of the catchment. Given the urban nature of the catchment, the water bodies within it are subject to prolonged and sustained pressure from pollution via point and diffuse sources. The water bodies have also been subject to high degrees of modification and canalisation as a result of development through the years.

The site is located within the Poddle waterbody sub-basin, part of the Dodder sub-catchment (Dodder_SC_010) that pertains to the Liffey and Dublin Bay Catchment. However, the Poddle is culverted for much of its length in the city centre and there is no connection between the proposed development area and this watercourse. The Liffey rises in the Wicklow Mountains near the Sally Gap, and the upper catchment consists of high mountains areas of Co. Wicklow. The river flows for c.125 km through Co. Wicklow, Co. Kildare, and Co. Dublin before entering the Irish Sea at Dublin Bay. The Liffey and Dublin Bay catchment area is 1,616 km². The Liffey is impounded by dams at Poulaphouca, Golden Falls and Leixlip; the impoundments are associated with the hydroelectric generation and water extraction. These installations regulate the river flow.

The river Liffey is 1.6 km downstream to the north of the site. The Grand Canal is located adjacent to the project site and forms a hydrological pathway between the project site and Dublin Bay via the River Liffey. It is located on the site's southern boundary and is designated as a Proposed Natural Heritage Area.

The Liffey Estuary stretches from Islandbridge (c. 4.5 km upstream of the subject site) to the end of the Bull Wall. For WFD assessment and classification, the estuary was split into the upper and lower water bodies. The Liffey Estuary land use is dominated by Dublin City and in the lower reaches by Dublin Port and the associated industrial areas. The former industrial docklands area has undergone major redevelopment in recent years and now has a service sector development along its perimeter. Whilst the flow in the estuary itself is to some extent regulated by the controlled release of water from the upstream reservoirs, the mixing processes in the estuary are typified by a classic "salt wedge".

The Liffey Estuary is transitional water (tidal) up to Islandbridge and has been classified as a eutrophic, nutrient sensitive water. The WFD report for the waterbody classifies the overall status as 'Good' with an objective to maintain good status by 2027. The catchment is currently 'at review' to assess the achieving of the conservation objective. The main threat to this body conservation is the Combined Sewer Overflows (CSOs). These are known to occur from many points within the Dublin City catchment, including from the combined sewerage receiving discharge from the subject site (further information in Chapter 7 of Vol. II of this EIAR).

The River Liffey Estuary has not been designated as a European Site under the Habitat's Directive. However, it is hydrologically linked to a number of designated sites, namely:

Special Areas of Conservation:

- North Dublin Bay SAC (000206), 7.9 km to the northeast;
- South Dublin Bay SAC (000210), 5.4 km to the east;

Special Protection Areas:

- North Bull Island SPA (004006), 5.1 km to the northeast; and
- South Dublin Bay and River Tolka Estuary SPA (004024), 5.4 km to the east.

The site and its vicinity are located in Flood Zone C and are not at risk of fluvial, tidal, or groundwater flooding. There are no flooding issues within the site and its surrounding area but the Grand Canal to the southern boundary of the site. The Canal has a flood probability of the 0.1% AEP.

Based on the GSI website, the aquifer beneath the site is 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones'. The site area has 'Moderate' Vulnerability of groundwater to contamination. The effective rainfall in the vicinity of the White Heather site is 275.300 – 285.200 mm/year. The GSI have designated the recharge coefficient in the immediate area of the Site as 20% due to lenses of sand and gravels within the boulder clay. Based on the GSI's Recharge Model, the total recharge would be equivalent to approximately 55- 57mm/year.

8.4.1.2 Local Hydrology

No watercourses or surface water features are present within the site boundary. However, the Grand Canal is aligned to the southern boundary of the site, and the site area includes c.0.22 ha of the Grand Canal bank area. It discharges to the River Liffey and ultimately to Dublin Bay.

The River Poddle is ca. 0.9km to the east at its closest point from the centre of the site; however there is no hydrological connection to the site.

All surface water runoff on the existing site is currently drained by road gullies on the concrete yard and the roof that discharges to the existing development drainage networks. The network serving the major catchment area discharges to the existing public 990x640mm brick combined sewer on South Circular Road, while the network serving the minor catchment area discharges to the existing public 300mm vitrified clay on St. James Terrace. The rainfall runoff in the grassed area, which is between the industrial warehouse

units and the Grand Canal, naturally infiltrates into the bank of the Canal or runs off towards the Canal.

The OCSC Engineering Services Report states the existing ground has low permeability in the clay soils, thereby unsuitable for infiltration with a soil potential rating index SPR value of 0.47%.

According to Met Éireann, the Standard Average Annual Rainfall (SAAR) value for the development site is 721mm.

The OCSC ESR estimated a rainfall runoff discharging from the brownfield site area to be developed (i.e. c.1.22ha of the overall c.1.44ha), in its existing condition QBARRURAL = 6.1 l/s (5.0 l/s/ha). However, Irish Water stated on the Confirmation of Feasibility in Appendix D of the OCSC Engineering Services Report that the stormwater inflow into the receiving combined sewer is limited to 2 l/s/ha, QBARRURAL = 2.4 l/s.

The Grand Canal WFD report 2013 to 2018 classifies its overall status as 'Good' with an objective to maintain good status by 2027. The Canal is currently 'not at risk' of not achieving the conservation objective.

The River Poddle's WFD status is unassigned. The river is currently 'at risk' of not achieving the good status by 2027 due to significant pressure of nutrients and diffuse urban sources of pollution.

8.4.1.3 Water Infrastructure Services

There is no apparent public gravity wastewater infrastructure in the immediate vicinity of the proposed development. However, the Irish Water public drainage records indicated 2no. combined sewers near the site.

Along South Circular Road, there is an existing 990x640mm brick combined sewer that starts close to the junction of St. James Terrace with South Circular Road towards the east. The existing 300mm vitrified clay combined sewer on St. James Terrace connects to the 750mm concrete combined sewer on Dolphin's Barn Street that travels toward the north.

The combined sewers (collecting both wastewater and surface water) are in the ownership of Irish Water that is operated and maintained in conjunction with Dublin City Council. The existing combined sewers provide services to domestic, commercial, and industrial customers in the site's immediate vicinity and the wider area.

Ringsend Wastewater Treatment Plant serves Dublin City and the City environs in the neighbouring counties. Its contributing residential population is in the order of 1.1 million.

Together with the non-domestic contribution, the existing treatment works is currently operating at its full capacity of 1.65 million population equivalent (P.E.).

In November 2012, Dublin City Council received planning permission to improve the plant to 2.1M PE firm capacity, equivalent to 2.4M PE ultimate design capacity. This decision was challenged by way of judicial review, and in November 2013, the decision to approve the scheme was confirmed by the High Court. Afterwards, Irish Water has inherited the treatment plant and plan to upgrade the existing plant to meet a capacity of up to 2.1M PE in the second half of 2023; this is currently being implemented.

The upgrade and expansion of the treatment works will be implemented in three phases. Phase 1 has already been completed and comprises advanced works to improve certain aspects of the existing works, including additional odour treatment and improved sludge handling capacity. Phase 2 expanded the wastewater treatment capacity to 2.1M PE by 2018. Phase 3 comprises an upgrade to nutrient removal at the existing works and is currently at the design and procurement stage, with construction due to progress from 2022 to 2026. When all the proposed works are complete in 2025/2026, the Ringsend Wastewater Treatment Plant will be able to treat wastewater for up to 2.4 million population equivalent.

The Greater Dublin Drainage Project is a regional wastewater project to serve the Greater Dublin Area, with a planned treatment plant in North County Dublin. The project includes an orbital sewer and two pumping stations, which will divert drainage from the north of Dublin City to the new treatment plant, thus freeing up additional treatment capacity at the Ringsend treatment works, which is currently treating drainage from this area. Subject to being granted planning approval, it is anticipated that this project will be operational in 2026.

8.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social

housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

8.5.1.1 Local Hydrology

As part of the proposed development, the existing surface water and wastewater networks will be decommissioned, and new surface water and wastewater networks will be constructed. The proposed surface water and wastewater networks are to discharge to the local public 990x640mm brick combined sewer on South Circular Road via a 225mm-dia. combined sewer.

An independent surface water and wastewater network will be provided for this development. However, it is noted that there is no public surface water network in the vicinity of the proposed site.

The development's surface water network will combine with the wastewater network at the site boundary before discharging as per GDR COP requirements. There will be no discharge to the Grand Canal (or ultimately the River Liffey or Dublin Bay via the Canal).

8.5.1.2 Water Utility Services

A further component of the SuDS protocol is to increase surface water runoff's overall quality before it enters a natural watercourse or a public sewer, which ultimately discharges to a water body. This protocol is to ensure the highest possible standard of surface water quality.

The site of the proposed development comprises approximately 1.44 hectares. Approximately 1.22-hectares of the overall site is to become a residential development. The remaining c.0.22-hectares comprise a mixture of hard and soft landscaping and amenity value, which will be drained via landscaping. Thereby, it will not contribute to the development's surface water drainage network.

Surface water runoff from the proposed development will be attenuated to equivalent greenfield runoff rates, based on the IH124 method for catchments smaller than 25km² (25ha) in the area and following the Greater Dublin Strategic Drainage Study (GDSDS) and Dublin City Council requirements. The equivalent greenfield runoff rate for the subject site is 2.4 l/s (2.0 l/s/ha), resulting in a total discharge rate from the site of 5.72 l/s. This is to be achieved with the provision of a flow restrictor (Hydro-Brake Optimum by Hydro-International, or similar approved) prior to discharging to the existing public 990x640mm brick combined sewer on South Circular Road, with the appropriate measures of attenuation provided. In addition, flow-control devices and associated attenuation will be strategically provided to maximise SuDS benefits.

Car park drainage will gather any vehicle runoff and discharge it to the wastewater network via a class 1 fuel separator. Therefore, no surface water runoff will enter the undercroft car park from the ground level.

The proposed surface water drainage system comprises a Sustainable Urban Drainage System (SUDS) consisting of green roofs, rain gardens, geocellular storage systems, detention basins, trapped road gullies, silt traps, flow control devices a fuel separator. The proposed SUDS devices provide a treatment train for rainfall runoff, delivering interception storage, water quality treatment, runoff volume reduction and runoff rate reduction.

Based on the nature and extent of the proposed development, the expected daily wastewater generation is 152.4m³/day with an equivalent Dry Weather Flow (DWF) of 1.76 l/s. With a peaking factor of 4.5 for domestic flow, the resulting peak flow is expected to be 7.8 l/s.

It is proposed to collect wastewater by gravity from the development above ground level in a network of gravity drainage pipes. The wastewater network goes from the highest point at the southwestern boundary to the northeastern border. The network will receive the discharge from each apartment block and terrace unit within the proposed development and discharge to the existing 990x640 brick combined sewer on South Circular road.

A capped spur connection will be provided from the last surface water manhole to facilitate a future connection to a public surface water network, should one be installed in the area.

8.6 Potential Impact of the Proposed Development

8.6.1 Construction Phase

The development will require the demolition and excavation of quantities of hardstanding areas and underlying soil. As a result of the construction works, surface water runoff may contain increased silt levels or become polluted during construction activities. Waterborne silt, cementitious material and other debris can arise from dewatering excavations, exposed ground, stockpiles, and site roads. In addition, construction materials such as concrete and cement are alkaline and corrosive and can cause pollution in watercourses. That presents a residual risk that untreated surface water runoff from the construction site to the public network and the Canal and discharging into the Liffey Estuary & Dublin Bay.

Material from construction works could potentially cause deoxygenation of water in the receiving watercourses, the gills of fish to become obstructed with waterborne silt, and aquatic plants and invertebrates to be smothered by settled silt, limiting exposure to sunlight and oxygen. In addition, there is potential for contamination of the surface water runoff with soil particles and debris when discharging to the public network. Heavy siltation or grit in the surface water runoff would lead to maintenance issues for the receiving gravity sewerage network on the South Circular Road. The combined sewerage network conveys typically flow to the Ringsend Wastewater Treatment Works.

During the construction of the new water utilities infrastructure systems, there is the potential for unattenuated and untreated surface water to be discharged to the existing public wastewater sewer /water supply systems due to pipes and manholes being left open.

There is a risk of groundwater/watercourses/surface water network pollution by accidental spillage of wastewater effluent when making connections to live sewers.

Pollution of groundwater/watercourses/soils by accidental spillage of oils/diesel from temporary storage areas, or where construction equipment is maintained, with particular risk to the adjacent Grand Canal.

In the absence of mitigation measures, these potential impacts are considered to be adverse, significant, and temporary. Compliance with the conditions of the discharge licence will effectively mitigate potential risks.

8.6.2 Operational Phase

No adverse impact regarding flooding downstream is anticipated, as flows are to be restricted to a maximum rate of 2 l/s/ha that is less than the greenfield runoff rate and significantly less than the pre-development – i.e. existing - conditions. A worst-case scenario is that minimal flooding may occur within the site for a very intense rainfall event while volumes drain down.

The time of year has a major bearing on the quality of stormwater runoff - in particular, the first rains after a prolonged dry period where accumulated deposits of rubber, particulates, oils, etc., are washed away. However, the impact from such runoff is likely to be slight due to the provision of intercepting devices and a fuel interceptor and the large volume of rainwater necessary to mobilise pollutants and runoff.

Stagnation of the water and siltation within the flow control device manholes may occur, which will require periodic inspection of the drainage systems, with collected silt and debris removed accordingly.

The existing volume of the wastewater drainage systems will increase the wastewater discharge rate from the site to the existing public combined sewer system. This rate rise on the public infrastructure has already been assessed by Irish Water as part of the Pre-Commencement Enquiry process and confirmed as feasible without the requirement of upgrade works. i.e., no adverse impact.

There is the possibility that new wastewater sewers would leak, allowing wastewater to leak out of the sewers, potentially causing contamination of groundwater and surface waters in the area. In the absence of mitigation measures, these impacts are considered to be adverse, significant, and permanent. However, all pipes will be tested prior to allowing wastewater effluent to discharge to them, in accordance with the requirements of Irish Water.

There may be the possibility of surface water ingress into the wastewater drainage system due to poor workmanship, which would increase the load on the existing sewers. However, all pipes will be tested and surveyed, in accordance with the Irish Water Code of Practice for Wastewater Infrastructure, prior to allowing wastewater effluent to discharge through the pipes.

The proposed development will result in an increase in water demand on the public water distribution network.

The additional demand on the public water infrastructure has already been assessed by Irish Water as part of the Pre-Commencement Enquiry process and confirmed as feasible without the requirement of upgrade works.

Boosting will be required for units above the ground floor. This will be carried out from the water storage tank room.

Contamination of the existing water supply network may result if unsterilised mains are connected to the public network. This would be mitigated against by scouring out the mains, swabbing and chlorinating the mains prior to connection to the public supply and occupation of any of the units, as per Irish Water's Code of Practice for Water Infrastructure, with all new installed mains to be tested prior to connection.

As the existing site is currently predominantly in hardstand, the proposed development will result in no significant increase in surface water runoff volume or runoff rates. The primary land use of the existing site is surface car-parking, with a resultant risk of surface water runoff containing elevated hydrocarbons. The proposed change from the existing scenario to the proposed development provides an inherent improvement for surface water.

The impacts on surface water discharge from the site are considered to be positive, significant, and permanent.

8.6.3 Do Nothing Scenario

If the proposed development were not undertaken, it is expected that there would be no change on the subject site and, therefore, no impact on water and hydrology arising from the subject site.

8.7 Mitigation Measures

8.7.1 Construction Phase

During construction, it is envisaged that the contractor will put in place temporary drainage facilities to manage water within excavations. Water entering excavation areas may be collected and discharged to the sewerage system following treatment (such as silt traps and interceptors) and at a flow rate subject to the conditions of a discharge licence from Irish Water. During the construction phase, welfare facilities for construction personnel will be located on site. Wastewater effluent from these facilities will be discharged to the sewerage system at a location and a flow rate subject to the conditions of a discharge licence from Irish Water. Discharge from the excavated areas could potentially lead to siltation, surcharge, and flooding within the sewerage system. In addition, effluent from the

welfare facilities could potentially lead to pollution of watercourses and flooding within the sewerage system.

Section 8.7 have a more detailed description of the mitigations measures for the Surface Water Drainage/ Wastewater Drainage Systems.

All excavated materials shall be sorted and separated on site to suitable stockpiles of the minimum area and remote from the adjacent Grand Canal. Stockpile areas shall be designed with suitable drainage and erosion protection to prevent the creation of soil bearing runoff and mixing of materials.

If encountered, contaminated soils should be excavated and disposed off-site in accordance with the Waste Management Acts 1996-2001 & associated regulations and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and the adjacent Grand Canal from fuel, oil and other hazardous materials (paints, cleaning agents, herbicides, fertilisers, etc.). Suitable bunded areas will be installed for oil all storage tanks with a minimum 110% storage volume. Designated fuel filling points will be put in place at secure locations, remote from the Grand Canal, with appropriate oil separators to provide protection from accidental spills. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill.

It is recommended the construction phase development be dealt with within an appointed contractor through the development and implementation of a Waste Construction & Environmental Management Plan. This plan should be agreed with the Local Authority prior to the commencement of construction.

The contractor will be required to prepare and implement a Surface Water Management Plan that ensures avoidance and minimisation of effects. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge off site at a controlled rate. Periodic testing of the surface water discharge may also be undertaken.

If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface.

All oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers to minimise any impact on the water environment from material spillages.

Any construction phase discharge to the wastewater sewerage infrastructure shall comply with the conditions of a Discharge Licence from Irish Water. In order to reduce the risk of defective or leaking sewers, all new sewers will be pressure tested and CCTV surveyed to ascertain any possible defects. Such defects, if they arise, would be repaired prior to the connection of any future development to the sewers.

8.7.2 Operational Phase

During the project's operational phase, sustainable drainage systems, trapped gullies and silt-trap manholes will lessen debris discharging into the surface water system and, ultimately, the public combined sewer network.

Filter Drains, pervious paving, green roofs, SuDS Tree Pits, intensive landscaping, will assist in reducing runoff volume and improving water quality.

Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.

All surface water drains and sewers/ wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to groundwater on the site.

The use of Class 1 fuel separators will reduce the amount of silt and grits present in the undercroft car park wash before discharge to the wastewater network and any contaminating pollutants, such as hydrocarbons, oils and grease.

Table 8.7: Mitigation Measures

Mitigation Measures
Water sewerage system treatment (such as silt traps and interceptors) will be implemented following conditions of a discharge licence from Irish Water.
All excavated materials shall be sorted and separated into stockpiles. The stockpiles will be kept remote from the adjacent Grand Canal. Stockpile areas shall be designed with appropriate drainage and erosion protection to prevent the creation of soil bearing runoff and mixing of materials.
In case contaminated soils are found on site, they should be excavated and disposed of off-site in accordance with the Waste Management Acts 1996-2001 & associated regulations and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.

Installation of bunded areas for oil storage tanks and oil separators at fuel filling points to protect from accidental spills. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill.
Waste Construction & Environmental Management Plan approved by the Local Authority prior to the commencement of construction.
Surface Water Management Plan. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated before discharge off site at a controlled rate. Periodic testing of the surface water discharge as required.
Any concrete mixing plant shall be sited in a designated area with an impervious surface.
All oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers to minimise any impact on the water environment from material spillages.
Any construction phase discharge to the wastewater sewerage infrastructure shall comply with the conditions of a Discharge Licence from Irish Water. New sewers will be pressure tested and CCTV surveyed to detect defective or leaking sewers. Such defects, if they arise, would be repaired prior to the connection of any future development to the sewers.
Sustainable drainage systems, trapped gullies and silt-trap manholes will lessen debris discharging into the surface water system and, eventually, the public combined sewer network.
Filter Drains, pervious paving, green roofs, SuDS Tree Pits, and intensive landscaping will reduce runoff volume and improve water quality.
Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.
All surface water drains and sewers/ wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to groundwater on the site.
The use of Class 1 fuel separators will reduce the amount of silt and grits present in the undercroft car park wash before discharge to the wastewater network and any contaminating pollutants, such as hydrocarbons, oils and grease.

8.8 Predicted Impact of the Proposed Development

8.8.1 Construction Phase

Provided the sustainable drainage systems and all mitigation measures are fully implemented as part of the proposed works, the predicted environmental impacts on the downstream receiving drainage infrastructure should reduce from Moderate to Slight. This should include any mitigation measures proposed in respect of flora and fauna, which is dealt with separately in this EIAR.

As surface water runoff from the site is discharged to the receiving combined sewerage infrastructure, the proposed development will result in a reduction in combined sewage discharges.

The impact from the proposed development on the existing wastewater / combined drainage systems will be a reduction in the quantity and rate of discharge of wastewater from the site to the existing public combined sewer system, with the contributing flows coming mainly from the site office and welfare facilities.

There will be minor traffic disruption when excavation works for providing new connection to the existing public combined sewer network at South Circular Road.

There will be a minor water supply demand for site offices and facilities during the construction phase.

There will be minor traffic disruption when excavation works are being carried out at Dolphin's Barn Street.

8.8.2 Operational Phase

Surface water discharge from the site will be restricted by means of attenuation to restrict the surface water runoff to less than the greenfield runoff equivalent, and significantly less than the existing, pre-development condition. Therefore, no adverse impact in respect of flooding downstream is envisaged as a result of the proposed development.

The surface water design has been prepared in accordance with best practice incorporating significant sustainable drainage systems, which include the installation of filter drains, permeable paving, green roofs and intensive landscaping. The integrated sustainable drainage system will reduce runoff volume and improve water quality, prior to discharging to the public combined sewer network.

The impact from the proposed development on the existing wastewater / combined sewer drainage network will be to increase the quantity and rate of discharge of wastewater from the site to the public network (the discharge from the existing industrial units is unknown. These increased flows are quite low and can be accommodated within the existing drainage network, as confirmed by Irish Water as part of the Pre-Connection Enquiry process.

Any possible increase in flow will be relatively small. It is noted that any potential increase in wastewater loadings will be offset by attenuating the surface water runoff from the new development that also discharges to the combined sewer network. Infrastructure

improvements ongoing at Ringsend WWTP will also ensure that there is no environmental risk posed to the receiving water environment (Dublin Bay) as a result of the discharges.

The proposed development will result in an increase in water demand on the water distribution network. This increase in demand can be accommodated in the existing network, as noted by Irish Water in the Confirmation of Feasibility letter.

8.8.3 'Do Nothing' Scenario

If the proposed development were not undertaken, it is expected that there would be no change on the subject site and, therefore no impact on water services and hydrology arising from the subject site.

8.9 Monitoring

The requirement and recommendation for monitoring related to the hydrological environment is as following:

Qualitative and quantitative monitoring of any water to be discharged to the combined sewerage during the construction and operation phases. This might include flow monitoring and a regular sampling and analysis programme as required by the Regulating Authority under any Discharge Licence.

Table 8.9: Monitoring Proposals

Monitoring Proposals
Watching Brief and Discovery Strategy for any potentially contaminated material to ensure adequate classification and disposal (refer to Chapter 8 of Vol. II of this EIAR, Land and Soils);
Monitoring of retaining wall structures, including inclinometers, tilt-meters, and water movements either seepages or through control points during the construction programme. The specific monitoring requirements and frequency will be defined in the Contractor's CMP;
Regular inspection of on-site fuel storage facilities to ensure environmental 'best-practices' are being employed during construction;
Upon installation of new drains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed drains; and
Following completion of the proposed drainage systems, a short-term flow and rainfall survey (involving in-pipe flow monitors and rain gauges on site) will be carried out to identify misconnections and allow for comparison with watermain meter readings to facilitate assessment and identification of any leakages.

8.10 Reinstatement

Reinstatement of open spaces and roads are proposed as part of the proposed works, namely the new connection to existing public services and any surrounding areas.

8.11 Interactions and Cumulative Impacts

8.11.1 Interactions

During the construction phase, the following aspects would interact with water and hydrology and, in the absence of mitigation, may give rise to likely significant effects;

- **Material Assets Built Services:** The construction of the proposed services (water supply, drainage etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids run off.
- **Land & Soils:** Site preparatory works (i.e. site clearance, re-profiling etc.) during the construction stage have the potential to impact the hydrology and hydrogeology due to the risk of suspended solids becoming entrained in surface water runoff and accidental spills etc.

During the operational phase, the potential interactions are;

- **Material Assets Built Services:** There will be an increased demand on potable water supply and on the municipal drainage system.

The potential significant impacts on water and hydrology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined

where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

8.11.2 Potential Cumulative Impacts

Taking account of the overall environment prior to the development of the White Heather Industrial Estate to date, the current environment in the vicinity of the proposed development, the current buildings & infrastructure, the development proposed under the current application and potential future in the vicinity of the subject site, in the context of the current County Development Plan and the proposed design life & life cycle for the current proposals the potential cumulative impacts may be considered to be Moderate and Long-term impacts. That is, any impact which may occur would be consistent with existing and emerging trends, and the proposed development will likely have a design life in the order of fifty years.

Any such new developments in the surrounding area (such as the Bailey Gibson and Player Wills developments) would be required to provide sustainable drainage systems, designed to reduce flow rates to greenfield equivalent and reduce overall discharge volumes, while improving the discharge quality. Wastewater and water supply impacts would be subject to similar Pre-Connection Enquiry process and approval with Irish Water. Therefore, the cumulative impact of new developments in the vicinity of the subject development would likely have just a minor but sustainable impact on the receiving environment.

Any redevelopment in the area complying with current best-practice methods will likely lead to an improvement in surface water runoff conditions, similar to the subject proposed development.

8-1 Impact determination – construction phase.

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Earthworks	Site Clearance Excavation Construction	Excavation of made ground and natural soils for redevelopment, services, etc.	Negative	Moderate	Local	Certain	Permanent	The minimum amount of space to construct the project has been designed for. Material will be reused on site where possible.	Moderate Negative
Earthworks	Excavation	Soil erosion causing airborne dust and/or nuisance dust on the Canal	Negative	Slight	Local	Unlikely	Short-term	Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted throughout the excavation period. Vehicle wheel wash facilities will be installed at site exits, and a road sweeping programme will be implemented.	Imperceptible negative
Earthworks Altering Groundwater/Surface water	Excavation Construction	Imported fill and aggregates will be required during the works	Negative	Slight - Moderate	Local (maybe a number of quarry sites)	Likely	Permanent	Contract and Procurement Procedures will ensure that all aggregates and fill material required for the construction are sourced from reputable suppliers. Declarations of conformity/ compliance	Imperceptible negative

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
								certificates will be required to ensure all aggregates meet the engineering specifications.	
Earthworks	Excavation	Excavation of a significant volume of made ground within site	Positive	Slight	Local	Likely	Permanent	Chemical contamination has been identified within made ground. Any such material which will be removed will be disposed of at a suitable facility. Where soil is classified as suitably inert, it will be reused were possible on site.	Slightly Positive
Altering Groundwater/Surface water	Excavation Construction	Altering existing local groundwater regime	Negative	Slight	Local	Likely	Permanent	The one-storey underground carpark will be founded within the made ground and/or silt and clay layers depending on location. Therefore, while a slight rise in groundwater level surrounding the site may occur up gradient of the pile wall. However, this is expected to be within the seasonal variation of	Slightly negative

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
								groundwater levels within this layer.	
Dewatering/ Lowering the water table	Excavation Construction	Discharge of potentially contaminated surface or groundwater to sewer; possible settlement of buildings as a result of dewatering	Negative	Slight	Local - maybe a number of nearby buildings	Likely	Short-term	The appointed dewatering contractor will be supplied with the 2008 and any subsequent groundwater analytical results. The contractor will design an on-site pre-treatment system based on the results.	Imperceptible negative
Storage of potentially polluting materials	Site Clearance, Excavation, and General Construction	Potential leak or spillage from construction-related liquids on site	Negative	Significant	Local	Unlikely	Short-term	Good housekeeping and proper handling, storage, and disposal of any potentially polluting substances can prevent soil and/or water contamination. Designated and bunded storage areas will be maintained.	Imperceptible negative

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Discharge to surface and groundwater	Excavation and General Construction	Potentially contaminated run-off percolating to ground and the underlying aquifer and runoff	Negative	Significant	Local	Unlikely	Short-term	There will be no direct discharge to groundwater during construction. Indirect discharges to the underlying bedrock aquifer may occur increasing the aquifer vulnerability as subsoil is removed from site. Protection of surface water and groundwater from potentially polluting substances will be dealt with through measures including correct handling and storage of potentially polluting substances.	Imperceptible negative

References

- Greater Dublin Strategic Drainage Study (2005) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council
- The Greater Dublin Region Code of Practice for Drainage Works (2012) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council
- I.S. EN12056: 2000 Gravity Drainage Systems inside Buildings (2000) – National Standards Agency Ireland
- I.S. EN752: 2017 Drain & Sewer Systems outside Buildings (2017) – National Standards Agency Ireland
- Code of Practice for Water Infrastructure (2020) – Irish Water
- Code of Practice for Wastewater Infrastructure (2020) – Irish Water
- Wastewater Treatment Manuals (1999) – Environmental Protection Agency
- Pollution Prevention Guideline PPG3 Use and design of oil separators in surface water drainage systems (2006) – U.K. Environment Agency
- Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009) – National Roads Authority
- Control of water pollution from linear construction projects – Technical guidance, Publication C648, CIRIA, 2006;
- Environmental Handbook for Building and Civil Engineering Projects (2000) – Construction Industry Research and Information Association
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- Works progress on the Ringsend Wastewater treatment plant upgrade project - Irish Water at <https://www.water.ie/news/works-progress-on-the-rin/>



Chapter 9. Material Assets: Built Services

9.0 Material Assets – Built Services

9.1 Introduction

This chapter was completed by O'Connor Sutton Cronin and Associates Limited (OCSC) and IN2 Design Partnership Ltd (IN2). OCSC have addressed the issues relating to the material assets of water services, i.e., surface water drainage, wastewater drainage, and water supply, in respect of the subject lands. These sections were prepared by Mark Killian, CEng, BE (Civil), MSc (Civil Eng.), M.I.E.I., Associate at OCSC.

IN2 have addressed the issues relating to the material assets of Electrical supply, Gas supply and Telecoms in respect of the subject lands. These sections were prepared by James Redmond CEng MIEI, a Director at IN2 Engineering. James is a Chartered Engineering with Engineers Ireland, holds an honours degree in Mechanical Engineering and has been practicing as a consulting engineer for over twenty years.

This chapter assesses the impact of the proposed development on these aspects of the existing environment. The chapter also identifies proposed mitigation measures to minimise any resulting impacts.

The water services elements of the chapter were prepared following the EPA guidance documents, "Advice notes on current practice (in the preparation of Environmental Impact Statements)" and "Guidelines in the information to be contained in Environmental Impact Statements.

This Chapter and assessment have been completed having regard to the guidance outlined in the EPA documents Guidelines on information to be contained in EIAR (Draft, August 2017) and Advice note for Preparing Environmental Impact Statements (Draft, September 2015) as outlined under Chapter 1 of this EIAR.

9.2 Consultation

This chapter was prepared in coordination with the details outlined in Chapter 6 – Biodiversity; Chapter 7 – Land, Soils, Geology and Hydrology; and Chapter 8 – Hydrology.

Further consultation was had with Irish Water and Dublin City council with respect to the design of the proposed watermain, wastewater and surface water drainage networks that are to serve the proposed development, along with the proposed connection locations.

A desktop study was carried out on the Electrical, Gas and Telecoms infrastructure based on the following documentation:

- ESB network utility plans
- Gas Networks Ireland utility plans

- OpenEir utility plans
- Virgin Media utility plans
- Field surveys of the Application Site carried out between April 2020 and May 2021
- Aerial maps of the area

IN2 Engineering met with the ESB to review the proposed installations at ESB Networks, South Lotts Road, Dublin 4. The existing site infrastructure was reviewed, and the proposed new infrastructure was discussed. The ESB noted a formal application was required in order to allow them fully assess the implications of the proposed development on the surrounding network.

9.3 Methodology

9.3.1 Scoping

A desk study of records received in digital format from the various utility companies/authorities, survey information and supplementary sources was undertaken. Consultations with Irish Water and Dublin City Council were conducted in order to identify their particular requirements for design and construction of the permanent arrangements.

Any existing utilities infrastructure to the site must be identified and removed prior to construction. The development will then require new suitably sized and located utilities connections to serve the proposed buildings.

9.3.2 Detailed Methodology

9.3.2.1 Surface Water Drainage

The existing topography of the subject site, which was carried out on behalf of the client on October 2020, was reviewed, with surface water catchments delineated accordingly. The details of acceptable methods of surface water discharge were submitted to Dublin City Council Drainage Department for review, with the proposed strategy accepted in principle. The surface water drainage design has been carried out in accordance with:

- Greater Dublin Strategic Drainage Study (GDSDS);
- CIRIA C753 – The SuDS Manual;
- Dublin City Council Development Plan.

The development lands are situated with the Grand Canal aligned to its southern boundary. The surface water runoff on the existing site currently discharges excess runoff to the public combined sewer network at South Circular Road, adjacent to the north-eastern corner of the site.

A separate Flood Risk Assessment (FRA) was carried out by OCSC, which has determined both the impact of the proposed works on the surrounding lands, along with potential risk on the development itself, during the critical 1 in 10, 100 and 1,000-year storm events. The FRA report accompanies this planning application under separate cover.

9.3.2.2 Wastewater Drainage

The existing record drawings for the combined drainage network for the area surrounding the subject lands were obtained from Dublin City Council, Irish Water, and online GIS mapping from Geological Survey Ireland (GSI).

The wastewater drainage effluent loading that is estimated to be produced as a result of the subject development was calculated using Irish Water's Code of Practice for Wastewater Infrastructure.

A Pre-Commencement Enquiry Form was submitted to Irish Water for their assessment of the potential impact of the proposed development on the existing public wastewater infrastructure, based on estimated occupancy as per their guidance documents.

9.3.2.3 Water Supply

The existing record drawings for the potable water supply network for the area surrounding the subject lands were obtained from Dublin City Council, Irish Water, and online GIS mapping from Geological Survey Ireland (GSI).

The water demand that is estimated as a result of the subject development was calculated using Irish Water's Code of Practice for Water Infrastructure.

A Pre-Commencement Enquiry Form was submitted to Irish Water for their assessment of the potential impact of the proposed development on the existing public water infrastructure, based on estimated occupancy.

9.3.2.4 Electrical Gas & Telecoms

The extent of existing Electrical, Gas and Telecoms utilities infrastructure to the site has been determined through reference to record drawings from each of the relevant Utilities authorities including ESB, Gas Networks, Eir and Virgin media.

The Electrical services installations have been assessed in accordance with:

- ESB Housing Schemes: Guidebook for ESB Networks Standards for Electrical Services rev5 Jan 2014
- ETCI Wiring Regulations 5th Edition I.S. 10101:2020

The Gas Services installations have been assessed in accordance with:

- IS 813:2014 Domestic gas installations. 3rd edition (+A1:2017)
- I.S. 820:2019 Non-domestic gas installations (Edition 3)
- I.S. 329: 2015+A1:2016 Gas distribution mains (Edition 3) and Amendment No. 1:2016
- S.R. 12007-5:2016 Guidance on the Application of I.S. EN 12007-5:2014, Gas Infrastructure - Pipelines for Maximum Operating Pressure up to and Including 16 Bar - Part 5: Service Lines - Specific Functional Requirements

Telecoms installations have been assessed in accordance with:

- Virgin Media New Build Handbook
- OpenEir Technical Handbook

A desktop study of the Electrical, Gas and Telecoms installations was carried out on the

local utilities infrastructure. Information on existing services was determined from the following:

- ESB Networks record drawings
- Gas Networks record drawings
- Virgin Media record drawings
- OpenEir record drawings
- HSQ record drawings and phase 1 Safety File information
- Site inspections were carried out by IN2 to verify the accuracy of the received documentation

9.4 Receiving Environment

9.4.1 Surface Water Drainage

The development lands are situated immediately adjacent to the Grand Canal, with the canal banks forming the southern site boundary.

The development site currently comprises a large asphalt yard and concrete pavements, which are surrounded on all sides by industrial buildings and the rear gardens of domestic dwellings. The central yard area is set at a level slightly lower than the top of northern-bank level of the Grand Canal, immediately adjacent.

All rainfall runoff falling on c.1.4-hectare site appears to be collected at roof level by traditional gutters and downpipes, and a collection of gullies in external areas. These convey the rainfall runoff to an underground network that appears to discharge untreated and unattenuated rainfall runoff to the existing combined sewer network at South Circular Road, at a location just outside the north-eastern corner of the site.

There is no apparent independent public surface water network sewer in the vicinity of the proposed development.

Further details are shown on the surface water drainage strategy that is enclosed with the Engineering Services Report and accompanying drawings, which are submitted under separate cover as part of this application.

9.4.2 Wastewater Drainage

The wastewater effluent from the occupied (and previously occupied) units within the proposed development area, discharge to the existing public combined sewer network at South Circular Road, at a location just outside the north-eastern corner of the site.

The public combined sewer network form part of the city-wide network, which ultimately discharges to the Wastewater Treatment Plant at Ringsend, Dublin 4.

Further details are shown on the wastewater drainage strategy that is enclosed with the Engineering Services Report and accompanying drawings, which are submitted under separate cover as part of this application.

9.4.3 Water Supply

The existing source of water supply to the development site is via a 6" cast iron service connection from the public 18" watermain at South Circular Road, at a location just outside the north-eastern corner of the site.

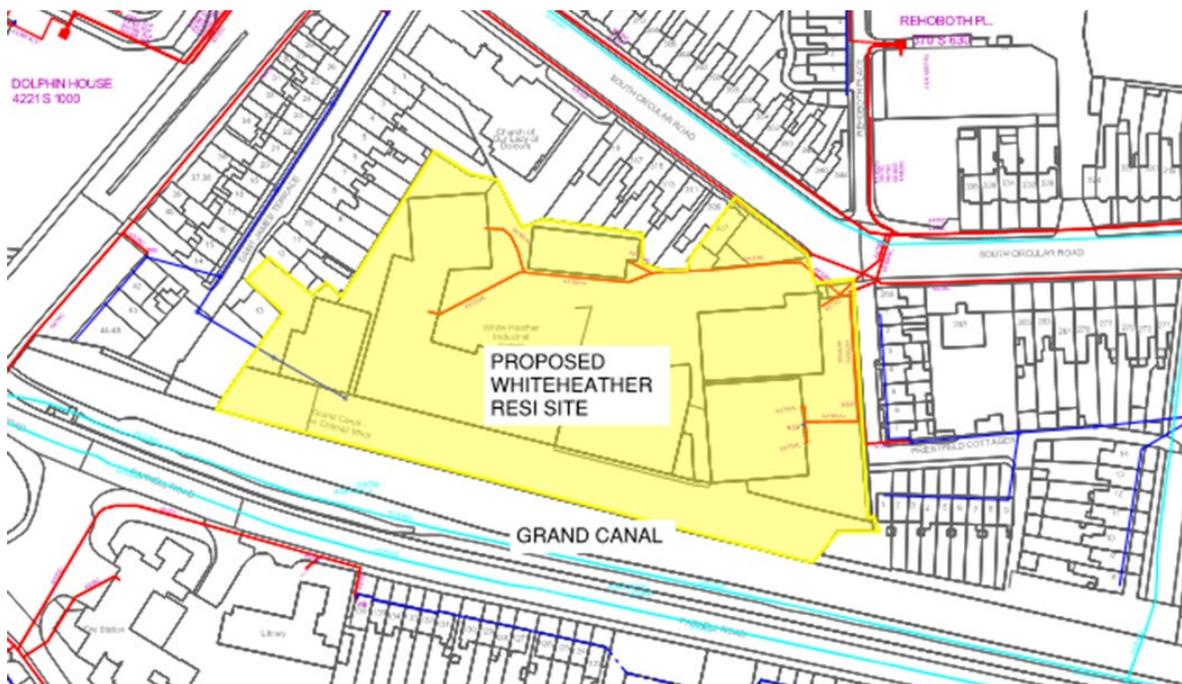
There is additional public water supply infrastructure in the vicinity of the proposed development, details of which are enclosed with the Engineering Services Report and accompanying drawings, which are submitted under separate cover as part of this application.

The subject site is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.443ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

9.4.4 ESB Utilities Existing

The existing ESB maps for the site indicate overhead and underground cables on the site including an ESB mini-pillar. All existing ESB meters will be isolated and removed with cabling terminated at the site boundary in advance of the construction works.

Fig 9.4.4.1 ESB Existing Site Services



9.4.5 Gas Utilities Existing

The Gas Networks infrastructure map for the site indicates several live gas supplies to the site. There is a 90mm primary gas supply from the South Circular Road serving the majority of

units. There are a further 2no. 63mm supplies entering the site from Priestfield Cottages to the East and 1no 63mm supply from St James's Terrace to the West.

All existing Gas meters will be isolated and removed. Gas service pipework will be fully purged and terminated at the site boundary by Gas Networks in advance of the construction works

Fig 9.4.5.1 Gas Networks Existing Site Services



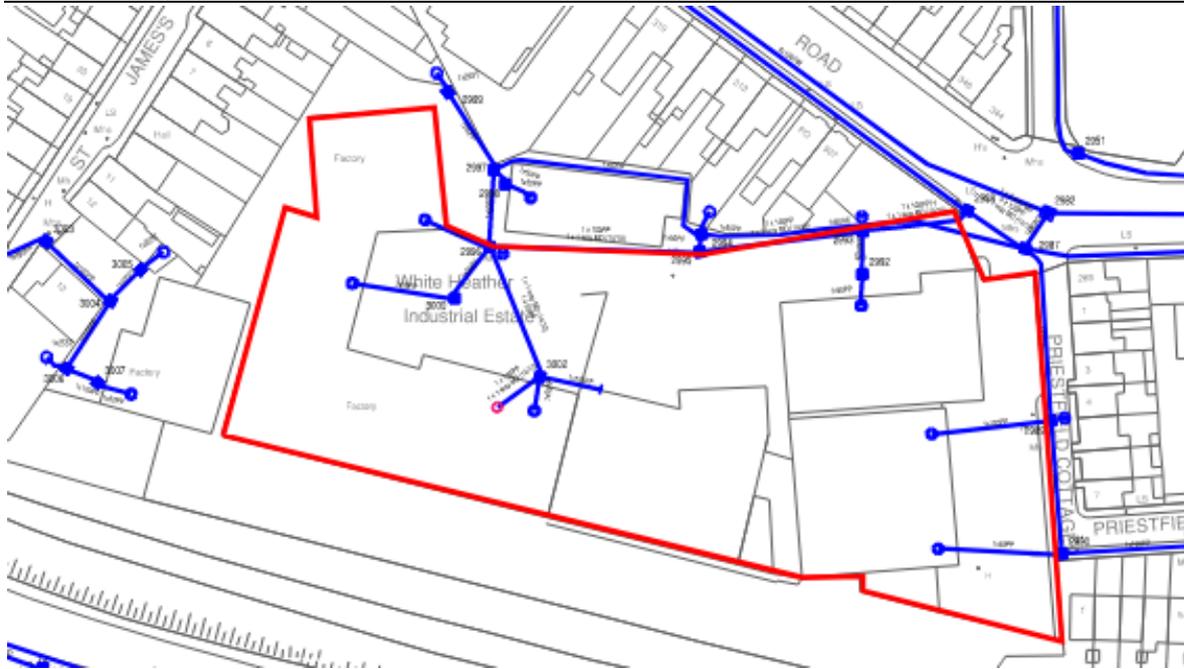
9.4.6 Telecoms Utilities Existing

The existing Telecoms utilities infrastructure comprises both Eir and Virgin Media ductwork and cabling.

The OpenEir infrastructure map for the site indicates duct connections to the site from the South Circular Road, Priestfield Cottages and St James's Terrace.

All existing Eir connections will be isolated and removed in advance of construction works.

Fig 9.4.6.1 OpenEir Existing Site Services



There is a single Virgin Media connection to the site. This will be removed to the site boundary in advance of the construction works. The Virgin Media utilities map indicates a hub cabinet located adjacent to the main entrance to the site on the South Circular Road.

Fig 9.4.6.2 Virgin Media Existing Site Services



9.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour’s Church and residential dwellings on the

South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

9.5.1 Surface Water Drainage

It is proposed to provide an independent surface water system to serve the new development, which will comprise an integrated sustainable drainage system (SuDS); split into a number of sub-catchments for optimum management of SuDS. All surface water within the proposed development will outfall ultimately to the aforementioned combined sewer network, as there is no local surface water infrastructure available. A capped spur to the site boundary will be provided, to allow the potential for future connection to a surface water network, should one be installed.

The surface water runoff from the hardstanding areas of the development will be restricted to a maximum of 2 l/s/ha before discharging to the public network, as required by the Greater Dublin Strategic Drainage Study, Dublin City Council and Irish Water, which is less than the greenfield runoff rate (QBAR), and significantly less than the pre-development unattenuated rates of discharge.

It is proposed to provide attenuation for surface water runoff from surfaced areas on site, prior to discharge to the public network. This attenuation will be provided within a variety of attenuation systems distributed around the site, comprising primarily 2nr. large attenuation

systems under landscaped areas, with the remaining being spread across the development's landscaping and podium build-up as well as filter drains and SuDS tree-pits. Green roofs, as required by DCC's Planning Policies, are to be provided across the development, along with further extensive use of SuDS, where practicable. These measures will assist in improving the water quality of the surface water runoff from these areas and will also assist in attenuating flows during periods of exceptional heavy rainfall, while also reducing the overall rainfall volume from leaving the site, through interception.

9.5.2 Wastewater Drainage

It is proposed to discharge the wastewater effluent from the site to the existing public combined sewer network at South Circular Road.

The assessment of the volume of wastewater that will be discharged from the proposed development is detailed within the Engineering Services Report that has been submitted under separate cover, as part of this application. The daily average flow from the proposed development, as per current Irish Water design guidance (Irish Water Code of Practice for Wastewater Infrastructure), is calculated to be approximately 1.75 l/s, with peak flows being calculated as 7.8 l/s.

The proposed development's wastewater loading on the public wastewater infrastructure was assessed by Irish Water, through the Pre-Commencement Enquiry process, and subsequently confirmed as feasible without the requirement for upgrade works.

9.5.3 Water Supply

It is proposed to obtain the water supply for the proposed development to the existing but newer 300mm watermain located at Dolphin's Barn Street, approximately 100m west from the proposed development, as advised by Irish Water in their returned Confirmation of Feasibility letter.

The new development will be served by a new 150mm connection from this public watermain, which will directly feed a water storage tank, for development distribution.

The proposed development's potable water demand – peak hour water demand of approximately 9.8 l/s - from the public water infrastructure was assessed by Irish Water, and confirmed as feasible without the requirement for upgrade works.

9.5.4 ESB Infrastructure proposed

There will be 3no new ESB LV sub-stations required to service the residential apartments, ancillary areas and site, including EV charging facilities. The sub-stations will be located in blocks B2, B3 & B4.

The ESB sub-stations will be serviced from a new ESB supply entering the site from the South Circular Road.

9.5.5 Gas Services Infrastructure proposed

A new Gas Networks supply will be provided to service the residential apartments and ancillary areas. The new supply will enter the site from the South Circular Road.

There is an option to provide heating and hot water to the residential development from a central district heating basement energy centre. This energy centre is powered by exhaust air heat pumps and gas fired boiler plant designed to achieve compliance with Part L NZEB energy requirements.

The existing gas services infrastructure to the surrounding area will not be affected by the proposed development or the enabling works to facilitate the proposed site development.

9.5.6 Telecoms Infrastructure proposed

Based on information received from Eir, the site is well serviced from a number of separate tie-in points and there are no supply issues in the area. The scheme allows for an extensive network of in-ground ducting and chambers throughout the site to allow future flexibility of supply. All apartment blocks and ancillary areas will be connected to this ducting network. Virgin Media were also consulted, and the design allows for supply of separate telecoms ducts to all apartment blocks with splitter panels to allow distribution through the electrical risers to each apartment.

The proposed telecoms design allows for tenants to choose their preferred telecoms provider.

9.6 Potential Impact of the Proposed Development

9.6.1 Construction Phase

9.6.1.1 Surface Water Drainage

There is no existing public surface water infrastructure in the vicinity of the site. However, the southern site boundary is aligned to the Grand Canal, with surface water also being required to be managed on site, prior to discharge to the local public combined sewer network.

The development will require the demolition and excavation of considerable quantities of hardstanding areas and underlying soil. These activities may result in the potential contamination of the surface water runoff with soil particles and debris when discharging to the public network.

There is potential for silt, cementitious material and other debris to be washed into the adjacent Grand Canal when the site is stripped, and during construction.

There is a risk during construction works for oil spills from construction plant/operations to pollute the proposed surface water network.

9.6.1.2 Wastewater Drainage

During the construction of the new wastewater drainage systems there is the potential for unattenuated and untreated surface water to be discharged to the existing public wastewater sewer system, due to pipes and manholes being left open.

There is risk of pollution of groundwater / watercourses by accidental spillage of wastewater effluent when making connections to live sewers.

Pollution of groundwater / watercourses / soils by accidental spillage of oils / diesel from temporary storage areas, or where maintaining construction equipment, can occur, with particular risk to the adjacent Grand Canal.

There is a risk of traffic disruption during construction works when connecting the development's wastewater sewer to the existing combined sewer network, at South Circular Road.

There is a risk of damage to existing services when excavating for the new wastewater sewer network.

9.6.1.3 Water Supply

There is a risk of contamination of the existing water supply during decommissioning of the existing watermain connection, and during the installation of the new development's service connection

There is a risk of traffic disruption during construction works when connecting to the existing public watermain.

There is a risk of damage to existing services when excavating for the connection to the existing water main. There will be a minor water demand for site offices and facilities.

9.6.1.4 ESB

Construction related activities will require temporary connection to the local electrical supply network. The construction phase will require the isolation and removal of existing electrical infrastructure from the site. If not undertaken in accordance with best practice procedure, this has the potential to impact on local electrical supplies. The potential impact from the construction phase of the proposed development on the local electrical supply network is likely to be short-term and low.

9.6.1.5 Gas

There is no requirement for gas to the site during the Construction phase. The construction phase will require the isolation and removal of existing gas infrastructure from the site. If not undertaken in accordance with best practice procedure, this has the potential to impact on local gas connectivity. The potential impact from the construction phase of the proposed development on the local gas network is likely to be short-term and low.

9.6.1.6 Telecoms

Fixed telecoms will not be operational during the construction phase. The potential impact from the construction phase of the proposed development on the local telecoms network is likely to be short-term and negligible.

9.6.2 Operational Phase

9.6.2.1 Surface Water Drainage

Surface water discharge from the site will be restricted to a maximum of 2 l/s/ha, by means of a flow-control devices prior to discharge to the public combined sewer network, and will be therefore be attenuated. This flow rate is less than the greenfield equivalent runoff rate. No adverse impact in respect of flooding downstream is anticipated, as a result of the proposed development, as flows are to be restricted to a maximum rate that is less than the greenfield runoff rate, and significantly less than the pre-development – i.e., existing - conditions.

The installation of an integrated Sustainable Drainage System, which includes green roofs, pervious paving, filter drains, SuDS Tree Pits, and intensive landscaping, will improve surface water runoff quality discharged to the public combined sewer network, while also reducing the overall volume discharging from site.

The installation of trapped gullies and manholes in accordance with BS 5911, along with a Class 1 fuel separator, will minimise the risk of contamination of the surface water system by silt and debris, prior to discharge from site.

A worst-case scenario is that for a very intense rainfall event, minimal flooding may occur within the site while volumes drain down.

The time of year has a major bearing on the quality of storm water run-off - in particular the first rains after a prolonged dry period where accumulated deposits of rubber, particulates, oils, etc. are washed away. However, the impact from such run-off is likely to be slight due to the provision of intercepting devices and a fuel interceptor, and the large volume of rainwater necessary to mobilise pollutants and runoff.

Stagnation of the water and siltation within the flow control device manholes may occur, which will require periodic inspection of the drainage systems, with collected silt and debris removed accordingly.

9.6.2.2 Wastewater Drainage

The primary impact of the proposed development on the existing wastewater drainage systems will be to increase the volume and rate of discharge of wastewater from the site to the existing public combined sewer system.

The additional loadings on the public infrastructure have already been assessed by Irish Water as part of the Pre-Commencement Enquiry process, and confirmed as feasible without the requirement of upgrade works. i.e., no adverse impact.

There may be the possibility of leakage from wastewater sewers and drains within the development and along the route of the outfall sewers. Any wastewater water leakage would result in contamination of groundwater in the area.

There may be the possibility of surface water ingress into the wastewater drainage system due to poor workmanship, which would increase the load on the existing sewers. However, all pipes will be tested and surveyed, in accordance with Irish Water Code of Practice for Wastewater Infrastructure, prior to allowing wastewater effluent to discharge through the pipes.

9.6.2.3 Water Supply

The proposed development will result in an increase in water demand on the public water distribution network.

The additional demand on the public water infrastructure has already been assessed by Irish Water, as part of the Pre-Commencement Enquiry process, and confirmed as feasible without the requirement of upgrade works.

Boosting will be required for units above ground floor. This will be carried out from the water storage tank room.

Contamination of the existing water supply network may result if unsterilised mains are connected to the public network. This would be mitigated against by scouring out the mains, swabbing and chlorinating the mains prior to connection to the public supply and occupation of any of the units, as per Irish Water's Code of Practice for Water Infrastructure, with all new installed mains to be tested prior to connection.

9.6.2.4 ESB

The new ESB supplies throughout the development will be provided from the new ESB sub-stations in each case ensuring no further increase to the local sub-station capacity. As the existing ESB supplies, which are currently supplied from an existing local sub-station, will be removed the net impact of the development will be to provide additional ESB capacity at the local LV sub-stations. The ESB will also retain the option to service local neighbouring developments from the 3no new sub-stations provided.

9.6.2.5 Gas

The new gas supply will increase the load on the local Gas Networks supply network however Gas Networks have confirmed there is adequate capacity within the network to accommodate the proposed development without impacting existing gas customers.

9.6.2.6 Telecoms

The telecoms capacity required to service the site will increase local connectivity marginally.

The potential impact from the operational phase on the ESB, Gas Networks and Telecoms networks is likely to be long term and neutral.

9.6.3 'Do Nothing' Scenario

If the proposed development were not undertaken, it is expected that there would be no change on the subject site and therefore no impact on surface water drainage, wastewater drainage, water supply and other utilities arising from the subject site.

9.6.3.1 Surface Water Drainage

All rainfall runoff would continue to discharge unattenuated and untreated to the existing public combined sewer network at South Circular Road.

9.6.3.2 Wastewater Drainage

In this scenario wastewater effluent from the existing industrial site will continue to be discharged to the existing sewer network, ultimately discharging to Ringsend WWTP.

9.6.3.3 Water Supply

In this scenario the existing water demand would continue on the older Irish Water network at South Circular Road.

9.6.3.4 ESB

In this scenario the existing ESB infrastructure to the site and surrounds would be unaffected.

9.6.3.5 Gas

In this scenario the existing Gas infrastructure to the site and surrounds would be unaffected.

9.6.3.6 Telecoms

In this scenario the existing Telecoms infrastructure to the site and surrounds would be unaffected.

9.7 Mitigation Measures

9.7.1 Construction Phase

9.7.1.1 Surface Water Drainage

The filtering of surface water that is likely to be contaminated by soil particles, prior to site discharge, in order to reduce the silting effects of these particles in the existing sewer.

Construction of suitable silt traps prior to the surface water discharging to the existing network.

Grassed areas, either established or new, may be used in the short term, where necessary and suitable, for combined treatment and disposal of silted-water. It is noted that this measure is not suitable when the soil below the grassed area is saturated or where silted-water may infiltrate to either surface or wastewater drains.

All excavated materials shall be sorted and separated on site to suitable stockpiles of minimum area and remote from the adjacent Grand Canal. Stockpile areas shall be designed with suitable drainage and erosion protection to prevent the creation of soil bearing runoff and mixing of materials.

If encountered, contaminated soils should be excavated and disposed off-site in accordance with the Waste Management Acts 1996-2001 & associated regulations, and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.

A Traffic management plan will be implemented to minimise disruption to the existing road network. The provision of wheel wash facilities at the construction entrance to the development will minimise the amount of soils deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis, if required, to prevent the

build-up of soils from the development site on the existing public roads and subsequent wash-down to existing surface water drains.

To protect against soils entering the existing drainage networks, soil & silt wash down protection measures such as filters or fences shall be put in place at vulnerable locations including road gullies, drainage channels and kerb inlets.

Prior to commencement of excavations in public areas all utilities and public services will be located and checked. Adequate protection measures will be implemented during the construction phase.

9.7.1.2 Wastewater Drainage

In order to reduce the risk of defective or leaking wastewater sewers the following measures will be implemented:

- All new foul sewers will be tested in accordance with Irish Water's Code of Practice for Wastewater Infrastructure, during the construction phase and prior to connection to the public sewer system, and in accordance with the requirements of Dun Laoghaire Rathdown County Council;
- All wastewater sewers will be inspected by closed circuit cameras (CCTV) to identify possible physical defects, and corrected accordingly;
- The connection of the new wastewater sewers to the public sewer will be carried out under the supervision of the Local Authority and will be checked prior to commissioning;
- Prior to commencement of excavations in public areas all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase;
- All excavations within the public roads will be back-filled in a controlled manner and the public road will be reinstated to the satisfaction of the Local Authority. Minimum standards of such works shall be to the Department of the Environment publication – Guidelines for the Opening, Backfilling and Reinstatement of Trenches in Public Roads;
- Method statements for all works to be carried out will be prepared and assessed prior to commencement of the works. All construction methods used will be tailored to reduce, where possible, dust, noise and interference with residents & visitors in neighbouring areas;
- All spoil and waste material will be removed to an approved location and storage of construction materials in public areas will be minimized;
- If encountered, contaminated soils should be excavated and disposed off site in accordance with the Waste Management Acts 1996-2001 & associated regulations, and guidance provided in the TII's Guidelines for the Management of Waste from National Road Construction Projects.

All excavated materials shall be sorted and separated on site to suitable stockpiles. Stockpile areas shall be designed with suitable drainage and erosion protection to prevent the creation of soil-bearing-runoff and mixing of materials.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and the adjacent Grand Canal from fuel, oil and other hazardous materials (paints, cleaning agents, herbicides, fertilisers, etc.). Suitable bunded areas will be installed for oil all storage tanks with a minimum 110% storage volume. Designated fuel filling points will be put in place at secure locations, remote from the Grand Canal, with appropriate oil separators to provide protection from accidental spills. Oil-absorbent materials shall be provided as an emergency measure in the event of a fuel spill.

A traffic management plan will be implemented to minimise disruption to the existing road network during connection to the existing combined sewer network at South Circular Road.

9.7.1.3 Water Supply

All watermain will be cleaned and tested in accordance with Irish Water's Code of Practice or Water Infrastructure, and to the satisfaction of the Local Authority, prior to connection to the public watermain. All connections to the public watermain will be carried out under the supervision of the Local Authority.

All excavated materials shall be sorted and separated on site to suitable stockpiles. Stockpile areas shall be designed with suitable drainage and erosion protection to prevent the creation of soil-bearing-runoff and mixing of materials.

A Traffic management plan will be implemented to minimise disruption to the existing road network during new connection at Dolphin's Barn Street.

Prior to commencement of excavations in public areas all utilities and public services will be located and checked. Adequate protection measures will be implemented during the construction phase. The proposed development will not give rise to any significant long term adverse impact. Minor negative impacts during the construction phase, such as potential disruption in water supply when connections to the public main are being carried out, will be short term only.

9.7.1.4 ESB Supply

The Contractors will provide the ducting and enabling works to facilitate the installation of the Electrical infrastructure by the ESB. All ducts and sub-stations will be installed and constructed to ESB technical guidance details and inspected and approved prior to installation.

Once the Electrical infrastructure is built and ready for the ESB to provide power the ESB will take ownership and responsibility for the sub-stations. They will be locked with access only by trained ESB personnel.

All works will follow best industry practice for the planning, supervision and construction of the works. The proposed works will adhere to the construction management plan for the development.

Potential impacts have been assessed as short-term & slight.

9.7.1.5 Gas Supply

The Contractors will provide the enabling works to facilitate the installation of the Gas Pipework infrastructure by Gas Networks Ireland. All trenches and pipework will be installed and constructed to GNI technical guidance details and inspected and approved prior to installation.

Once the Gas infrastructure is complete, tested and certified, Gas Networks will enable gas supply to the meters.

All works will follow best industry practice for the planning, supervision and construction of the works. The proposed works will adhere to the construction management plan for the development.

Potential impacts have been assessed as short-term & slight.

9.7.1.6 Telecoms Supply

The Contractors will provide the ducting and enabling works to facilitate the installation of the Telecoms infrastructure by each of the Telecoms providers. All ducts will be installed and constructed to respective Telecoms providers technical guidance details and inspected and approved prior to installation.

Separate telecoms ducts and manholes will be provided for each provider. No shared ducts or manholes will be allowed.

All works will follow best industry practice for the planning, supervision and construction of the works. The proposed works will adhere to the construction management plan for the development.

Potential impacts have been assessed as short-term & slight.

9.7.2 Operational Phase

9.7.2.1 Surface Water Drainage

During the operational phase of the project, sustainable drainage systems, trapped gullies and silt-trap manholes will lessen debris discharging into the surface water system, and ultimately the public combined sewer network.

Filter Drains, pervious paving, green roofs, SuDS Tree Pits, intensive landscaping, will assist in reducing runoff volume and improving water quality.

Best management drainage policies, in accordance with CIRIA 753 – The SuDS Manual - will be implemented and incorporated into the design and management of the surface water drainage system.

All surface water drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration.

9.7.2.2 Wastewater Drainage

All wastewater drains and sewers will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled groundwater penetration or leakage of foul water to ground water on the site.

The use of Class 1 fuel separators will reduce the amount of silt and grits present in the undercroft car park wash down, prior to discharge to the wastewater network, as well as any contaminating pollutants, such as hydrocarbons, oils and grease.

9.7.2.3 Water Supply

It is not envisaged that any further mitigation will be necessary upon the completion of the development.

9.7.2.4 ESB, Gas and Telecoms

All buried utilities will be marked with warning tape. The location of the ducts and pipes will be recorded by the relevant utility providers and the main contractor. The main contractor will include the record drawing in the project Safety File.

Table 9.7: Mitigation Measures

Mitigation Measures
The Main Contractor will liaise with the relevant utility providers to provide all necessary attendances including trenching and protection of the works.
The Utilities will be installed in each case to the specific Utility providers requirements and the relevant standards.
The installed utilities will be tested and certified prior to being made live.
The completed utility connections will be recorded by both the Utility provider and the main contractor. The main contractor will include an as-built site services layout in the project Safety File including details of all utilities throughout the site.

9.8 Predicted Impact of the Proposed Development

9.8.1 Construction Phase

9.8.1.1 Surface Water Drainage

Provided the sustainable drainage systems and all mitigation measures are fully implemented as part of the proposed works, the predicted environmental impacts on the downstream receiving drainage infrastructure should reduce from Moderate to Slight. This should include any mitigation measures proposed in respect of flora and fauna which is dealt with separately in this EIAR.

9.8.1.2 Wastewater Drainage

The impact from the proposed development on the existing wastewater / combined drainage systems will be a reduction in the quantity and rate of discharge of wastewater from the site to the existing public combined sewer system, with the contributing flows coming mainly from the site office and welfare facilities.

There will be minor traffic disruption when excavation works for providing new connection to the existing public combined sewer network at South Circular Road.

9.8.1.3 Water Supply

There will be a minor water demand for site offices and facilities.

There will be minor traffic disruption when excavation works are being carried out at Dolphin's Barn Street.

9.8.1.4 ESB, Gas and Telecoms

The predicted impacts during the construction phase is the same as those presented in the potential impacts section. The mitigations outlined above will ensure the Utilities are installed correctly to the relevant standards and the predicted impacts remain short-term and slight for both ESB and Gas, and short-term and negligible for the Telecoms.

9.8.2 Operational Phase

9.8.2.1 Surface Water Drainage

Surface water discharge from the site will be restricted by means of attenuation to restrict the surface water runoff to less than the greenfield runoff equivalent, and significantly less than the existing, pre-development condition. Therefore, no adverse impact in respect of flooding downstream is envisaged as a result of the proposed development.

The surface water design has been prepared in accordance with best practice incorporating significant sustainable drainage systems, which include the installation of filter drains, permeable paving, green roofs and intensive landscaping. The integrated sustainable drainage system will reduce runoff volume and improve water quality, prior to discharging to the public combined sewer network.

9.8.2.2 Wastewater Drainage

The impact from the proposed development on the existing wastewater / combined sewer drainage network will be to increase the quantity and rate of discharge of wastewater from the site to the public network (the discharge from the existing industrial units is unknown. These increased flows are quite low and can be accommodated within the existing drainage network, as confirmed by Irish Water as part of the Pre-Connection Enquiry process.

Any possible increase in flow will be relatively small. It is noted that any potential increase in wastewater loadings will be offset by attenuating the surface water runoff from the new development that also discharges to the combined sewer network.

9.8.2.3 Water Supply

The proposed development will result in an increase in water demand on the water distribution network. This increase in demand can be accommodated in the existing network, as noted by Irish Water in the Confirmation of Feasibility letter.

9.8.2.4 ESB, Gas and Telecoms

The predicted impacts in operation phase are the same as outlined in the potential impacts section above.

9.9 Monitoring

Water quality monitoring will be carried out on the Grand Canal during the construction stage of the project. Water samples will be collected upstream and downstream of the proposed development works. Any deterioration in water quality will be immediately addressed.

The isolation of the existing Utilities infrastructure and the installation of the new infrastructure will be monitored by the main contractor as the site co-ordinator.

All site works will be programmed and managed to ensure the utilities are installed safely and protected for the duration of the works. On completion of the works the installations shall be recorded in the Safety File.

9.10 Reinstatement

Reinstatement of open spaces and roads are proposed as part of the proposed works, namely the new connection to existing public services and any surrounding areas.

9.11 Interactions and Potential Cumulative Impacts

9.11.1 Interactions

The impact from the construction and operation of the proposed development has the potential to affect the local biodiversity, hydrogeology, and hydrology, each of which respectively are discussed in Chapters 6, 7 and 8. These impacts have been reviewed alongside the relative chapters of this report, and coordinated with the authors.

The proposed Utilities services connections are sized to provide adequate power and connectivity to all areas of the site with the capacity included for future expansion, such as EV charging to all car parking spaces. Therefore, the proposed development is predicted to have a positive interaction with population and human health.

9.11.2 Potential Cumulative Impacts

Taking account of the overall environment prior to the development of the White Heather Industrial Estate to date, the current environment in the vicinity of the proposed development, the current buildings & infrastructure, the development proposed under the current application and potential future in the vicinity of the subject site, in the context of the current Dublin City Council Development Plan and the proposed design life & life cycle for the current proposals the potential cumulative impacts may be considered to be Moderate and Long-term impacts. That is, any impact which may occur would be consistent with existing and emerging trends, and the proposed development will likely have a design life in the order of fifty years.

Any such new developments in the surrounding area (such as the Bailey Gibson and Player Wills developments) would be required to provide sustainable drainage systems, designed to reduce flow rates to greenfield equivalent and reduce overall discharge volumes, while improving the discharge quality. Wastewater and water supply impacts would be subject to similar Pre-Connection Enquiry process and approval with Irish Water. Therefore, the cumulative impact of new developments in the vicinity of the subject development would likely have just a minor but sustainable impact on the receiving environment.

The impact of the local Player Wills and Baily Gibson sites has been considered by the Utilities providers in their assessment of the local capacity to service the proposed White Heather development. The potential cumulative impacts of the development on utilities infrastructure are slight.

9.12 References

Guidelines on the information to be contained in Environmental Impact Statements, EPA, 2002

- Advice notes on current practice (in the preparation of Environmental Impact Statements), EPA, 2003

Greater Dublin strategic drainage study, DLRCoCo et al, 2005

- Dún Laoghaire Rathdown County Development Plan 2016 – 2022, DLRCoCo, 2016

- The SuDS Manual, Publication C753, CIRIA, 2017

- Development and flood risk – guidance for the construction industry, Publication C624, CIRIA, 2004;

- Control of water pollution from linear construction projects – Technical guidance, Publication C648, CIRIA, 2006;

- Flood estimation for small catchments, Report No.124, IH, 1994;

- Irish Water Code of Practice for Water Infrastructure, Irish Water, 2020;

- Irish Water Code of Practice for Wastewater Infrastructure, Irish Water, 2020.

IN2 referenced the following documents or sources above:

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- ESB network utility plans
 - ESB Housing Schemes: Guidebook for ESB Networks Standards for Electrical Services rev5 Jan 2014
 - Wiring Regulations 5th Edition I.S. 10101:2020
 - Gas Networks Ireland utility plans
 - IS 813:2014 Domestic gas installations. 3rd edition (+A1:2017)
 - I.S. 820:2019 Non-domestic gas installations (Edition 3)
 - I.S. 329: 2015+A1:2016 Gas distribution mains (Edition 3) and Amendment No. 1:2016
 - S.R. 12007-5:2016 Guidance on the Application of I.S. EN 12007-5:2014, Gas Infrastructure - Pipelines for Maximum Operating Pressure up to and Including 16 Bar - Part 5: Service Lines - Specific Functional Requirements

- OpenEir utility plans
 - OpenEir Technical Handbook
 - Virgin Media utility plans
 - Virgin Media New Build Handbook
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Chapter 10. Material Assets: Transportation

10.0 Material Assets – Transportation

10.1 Introduction

This chapter of the EIAR has been prepared to assess the potential impact of the proposed development in terms of traffic and transport. The chapter provides the following:

- An overview of the existing receiving environment;
- A detailed and robust assessment of the potential impact of the proposed development on the local road network both during the short-term construction phase and long-term operational phase; and
- Outlines mitigation measures to ensure significant effects are minimised or avoided.

The assessment of the traffic and transport section has been prepared by Andrew Archer, BCE CEng, and Bridget Fleming, MA (Hons), of SYSTRA Ltd. Andrew is a Project Director for SYSTRA's operation in Ireland, with over 20 years of diverse and challenging experience in a wide range of transportation planning and engineering projects. Works completed include detailed Traffic and Transport assessments for residential and commercial developments throughout Dublin & Ireland, including mixed use development at the adjacent Bailey Gibson and Player Wills sites, Clonburris, Monard & Cherrywood Strategic Development Zones (SDZs), residential development at Water Rock Middleton and Oldtown Celbridge amongst others. Bridget is a Senior Consultant with over 5 years' experience in transport planning, traffic engineering and development planning. She has worked on numerous Transport Impact Assessments, Mobility Management Plans and Environmental Impact Assessments including work on the Bailey Gibson and Player Wills sites, and residential and commercial applications at Clonliffe, Oldtown Celbridge, Dunboyne and Dundrum Town Centre, amongst others.

Full details of the Traffic Impact Assessment undertaken by SYSTRA are provided in the Transport and Transport Assessment and Mobility Management Plan report included under separate cover as part of the planning application for the proposed development.

10.2 Consultation

A number of Pre-Application meetings were held with Dublin City Council (DCC) as part of planning consultation process. The methodology and extent of the study area for the Traffic and Transport Assessment (TTA) was presented to DCC along with the proposed access strategy and road layout design. The proposed parking strategy, car parking ratio and proposed mobility management measures were also discussed. DCC emphasised the importance of mobility management on the proposed development site and supporting measures required to support planning application.

It should be noted that the proposed development quantum is such that it does not trigger the requirement for an EIAR to support the planning application. The Applicant is opting to provide an EIAR for further robustness in the testing of the proposed development.

This EIAR Traffic and Transport Chapter has been prepared in line with assumptions adopted within the TTA and the relevant EIAR guidance documents, as outlined below.

10.3 Methodology

10.3.1 Guidelines

This chapter has been prepared with cognisance of the following guidelines;

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002)
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015);
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017);
- Transport Infrastructure Ireland's (TII's) Traffic & Transport Assessment Guidelines (2014).
- Guidelines for the Environmental Assessment of Road Traffic, 2003, Institute of Environmental Management & Assessment (UK Based).

10.3.2 Assessment Criteria

The EPA draft EIAR guidelines (2017) outlines a number of definitions that can be used to describe potential significant effects. This includes definitions for the quality of effects, significance of effects, extent of effects, probability of effects, duration and frequency of effects and the type of effects. Whilst some of these are easily qualified using the EPA guidelines the significance of the effects is open to interpretation and relies on the professional engineering judgement.

In Ireland, there are currently no guidelines or standards which outline how the effect of traffic and transport should be quantified or described for the purposes of Environmental Impact Assessment. However, TII's 'Traffic and Transport Guidelines' indicate that if the impact generated by the additional traffic generated by a new development amounts to over 10% upon the local network, where there is no existing prolonged congestion, it is considered material in the context of the local network. This threshold is reduced to 5% in situations where the network is experiencing notable congestion.

Similarly, the UK's Institute of Environmental Management and Assessment (IEMA) 'Guidelines for the Environmental Assessment of Road Traffic' (2003) state that only links which experience an increase in traffic of 30% should be considered for more detailed assessment, or 10% in sensitive locations or where HGV traffic increases substantially. As referenced in the IEMA Guidelines, a range of indicators for determining the significance of the relief from severance advises that changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes respectively. Additionally, it is generally accepted that traffic flow increases of less than 10% on uncongested roads are generally considered to be 'not significant', given that daily variations in background traffic flow may vary by this amount.

Based on these guidelines, the prevailing traffic levels local to the proposed development and professional judgement, a rating of the potential effects has been assigned to the definitions within the EPA guidelines based on potential traffic increases, as outlined in Table 10.1. To ensure the robustness of the assessment these ratings are more conservative than outlined in the IEMA guidelines. This is intended to guide the assessment of the likely effects of the proposed development.

Table 10.1: Rating of Effects Based in Traffic Contribution

Significance of Effects	Traffic Increase
Imperceptible	0-2.5%
Not Significant	2.5-5%
Slight	5-10%
Moderate	10-20%
Significant	20-30%
Very Significant	30%-50%
Profound	50%+

10.4 Receiving Environment

10.4.1 Site Location

The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolours Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west. Additionally, the site benefits from being adjacent to the Dolphin's Barn bridge, connecting the City with suburban areas such as Drimnagh and Crumlin.

The surrounding land use is largely residential comprising of predominantly terraced housing. The site currently operates as White Heather Industrial Estate, accommodating a number of industrial units such as self-storage facilities, building suppliers and a Post Delivery Office.

The primary access point to the site is currently located along the South Circular Road, west of Priestfield Cottages, with an additional non-vehicular access to the southwest of the site off St James's Terrace.

10.4.2 Pedestrian Infrastructure

There is a well-established network of footpaths within the local area, providing access to a wide range of local community, education, health, retail and employment facilities. There are a number of large employment centres as well as leisure and retail facilities.

In the immediate vicinity of the site there are well lit, good quality pedestrian routes along South Circular Road with footpath varying between 2.2m and 4.2m wide from Donore Avenue to Dolphin's Barn Cross. The existing footpaths are therefore in compliance with DMURS' recommended minimum width of 1.8m for two people to pass comfortably.

There are currently no formal zebra or signalised crossing points along this stretch of the South Circular Road. However, as part of the mitigation package agreed for the neighbouring Bailey Gibson Strategic House Development (SHD) site, the existing dropped kerb pedestrian crossing on South Circular Road, (currently located approximately 25m east of Rehoboth Place) is to be upgraded and relocated approximately 100m further east on South Circular Road.

This new formal crossing will also benefit residents of the proposed development. This will replace the existing unmarked pedestrian crossing, with dropped kerb lines and traffic island approximately 25m east of Rehoboth Place. The crossing will be improved to a signalised crossing, providing safe pedestrian routes to the eastbound bus stop and Donore Avenue towards St Catherine's and Warrenmount.

There are signalised pedestrian crossing points at Dolphin's Barn Cross/ South Circular Road junction, northwest of the site, and on Donore Avenue/ South Circular Road junction east of the site.

10.4.3 Cycling Infrastructure

The site is highly accessible by bicycle. The city centre, TUD Grangegorman, Coombe and St James's Hospitals and Heuston Station are all within a 20-minute cycle of the site. There are an estimated 148,050 employment places within a 15-minute cycle of the site and over 340,000 within a 30-minute cycle.

The site benefits from proximity to bus lanes along the South Circular which provide facilities for cyclists segregated from the private vehicle driver. Furthermore, advanced stop lines for cyclists are provided at the Dolphin's Barn Street / South Circular signalised junction on the R110 in both directions. There are formal cycle lanes provided from Dolphin's Barn Cross to the City Centre and along the length of the Canal towards the docklands.

In addition, there are proposals for a new cycle and pedestrian route along the Grand Canal. This would run from La Touche Bridge at Portobello to Black Horse at Tyrconnell Road.

10.4.4 Public Transport

The proposed development site lies within close proximity to excellent existing public transport routes and is located within a 5-minute walk of several high frequency Dublin Bus and Go-Ahead services which route along Dolphin's Barn Street/ Cork Street, a dedicated Quality Bus Corridor, and the South Circular Road.

Bus stops within the local area all include shelters, seating and timetable information, and are located within lay-bys off the highway network.

The Luas Red Line runs between Saggart/ Tallaght Park and Ride, to Connolly and The Point. The nearest stop on the Red Line Luas is the Fatima stop approximately 850m north of the site.

10.4.5 Local Road Network

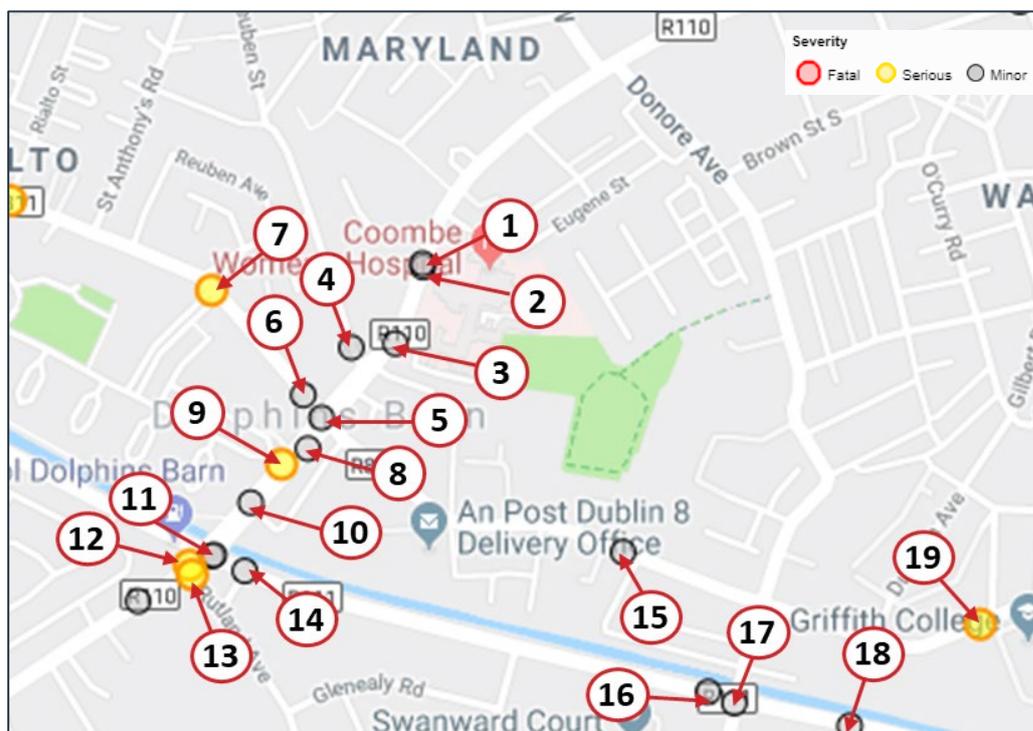
The surrounding road network is a mix of quieter residential streets and more heavily trafficked regional, urban roads such as the R811 South Circular Road, the R110 Dolphin's Barn Street/Cork Street and the R111 Parnell Road (Canal Road). Many of the residential streets are narrow in nature due to restricted carriageway widths and/or on-street parking. There are several busy signalised junctions, such as the Dolphin's Barn Cross, along the South Circular Road as well as along the Canal. These roads carry heavier volumes of traffic particularly during the morning and evening peaks.

Dolphin's Barn Street and Cork Street have bus lanes in both directions for much of their length. The South Circular Road has an eastbound bus lane which operates in the morning from 0700-1000. Donore Avenue provides a more local link connecting residential streets with the South Circular Road and Cork Street.

10.4.6 Road Safety

The Road Safety Authority's (RSA's) online collision map was reviewed to assess any local accidents and safety trends which may impact the proposed development. The collision map includes all fatal, serious and minor accidents officially recorded between 2005 and 2016. The data for subsequent years is not yet available on the RSA's website. The recorded accidents near the subject site are shown in Figure 10.1.

Figure 10.1: RSA Collision Map



(Map Data © Google & Road Safety Authority)

As shown, there is only one minor accident in the immediate vicinity of the site along the South Circular Road. There were more accidents reported further from the site along Dolphin's Barn Street, including a number of serious accidents, none were fatal.

10.5 Characteristics of the Proposed Development

The development proposals comprise the promotion of up to 335 residential dwellings (481 bedrooms) and approximately 260 sqm creche and ancillary residential amenity totalling 1,212 sqm. Details of the full development proposals are summarised below:

- Provision of communal open space distributed throughout the site;
- Construction of a childcare facility with a gross floor area of 260 sqm and associated play area;

- Construction of 1,212 sqm of residential amenity at ground and fifth floor level within Block 03 and Block 05;
- 106 no. standard parking spaces overall, comprising 7 no. disabled, 22 no. standard electric vehicle charging spaces (over 20% of total provision) and 7 no. car club spaces (with ability to expand). In addition to the car parking spaces, 4 no. motorcycle spaces are provided;
- In total, 558 cycle parking spaces will be provided across the development, comprising:
 - Provision in excess of one cycle parking space per bedroom – 488 no. long-stay bicycle parking spaces;
 - 62 no. short-stay cycle spaces for visitors across the development, including adjacent to the crèche, main access, boulevard, and boardwalk;
 - 8 no. cargo bike spaces;
- Vehicular access will be via South Circular Road in the existing location but will be reconfigured to a simple priority of 5.5m width and 5m radii. Visibility splays of 2.4m x 49m can be achieved in line with DMURS standards. Provision of 3 no. pedestrian access points; 1 no. from the South Circular Road; 1 no. from St James's Terrace; and 1 no. onto the Grand Canal. Improvement works to the existing entrance on South Circular Road; and
- All ancillary site development works, plant, waste storage, meter rooms, landscaping, boundary treatment and lighting.

10.6 Potential Impact of the Proposed Development

10.6.1 Demolition & Construction Phase

The demolition and construction will be short-term in nature relative to the operational phase. In total it will last approximately 42 months. The traffic generated, both as a result of construction activity and staff required onsite, will vary during this time depending on the construction stage and activity though staff will generally be encouraged to travel to site by sustainable means.

10.6.1.1 Staff Trip Generation

Staff numbers onsite will range from approximately 100 – 200 per day, depending on the phase of construction. As a worst-case, this will result in a maximum of 400 two-way daily car trips to and from site over the course of the construction period (allowing for potentially multiple visitor trips per day and assuming that there will be an element of car-sharing amongst staff and visitors). The staff and visitor parking will be accessed via South Circular Road.

The working hours onsite are expected to be 07:00 – 18:00 Monday to Friday and 08:00 – 14:00 on Saturdays (subject to confirmation/approval from DCC). As such, the majority of staff will arrive before busiest morning peak and depart after evening peak.

The estimated annual average daily traffic (AADT) flow along the South Circular Road is 9,000 vehicles per day, therefore, the development's contribution of staff / visitor trips will represent a worst-case maximum increase of 4.4% of daily traffic, which is considered to be a negligible and 'not significant' impact. Notwithstanding this, the proposed development will provide a limited amount of car parking onsite during the construction phase to actively encourage car-sharing and the use of sustainable modes by staff travelling to and from the site. Therefore, the impact of staff vehicle movements during the construction phase is likely to be considerably lower than 4.4% per day.

10.6.1.2 HGV Trip Generation

The number of HGVs will depend on the construction activity taking place on site. Estimates of traffic generation associated with the construction phases have been derived from first principles using the guidance from the Trip Rate Information Computer System (TRICS) Construction Traffic Research Report (2008). The quantum of vehicles associated with each construction phase have been derived using the formulae in the 'Construction Site Transport, The Next Big Thing', Building Research Establishment (BRE) (2003). This guidance suggests that construction traffic can amount to 25 arrivals and 25 departures per €100,000 of project value for deliveries of materials, the indicator simply considers the final delivery journey to site, therefore, not accounting for offsite storage, consolidation of loads or other factors.

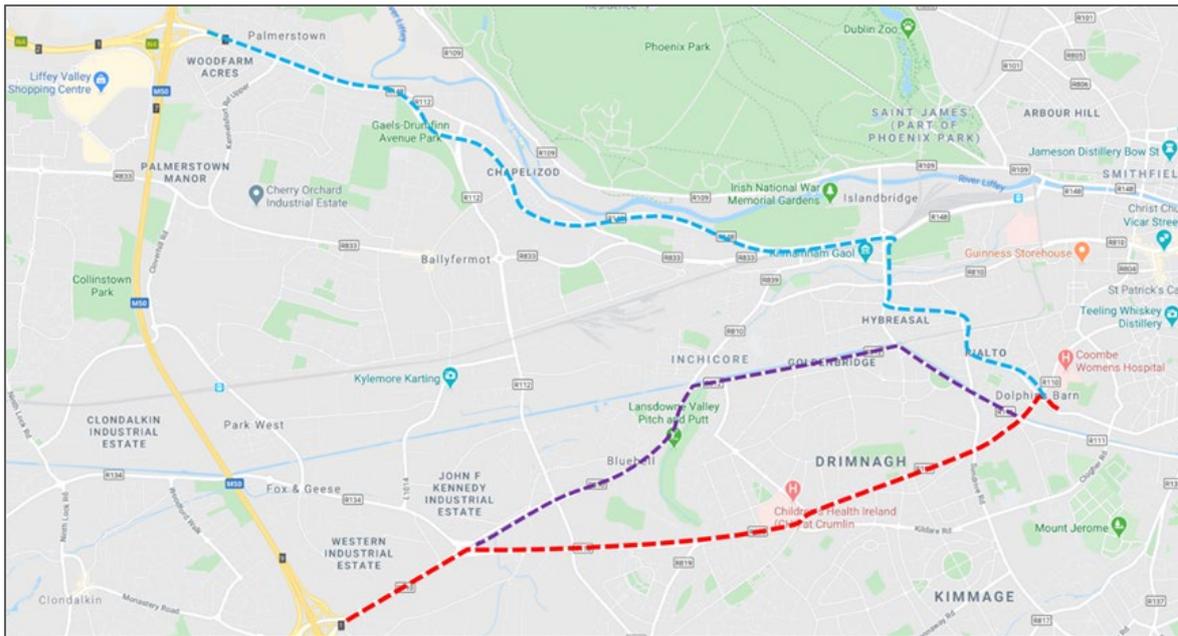
The contract sum of the proposed development is currently estimated at €80M. Based on the approach outlined above, approximately 20,000 one-way construction vehicle trips to take place over the lifetime of the construction of the development could be expected.

It is assumed that the total construction vehicle movements will take place over approximately 255 days per year (i.e. no movements on Sundays and Bank Holidays). This equates to approximately 22 construction days on average per month. It is envisaged that the construction works associated with the development scheme will take place over a period of approximately 3.5 years (42 months). This equates to a generation of approximately 22 one-way HGV trips per day.

10.6.1.3 HGV Routing & Impact

HGVs will enter and exit the site from the South Circular Road, a designated route for HGVs within the DCC HGV strategy. The proposed routing of HGVs from the site to the M50 where the majority will travel to/from is shown in Figure 10.2.

Figure 10.2: Construction HGV Potential Routes to Site



The majority of HGV traffic will be encouraged to use the Red or Purple route outlined to the M50/N7 Junction. On average this will increase the absolute number of HGVs along the South Circular Road by less than 10%, and on the Dolphin's Barn Cross Canal Bridge by less than 5%.

The increase in overall traffic as result of the additional HGVs along these links will be less than 0.5%. This will have an imperceptible effect based on criteria outlined in Table 10.1. The HGV traffic will be spread throughout the day with commuting peaks avoided where possible.

In summary, the combined additional light and heavy construction traffic is likely to have a negative but slight impact on the local network. It will be short-term in nature and the impacts outlined represent the 'worst case' effects.

10.6.2 Operational Phase

10.6.2.1 Trip Generation

An operational trip generation exercise for proposed development was undertaken as part of the TTA. This assessment adopts the same trip generation methodology and assumptions, which are summarised below. Full details can be found within the Chapter 8 of the accompanying TA.

The proposals are directly comparable to those of the recently consented Bailey Gibson development (for which SYSTRA produced the TTA and EIA Traffic and Transport Chapter) with regards to location, accessibility, car and cycle parking provision and on-site amenities. The Bailey Gibson development used data within the NTA's Eastern Regional Model to determine the likely level of person trips generated by the residential element of the

development. Therefore, it was agreed with DCC that the Bailey Gibson trips rates would be used to determine the level of trip generation at the proposed development.

A vehicle trip rate of 0.012 arrivals and 0.074 departures per unit in the AM peak hour, and 0.050 arrivals and 0.020 departures in the PM peak hour has been adopted for the residential element of the proposed development. A small number of external vehicle trips are assumed to be generated by the creche, with the majority from the residential units of the proposed development and all café trips assumed as internal (or accessed by sustainable modes by non-residents). This equates to the following breakdown of vehicle trips in the AM and PM peak periods shown in Table 10.2 below.

Table 10.2: Operational Vehicle Trip Generation

Land Use	AM			PM		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
Residential	4	25	29	17	7	24
Creche	2	4	6	2	2	2
Café	0	0	0	0	0	0
Total	6	29	35	19	9	28

The development site is currently used for employment uses and benefits from an existing planning consent for 6,634 sqm of B1/B2/B8 land uses. As this use will discontinue, account has been made of its potential trip generation in order to establish the net increase in trips attributable to the proposed development by obtaining trip rates for these land uses from the TRICS database. The net change in vehicle trips is outlined in Table 10.3 below.

Table 10.3: Net Change in Vehicle Trips

Scenario	AM			PM		
	IN	OUT	TWO WAY	IN	OUT	TWO WAY
Existing	22	7	29	6	19	25
Proposed	6	29	35	19	9	28
Net Change	-16	+22	+6	+13	-10	+3

As shown in Table 10.3, the proposed development will result in a net increase of six two-way trips the AM peak and three trips in the PM peak, when compared to the trips attributable to the existing use at the site.

Notwithstanding this, the traffic impact of the proposed development without accounting for existing trips on the local road network, is considered below to provide a robust assessment of the proposed development's contribution.

10.6.2.2 Traffic Impact

Trip distribution of the vehicular trips is based on the trip assignment approached for the Bailey Gibson development.

Table 10.4 shows the difference in trips generated by the proposed development compared to the existing permission on the site. It should be noted that this is for comparative information only, and no account has been taken of these existing trips in the forthcoming junction assessments.

Table 10.4: HGV Trips by Construction Stage

Distribution	AM Peak		PM Peak	
	WB	EB	WB	EB
In	56%	44%	57%	43%
Out	64%	36%	73%	27%

Impact at Access Junction

The resultant traffic distribution and development impact on South Circular Road at the access junction to the proposed development is illustrated in Figure 10.3.

Figure 10.3: Trip Assignment & Impact on South Circular Road



As shown in Figure 10.3, the proposed development will contribute a maximum of only 5% additional vehicles at any one movement at the access junction (left turn onto South Circular Road westbound). This represents a minor impact, however, capacity analysis at the proposed site access junction has been undertaken using Junctions 9 software. The following scenarios were modelled:

- 2019 Baseline flows;
- 2024 Future Baseline (includes the committed development + any committed mitigation);
- 2024 Future Baseline + White Heather Development + any proposed mitigation;
- 2029 Future Baseline + White Heather Development + any proposed mitigation; and
- 2039 Future Baseline + White Heather Development + any proposed mitigation.

To forecast the growth in background traffic for each of these years, link based regional forecasts for the Dublin Metropolitan Area from TII 'PAG Unit 5.3: Travel Demand Projections' have been applied. This results in the following growth in background traffic for each year:

- 2019 – 2024: 8.4%
- 2019 – 2029: 17.4%
- 2019 – 2039: 23.6%

The full analysis is detailed in Chapter 9 of the TTA. In summary, the results demonstrate that the junction currently operates with significant reserve capacity during both the AM and PM peak periods and will continue to do so with development traffic in the 2024, 2029 and 2039 future year scenarios. The proposed development will not result in any additional queuing with the queues remaining less than one vehicle including on South Circular Road between the junctions. It is therefore concluded that the proposed development will have a negligible impact on the operation of the junction.

Impact on Wider Network

The development contribution to the future year link flows on the wider local road network during the AM and PM Peak periods are shown in Table 10.5 and Table 10.6 below.

Table 10.5: AM Peak Link Flows Development Contribution

Location	AM Do-Nothing Flows				Dev Flows	Development Contribution (% Increase)		
	2020	2024	2029	2039		2024	2029	2039
South Circular Road (West of Site Access)	718	763	827	886	21	2.75%	2.54%	2.37%
South Circular Road (East of Site Access)	708	753	816	874	14	1.86%	1.72%	1.60%
Dolphin's Barn (South)	1495	1589	1723	1846	11	0.66%	0.61%	0.57%
South Circular Road (West of Dolphin's Barn)	625	665	721	772	6	0.97%	0.90%	0.84%
Dolphin's Barn (North)	1420	1510	1637	1754	4	0.27%	0.25%	0.23%
Clanbrassil Street Lower	438	465	505	541	1	0.19%	0.17%	0.16%
South Circular Road (East of Clanbrassil Street)	1016	1080	1170	1255	7	0.65%	0.60%	0.56%
Clanbrassil Street Upper	820	872	944	1013	6	0.70%	0.65%	0.60%

Table 10.6: PM Peak Link Flows Development Contribution

Location	AM Do-Nothing Flows				Dev Flows	Development Contribution (% Increase)		
	2020	2024	2029	2039		2024	2029	2039
South Circular Road (West of Site Access)	745	792	858	919	18	2.27%	2.10%	1.96%
South Circular Road (East of Site Access)	687	731	791	848	10	1.37%	1.26%	1.18%
Dolphin's Barn (South)	1636	1739	1885	2020	7	0.39%	0.36%	0.34%
South Circular Road (West of Dolphin's Barn)	707	752	815	873	7	0.91%	0.84%	0.79%
Dolphin's Barn (North)	1467	1560	1690	1811	4	0.27%	0.25%	0.24%
Clanbrassil Street Lower	390	414	449	482	1	0.19%	0.17%	0.16%
South Circular Road (East of Clanbrassil Street)	1075	1143	1238	1327	4	0.34%	0.31%	0.29%
Clanbrassil Street Upper	810	861	933	1000	5	0.63%	0.58%	0.54%

The results demonstrate that during the operational phase, the proposed development will contribute, at most, a 2.75% increase in traffic flows in the 2024 AM peak period on the South Circular Road to the west of the site access, and significantly lower elsewhere. Similarly, in the PM peak period the maximum contribution is 2.27% on the South Circular Road to the west of the site access and significantly lower elsewhere. This is considered to be a negligible impact on all road links in both the AM and PM peak periods.

It should be noted that Table 10.5 and Table 10.6 consider a wider study area to that agreed with DCC for assessment within the TTA. This is given that traffic flow data for these road links was available from the Bailey Gibson application and to demonstrate that the proposed development impact reduces considerably (to amounts <1%) beyond the site access on South Circular Road.

As per the rating of effects in traffic contribution in Table 1, which is based on a conservative interpretation of the EPA Guidelines and IEMA Guidelines, the proposed development will result in a negligible and 'not significant' long-term effect.

10.7 Mitigation Measures

10.7.1 Incorporated Design Mitigation

There are a number of measures which have been included from the outset in the design of the development to reduce any potential negative impacts on the local transport network arising from additional traffic generated by the development. The most significant measure is the parking ratio which has been applied with just 0.29 car parking spaces per residential unit and 1.3 bikes spaces provided per unit. This has been included in the results presented.

The car parking ratio is below the maximum standards for 1 per unit, as set out in the Dublin City Development Plan 2016-2022, and results in a significantly lower number of car trips generated. The Development Plan bike parking standards are 1 per unit, lower than the proposed 1.3 in this application. The additional bike spaces provided should allow more residents to travel sustainably by bicycle. In addition, residential amenity facilities and a creche on-site are intended to reduce the need for external travel. Further details on the parking strategy are included in the TTA.

10.7.2 Construction Phase

An Outline Construction Traffic Management Plan has been prepared which identifies measures that aim to minimise the effect of construction traffic on the surrounding road network with respect to potential temporary changes to vehicular traffic and pedestrian movements. The CTMP measures include the following:

- Construction Staff will typically arrive before 07:00 and leave after 18:00, Monday to Friday (i.e. avoiding network peak periods);
- Limited parking on site for staff (to prevent overspill onto surrounding roads), with majority required to arrive by sustainable means;
- Appointment of Construction Site Manager/Community Liaison Officer to manage the implementation of the CTMP and act as the main point of contact for staff, contractors, DCC and general public;
- Construction staff Travel Plan to be developed by appointed Contractor;
- Cycle parking, storage and drying areas provided on site;
- Agreed haulage routes along designated HGV routes;
- Minimising HGV deliveries during the peak hours (generally 08:00 - 09:00 and 17:00 - 18:00);
- On-site wheel wash facilities;
- HGVs carrying soil to be fully sheeted;
- HGVs inspected for dirt and mud before exiting onto public road network;
- Road cleaning and sweeping along section of South Circular Road adjacent to the site;
- Construction signage at all entrances and exits;
- Control and timing of deliveries where possible;
- Entrances and exits manned during deliveries.

A more detailed and comprehensive CTMP will be produced by the contractor for specific phases of the development construction post-planning consent.

10.7.3 Operational Phase

10.7.3.1 Mobility Management Plan

A Mobility Management Plan (MMP) has been prepared to accompany the planning application and is the key mitigation measure to manage effects during the operational phase.

The aim of the MMP is to further reduce the proportion of car trips, from an already low baseline, by promoting sustainable travel by future residents of the development. These mobility measures will also support and enable those residents who may be living 'car-free' providing them with a range of sustainable mobility options and negating the need to own a car.

The measures included in the MMP are as follows:

- Appointment of Mobility Manger who will market and promote the MMP to residents of the site, and monitor the progress of the MMP;
- A Welcome Travel Pack to residents with details of local transport network, maps of local amenities, detail of on-site facilities, incentives for sustainable travel and initial subsidised use of Car Club;
- Marketing and Travel information and Personalised Travel Planning to be provided by Mobility Manager;
- Walking and Cycling Challenges and promotion events;
- Four on-site GoCars exclusively for the use of residents, in addition to three GoCars provided for general public use.

10.8 Predicted Impact of the Proposed Development

10.8.1 Demolition & Construction Phase

The assessment of potential demolition and construction traffic impact demonstrates that no significant effects are expected to arise from traffic associated with the proposed development, prior to mitigation.

A CTMP will be implemented during the construction phase which will further ensure that no significant effects arise from construction traffic. As such, the predicted impact during the construction phase is considered to have a negative, slight and short-term effect. This is considered 'not significant' overall.

10.8.2 Operational Phase

The assessment of potential operational traffic impact demonstrates that no significant effects are expected to arise from operational traffic associated with the proposed development, prior to mitigation.

A TP will be implemented which will seek to minimise car-based trips, particularly single-occupancy car trips, through the proposed measures to discourage car use and encourage sustainable transport options. This further ensures that the vehicle impact of the operational development can be accommodated by the local road network without significant effects arising. As such, the predicted impact during the operational phase is considered to have a negligible and 'not significant' long-term effect.

10.9 Monitoring

10.9.1 Demolition & Construction Phase

The construction phase will be monitored by the appointed site manager and regular progress reports will be prepared. The manager will ensure the mitigation measures outlined will be implemented and adhered to.

10.9.2 Operational Phase

10.9.2.1 Mobility Manager

A Mobility Manager will be appointed from within the management company to ensure the implementation of the MMP. They will also be responsible for the undertaking of post occupation travel surveys and act as a point of contact for residents for all mobility and access related issues.

10.10 Interactions and Potential Cumulative Impacts

10.10.1 Interactions

Transportation has interactions with air quality and noise effects. These are addressed by the respective assessments in Chapter 12 Air Quality and Climate, and Chapter 13 Noise and Vibration. Chapter 20 Interactions and Cumulative Impacts of this EIA also contains details on interactions.

10.10.2 Potential Cumulative Impacts

Consideration has been given to the potential cumulative impact of the proposed development alongside the neighbouring Bailey Gibson and Player Wills SHDs in both the construction and operational phases.

Regarding the construction phase, a CTMP will be implemented on all sites which will ensure that the impact of the construction traffic will be minimised and can be expected to be negative, slight and short-term. The impact will be local and broadly limited to the South Circular Road.

Regarding the operational phase, capacity analysis at the access junction demonstrates that the junction will continue to operate with significant residual capacity in the future year scenarios, taking committed developments into account. The proposed development in isolation will contribute to <3% impact along the South Circular Road and the impact reduces considerably beyond the site access (<1% elsewhere within the wider local area). With the MMP in place the car mode share should be reduced further. Therefore, the operational impact of the combined Masterplan lands is considered to be at worst, negative, slight and long-term but confined to the local network. This is considered 'not significant' overall.

10.11 References

Building Research Establishment (BRE) (2003), 'Construction Site Transport, The Next Big Thing', (Ref. 14-19).

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Design Manual for Urban Roads and Streets (DMURS).

Dublin City Development Plan 2016-2022, 2016, Dublin City Council.

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

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Project Appraisal Guidelines for National Roads Unit 5.1 - Construction of Transport Models, October 2016, TII.

Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, October 2016, TII.

Transport Infrastructure Ireland (TII) (2014), Traffic and Transport Assessment Guidelines.

Trip Rate Information Computer System (TRICS) (2008), Construction Traffic Research Report, (Ref. 14-18).



Chapter 11. Material Assets: Waste Management

11.0 Material Assets – Waste Management

11.1 Introduction

This Chapter of the EIAR comprises an assessment of the likely impact of the proposed Development on the waste generated as well as identifying proposed mitigation measures to minimise any associated impacts.

This Chapter was prepared by Chonaill Bradley of AWN Consulting. Chonaill Bradley is a Senior Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia. He is an Associate Member of the Institute of Waste Management (CIWM). Chonaill has over seven years' experience in the environmental consultancy sector.

A site-specific Resource Waste Management Plan (RWMP) has been prepared by O'Connor Sutton Cronin (OCSC) to deal with waste generation during the demolition, excavation and construction phases of the proposed Development and has been included as Appendix 11.1. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government (DoEHLG)(2006).

A separate Operational Waste Management Plan (OWMP) has also been prepared for the operational phase of the proposed Development and is included as Appendix 11.2 of this Chapter.

The Chapter has been prepared in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017) and the EPA Guidelines on the Information to be contained in EIAR (2017, Draft)

These documents will ensure the sustainable management of wastes arising at the Development Site in accordance with legislative requirements and best practice standards.

11.2 Consultation

This chapter did not require direct consultation with Statutory or Non-Statutory bodies. Waste management legislation and regulations and National and Regional Waste Management

Policies and Objectives provide adequate guidance with respect to the preparation of this chapter of the EIAR.

11.3 Methodology

The assessment of the impacts of the proposed Development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management, including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed Development, as described in Chapter 2 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including demolition, site preparation and excavation); and
- Operational phase.

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed Development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources and estimates calculated by OCSC.

Mitigation measures are proposed to minimise the effect of the proposed Development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 11.7.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 7 of this EIAR (Land, Soils, Geology and Hydrogeology). Chapter 7 also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed Development.

11.3.1 Legislation and Guidance

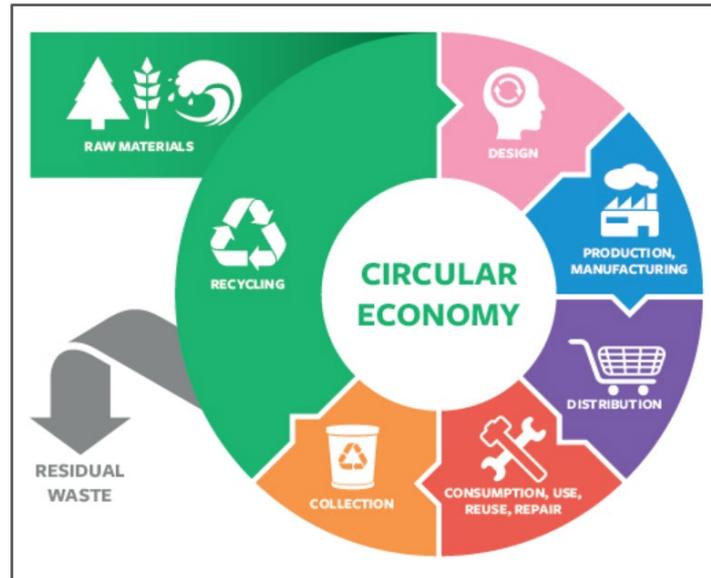
Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 11.1).

Figure 11.1: Waste Hierarchy (Source: European Commission)



EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 11.2).

Figure 11.2: Circular Economy (Source: Repak)



The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland*, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity*, in 2012.

One of the first actions to be taken from the WAPCE was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less'* (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' and the DoEHLG's Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects. The guidance document, *Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers* (FÁS & Construction Industry Federation, 2002), was also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, the Dublin City Council (DCC) Waste Management (Storage, Presentation and Segregation of Household and Commercial

Waste) Bye-Laws 2018, the EPA National Waste Database Reports 1998 – 2019 and the EPA National Waste Statistics Web Resource.

11.3.2 Terminology

Note that the terminology used herein is generally consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

- a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
- b) the adverse impacts of the generated waste on the environment and human health; or
- c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations.

11.4 Receiving Environment

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The full detail of the nature and extent of the proposed development is set out in Chapter 2 of this EIAR and the Draft Construction Management Plan is appended to same. A full description of the proposed Development can be found in Chapter 2 (Description of the Proposed Development).

In terms of waste management, the receiving environment is largely defined by Dublin City Council (DCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021 and the Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland.

The waste management plans set out the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of “70% preparing for reuse, recycling and other recovery of construction and demolition waste” (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. Ireland achieved 84 per cent material recovery of such waste in 2019, and therefore surpassed the 2020 target and is currently surpassing the 2025 target. The National Waste Statistics update published by the EPA in November 2021 identifies that Ireland's current against “Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)” was met for 2020 at 51% however they are currently not in line with the 2025 target (55%).

The Dublin City Council Development Plan 2016 – 2022 and Dublin City Council Development Plan 2022 – 2028 also set policies and objectives for the DCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, DCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

11.5 Characteristics of the Proposed Development

A full description of the proposed Development can be found in Chapter 2 (Description of the Proposed Development). The characteristics of the proposed Development that are relevant in terms of waste management are summarised below.

11.5.1 Demolition Phase

Demolition works at the site will involve demolishing the existing industrial warehouse units and all associated ancillary structures and walls. The site will also be cleared of all organic material along with all existing hardstanding for internal paths and roads. Further detail on the waste materials likely to be generated during the demolition works are presented in the project-specific RWMP in Appendix 11.1 and prepared by OCSC. The RWMP provides an estimate of the main waste types likely to be generated during the C&D phase of the proposed Development and these are summarised in Table 11.1.

Table 11.1: Estimated Demolition Waste

Waste Type	Tonnes
Concrete, Bricks, Tiles, Plastics etc	4,000
Asphalt, Tar/Tar products	1,100
Metals	6,500
Timber	N/A
Made Ground / Rubble	750
Total	12,350

11.5.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

In addition, topsoil, subsoil, clay and made ground will require excavation to facilitate site levelling, construction of foundations, along with the installation of underground services. The Project Engineers (OCSC) have estimated that c. 10,000 m³ of material will require excavation. It is envisaged that the majority of this material will be removed off-site in with only c. 500 m³ of material expected to be kept for on-site reuse. These estimates will be refined prior to commencement of construction.

If the material that requires removal from Site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011). For more information in relation to the envisaged management of by-products, refer to the RWMP (Appendix 11.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2019). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at

either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (Appendix 11.1). The RWMP provides an estimate of the main waste types likely to be generated during the Construction phase of the proposed Development. These are summarised in Table 11.2.

Table 11.2: Estimated off-site Reuse, Recycle and Disposal Rates for Construction Waste

Waste Type	Tonnes	Reuse / Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Soil & Stones	10,000	5	500	-	-	95	9,500
Concrete, Bricks, Tiles Plastics etc	1,500	-	-	75	1,125	25	375
Asphalt, Tar/Tar Products	100	-	-	25	25	75	75
Metals	100	5	5	80	80	15	15
Other	200	10	20	40	80	50	100
Total	11,900		525		1,310		10,065

11.5.3 Operational Phase

As noted in Section 11.1, an OWMP has been prepared for the proposed Development and is included as Appendix 11.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables (DMR), organic waste and mixed non-recyclable waste (MNR), as well as providing a strategy for management of waste glass, batteries, WEEE, printer / toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The total estimated waste generation for the proposed Development for the main waste types, based on the AWN waste generation model (WGM), is presented in Table 11.3, below, and is based on the uses and areas as advised by the Project Architects. Further unit breakdowns can be found in Appendix 11.2.

Table 11.3: Estimated Waste Generation During Operational Phase

Waste Type	Waste Volume (m ³ /week)	
	Residential Waste	Commercial Waste
Organic Waste	4.76	0.25
Dry Mixed Recyclables	32.53	2.78
Glass	0.92	0.59
Mixed Non-Recycling	21.64	1.28
Total	59.84	4.90

The residents and staff will be required to provide and maintain appropriate waste receptacles within the residential and commercial units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the residents, staff and facilities management. As required, the residents, staff and facilities management company will need to bring these segregated wastes from their units to the allocated satellite Waste Storage Areas (WSAs) within the proposed development.

The OWMP seeks to ensure that the proposed Development contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021 and the DCC (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018)".

Mitigation measures proposed to manage impacts arising from wastes generated during the operational phase of the proposed Development are summarised below

11.6 Potential Impact of the Proposed Development

11.6.1 Construction Phase

The proposed Development will generate a range of non-hazardous and hazardous waste materials during site demolition, excavation and construction. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the Development Site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local environment is likely to be **short-term, significant** and **negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **Long-term, significant** and **negative**.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the Development Site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However,

in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed Development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 7. It is anticipated that c. 9,500 m³ of excavated material will need to be removed off-site, however it is envisaged that c. 500 m³ tonnes of excavated material will be reused on-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

11.6.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be **Long-term, significant** and **negative**.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the Development Site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local environment is likely to be **short-term, significant** and **negative**.

Waste contractors will be required to service the proposed Development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **Long-term, significant** and **negative**.

11.6.3 'Do Nothing' Scenario

If the proposed Development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no demolition, excavation or construction waste generated. Operational waste generated at this site will continue as it currently does. There would, therefore, be a neutral effect on the environment in terms of waste.

11.7 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

11.7.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed Development:

As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of the '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*' (DoEHLG, 2006) and The EPA, '*Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects*' (2021) and is included as Appendix 11.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 11.1) in agreement with DCC, or submit an addendum to the RWMP to DCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction and demolition phases.

A quantity of topsoil, sub soil, clay and made ground which will need to be excavated to facilitate the proposed Development. Project Engineers have estimated that c. 10,000 m³ of excavated material will need to be removed off-site, however it is envisaged that c. 500 m³ excavated material will be reused on-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals;

- Glass; and
- Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition, excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.
- Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed Development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the *EMR Waste Management Plan 2015 – 2021*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

11.7.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 11.2. The mitigation measures outlined in the OWMP will be implemented in full and form part of mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *EMR Waste Management Plan 2015 – 2021*, *Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland* and the DCC waste bye-laws.

- The Residents / Commercial Tenants / Facilities Manager of the Site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the Site of the proposed Development.

In addition, the following mitigation measures will be implemented:

- The Residents / Commercial Tenants / Facilities Manager will ensure on-Site segregation of all waste materials into appropriate categories, including (but not limited to):
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Glass;
 - Waste electrical and electronic equipment (WEEE);
 - Batteries (non-hazardous and hazardous);
 - Cooking oil;
 - Light bulbs;
 - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
 - Furniture (and from time to time other bulky waste); and
 - Abandoned bicycles.
- The Residents / Commercial Tenants / Facilities Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Residents / Commercial Tenants / Facilities Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Residents / Commercial Tenants / Facilities Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed Development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, *the Litter Pollution Act 1997*, the *EMR Waste Management Plan 2015 – 2021* and the DCC (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

Table 11.4: Mitigation Measures

Likely Significant Effect	Mitigation Measures
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Litter Pollution	The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase.
Unlicensed Waste Collection (Illegal Dumping)	All waste leaving the site will be recorded and copies of relevant documentation maintained.
Insufficient Waste Facilities	All waste leaving the site will be recorded and copies of relevant documentation maintained.
Lack of waste Classification	All waste material leaving site will be correctly classified and segregation prior to removal where possible.
Unlicensed Waste Collection (Illegal Dumping)	The Residents / Commercial Tenants / Facilities Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.
Poor Waste Segregation	The Residents / Commercial Tenants / Facilities Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
Litter Pollution	The Residents / Commercial Tenants / Facilities Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available

11.8 Predicted Impact of the Proposed Development

The implementation of the mitigation measures outlined in Section 11.7 will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the proposed Development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved

11.8.1 Construction Phase

A carefully planned approach to waste management as set out in Section 11.7 and adherence to the RWMP (Which include mitigation) during the construction phase will ensure that the predicted effect on the environment will be **short-term, imperceptible and neutral**.

11.8.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 11.7 and adherence to the OWMP (Which include mitigation) will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be **long-term, imperceptible and neutral**.

11.8.3 'Do Nothing' Scenario

If the proposed Development was not to go ahead (i.e. in the Do-Nothing scenario) there

would be no demolition, excavation or construction waste generated. Operational waste generated at this site will continue as it currently does. There would, therefore, be a neutral effect on the environment in terms of waste.

11.9 Monitoring

The management of waste during the construction phase will be monitored by the Contactor's appointed Waste Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the Residents / Commercial Tenants / Facilities Manager to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

11.9.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the demolition, excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting construction schedule targets. The RWMP specifies the need for a Waste Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Waste Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed Development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future Developments.

11.9.2 Operational Phase

During the operational phase, waste generation volumes will be monitored by the Residents / Commercial Tenants / Facilities Manager against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

Table 11.5: Monitoring Proposals

Likely Significant Effect	Monitoring Proposals
Litter Pollution	The Contractor will review and maintain waste records and site audits
Unlicensed Waste Collection (Illegal Dumping)	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of waste Classification	An appointed Resource Waste Manager will monitor all onsite waste segregation and classification
Unlicensed Waste Collection (Illegal Dumping)	The Residents / Commercial Tenants / Facilities Manager will maintain waste receipts onsite for a period of 7 years and make available to DCC as requested.
Poor Waste Segregation	Waste generation volumes will be monitored by the Residents / Commercial Tenants / Facilities Manager
Litter Pollution	Waste storage areas will be monitored by the Residents / Commercial Tenants / Facilities Manager

11.10 Reinstatement

In the event that the proposed Project is discontinued, there is not likely to be any significant impacts on waste management at the Site.

The Proposed Development may be decommissioned at some stage in the future. At that time, a demolition or refurbishment plan will be formulated for the decommissioning phase of the Proposed Development to ensure no waste nuisance occurs at nearby sensitive receptors.

11.11 Interactions and Potential Cumulative Impacts

11.11.1 Interactions

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR.

11.11.1.1 Land, Soils, Geology & Hydrogeology

During the construction phase, excavated soil, stone, clay and made ground (c. 10,000 m³) will be generated from the excavations required to facilitate site levelling and the construction of new foundations. It is estimated that c. 9,500 m³ of excavated material will need to be removed off-site. However, it is envisaged that c. 500 m³ material will be reused on-site. Where material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 11 and the requirements of the RWMP (Appendix 11.1), will ensure the effect is **long-term, imperceptible** and **neutral**.

11.11.1.2 Traffic & Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the Site during the construction and operational phases of the proposed Development. The increase in vehicle movements as a result of waste generated during the construction phase will be *temporary* in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 10 (Traffic and Transportation). Provided the mitigation measures detailed in Chapter 10 and the requirements of the OWMP (included as Appendix 11.2) are adhered to, the predicted effects are **short to long-term, imperceptible** and **neutral**.

11.11.1.3 Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and OWMP (Appendices 11.1 and 11.2, respectively), will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be **long-term, imperceptible and neutral**.

11.11.2 Potential Cumulative Impacts

As has been identified in our receiving environment section all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

11.11.2.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase.

Developments that potentially could overlap during the construction phase of note:

- SHD0012/21 (ABP-310567-21)
- SHD0009/21 (ABP-310112-21)
- SHD0002/21 (ABP-309317-20)
- SHD0031/20 (ABP-308917-20)
- SHD0029/20 (ABP-308871-20)
- SHD0023/20 (ABP-305483-19)

- SHD0020/20 (ABP-308162-20)
- SHD0009/20 (ABP-307221-20)
- SHD0007/20 (ABP-307067-20)
- SHD0001/20 (ABP-306569-20)
- SHD0018/19 (ABP-305324-19)
- SHD0013/19 (ABP-305061-19)
- SHD0011/19 (ABP-304686-19)
- SHD0003/19 (ABP-303436)
- SHD0002/19 (ABP-303435-19)

Due to the high number of waste contractors in the Dublin region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be **short-term, not significant** and **neutral**.

11.11.2.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in the area. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

11.12 References

- Waste Management Act 1996 (No. 10 of 1996) as amended.
- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

- Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (2020).
- DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)
- Department of Environment and Local Government (DELG) (1998). *Waste Management – Changing Our Ways, A Policy Statement*.
- Department of Environment, Communities and Local Government (DECLG) (2012). *A Resource Opportunity - Waste Management Policy in Ireland*.
- Dublin City Council (DCC), Dublin City Council Development Plan 2016-2022 (2015)
- DCC, Draft Dublin City Council Development Plan 2022-2028 (2021)
- DCC, Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018)
- Department of Housing, Local Government and Heritage (DoHLGH) (2020). *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities*.
- Department of Environment, Heritage and Local Government (DEHLG) (2006). *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects*.
- Eastern-Midlands Region Waste Management Plan 2015-2021 (2015).
- Environmental Protection Agency (EPA). National Waste Database Reports 1998-2019.
- EPA (2015). *Waste Classification-List of Waste & Determining if Waste is Hazardous or Non-Hazardous*.
- EPA and Galway-Mayo Institute of Technology (GMIT) (2015). *EPA Research Report 146-A Review of Design and Construction Waste Management Practices in Selected Case Studies-Lessons Learned*.
- FÁS and the Construction Industry Federation (CIF) (2002). *Construction and Demolition Waste Management-a handbook for Contractors and Site Managers*.
- Forum for the Construction Industry-Recycling of Construction and Demolition Waste.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended.
- Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
- Health Service Executive (HSE), *Waste Management Awareness Handbook* (2011).



Chapter 12. Air Quality and Climate

12.0 Air Quality and Climate

12.1 Introduction

This chapter assesses the likely air quality and climate impacts associated with the proposed Strategic Housing Development (SHD) at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8; 307/307a South Circular Road, Dublin 8; and 12a St. James's Terrace, Dublin 8.

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12.1.1 Relevant Legislation & Guidance

12.1.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see APPENDIX 12.1: AMBIENT AIR QUALITY STANDARDS).

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 (S.I. No. 180/2011), which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values for NO₂, PM₁₀ and PM_{2.5} are of relevance to this assessment (see Table 12.1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directive are used which are triggers for particular actions (see APPENDIX 12.1: AMBIENT AIR QUALITY STANDARDS).

Table 12.1: Ambient Air Quality Standards

Pollutant	Regulation ^{Note 1}	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 ³

Pollutant	Regulation ^{Note 1}	Limit Type	Value
		Annual limit for protection of human health	40 µg/m ³
Particulate Matter (as PM ₁₀)	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³
		Annual limit for protection of human health	40 µg/m ³
Particulate Matter (as PM _{2.5})	2008/50/EC	Annual limit for protection of human health	25 µg/m ³

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

12.1.1.2 Dust Deposition Guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM₁₀) and less than 2.5 microns (PM_{2.5}) and the EU ambient air quality standards outlined in **Table 12.1** have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

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/(m²*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 value of 350 mg/(m²*day) to the site boundary of quarries. This limit value can also be implemented with regard to potential dust impacts from construction of the proposed development.

12.1.1.3 Climate Agreements

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement on elevating adaption onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013* (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050' (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act made provision for a national mitigation plan, and 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_{2e} by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the

General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Bill 2021 (hereafter referred to as the 2021 Climate Bill) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021b), 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 that each Local Authority produce a climate action plan lasting five years, specifying the mitigation measures and the adaptation measures to be adopted by the Local Authority.

The Dublin City Council Climate Change Action Plan published in 2019 (Dublin City Council and Codema, 2019) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management. Some of the measures promoted within the Action Plan under the 5 key areas involve building retrofits, energy master-planning, development of segregated cycle routes, the promotion of bike share schemes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the Dublin City Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Action Plan and incorporate climate friendly designs and measures where possible.

Under amendments to Part L of the Building Regulations from November 2019 all new buildings were required to comply with the Near Zero Energy Building (NZEB) regulations. This aims to make new residential buildings 70% more energy efficient than the 2005 levels. The Part L Technical Guidance Document was updated by the Minister for Housing, Local Government & Heritage in July 2021. The amendments to Part L give effect to the European Union (Energy Performance of Buildings) Regulations 2019, published on 3 May 2019 (S.I. 183 of 2019). The regulations transpose Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings (recast), as amended by Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018. The Directive sets requirements for Member States to improve the energy performance of buildings and make an important contribution to the reduction of greenhouse gas emissions. The improved

efficiency of buildings will help in reducing Ireland's GHG emissions and thus help to mitigate climate change. The regulations require that at least 20% of the total energy use of buildings is sourced from renewables. There is also a requirement to reduce the heat loss from buildings and avail of heat gain through the fabric of the building in addition to providing energy efficient space and water heating systems. The NZEB requirements will result in a typical Building Energy Rating (BER) of A2 which represents a 70% improvement in carbon emissions levels on the emissions levels of buildings from 2005.

12.2 Consultation

Having regard to the nature of the proposed development together with the available guidelines for completing air quality and climate assessments, sufficient information existed to scope the content of this chapter and consultation was not deemed necessary.

12.3 Methodology

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

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017)

12.3.1 Methodology

12.3.1.1 Construction Phase Air Quality

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site specific mitigation required. The use of UK guidance is considered best practice in the absence of applicable Irish guidance.

The major dust generating activities are divided into four types within the IAQM guidance (2014) to reflect their different potential impacts. These are: -

- Demolition.
- Earthworks.

- Construction.
- Trackout (movement of heavy vehicles).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site specific mitigation to be determined.

Demolition and construction phase traffic also has the potential to impact air quality and climate. The UK Highways Agency guidance *LA 150 (2019)* states the following scoping criteria shall be used to determine whether the air quality impacts of a project can be scoped out or require an assessment based on the changes between the do something traffic (with the project) compared to the do minimum traffic (without the project):¹

- 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.

In addition, the impact of construction activities on vehicle movements shall be assessed where construction activities are programmed to last for more than 2 years (UK Highways Agency, 2019). Traffic data for the proposed development was provided by Systra (the appointed traffic consultant) on 20/01/2022 to inform this assessment.

None of the surrounding road links meet the scoping criteria and therefore, a detailed assessment of construction traffic is not required as there is no potential for likely significant impacts to air quality as a result of traffic emissions.

12.3.1.2 Construction Phase 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.

12.3.1.3 Operational Phase Air Quality

The air quality assessment has been carried out following procedures described in the publications by the EPA (2015; 2017) and using the methodology outlined in the guidance documents published by the UK Highways Agency (2019a) and UK Department of Environment Food and Rural Affairs (DEFRA) (2016; 2018). Transport Infrastructure Ireland (TII)

¹ *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes, 2011* was produced by Transport Infrastructure Ireland based on the previous version of the UK Design Manual for Roads and Bridges ("DMRB") guidance (UK Highways Agency, 2007). The 2011 TII Guidance note they should be updated to reflect updates to the DMRB (see Section 1.1 of TII, 2011). The UK Highways Agency guidance *LA 150 (2019)* and the above scoping criteria are a useful update to the 2007 DMRB.

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) (the “TII Guidance”). 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.

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. Traffic data for the proposed development was provided by Systra on 20/01/2022. The UK Highways Agency DMRB scoping criteria detailed in Section 12.3.1.1 was used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. The proposed development will not increase traffic volume (AADT or HGVs), speeds or change the road alignment by an amount greater than the scoping criteria. Therefore, no road links impacted by the proposed development satisfy the criteria and a quantitative assessment of the impact of traffic emissions on ambient air quality is not necessary as there is no potential for significant impacts to local air quality.

12.3.1.4 Operational Phase Climate

Ireland has annual GHG targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*. Which has set a target of a 30% reduction in non-ETS sector emissions by 2030 relative to 2005 levels.

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established by reference to EPA data on annual GHG emissions (see Section 12.4.12.4.3). Thereafter the impact of the proposed development on climate is determined. Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO₂) which will impact climate.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency, 2019b), this guidance can be applied to any development that causes a change in traffic. The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. During the operational phase, if any of the road links impacted by the proposed development meet 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.

None of the road links impacted by the proposed development meet the above criteria and therefore a detailed assessment is not required as there is no potential for significant impacts to climate as a result of traffic emissions.

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. The Building Lifecycle Report prepared by Liv Consulting in relation to this development has been reviewed and used to inform the operational phase climate assessment. This report outlines a number of measures in relation to energy usage from the proposed development primarily in relation to heat and electricity. A number of measures have been incorporated into the overall design of the development to reduce the impact to climate where possible.

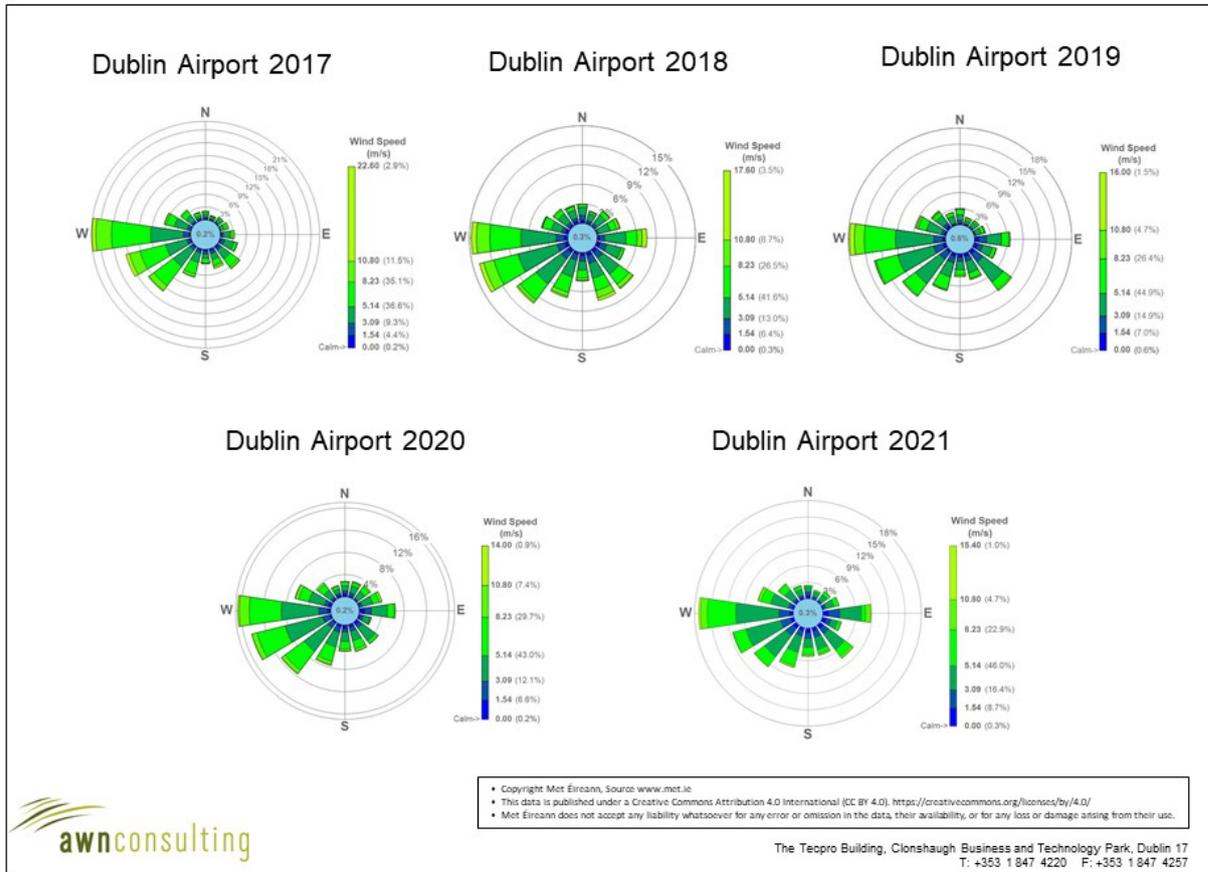
12.4 Receiving Environment

12.4.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM_{2.5} - PM₁₀) will actually increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

Representative meteorological data from nearby meteorological stations operated by Met Eireann are typically used to inform the prevailing meteorological conditions in an area in the absence of site specific data. This approach is considered best practice and provides a long-term data set for informing the assessment. The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station which is located approximately 10.5 km north of the site. For data collated during five representative years (2017 – 2021), the predominant wind direction is westerly to south-westerly, with generally moderate wind speeds (see **Figure 12.1**) (Met Eireann, 2022).

Figure 12.1: Dublin Airport Windroses 2017 – 2021



12.4.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality in Ireland is “Air Quality In Ireland 2020” (EPA, 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). The EPA data provides a long-term data set for background air quality at a variety of locations throughout Ireland. The use of existing long-term data is considered best practice in air quality assessments (TII, 2011).

As part of the implementation of the EU Council Directive 96/62/EC (transposed into Irish Legislation as S.I. No. 33 of 1999), 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 is within Zone A (EPA, 2022). The long-term EPA monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The

background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

In 2020 the EPA reported (EPA, 2021a) that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA *Air Quality in Ireland 2020* report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the baseline section and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

With regard to NO₂, continuous monitoring data from the EPA (EPA, 2021a) at suburban Zone A locations in Ringsend, Dun Laoghaire, Swords and Ballyfermot show that current levels of NO₂ are below both the annual and 1-hour limit values, with annual average levels ranging from 15 – 24 µg/m³ in 2019 (see **Table 12.2**). Sufficient data is available for the stations in Ballyfermot, Dun Laoghaire and Swords to observe the long-term trend since 2015 (EPA, 2021a) (see **Table 12.2**), with results ranging from 13 – 20 µg/m³ and few exceedances of the one-hour limit value. In addition, continuous monitoring data from the EPA (EPA, 2021a) at urban Zone A locations in Winetavern Street and Rathmines show that annual concentrations of NO₂ were 28 µg/m³ and 22 µg/m³ at both locations respectively in 2019. Based on the results at suburban and urban Zone A locations, an estimate of the background NO₂ concentration in the region of the proposed development is 22 µg/m³.

Table 12.2: Trends In Zone A Air Quality - Nitrogen Dioxide (NO₂)

Station	Averaging Period ^{Notes 1, 2}	Year				
		2015	2016	2017	2018	2019
Winetavern Street	Annual Mean NO ₂ (µg/m ³)	31	37	27	29	28
	Max 1-hr NO ₂ (µg/m ³)	182	194	196	165	142
Rathmines	Annual Mean NO ₂ (µg/m ³)	18	20	17	20	22
	Max 1-hr NO ₂ (µg/m ³)	106	102	116	138	183
Ringsend	Annual Mean NO ₂ (µg/m ³)	-	-	22	27	24
	Max 1-hr NO ₂ (µg/m ³)	-	-	138	121	109
Ballyfermot	Annual Mean NO ₂ (µg/m ³)	16	17	17	17	20
	Max 1-hr NO ₂ (µg/m ³)	127	90	112	217	124
Dún Laoghaire	Annual Mean NO ₂ (µg/m ³)	16	19	17	19	15
	Max 1-hr NO ₂ (µg/m ³)	103	142	153	135	104
Swords	Annual Mean NO ₂ (µg/m ³)	13	16	14	16	15
	Max 1-hr NO ₂ (µg/m ³)	170	206	107	112	108

Note 1 Annual average limit value - 40 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 1-hour limit value - 200 µg/m³ as a 99.8th percentile, i.e. not to be exceeded >18 times per year (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Continuous PM₁₀ monitoring carried out at the Zone A locations of Winetavern Street, Rathmines, Phoenix Park and Dún Laoghaire showed 2015 – 2019 annual mean concentrations ranging from 9 - 15 µg/m³ (Table 12.3), with at most 9 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m³ (35 exceedances are permitted per year). The most representative location is Rathmines which had an average annual mean concentration of 14.6 µg/m³ over the five-year period. Based on the EPA data (Table 12.3), a conservative estimate of the current background PM₁₀ concentration in the region of the proposed development is 15 µg/m³.

Table 12.3: Trends In Zone A Air Quality - PM₁₀

Station	Averaging Period ^{Notes 1, 2}	Year				
		2015	2016	2017	2018	2019
Winetavern Street	Annual Mean PM ₁₀ (µg/m ³)	14	14	13	14	15
	24-hr Mean > 50 µg/m ³ (days)	4	2	3	1	9
Rathmines	Annual Mean PM ₁₀ (µg/m ³)	15	15	13	15	15
	24-hr Mean > 50 µg/m ³ (days)	5	3	5	2	9
Phoenix Park	Annual Mean PM ₁₀ (µg/m ³)	12	11	9	11	11
	24-hr Mean > 50 µg/m ³ (days)	2	0	1	0	2
Dún Laoghaire	Annual Mean PM ₁₀ (µg/m ³)	13	13	12	13	12
	24-hr Mean > 50 µg/m ³ (days)	3	0	2	0	2

Note 1 Annual average limit value - 40 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 24-hour limit value - 50 µg/m³ as a 90.4th percentile, i.e. not to be exceeded >35 times per year (EU Council Directive 1999/30/EC & S.I. No. 180 of 2011).

Monitoring of both PM₁₀ and PM_{2.5} takes place at the station in Rathmines which allows for the PM_{2.5}/PM₁₀ ratio to be calculated. Average PM_{2.5} levels in Rathmines over the period 2015 – 2019 ranged from 8 - 10 µg/m³, with a PM_{2.5}/PM₁₀ ratio ranging from 0.53 – 0.68 (EPA, 2021a). Based on this information, a conservative ratio of 0.7 was used to generate an existing PM_{2.5} concentration in the region of the development of 11.2 µg/m³.

12.4.3 Climate Baseline

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details provisional emissions up to 2020 (EPA, 2021b). The data published in 2021 states that Ireland will exceed its 2020 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.73 Mt. For 2021, total national greenhouse gas emissions are estimated to be 57.70 million tonnes carbon dioxide equivalent (Mt CO₂eq) with 44.38 MtCO₂eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2021 at 37.1% of the total, with the transport sector accounting for 17.9% of emissions of CO₂.

GHG emissions for 2020 are estimated to be 3.6% lower than those recorded in 2019. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for five years in a row. Emissions from 2016 – 2020 exceeded the annual EU targets by 0.29 MtCO₂eq, 2.94 MtCO₂eq, 5.57 MtCO₂eq, 6.85 MtCO₂eq and 6.73 MtCO₂eq respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2020 GHG Emissions Projections Report for 2020 – 2040 (EPA, 2021c) notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan (NDP) which was published in 2018 and the Climate Action Plan published in 2019. Implementation of these are classed as a “*With Additional Measures scenario*” for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2013 to 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 12.2MtCO₂eq under the “*With Existing Measures*” scenario and under the “*With Additional Measures*” scenario. The projections indicate that Ireland can meet its non-ETS EU targets over the period 2021 – 2030 assuming full implementation of the 2019 Climate Action Plan and the use of the flexibilities available (EPA, 2021c).

12.4.4 Sensitivity of the Receiving Environment

In line with the IAQM guidance document (2014) prior to assessing the impact of dust from a proposed development, the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

In terms of receptor sensitivity to dust soiling, there are numerous residential properties bordering the site, there is also the Coombe Hospital within 350 m to the north. There are over 10 high sensitivity receptors within 20 m of the site boundary. Based on the IAQM criteria outlined in **Table 12.4**, the worst-case sensitivity of the area to dust soiling is considered high.

Table 12.4: Sensitivity of the Area to Dust Soiling Effects on People and Property

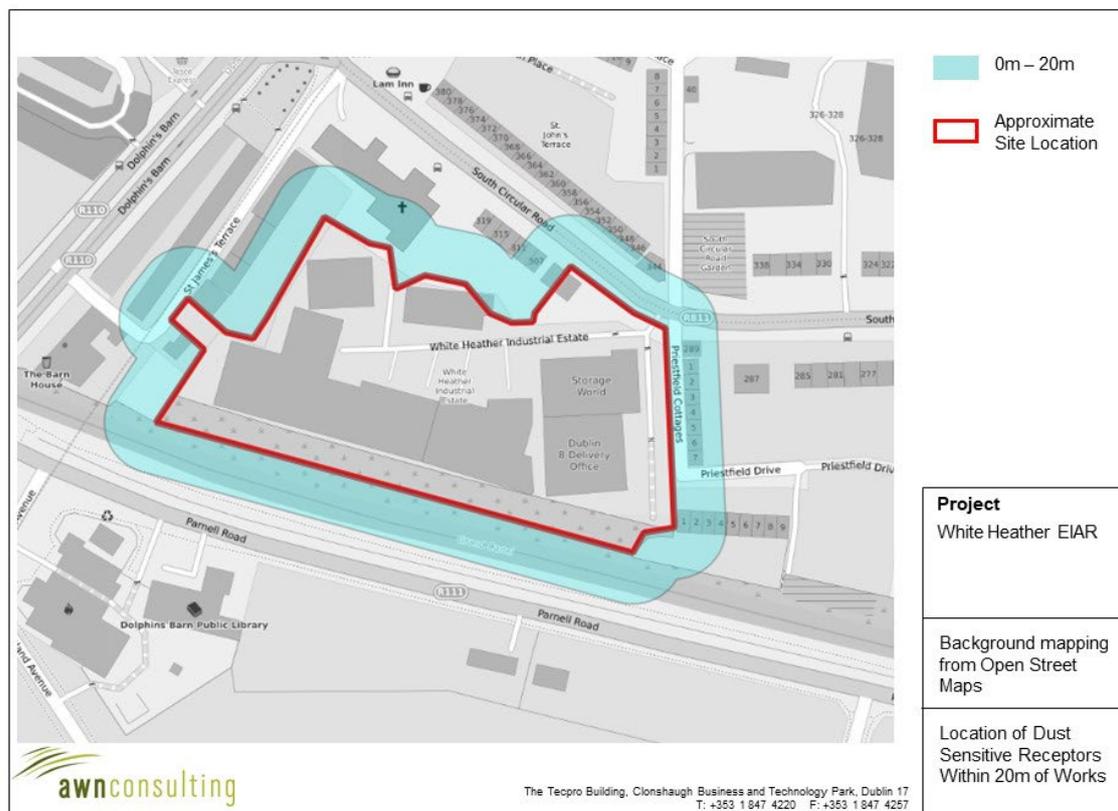
Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM₁₀ concentration, receptor sensitivity based on type and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM₁₀ concentration in the vicinity of the proposed development is 15 µg/m³ and there are over 10 but less than 100 high sensitivity receptors located within 20m of the proposed works. Based on the IAQM criteria outlined in **Table 12.5**, the worst-case sensitivity of the area to human health impacts is considered low.

Table 12.5: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<200
High	< 24 µg/m ³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	< 24 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	< 24 µg/m ³	>1	Low	Low	Low	Low

Figure 12.2: Location of Dust Sensitive Receptors Within 20m of Site



The IAQM guidance (2014) also outlines the criteria for determining the sensitivity of an ecological receptor to dust impacts. The sensitivity is determined based on the distance to

the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present. Only ecological sites within 50 m of the proposed development site need to be considered in relation to dust impacts (IAQM, 2014).

The Grand Canal pNHA is to the direct south of the site. The vegetation within the pNHA is potentially dust sensitive. However, the site synopsis portfolio for the Grand Canal pNHA notes that “The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species”. The Grand Canal pNHA can be considered a lower sensitivity receptor with regards to dust soiling as per the criteria in the IAQM guidance (2014) as it does not have official designation (national or European) and the vegetation may be affected by dust deposition.

The Grand Canal pNHA is within 20m of the boundary of the site. According to the IAQM criteria in **Table 12.6** the sensitivity of the area to dust related ecological impacts is conservatively classed as high.

Table 12.6: Sensitivity of the Area to Dust Related Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

12.5 Characteristics of the Proposed Development

The site is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8; 307/307a South Circular Road. Further details of the development can be found in Chapter 2.

When considering a development of this nature, the potential air quality and climate impact on the surroundings must be considered for each of two distinct stages:

- Construction phase, and;
- Operational phase.

During the construction stage the main source of air quality impacts will be as a result of fugitive dust emissions from site activities. Emissions from construction vehicles and machinery have the potential to impact climate. The primary sources of air and climatic emissions in the operational context are deemed long term and will involve the change in traffic flows or congestion in the local areas which are associated with the development. The following describes the primary sources of potential air quality impacts which have been assessed as part of this EIAR.

12.6 Potential Impact of the Proposed Development

12.6.1 Construction Phase

12.6.1.1 Air Quality

A review of Dublin Airport meteorological data (see Section 12-5) indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Dublin Airport indicates that on average 191 days per year have rainfall over 0.2 mm (Met Eireann, 2022) and therefore it can be determined that over 50% of the time dust generation will be reduced. It is important to note that the potential impacts associated with the construction phase of the proposed development are short-term in nature.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 12.4.4). The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and

- Trackout (movement of heavy vehicles).

Demolition

Demolition will primarily involve the removal of buildings or structures currently on the site in a potentially dusty manner. This may also involve dust generation at heights. Dust emission magnitude from demolition can be classified as small, medium and large and are described below.

- Large: Total building volume >50,000 m³, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level;
- Medium: Total building volume 20,000 m³ – 50,000 m³, potentially dusty construction material, demolition activities 10-20 m above ground level; and
- Small: Total building volume less than 20,000 m³.

Demolition works required for the proposed development have a total area of c. 6,604 m². of commercial floorspace, these are industrial storage warehouses and office buildings (see Outline Construction Management Plan). The demolition works can be classified as large as the total building volume associated with the works is greater than 50,000 m³. This results in an overall high risk of dust soiling impacts, a medium risk of human health impacts and a high risk of ecology impacts as a result of demolition activities prior to mitigation see **Table 12.7**).

Table 12.7: Risk of Dust Impacts - Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Earthworks

Earthworks typically involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. Following the IAQM guidance (2014), dust emission magnitude from earthworks can be classified as small, medium and large and are described below.

- Large: Total site area > 10,000 m², potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;

- Medium: Total site area 2,500 m² – 10,000 m², moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes; and
- Small: Total site area < 2,500 m², soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

Under the IAQM guidance (2014) the proposed earthworks can be classified as large due to the total site area exceeding 10,000 m². This results in an overall high risk of dust soiling impacts, a low risk of human health impacts and high risk of ecology impacts as a result of earthworks activities prior to mitigation (see **Table 12.8**).

Table 12.8: Risk of Dust Impacts - Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- Large: Total building volume > 100,000 m³, on-site concrete batching, sandblasting;
- Medium: Total building volume 25,000 m³ – 100,000 m³, potentially dusty construction material (e.g. concrete), on-site concrete batching;
- Small: Total building volume < 25,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude from construction associated with the proposed development works can be classified as large due to the total building volume involved exceeding 100,000 m³. The gross floor area of the overall development is circa 37,000 m². Assuming an average floor to floor height of 2.7m this would equate to a gross buildings volume of >100,000 m³. Therefore, there is an overall high risk of dust soiling impacts, a low risk of human health impacts and a high risk of ecology impacts as a result of the proposed construction activities prior to mitigation (**Table 12.9**).

Table 12.9: Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Factors which determine the dust emission magnitude associated with trackout are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- Large: > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- Medium: 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;
- Small: < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

Dust emission magnitude from trackout can be classified as medium under IAQM guidance as the maximum number of HGVs will be 38. This results in an overall medium risk of dust soiling impacts, a low risk of human health impacts and a medium risk of ecology impacts as a result of the proposed trackout activities prior to mitigation (see **Table 12.10**).

Table 12.10: Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in **Table 12.11** for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity in order to prevent significant impacts occurring.

Overall, in order to ensure that no dust nuisance occurs during the demolition, earthworks, construction and trackout activities, a range of dust mitigation measures associated with a

high risk of dust impacts must be implemented. In the absence of mitigation dust impacts from construction works are predicted to be short-term, localised, negative and moderate.

Table 12.11: Trends Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High Risk	High Risk	High Risk	Medium Risk
Human Health	Medium Risk	Low Risk	Low Risk	Low Risk
Ecology	High Risk	High Risk	High Risk	Medium Risk

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 provided 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 UK HA LA 105 assessment criteria in Section 12.3.1.1. It can therefore be determined that the construction stage traffic will have a neutral, imperceptible, localised and short-term impact on air quality due to the minor increase in site related traffic as a result of the proposed development.

12.6.1.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., will give rise to CO₂ and N₂O 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 emissions. Therefore, the impact on climate is assessed to be neutral, localised, imperceptible and short term.

12.6.2 Operational Phase

12.6.2.1 Air Quality

There is also the potential for traffic emissions to impact air quality in the long-term over the operational phase. The construction stage traffic provided by Systra 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 12.3.1.1. It can therefore be determined that the operational stage traffic will have a neutral, imperceptible, localised and short-term impact on air quality due to the minor increase in site related traffic as a result of the operational phase of the proposed development.

12.6.2.2 Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. However, the site is located within flood Zone C which details the

probability of flooding occurring at less than 0.1% and there is no history of flooding on site (see Civil Engineering Infrastructure Report for full details). In order to account for climate change, drainage has been increased by 20%, a 20% increase in fluvial flows and sea level rise of 500 mm have been included in the design parameters.

Adequate attenuation and drainage have been provided for to account for increased rainfall in future years as part of the design of this development in accordance with the GDSDS (see Section 12.7.2). Therefore, the impact will be long-term, localised, neutral and imperceptible.

There is also the potential for increased traffic volumes to impact climate. The change in AADT values is not of the magnitude to require a detailed climate assessment as per the DMRB screening criteria outlined in Section 12.3.1.4 (UK Highways Agency, 2019b). It can therefore be determined that traffic related CO₂ emissions during the operational phase are long-term, localised, neutral and imperceptible. There is no mitigation required for the operational phase of the development in terms of climate.

12.6.3 Do-Nothing scenario

The Do-Nothing scenario includes retention of the current site without the proposed development in place. In this 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).

12.7 Mitigation Measures

12.7.1 Construction Phase Mitigation

12.7.1.1 Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. A dust management plan will be implemented onsite. The main contractor will be responsible for the coordination 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 12.2: Dust Management Plan. These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) for the site.

In summary the measures which will be implemented will include:

- Drop heights from conveyors, loading shovels, hoppers and other loading equipment will be minimised, if necessary fine water sprays will be employed.

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- When conditions are such that there is a risk of trackout of dust (i.e. very dry or muddy), vehicles exiting the site shall make use of a wheel wash facility prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted through speed limit implementation, and this speed restriction will be enforced rigidly. On any site roads, this will be 20 kmph.
- 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 and other dust generating activities will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

12.7.1.2 Climate

Impacts to climate during the construction stage are predicted to be imperceptible however, good practice measures can be incorporated to ensure potential impacts are lessened. These include:

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

12.7.2 Operational Phase Mitigation

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 additional site-specific mitigation measures are required beyond the site-specific incorporated design mitigation as described below.

The proposed development has been designed so as to reduce the impact on climate as much as possible during operation. The Building Lifecycle Report submitted under separate

cover with this planning application details a number of design measures that have been considered in order to reduce the impact on climate wherever possible. The Mobility Management Plan prepared by Systra details integrated initiatives to promote and encourage sustainable travel methods by residents thereby reducing travel related impacts to climate. Such measures included in the proposed development to reduce the impact to climate are:

- The development will be in compliance with the requirements of the Near Zero Energy Building (NZEB) Standards;
- A renewable energy rating (RER) of 20% will be achieved to comply with Part L (2021) of the NZEB regulations;
- Minimising heat loss where possible;
- Use of natural ventilation where possible;
- Use of heat pumps;
- Use of energy efficient lighting and maximising natural daylight where possible;
- Provision of electric car charging points;
- Provision of increased bicycle parking;
- Reduction in maximum DCC car parking spaces to promote a modal shift in transport uses;
- Accessible public transport links to reduce dependence on private cars.

These measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Dublin City Development Plan 2016-2022 and Climate Change Action Plan.

In addition, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years.

Table 12.12: Mitigation Measures

Mitigation Measures
Dust Mitigation during the construction phase – full details available in APPENDIX 12.2: Dust Management Plan
On site good practice to mitigate impact on climate during construction phase: <ul style="list-style-type: none"> • Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. • Ensure all plant and machinery are well maintained and inspected regularly. • Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
No operational phase mitigation outside of design measures already included in the Building Lifecycle Report required.

12.8 Predicted Impact of the Proposed Development

12.8.1 Construction Phase

With the implementation of the dust mitigation measures, associated with a high level of dust control, outlined in Section 12.7.1.1 and APPENDIX 12.2: Dust Management Plan, dust impacts from demolition and construction will be localised, imperceptible, negative and short-term but will not pose a nuisance at nearby receptors.

Best practice mitigation measures are proposed for the demolition and construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values (see **Table 12.1**) which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

Without mitigation and relevant precautions, there is the potential for significant human health impacts due to asbestos removal activities. In the case asbestos is found during pre-demolition studies, any remedial works will be carried out by a certified contractor and air monitoring will be conducted during any disturbance of the asbestos containing materials to ensure concentrations are within the acceptable thresholds. Standard mitigation measures will be implemented for the duration of any remedial works to avoid any significant impacts to air quality or human health. As a result, impacts are predicted to be local, temporary and insignificant with regards to human health.

12.8.2 Operational Phase

The proposed development has been designed to reduce the impact on climate where possible. The proposed development will comply with the NZEB standards. Electric vehicle car charging points have been incorporated into the development with a reduction in car parking spaces, car sharing schemes and increased bicycle parking to promote a modal shift and thus reduce GHG emissions this will have an overall positive impact on climate.

None of the road links impacted by the proposed development satisfied the assessment criteria outlined in section 12.3.1.1 for carrying out a detailed air modelling assessment. Therefore, there is no potential for significant impacts to air quality or climate as a result of traffic related to the proposed development. It can therefore be determined that the impact to air quality and climate as a result of increased traffic volumes during the operational phase of the proposed development is localised, neutral, imperceptible and long-term.

12.9 Monitoring

Monitoring of construction dust deposition at locations along the site boundary close to the nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m²*day) during the monitoring period between 28 - 32 days.

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

Table 12.13: Monitoring Proposals

Monitoring Proposals
Dust Deposition Monitoring via Bergerhoff Gauge during construction phase

12.10 Interactions and Potential Cumulative Impacts

12.10.1 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 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 respect 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 roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible due to the low-level changes in traffic associated with the proposed development.

There is the potential for air quality to interact with ecology as a result of dust emissions impacting vegetation. Dust emissions from the demolition and construction phase have the

potential to deposit onto plant surfaces affecting photosynthesis. The Grand Canal pNHA is to the direct south of the site. It has been determined that the sensitivity of this ecological area is high with respect to dust impacts. There is at most a high risk of dust impacts affecting vegetation during the demolition works and a low risk during construction works. Provided the dust mitigation measures associated with a high level of dust control set out in this chapter and APPENDIX 12.2: Dust Management Plan are implemented on site, impacts to ecology from dust emissions will be short-term, localised, negative and imperceptible.

With the appropriate mitigation measures to prevent fugitive dust emissions (see Section 12.7.1 and APPENDIX 12.2: Dust Management Plan), it is predicted that there will be no significant interactions between air quality and land and soils. No other significant interactions with air quality have been identified.

12.10.2 Potential Cumulative Impacts

Cumulative construction phase impacts will result from dust emissions impacting people and property within 350m of the proposed development site and neighbouring sites. Impacts are predicted to be negative, short-term and imperceptible at nearby receptors once the best practice dust mitigation measures outlined in APPENDIX 12.2: Dust Management Plan are implemented.

Operational phase impacts involve an increase in traffic related pollutants in the local area. The traffic data for the proposed development in conjunction with other nearby permitted and proposed developments was found to have an imperceptible, neutral and long-term impact on local air quality and climate.

Table 12.14: Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Nuisance construction dust emissions impacting people and property	Implement dust management plan with a high level of dust control (Section 12.7.1 and APPENDIX 12.2: Dust Management Plan)	Construction dust monitoring using Bergerhoff gauges along site boundary with sensitive receptors (see Section 12.9)

12.11 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
- Dublin City Council (2016) Dublin City Development Plan 2016 – 2022
- Dublin City Council & Codema (2019) Dublin City Council Climate Change Action Plan 2019 -2024
- Environmental Protection Agency (EPA) (2015) Advice Notes for Preparing Environmental Impact Statements – Draft
- 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
- HSE (2018) National Guidelines for the Prevention of Nosocomial Aspergillosis
- Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1
- Met Éireann (2022) Met Eireann website: <https://www.met.ie/>
- National Disease Surveillance Centre (2002) The National Guidelines for the Prevention of Nosocomial Invasive Aspergillosis During Construction/Renovation Activities
- 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 Department of the Environment, Transport and Roads (1998) Preparation of Environmental Statements for Planning Projects That Require Environmental Assessment - A Good Practice Guide, Appendix 8 - Air & Climate

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)



Chapter 13. Noise and Vibration

13.0 Noise and Vibration

13.1 Introduction

This section of the EIAR has been prepared by AWN Consulting Ltd (AWN) to assess the potential noise and vibration impact 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 impact associated with the proposed development during both the short-term construction phase and the long-term operational phase on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

This assessment has been prepared by Leo Williams BAI MAI PgDip AMIOA, Acoustic Consultant at AWN Consulting who 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.

13.2 Consultation

Consultation with the local authority was not necessary in relation to noise and vibration.

13.3 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 – Draft (EPA, 2017); 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:

- An environmental noise survey has been undertaken in the vicinity of the subject site in order to characterise the existing baseline noise environment;

- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Predictive calculations have been performed during the construction phase of the project at the nearest sensitive locations to the development site;
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the development site; and,
- A schedule of mitigation measures has been proposed to reduce, where necessary, the identified potential outward impacts relating to noise and vibration from the proposed development.

13.3.1 Construction Phase – Noise Impacts

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. Dublin City Council (DCC) typically controls construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

13.3.1.1 DCC – Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Dublin City Council's "Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition" (hereinafter referred to as DCC GPG) outlines a risk assessment methodology directly applicable to the specific construction activities on the proposed site.

The Proposed Development has been classed as a high risk category site based on the DCC GPG risk assessment factors as detailed below: -

- Duration of the works;
- Distance to NSLs;
- Ambient noise levels;
- Site operating hours;
- Location of works;
- Duration of demolition; and
- Intrusive noise activities, including vibration generating activities.

As the Proposed Development is in the high risk category, the monitoring section (S.6) of the DCC GPG document identifies that: -

"The ABC Method detailed in Paragraph E.3.2 of BS 5228-1:2009 shall be used to determine acceptable noise levels for day, evening and night time work."

Please note that construction works in relation to this development are proposed during normal working hours only as set out below: -

- Monday to Friday: 07:00 to 19:30hrs
- Saturdays: 08:00 to 14:00hrs
- Sundays and Bank Holidays: No construction works.

13.3.1.2 British Standard BS 5228 – 1: 2009+A1:2014

DCC GPG refers 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 Noise and Vibration*)

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 impacts 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 impact 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 impact 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 13.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

Table 13.1: Example Threshold of Significant Effect at Dwellings

Assessment category and threshold value period (L _{Aeq})	Threshold value in decibels (dB)		
	Category A	Category B	Category C
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75
Evenings and Weekends	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 houses on South Circular Road outside the northern site boundary and houses at St James' Terrace to the west of the site. Other residential receptors include houses at Priestfield Cottages to the east and houses on Parnell Road to the south of the proposed development site. Our Lady of Dolours church is located outside the northern site boundary.

Fixed Limits

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 13.3), BS 5228-1:2009+A1:2014 has been used to inform the assessment approach for construction noise in line with the DCC GPG.

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. Given the baseline monitoring carried out, it would indicate that Category A values are appropriate using the ABC method.
- For amenity buildings, namely the church, it is considered appropriate to adopt the 70 dB(A) CNT.
- For commercial NSLs it is considered appropriate to adopt the 75 dB(A) CNT, given the urban environment in which the closest commercial properties reside, in line with BS 5228-1:2009+A1:2014 and DCC GPG.

Interpretation of the CNT

In order to assist with interpretation of CNTs, Table 13.2 includes guidance as to the likely magnitude of impact 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 13.2: 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 impacts during the construction stages.

13.3.1.3 Construction Phase – Traffic Noise Impacts

In order to assist with the interpretation of construction traffic noise, Table 13.3 includes guidance as to the likely magnitude of impact associated with changes in traffic noise levels along an existing road. This is taken from Table 3.17 of the *DMRB Noise and Vibration* (UKHA 2020).

Table 13.3: Likely Effect Associated with Change in Traffic Noise Level – Construction Phase

Magnitude of Impact	Increase in Traffic Noise Level (dB)
Negligible	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 impacts 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.

13.3.2 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.

13.3.2.1 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 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking the above into consideration the vibration criteria in Table 13.4 are recommended.

Table 13.4: 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 13.5.

13.3.2.2 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 13.5 below summarises the range of vibration values and the associated potential effects on humans.

Table 13.5: Guidance on Effects of Human Response to PPV Magnitudes

Vibration Level, PPV	Effect
0.140mm/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 ground breaking etc.) the vibration limits set within 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 13.6 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS5228-2:2009+A1:2014.

Table 13.6: 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

13.3.3 Operational Phase – Noise

13.3.3.1 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, $L_{Aeq, T}$ ” is equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T . This level has been determined with reference to manufacturers information for specific plant items.
- “Rating level” $L_{A, T}$ 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 L_{A90} 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.

13.3.3.2 Additional Vehicular Traffic on Surrounding Roads

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with the development. In order to assist with the interpretation of the noise associated with additional vehicular traffic on public roads, Table 13.7 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 13.7: Significance in Change of Noise Level

Change in Sound Level (dB)	Subjective Reaction	Magnitude of Impact	EPA Glossary of Effects ¹
10+	Over a doubling of loudness	Major	Significant
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate
3 – 4.9	Perceptible	Minor	Slight
0.1 – 2.9	Imperceptible	Negligible	Imperceptible
0	None	No Change	Neutral

The guidance outlined in Table 13.7 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 impacts during the operational phase.

¹ EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017)

13.3.3.3 Vibration

The development is residential in nature, therefore it is not anticipated that there will be any impact associated with vibration during the operational phase.

13.4 Receiving Environment

The subject site is located within the Dublin 8 area, on the boundary of South Circular Road within the White Heather Industrial Estate. The site is bounded to the north by the South Circular Road and the Grand Canal to the south. To the east and west are residential streets with several houses. The existing noise environment is dictated by road traffic and activity in the An Post Depot and in the industrial estate itself.

13.4.1.1 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.

13.4.1.2 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.

Choice of Measurement Locations

The measurement locations are described below and shown in Figure 13:1.

- N1** located on the junction of south circular road and White Heather Industrial estate.
- N2** located to the north west of N1 within White Heather Industrial estate.

Figure 13.1: Noise Monitoring Locations (Image Source: Google Maps)



Survey Periods

The noise survey was carried out over the following periods:

Table 13.8: Survey Periods

Aspect	Survey Position	Survey Period
Noise	N1	11:40hrs to 14:38hrs on 24th January 2022
	N2	

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 13.9: Noise Monitoring Equipment Details

Measurement	Manufacturer	Equipment Model	Serial Number	Calibration date
Sound Level Meter	Rion	NL-52	164426	5 May 2020
Calibrator	Brüel & Kjær	Type 4231	3010369	14 January 2020

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 2×10^{-5} Pa.

Survey Results and Discussion

The results of the noise survey at the two monitoring locations are summarised below.

Location N1

Table 13.10: Measured Noise Levels at N1

Date	Time	Measured Noise Levels (dB re. 2×10^{-5} Pa)		
		L _{Aeq}	L _{Amax}	L _{A90}
24 January 2022	11:40	64	77	53
	13:23	65	85	52
	14:03	66	95	51

At this location, the primary noise sources were observed to be vehicles passing on the South Circular Road, intermittent local traffic within the industrial estate and both movements and conversation from members of the general public. Industrial noise such as that from forklifts within White Heather Industrial estate also contributed to the measured noise levels. Ambient noise levels were in the range of 64 to 66 dB L_{Aeq}. Background noise levels were in the range of 51 to 53 dB L_{A90}.

Location N2

Table 13.11: Measured Noise Levels at N2

Date	Time	Measured Noise Levels (dB re. 2×10^{-5} Pa)		
		L _{Aeq}	L _{Amax}	L _{A90}
24 January 2022	13:01	52	82	43
	13:43	55	83	46
	14:23	59	82	44

At this location the primary noise sources were observed to be distant road traffic noise from the South Circular Road, forklift movements within the Industrial estate and bird song. General yard noise and shutter noise from workplaces within the industrial estate also contributed to measured levels to vary degrees. Ambient noise levels were of the order of 59 dB L_{Aeq}. The elevated max level of 83 dB was caused by a box falling from a forklift within close proximity to the measurement point. Background noise levels were in the range of 43 to 46 dB L_{A90}.

13.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

When considering a development of this nature, the potential noise and vibration impact on the surroundings is considered for each of two distinct stages:

- Construction and demolition phase; and,
- Operational phase.

The construction phase will involve demolition of existing buildings, 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 impact due to the works involved, however the time frame is short term in nature.

The primary sources of outward noise in the operational context are link to the operation of the proposed development and therefore are permanent 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 detail in the following sections.

13.6 Potential Impact of the Proposed Development

The potential noise and vibration impacts associated with the construction and operational phases of the proposed development are discussed in the following sections.

13.6.1 Construction Phase

13.6.1.1 Noise

During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, piling equipment, 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 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.

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. **Table 13.12** shows the potential noise levels calculated at various distances based on the assumed sound power level and attenuation provided by the barrier of 10 dB.

The closest noise sensitive locations have been identified as shown in Figure 13:2 and described below. There are several residential receptors located surrounding the proposed development to the south and northeast. Houses are set back some 90m to 160m from areas of significant construction works.

The proposed development site is surrounded by existing commercial and industrial receptors. For the most part these buildings are warehouses with low noise sensitivity. The

closest offices, showrooms and cafés are located between 25m and 40m from areas of significant works.

Review of the baseline noise survey, available noise mapping and the threshold values detailed in Table 13.1 indicates that the appropriate daytime noise criteria for construction noise are as follows:

- Residential receptors 65 dB $L_{Aeq,T}$
- Commercial/industrial receptors 75 dB $L_{Aeq,T}$

A night-time threshold is not included as construction work will not be taking place at night.

Figure 13:2: Site Context and Noise Sensitive Locations

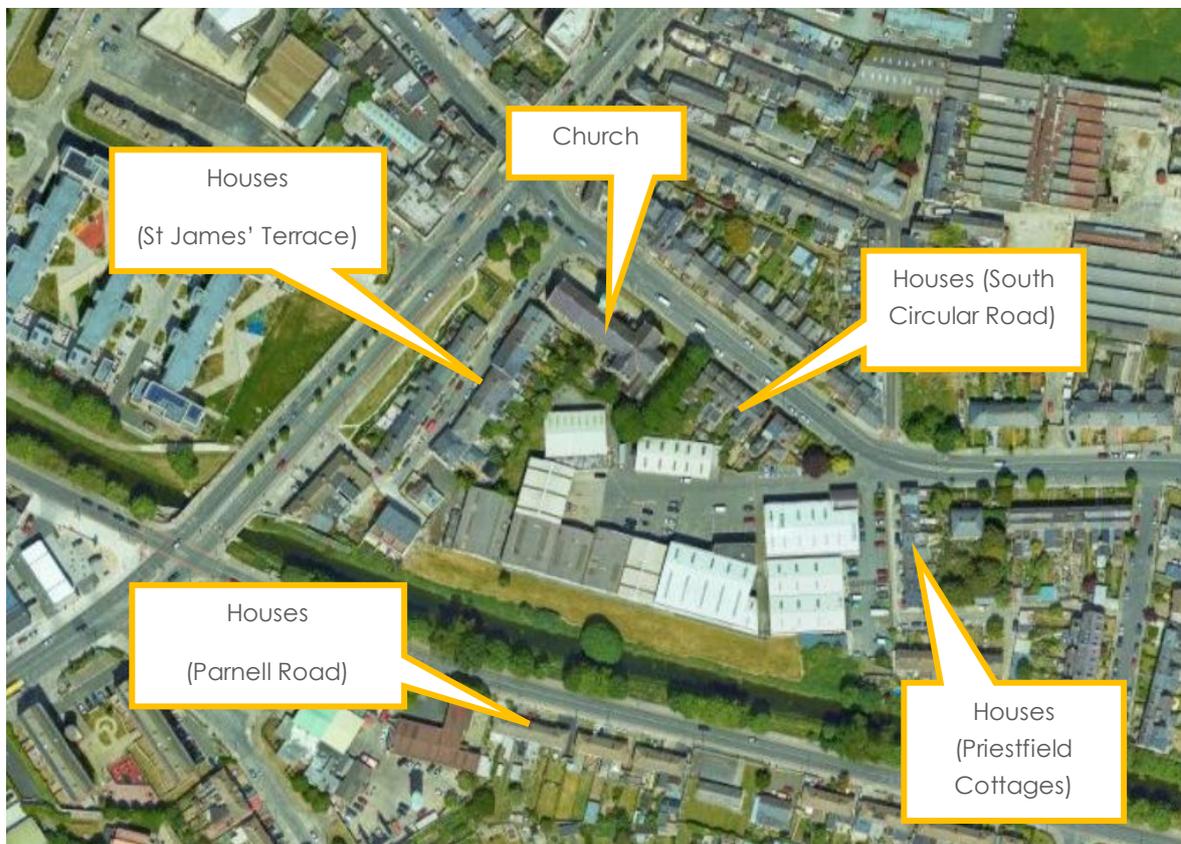


Table 13.12: Potential Construction Noise Levels at Varying Distances Assuming Attenuation of 10 dB from Site Hoarding

Description of Noise Source	Sound Power Level (dB L _{w(A)})	Calculated noise levels at varying distances (dB L _{Aeq,T})				
		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

The calculated noise levels in show that the criteria for residential receptors will be exceeded at locations that are up to 35m from areas of construction works. In this instance the nearest houses are located some 10-20m from the site boundary and therefore the contribution of construction noise is predicted to be in the range of +11 to +5 dB above the recommended criteria, therefore a negative, significant to very significant and short-term impact is expected at these nearest residential locations.

The predicted construction noise levels at residential NSLs at 35m from works is predicted to be below the recommended noise criteria and therefore a negative, moderate and short-term impact is predicted.

The predicted construction noise levels are within the recommended criteria for commercial receptors at distances greater than 10 m from construction works. Identified commercial receptors are set back at distances greater than 10m from the works. Therefore, it is expected that a slight impact is associated with construction works at these receptors.

In order to minimise the impact of construction activity good practice measures are detailed in Section 13.6.1.

Construction Traffic

During the construction phase of the proposed development there will be additional construction traffic on local roads. The proposed route for construction traffic to and from the proposed development will be along the South Circular Road. 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 impact.

13.6.1.2 Vibration

Potential for vibration impacts during the construction phase programme are associated with the ground breaking, piling and excavations required.

During demolition and ground-breaking in the excavation phase, there is potential for vibration to propagate through the ground. Empirical data for this activity is not provided in the BS 5228- 2:2009+A1:2014 standard, however the likely levels of vibration from this activity is expected to be below the vibration threshold for building damage on experience from other sites.

AWN have previously conducted vibration measurements under controlled conditions, during trial construction works, on a sample site where concrete slab breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator
- 6 tonne hydraulic breaker on large Liebherr tracked excavator

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 to 0.25 PPV (mm/s) at distances of 10 to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.49 to 0.24 PPV (mm/s) at distances of 10 to 50m respectively.

The range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity likely required on the proposed site. This range of vibration magnitudes indicate vibration levels at the closest neighbouring buildings are likely to be below the limits set out in Table 13.4 to avoid any cosmetic damage to buildings. In terms of disturbance to building occupants, works undertaken within close proximity to the commercial receptors on the eastern site perimeter have the potential to emit perceptible vibration levels.

For the purposes of this assessment the expected vibration levels during piling assuming augured or bored piles have been determined through reference to published empirical data. The British Standard BS 5228 – Part 2: Vibration, publishes the measured magnitude of vibration of rotary bored piling using a 600mm pile diameter for bored piling into soft ground over rock, (Table D.6, Ref. No. 106):

- 0.54 mm/s at a distance of 5m, for auguring;
- 0.22 mm/s at a distance of 5m, for twisting in casing;
- 0.42 mm/s at a distance of 5m, for spinning off, and;
- 0.43 mm/s at a distance of 5m, for boring with rock auger.

Considering the low vibration levels at very close distances to the piling rigs, vibration levels at the nearest buildings are not expected to pose any significance in terms of cosmetic or structural damage. In addition, the range of vibration levels is typically below a level which would be likely to cause disturbance to occupants of nearby buildings.

In this instance, taking account of the distance to the nearest sensitive off-site buildings, vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 13.4 to avoid any cosmetic damage to buildings. Vibration levels are also expected to be below a level that would cause disturbance to building occupants, as set out in Table 13.5. The potential vibration impact during the construction phase is of neutral, imperceptible and short-term impact.

Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration threshold set out in Table 13.4 during all activities. Further discussion on mitigation measures during this phase are discussed in Section 13.6.1.

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.

13.6.2 Operational Phase

13.6.2.1 Mechanical Services 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 impact 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 13.2.3.1.

The effect associated with building services plant, once designed to achieve the relevant noise criteria, is categorised as negative, imperceptible and permanent.

13.6.2.2 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 impact assessment relating to the proposed development has been prepared by Systra consulting

engineers, as part of this EIAR. Using this information, the related noise impacts along the relevant road links has been assessed.

Table 13.13 and Table 13.14 below presents 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 13.3: Road Link Locations

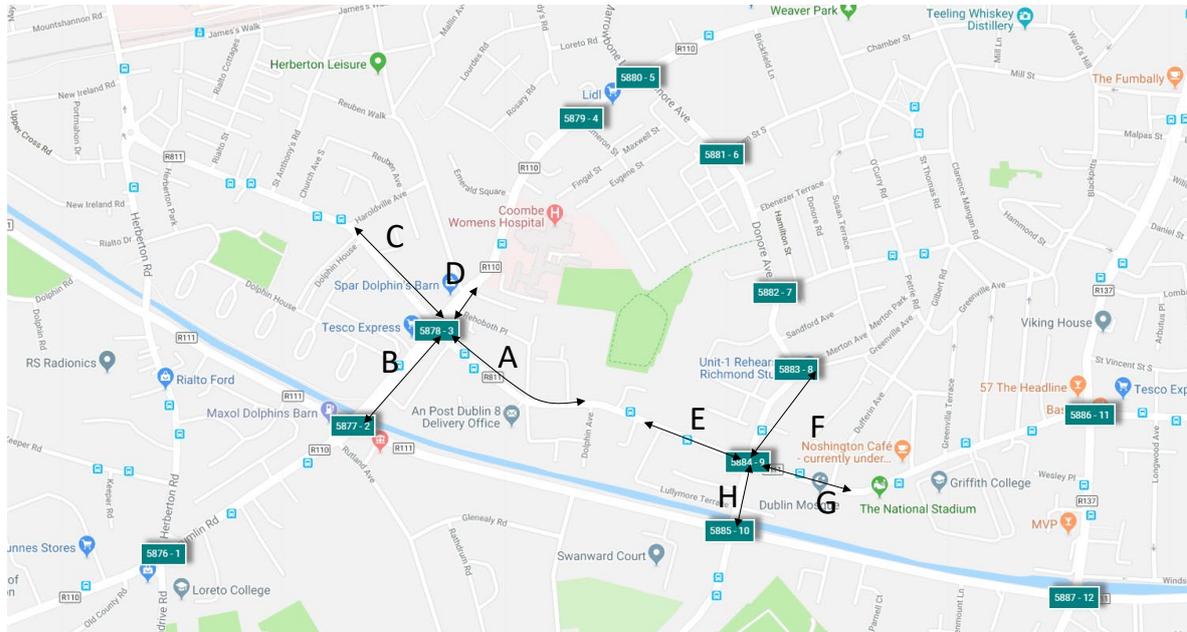


Table 13.13: Predicted Change in Noise Level associated with Vehicular Traffic – 2024

Road Link	Opening Year (2024)		
	Do Nothing - AADT Without Development	Do Something - AADT With Development	Change in Noise Level (dB)
A	17,393	17,645	+0.1
B	36,358	36,470	0.0
C	18,131	18,217	0.0
D	33,764	33,818	0.0
E	17,871	18,026	0.0
F	9,496	9,507	0.0
G	24,406	24,476	0.0
H	18,671	18,745	0.0

With reference to Table 13.7, 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 impact is therefore neutral, imperceptible and permanent.

Table 13.14: Predicted Change in Noise Level associated with Vehicular Traffic – 2039

Road Link	Opening Year (2024)		
	Do Nothing - AADT	Do Something - AADT	Change in Noise Level
	Without Development	With Development	(dB)
A	19,898	20,150	+0.1
B	41,594	41,706	0.0
C	20,742	20,828	0.0
D	38,626	38,680	0.0
E	20,445	20,600	0.0
F	10,864	10,875	0.0
G	27,921	27,991	0.0
H	21,360	21,434	0.0

With reference to Table 13.7, 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 impact is therefore neutral, imperceptible and permanent.

13.6.3 'Do Nothing' Scenario

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations will remain largely unchanged. The noise and vibration levels measured/noted during the baseline studies are considered representative of the Do-Nothing scenario. The Do-Nothing scenario is therefore considered to have neutral impact.

That said, if the proposed development were not to proceed, then a different development, similar in nature may be constructed as the land is zoned for development in keeping with national policy.

13.7 Mitigation Measures

13.7.1 Construction Phase

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. Whilst construction noise and vibration impacts 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 impacts at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009 +A1 2014) 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 below on these items. 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.

Table 13.15: Construction Mitigation Measures

Mitigation Measure	Details
Selection of Quiet Plant	<p>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.</p>
Noise Control at Source	<p>Referring to the potential noise generating sources for the works under consideration, the following best practice mitigation measures should be considered:</p> <ul style="list-style-type: none"> • Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The lifting of 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 percussive tools such as pneumatic concrete breakers, noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries. • For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum. • For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials. • 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.

Mitigation Measure	Details
	<ul style="list-style-type: none"> 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.
Piling	<p>Piling is the construction activity which is most likely to cause disturbance. General guidance in relation to piling is outlined in the following paragraphs.</p> <p>Piling programmes should be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. If piling works are in progress on a site at the same time as other works of construction or demolition that themselves may generate significant noise and vibration, the working programme should be phased so as to prevent unacceptable disturbance at any time.</p> <p>During consultation the planner, developer, architect and engineer, as well as the local authority, should be made aware of the proposed method of working of the piling contractor. The piling contractor should in turn have evaluated any practicable and more acceptable alternatives that would economically achieve, in the given ground conditions, equivalent structural results.</p> <p>On typical piling sites the major sources of noise are essentially mobile and the noise received at any control points will therefore vary from day to day as work proceeds. The duration of piling works is short in relation to the length of construction work as a whole, and the amount of time spent working near to noise sensitive areas can represent only a part of the piling period.</p> <p>Noise reduction can be achieved by enclosing the driving system in an acoustic shroud. For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover.</p> <p>Screening by barriers and hoardings is less effective than total enclosure but can be a useful adjunct to other noise control measures. For maximum benefit, screens should be close either to the source of noise (as with stationary plant) or to the listener. Removal of a direct line of sight between source and listener can be advantageous both physically and psychologically. In certain types of piling works there will be ancillary mechanical plant and equipment that may be stationary, in which case, care should be taken in location, having due regard also for access routes. When appropriate, screens or enclosures should be provided for such equipment.</p> <p>Contributions to the total site noise can also be anticipated from mobile ancillary equipment, such as handling cranes, dumpers, front end loaders etc. These machines may only have to work intermittently, and when safety permits, their engines should be switched off (or during short breaks from duty reduced to idling speed) when not in use.</p>
Screening	<p>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</p>

Mitigation Measure	Details
	<p>boundaries as standard. The hoarding will be constructed of a material with a mass per unit of surface area greater than 7 kg/m² to provide adequate sound attenuation.</p> <p>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.</p>
Liaison with the Public	<p>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.</p>
Monitoring	<p>The contractor will be required to ensure construction activities operate within the noise and vibration limits set out in Section 13.3.3.1. The contractor will be required to undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.</p> <p>Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.</p> <p>Vibration monitoring should be conducted in accordance with BS 6472:2008 <i>Guide to evaluation of human exposure to vibration in buildings - Vibration sources other than blasting</i> (human disturbance) and BS ISO 4866:2010 <i>Mechanical vibration and shock - Vibration of fixed structures- Guidelines for the measurement of vibrations and evaluation of their effects on structures</i> (building damage).</p>
Project Programme	<p>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.</p>

13.7.2 Operational Phase – Noise

13.7.2.1 Mechanical Services Plant

Plant items will be designed and selected so that cumulative noise emissions are within the recommended noise criteria. Therefore no mitigation is required.

13.7.2.2 Additional Traffic on Adjacent Roads

During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary.

13.7.3 Operational Phase – Vibration

The proposed development is not anticipated to generate any significant level of vibration once operational and therefore no vibration mitigations measures are necessary.

13.8 Predicted Impact of the Proposed Development

13.8.1 Construction Phase

13.8.1.1 Noise

Construction noise levels are predicted to be above the Construction Noise Threshold to varying degrees at the offsite residential noise sensitive receivers located at distances less than 35m from construction works. Construction noise levels are predicted to be below the Construction Noise Threshold at the offsite residential noise sensitive receivers located at distances greater than 35m from construction works. Good practice noise control measures have been presented to reduce the impact of construction works. The impact of construction works at distances of up to 10m is therefore predicted to be negative, significant to very significant and short-term. At distances of 20m, the impact is predicted to be negative, moderate to significant and short-term. At distances of 35m and greater, the impact is predicted to be negative, slight to moderate and short-term.

Noise levels associated with construction traffic have been predicted to represent an increase of less than 1 dB and therefore predicted to be of negative, not significant and short-term impact.

The above effects should be considered in the context that the effect is variable, and that this assessment considers the locations of the greatest potential impact.

13.8.1.2 Vibration

Due to the distances between construction works and the nearest offsite receptors it is predicted that for the majority of receptors the impact of construction vibration will be neutral, imperceptible and short-term.

13.8.2 Operational Phase

13.8.2.1 Noise

Mechanical Services Plant

Plant items will be located and selected so that cumulative plant noise emissions from the development achieve the appropriate noise criteria, the noise impact is predicted to be neutral, imperceptible and long-term.

Additional Traffic on Adjacent Roads

Based on the traffic flows associated with the operation of the proposed development the impacts are predicted to be neutral, imperceptible and permanent.

13.9 Monitoring

Monitoring requirements relevant to the proposed development are set out in Section 13.6.1. Any monitoring undertaken should be done so in accordance with the standards below.

Table 13.16: Monitoring Standards

Monitoring Proposals
Construction Phase - Noise
Noise monitoring should be conducted in accordance with the International Standard ISO 1996:2017: Acoustics – Description, measurement and assessment of environmental noise.
Construction Phase - Vibration
Vibration monitoring should be conducted in accordance with BS 6472:2008 <i>Guide to evaluation of human exposure to vibration in buildings - Vibration sources other than blasting</i> (human disturbance) and BS ISO 4866:2010 <i>Mechanical vibration and shock - Vibration of fixed structures- Guidelines for the measurement of vibrations and evaluation of their effects on structures</i> (building damage).

13.10 Reinstatement

Not applicable.

13.11 Interactions and Potential Cumulative Impacts

13.11.1 Interactions

13.11.1.1 General

In compiling this environmental impact 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 impact assessment has been prepared in consultation with the design team and traffic engineers. Reference can be made to the relevant chapters for additional information.

13.11.1.2 Human Health

The potential impacts on human beings in relation to the generation of noise and vibration during the construction phases are that high levels of noise and vibration could cause a

degree of nuisance to people in nearby sensitive locations. Implementation of the mitigation measures set out and adherence to good practice noise reducing measures will ensure that the residual impact on human health will be lessened.

Similarly, during the operational phase, plant selections designed to achieve the relevant noise criteria will result in a residual impact that is imperceptible to people in nearby noise sensitive locations.

13.11.2 Potential Cumulative Impacts

During the construction phase of the proposed development, construction noise on site will be localised and will therefore likely be the primary noise source at the nearest noise sensitive receivers.

Should another construction site become active in proximity to the proposed development, there is the possibility that cumulative noise impacts could occur at sensitive receptors that are equidistant to both 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 impacts on nearby sensitive receptors.

In the context of the operational phase, permitted developments are included in the traffic impact and therefore the potential for a cumulative impact has been assessed.

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 impacts resulting from noise and vibration will occur as a result of those developments.

13.12 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 – Draft (EPA, 2017);
- 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;
- DCC; FCC; SDCC; DLRCC (2018). Dublin Agglomeration Third Environmental Noise Action Plan December 2018 – July 2023;
- EPA (2015). Advice Notes for Preparing Environmental Impact Statements. Draft. September 2015;
- EPA (2017). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Draft. August 2017;
- EPA (2020). EPA Maps [Online] Available from 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; and,
- UKHA (2020). Design Manual for Roads and Bridges Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2.



Chapter 14. Daylight, Sunlight and Overshadowing

14.0 Microclimate - Daylight, Sunlight and Overshadowing

14.1 Introduction

This Chapter assesses the likely significant daylight, sunlight and overshadowing effects of the proposed development at White Heather (the '*Proposed Development*').

This Chapter outlines the methodologies applied to identify and assess the baseline conditions of the Site and its surrounds, the potential daylight, sunlight and overshadowing effects of the Proposed Development, and the proposed daylight, sunlight and overshadowing within the Proposed Development. Mitigation is set out as necessary and the residual likely significant effects are identified.

The following daylight, sunlight and overshadowing matters are considered within this Chapter:

- The potential effect of the Proposed Development on the daylight and sunlight amenity to sensitive existing neighbouring properties;
- The potential for overshadowing effects to existing neighbouring amenity areas;
- The daylight and sunlight amenity achieved by all newly proposed habitable rooms within the Proposed Development; and
- Overshadowing to newly proposed amenity areas.

This Chapter has been prepared by Mark Feighery (Principal and Managing Director, BSC Architecture, BArch Hons, MSc Project Management) and Sophie Probert-Hughes (Associate Director, BA Hons Geography) of Avison Young who have specialised in Daylight, Sunlight and Overshadowing matters for over 11 years and 7 years respectively. Avison Young are members of the Royal Institution of Chartered Surveyors and have over 35 years of experience specialising in daylight, sunlight and overshadowing matters in Ireland and the UK.

14.2 Consultation

Avison Young have been working closely with the White Heather design team for over 18 months to identify neighboring properties which may be sensitive to daylight, sunlight and overshadowing impacts arising from the Proposed Development. Ongoing analysis and consultation was also undertaken to assess and improve the daylight performance of the proposed units within the Proposed Development, which has resulted in numerous rounds of technical testing and amendments to the scheme.

During the course of Avison Young's involvement in the project, there were a number of pre-application consultations with Dublin City Council (20th May 2021) and representatives from

An Bord Pleanála (29th November 2021), which considered the daylight, sunlight, overshadowing performance of the Proposed Development.

In response to comments received at these consultations, amendments were introduced to the proposed scheme which sought to further reduce the impact upon sensitive neighboring receptors and to improve the quantum of light amenity within proposed units.

14.3 Methodology

14.3.1 Scoping

Following a site visit and a review of the scheme proposals, Avison Young identified surrounding receptors which had the potential to experience alterations in daylight, sunlight and/or overshadowing in accordance with the methodologies set out in the Building Research Establishment (BRE) guidelines (*'Site Layout Planning for Daylight and Sunlight, A guide to good practice'* - 2011), which is based upon British Standard BS 8206-2: 2008.

All properties and windows within these properties that are orientated towards the proposed site which were identified as being at risk were then included in Avison Young 3D analysis model (see *'Sources of Information, Scope and Assumptions'* section below). Illustrations of this 3D model are located in Figure 1 and 2 below, and also located in Appendix 2.

The scope of analysis has included all site facing windows within these properties that could be identified from external observation. Vertical Sky Component (VSC) and sunlight (Annual Probable Sunlight Hours – APSH) analysis was run against in the existing baseline condition, and in the proposed scenario. This was run in accordance with the BRE Guidelines to determine 1) the existing levels of light in the baseline condition; 2) the change that will occur with the Proposed Development in place; and 3) the retained levels of light amenity with the Proposed Development in situ.

Avison Young have also modelled rooms behind the identified windows in accordance with industry standards where no floorplans were available (see *'Sources of Information, Scope and Assumptions'* section below), to enable No Sky Line (NSL) assessment in accordance with the BRE Guidelines.

All identified neighbouring gardens were assessed for shadow/sun amenity in accordance with the BRE Guidelines Sun Hours on Ground (SHOG) methodology.

All proposed habitable residential rooms and amenity areas within the Proposed Development have been modelled and assessed in accordance with the BRE Guidelines.

Supplementary daylight analysis has also been run against the European Standard EN 17037 and updated British Standard BS EN 17037.

Neither EN 17037 nor BS EN 17037 is a requirement under the Dublin City Development Plan (2016-2022); the Sustainable Urban Housing: Design Standards for New Apartments'; or the Urban Development and Building Heights: Guidelines for Planning Authorities; all of which directly refer to the BRE Guidelines (2011) and BS-8206.

14.3.2 Defining a Baseline

The baseline has been identified using a 3D AccuCities model of the existing site and surrounding context (received 14th September 2020); Google Map aerial and street view imagery; a site visit; and a desktop search of online planning records for sensitive neighbouring properties.

The baseline conditions have been assessed and analysed using a 3D analysis model created using specialist software and undertaking technical analysis of existing daylight, sunlight and overshadowing conditions around the Site.

14.3.3 Planning Policy and Guidance

Planning policy and guidance in relation to daylight, sunlight and overshadowing is important context to determine acceptable levels of amenity.

The following key documents have therefore been considered:

- Sustainable Urban Housing: Design Standards for New Apartments (2020);
- Urban Development and Building Heights: Guidelines for Planning Authorities (2018);
- Dublin City Development Plan 2016-2022;
- Draft Dublin City Development Plan 2022-2028;
- BRE Guidelines (2011) - BR 209;
- European Standard: EN17037 / IS EN 17037; *and*
- British Standard: BS EN17037:2018 – Daylight in buildings.

14.3.3.1 Sustainable Urban Housing: Design Standards for New Apartments (2020)

The Department of Housing, Local Government and Heritage issued the 'Sustainable Urban Housing: Design Standards for New Apartments' Guidelines in December 2020.

This document provides 'ministerial guidance, setting out standards for apartment development' for planning authorities in Ireland, and was issued under Section 28 of the Planning and Development Act 2000.

Sections 6.5 to 6.7 of this report state that:

'The provision of acceptable levels of natural light in new apartment developments is an important planning consideration as it contributes to the liveability and amenity enjoyed by apartment residents. In assessing development proposals, planning authorities must however weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision with the location of the site and the need to ensure an appropriate scale of urban residential development.'

Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.'

Indeed, in this context, the High Court has established that this means:

'What is required is appropriate and reasonable regard, and if the standards identified are not being complied with, it must be clear why.'

British Standard BS 8206-2 referred to in the Design Standards for New Apartments document was withdrawn in the UK in 2018 and replaced in the UK with British Standard BS EN17037.

No reference is made to BS EN17037 in the 'Design Standards for New Apartments'.

It is important to note that the 2011 BRE Guidelines (which originate from BS 8206) have not been withdrawn (as of March 2nd 2022).

To our knowledge the BRE Guidelines remain the principal non statutory guide referred to by most local authorities in Ireland and the UK, as the appropriate scientific and empirical method of measuring daylight and sunlight in new buildings, to provide objective data upon which to apply their planning policies.

The BRE have confirmed that until the revised BRE Guidelines are published (expected later in 2022), they consider it reasonable and acceptable to continue using the current BRE Guidelines (i.e., 'Site Layout Planning for Daylight and Sunlight' 2nd edition, published 2011), until such time as they publish an update to reflect BS EN17037.

14.3.3.2 Urban Development and Building Heights: Guidelines for Planning Authorities (2018)

The Government of Ireland issued 'Urban Development and Building Heights: Guidelines for Planning Authorities' dated December 2018.

This provides '*new statutory guidelines for planning authorities on urban development and building heights...to secure better and more compact forms of future development*'.

Under Section 3.0 Building Heights and Development Management Process, point 3.2 states in regard to the scale of the site/building:

• The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.

• Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting.' (Emphasis in bold added)

• Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.'

No reference to BS EN17037 is mentioned.

14.3.3.3 Dublin City Development Plan 2016-2022

The Dublin City Development Plan (2016-2022) sets out policies and objectives to guide how and where development will take place in the city over the lifetime of the Plan.

Chapter 16, Development Standards: Design, Layout, Mix of Uses and Sustainable Design states under Aspect, Natural Lighting, Ventilation and Sunlight Penetration:

'Development shall be guided by the principles of Site Layout Planning for Daylight and Sunlight, A guide to good practice (Building Research Establishment Report, 2011).

14.3.3.4 Draft Dublin City Development Plan 2022-2028

Whilst the Board is required to consider the Development Plan currently in force, for the sake of completeness, it should be noted that Dublin City Council is preparing a new Dublin City Development Plan. The Draft Dublin City Development Plan 2022-2028 sets out policies and objectives to guide how and where development will take place in the city over the lifetime of the Plan.

Paragraph 15.9.16.1 Daylight and Sunlight states:

'Good daylight and sunlight contribute to making a building energy efficient; it reduces the need for electric lighting, while winter solar gain can reduce heating requirements. Daylight animates an interior and makes it attractive and interesting, as well as providing light to work or read by. A daylight and sunlight assessment should be provided to assess the impact of the proposed development on the surrounding properties and amenity areas outside the site boundary and assess the daylight and sunlight received within each individual unit and communal areas of a proposed scheme. A best practice guide for the assessment and methodology of Daylight and Sunlight Assessments is set out in Appendix 16.'

Appendix 16 sets out proposed draft guidance on how to carry out daylight and assessments.

14.3.3.5 National Planning Policy Considerations

In terms of the general planning context, Section 4.5 of the National Planning Framework (Section 4.5) envisages the flexible application of standards. The guidance provided by section 4.5 of the NPF is as follows:

'To enable brownfield development, planning policies and standards need to be flexible, focusing on design led and performance-based outcomes, rather than specifying absolute requirements in all cases. Although sometimes necessary to safeguard against poor quality design, planning standards should be flexibly

applied in response to well-designed development proposals that can achieve urban infill and brownfield development objectives in settlements of all sizes. This is in recognition of the fact that many current urban planning standards were devised for application to greenfield development sites and cannot account for the evolved layers of complexity in existing built-up areas.' (Emphasis in bold added)

National Policy Objective 13 of the NPF states as follows:

*'In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high-quality outcomes in order to achieve targeted growth. **These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes**, provided public safety is not compromised and the environment is suitably protected.'* (Emphasis in bold added)

The Urban Design Manual published by the Department of Energy Heritage and Local Government, 2009, states (at p.43):

*"Where design standards are to be used (such as the UK document Site Layout Planning for Daylight and Sunlight, published by the BRE), it should be acknowledged that for higher density proposals in urban areas **it may not be possible to achieve the specified criteria, and standards may need to be adjusted locally to recognise the need for appropriate heights or street widths.**"* (Emphasis in bold added)

14.3.3.6 The BRE Guidelines (2011)

In consideration of the Sustainable Urban Housing: Design Standards for New Apartments and Urban Development, Building Heights: Guidelines for Planning Authorities and both the current and proposed draft Dublin City Development Plan documents, Avison Young have concentrated the focus this report on criteria and methodologies set out in the 2011 BRE Guidelines.

The current 2011 BRE Guidelines are intended to be applied and significantly overlap with the now withdrawn British Standard 8206:2008 Lighting for Buildings, Part 2: Code of Practice for Daylight document.

The BRE Guidelines are not fixed standards and should be applied flexibly to take account of the specific circumstances of each case. The Introduction of the Guidelines states:

'The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the developer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design

... in certain circumstances the developer or planning authority may wish to use different target values...'

It is therefore important that the Guidelines are not incorrectly interpreted at face value, by applying a rigid interpretation of the targets in the Guidelines as being rigid targets, regardless of context, when assessing new development in urban locations or when assessing new housing schemes which may include areas with higher levels of density where lower levels of daylight are to be expected. This is not a correct or appropriate interpretation of the BRE Guidelines. The 'flexibility' should reflect the specific characteristics of each case being considered.

The Guidelines go on to state:

'Note that numerical values given here are purely advisory. Different criteria may be used based upon the requirements for daylighting in an area viewed against other site constraints'.

However, as stated above, the Board is required to have 'appropriate and reasonable regard' to the BRE Guidelines and, if the standards identified in those Guidelines are not being complied with, then the reasons for any departure must be clearly stated.

14.3.3.7 European Standard: EN 17037

The new European Standard (EN 17037) was published late 2018. It is the first European standard that deals with the assessment of daylight within buildings.

The European Standard is not referenced in the Design Standards for New Apartments (2020), the Urban Development and Building Heights: Guidelines for Planning Authorities (2018), or the current Dublin City Development Plan 2016-2022. However, for the sake of completeness, and whilst the Board is required to consider the current Development Plan, the European Standard is referenced in the Draft Dublin City Development Plan 2022-2028.

EN 17037 assesses daylight illuminance to determine if rooms can achieve certain lux levels, using Climate -based daylight modelling ('CBDM'). CBDM is the prediction of any luminous quantity (illuminance and/or luminance) using realistic sun and sky conditions derived from standardised climate data.

CBDM evaluations are carried out for a full year, for every hour, over every day of the year, to capture the daily and seasonal dynamics of daylight. CBDM requires a significant quantum of analysis and computing power. Each room is divided up into divided into 400 grid squares, on the working plane (850mm) of a room. Each grid square is then assessed

against 8,760 individual calculations using real world climate-based data for the region being tested (i.e. in this case a weather file for Dublin.epw was used in our analysis).

The analysis then determines the hourly median daylight illuminance that is exceeded over half the space, and the minimum daylight illuminance over the majority of the space, for at least half of the daylight hours in the year (2190h).

In response to the publication of EN 17037, many countries produced their own National Annex, which adopted the CBDM method of daylight analysis, but applied their own national target criteria. However, no National Annex has been published in Ireland.

14.3.3.8 British Standard: BS EN 17037

In response to the European Standard (EN 17037), the British Standard (BS) did produce a UK National Annex which overrides the baseline EN17037 target guidelines for the UK; but which adopted the CBDM method of addressing daylight.

The UK National Annex ('NA') provides further recommendations and data for daylight provision and application of the new European Standard in the UK and Channel Islands.

The NA was prepared, in part, in response to the perceived challenges of applying the European Standard in the UK, due to its high benchmark. The introduction of the NA states:

'The UK committee supports the recommendations for daylight in buildings given in BS EN 17037:2018; however, it is the opinion of the UK committee that the recommendations for daylight provision in a space (see Clause A.2) may not be achievable for some buildings, particularly dwellings. The UK committee believes this could be the case for dwellings with basement rooms or those with significant external obstructions (for example, dwellings situated in a dense urban area or with tall trees outside), or for existing buildings being refurbished or converted into dwellings. This National Annex therefore provides the UK committee's guidance on minimum daylight provision in all UK dwellings.'

The NA makes no direct reference to the Republic of Ireland, and no Irish specific National Annex exists.

However, the soon to be updated BRE Guidelines are expected to largely mirror the methodology and target criteria which is set out in the NA / BS EN 17037.

14.3.4 Daylight, Sunlight and Overshadowing Methodology

Daylight, sunlight and overshadowing technical analysis has been undertaken in accordance with the Building Research Establishment Guidelines: '*Site Layout Planning for Daylight and Sunlight 2011: A Guide to Good Practice*' (the '*BRE Guidelines*'); and in consideration of the recommendations set out in BS 8206-2: 2008, '*Lighting for Buildings Part 2: Code of Practice for Daylighting*' ('*BS 8206-2*').

The BRE Guidelines are largely based upon the recommendations set out in BS 8206-2 which has now been superseded by the new European Standard EN 17037:2018 for daylight, published towards the end of 2018.

AY understand that the BRE intend to keep using the current 2011 BRE Guidelines until either a revised addendum or an updated edition of the BRE Guidelines is published later in 2022.

To date and at the time of preparing this report (March 2022) neither a revised addendum nor updated edition of the BRE Guidelines has been produced. The assessments undertaken in support of this report have therefore been undertaken in accordance with the existing 2011 BRE Guidelines and in consideration of BS 8206-2.

The BRE Guidelines are a well-established non-statutory guide referred to by most local authorities in Ireland and the UK as the scientific and empirical methods of measuring daylight and sunlight in order to provide objective data upon which to apply their planning policies.

As mentioned above, the BRE Guidelines are not fixed standards and they should be applied flexibly to take account of the specific circumstances of each case.

It is therefore important that the Guidelines are not incorrectly interpreted at face value, by applying a rigid interpretation of the baseline targets in the Guidelines as being the set target criteria regardless of context, when assessing new development in more urban locations or when assessing new housing schemes which may include areas with higher levels of density where lower levels of daylight are to be expected.

The following technical assessments have been undertaken:

- Daylight and sunlight amenity to sensitive existing neighbouring properties: daylight – Vertical Sky Component ('VSC') and No Sky Line ('NSL'), and sunlight - Annual Probable Sunlight Hours ('APSH') - BRE 2011;
- The potential for overshadowing effects to existing neighbouring amenity areas: Sun Hours on Ground ('SHOG') and Transient overshadowing: BRE 2011;

- The daylight and sunlight amenity to all newly proposed habitable rooms within the Proposed Development: daylight - Average Daylight Factor ('ADF'), No Sky Line (NSL) and Annual Probable Sunlight Hours (APSH): BRE 2011;
- Overshadowing to proposed amenity areas: SHOG and Transient overshadowing: BRE 2011;

The following supplementary analysis has also been undertaken, which is not specified as a requirement in 1) the *Urban Development and Building Heights guidelines (2018)*; the *Design Standards for New Apartments (2020)* guidelines; or the *Dublin City Development Plan (2016 – 2022)*:

- Climate Based Daylight Modelling assessments in accordance with 1) European Standard EN 17037 and 2) British Standard BS EN 17037.

14.3.4.1 Daylight – Vertical Sky Component (VSC): BRE 2011

The Vertical Sky Component (VSC) method is described in the BRE Guidelines as the:

'Ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.'

This ratio is the percentage of the total unobstructed view that is available, once obstructions (e.g. a proposed development), are placed in front of the point of view. The assessment considers an overcast sky (CIE standard) and is calculated from the centre of a window on the outward face and measures the amount of light available on a vertical wall or window following the introduction of visible barriers, such as buildings.

The VSC has been calculated by using a 'Waldram Diagram'. The Waldram Diagram is effectively a snapshot that is taken from that point of the sky in front of the window, together with all relevant obstructions to it, i.e. the buildings.

The maximum VSC value is almost 40% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state that:

'If the VSC, with the development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in

the amount of skylight. The area lit by the window may appear more gloomy and electric lighting will be needed more of the time.'

The amount of daylight a room needs depends on what it is being used for. The BRE Guidelines suggest that windows in a façade with an obstruction angle of less than 250 (which would equate to a VSC of circa 27%) will usually provide acceptable levels of daylight to the rooms behind the fenestration when using conventional window design.

It should be noted that this form of assessment does not take account of window size, room use, room size, window numbers or dual aspect rooms. The assessment also assumes that all obstructions to the sky are 100% non-reflective.

14.3.4.2 Daylight – No Sky Line (NSL): BRE 2011

The BRE Guidelines advise that where room layouts are known, the effect on the daylight distribution can be calculated by plotting the NSL. It has not been possible to obtain room layouts for all of the sensitive neighbouring residential properties and therefore layouts have been assumed where information has been unavailable.

The NSL is a measure of the distribution of daylight at the 'working plane' within a room. The 'working plane' means a horizontal 'desktop' plane 0.85m in height for residential properties. The NSL divides those areas of the working plane which can receive direct sky light from those which cannot. If a significant area of the working plane (normally more than 20%) lies beyond the NSL (i.e. it receives no direct sky light), then the distribution of daylight in the room will look poor and supplementary electric lighting may be required.

The potential effects of daylight distribution in an existing building can be identified by plotting the NSL in each of the main rooms. The BRE Guidelines identify that if the area of a room that does receive direct sky light is reduced to less than 0.8 times its former value, then this would be noticeable to its occupants. The BRE therefore implies that NSL of at least 80% would be considered sufficiently lit.

Appendix C of the BRE Guidelines – 'Interior Daylighting Recommendations' also recommends running NSL (daylight distribution) analysis when assessing the likely daylight amenity within a room. The BRE Guidelines state in Appendix C, C17: *'Even if the amount of daylight in a room (given by the ADF) is sufficient, the overall daylight appearance will be impaired if its distribution is poor.'*

14.3.4.3 Daylight – Average Daylight Factor (ADF): BRE 2011

Appendix C of the BRE Guidelines sets out various detailed tests that may be used to assess the interior daylight conditions of proposed habitable rooms for residential usage. These include the calculation of the Average Daylight Factor (ADF).

The methodology of the ADF assessment is set out in the BRE guidelines and also in BS 8206-2: 2008.

The BRE Guidelines state in the opening Summary:

'This guide gives advice on site layout planning to achieve good sunlighting and daylighting both within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylight recommendations in the British Standard Code of practice for daylighting, BS 8206-2.'

The Average Daylight Factor (ADF) is defined within the 2011 BRE Guidelines as the:

'...ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance'.

This calculation considers not only the amount of skylight falling on the vertical face of the window, but also the glazing size, transmittance value, average reflectance, room area and room use. It is therefore a detailed analysis of the daylight levels within a room.

The ADF criteria is the prescribed methodology for evaluating daylight within proposed accommodation and the ADF values based on room use referenced by the BRE Guidelines can be found in the British Standard document BS8206 Part 2. The values for those rooms that are most relevant for our assessments are:

- 2% for a kitchen;
- 1.5% for a living/dining room ('LD'); and
- 1% for a bedroom.

Where a room is served by more than one purpose, it is suggested that the minimum ADF should be for the highest value, i.e. 2% for Living/Kitchen/ Dining rooms ('LKD's').

The ADF calculation determines the average illuminance on the working plane in a room, divided by the illuminance on an unobstructed surface outdoors.

It is designed to quantify the amount of daylight in a room as a whole and does not therefore illustrate the likely levels of daylight in the different areas of a large multiuse room. For example, where the living room is generally situated at the front of the room, followed by the dining area and then the kitchen at the rear (which is common in most modern apartment block developments), the living and dining areas may receive good levels of daylight amenity, whilst the kitchen at the rear may not be expected to achieve a good level of daylight amenity. It is important therefore to take this into consideration.

In the case of the Proposed Development, the proposed units feature open plan living/kitchen/dining rooms ('LKD's') where some of the kitchens/food preparation areas are located at the rear of deep open plan spaces. These kitchen areas are therefore intended to be predominantly artificially lit given their location from the main window wall.

Full depth LKD's have therefore been considered against the BRE's minimum recommended 2% ADF target for a multi-use room such as this, and this primary assessment is the focus of this Chapter.

As it is not uncommon for deep LKD's served by balconies in multi storey apartment blocks to experience reduced quantum's of daylight to the rear of their rooms, LKD's have also been considered against a lower 1.5% ADF target as an alternative and supplementary assessment to provide additional context. It should be noted that 1.5% ADF is the recommended target for a living room and is lower than the 2% ADF target recommended by the BRE for a multi-use LKD.

14.3.4.4 Sunlight – Annual Probable Sunlight Hours (APSH): BRE 2011

With regard to sunlight, the same skylight indicator is used as the VSC assessment using the same reference point to calculate APSH, which is expressed as a percentage. The BRE guidelines state:

'Access to sunlight should be checked for the main window of each room which faces within 90 degrees (°) of due south.'

Sunlight is considered important for living rooms and conservatories but is generally viewed as less important in bedrooms and in kitchens. The BRE Guidelines state in Section 3.2.3 that:

'[...] kitchens and bedrooms are less important, although care should be taken not to block too much sun.'

The BRE Guidelines accept site layout (i.e. orientation and overshadowing) as the most important factor affecting the duration of sunlight in buildings and it is appreciated that a site's existing layout and other design constraints may impose orientation or sunlight

constraints which may not be possible to overcome. The orientation of a window/room is the main determining factor in relation to the quantum of sunlight that will hit the centre point of a window – i.e. the point of assessment.

This is acknowledged in Paragraph 3.1.6 of the BRE Guidelines which states:

'A south-facing window will, in general, receive most sunlight, while a north facing one will only receive it on a handful of occasions (early morning and late in summer). East and west facing windows will receive sunlight only at certain times of the day.'

Calculations of both summer and winter availability are made with the winter analysis covering the period from the 21st September to 21st March.

Sunlight is measured using a sun indicator which contains 100 spots; each spot represents 1% of the Annual Probable Sunlight Hours (APSH). The maximum number of APSH for the Dublin orientation is 1,438 hours (each spot = 14.38 hours of total APSH).

The BRE Guidelines suggest that a window in an existing dwelling may be adversely affected if APSH to main living rooms is: i) less than 25% annually and 5% during the winter period (21st September to 21st March); ii) reduced to less than 0.8 times its former value during either period; and iii) with a loss of sunlight over the whole year greater than 4% APSH in real terms. Therefore, if any of these criteria are met, the BRE Guidelines are deemed to have been satisfied for the purposes of this report.

Access to sunlight can be quantified for the interior of rooms and is based on the Annual Probable Sunlight Hours (APSH) method of assessment. The BRE Guidelines state:

'BS 8206-2 recommends that interiors where the occupants expect sunlight should receive at least one quarter (25%) of APSH, including in the winter months between 21 September and 21 March at least 5% of APSH.'

BS 8206-2 states:

'The degree of satisfaction is related to the expectation of sunlight. If a room is necessarily north facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary.'

It is often not possible to achieve the 25% Annual and 5% Winter sunlight tests when assessing schemes in dense urban locations or apartment blocks over three/four floors located near similarly sized blocks, particularly where a provision of private external amenity (i.e. balconies) is required under the Sustainable Urban Housing: Design Standards for New

Apartments. Balconies reduce the view of the sky dome/sun from the rear face of the window being assessed (i.e., the APSH point of calculation under the BRE Guidelines).

Paragraph 3.2.8 of the BRE Guidelines states that:

'In certain situations care needs to be taken in applying these guidelines. For example if the proposed new development is one of a number of successive extensions to the same building then the total impact on sunlight due to all the extensions should be assessed. On the other hand, if the existing building stands unusually close to the common boundary with the new development... then a greater reduction in sunlight access may be unavoidable. The guidelines are purely advisory. Planning authorities may wish to use different criteria based on the requirements for sunlight in particular types of developments in particular areas.'

Whilst the BRE Guidelines do not specifically state that only south facing windows should be analysed when assessing new developments, it provides no guidance on how to benchmark the performance of windows that are predominantly north facing. This is an important point, as north facing windows have a low expectation of direct sunlight due to their orientation and the fact that the sun transits from east to west in a southerly trajectory throughout the day.

For this reason, it is usually accepted that only windows which are oriented within 90 degrees of due south (or all windows in a room where at least one of the windows serving the space is orientated within 90 degrees of due south) are assessed for sunlight. The BRE Guidelines state at Paragraph 3.1.7:

'The overall sunlighting potential of a large residential development may be initially assessed by counting how many dwellings have a window to a main living room facing south, east or west.'

A window that is predominantly north facing will not meet the BRE's guide of 25% for total sunlight and 5% for winter sunlight. Therefore, if a north facing window is considered for assessment, reasonable care must be taken when considering the performance of these windows when benchmarked against the default BRE target criteria (above).

Furthermore, where external features such as balconies are included on the façade of a multi-storey building (i.e. to satisfy external private amenity requirements), even windows that are orientated within 90 degrees of due south but which are predominantly east or west facing, may also find it difficult to meet the BRE's guide of 25% total and 5% winter sunlight, as they predominately see the sun in the morning or evening.

Balconies often restrict the sun from hitting the centre point of the windows being assessed (i.e. the point of calculation for APSH/WPSH) for periods of the day/year.

Therefore, the ability of multi-storey apartment blocks (that include balconies and single aspect units orientated north, south, east and west facing) to meet the BRE's recommended target criteria must be considered contextually.

There is often a trade-off between providing external private amenity space for residents (i.e. balconies), and achieving a higher level of sunlight performance.

The summary paragraph in the BRE Guidelines clearly states that the numerical target values may be varied to meet the needs/type of development being assessed. This is again stated in paragraph 3.1.14:

'The BS 8206-2 criterion is intended to give good access to sunlight in a range of situations. However, in special circumstances the designer or planning authority may wish to choose a different target value for hours of sunlight. If sunlight is particularly important in a building, a higher target value may be chosen, although the risk of overheating needs to be borne in mind. Section 4 gives guidance on passive solar design. Conversely, if in a particular development sunlight is deemed to be less important but still worth checking for, a lower target value could be used.'

14.3.4.5 Overshadowing – Sun Hours on Ground (SHOG): BRE 2011

The BRE Guidelines state that the availability of sunlight should be checked for open spaces where it will be required. This would normally include:

- Gardens, usually the main back garden of a house;
- Parks and playing fields;
- Children's playgrounds;
- Outdoor swimming pools and paddling pools;
- Sitting out areas such as those between non-domestic buildings and in public squares; and
- Focal points for views such as a group of monuments or fountains.

The Sun Hours on Ground (SHOG) overshadowing methodology is set out in the BRE Guidelines in Section 3.3.17 as follows:

'It is recommended that for it to appear adequately sunlit throughout the year, at least half (50%) of a garden or amenity area should receive at least two hours of sunlight on 21st March.'

If, as a result of new development, an existing garden or amenity area does not meet the above, and the area which receives two hours of sun on 21st March is less than 0.8 times its former value, then the loss of light is likely to be noticeable.

The Vernal Equinox, 21st March date is chosen as it represents average annual conditions, therefore sunlight amenity within the amenity area is expected to increase after this point, to a maximum on the summer solstice (21st June).

The SHOG assessments have also been carried out on 21st April, which is just a month after the BRE's recommended date of assessment, and also 21st June, as this is the time of year that the balconies are most likely to be in use. These additional SHOG assessments have been undertaken to provide further context to the 21st March results.

Using specialist software, the path of the sun is tracked at one-minute intervals to establish where sunlight falls on the ground and where it is prevented from doing so as a result of surrounding obstructions.

The BRE does not provide any specific guidance or requirement to assess overshadowing/sunlight amenity to balconies, as such there is no recommended methodology or benchmark against which to assess the sunlight performance of balconies. However, we note that the 'Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities' document dated March 2018 produced by the Department of Housing, Planning and Local Government suggests that analysis is undertaken to determine if the balconies will achieve sunlight amenity; however, no guidance is provided in relation to how this test should be undertaken.

It is noted that SHOG appears to be an accepted method of analysis by some assessors in Ireland. As a result, we have therefore applied the Sun Hours on Ground Overshadowing 21st March assessment to proposed balconies, including those which are oriented within 90 degrees of due north, despite the fact this is not a BRE requirement, nor do north facing balconies have a high expectation of direct sunlight for long periods of the year/day due to the southerly trajectory of the sun.

As is the case with sunlight to windows, the orientation of a balcony and any obstructions near (such as the building itself) are key factors that dictate the quantum and availability of sun that can be received onto a balcony.

A south facing balcony with little obstruction to the south will always achieve high levels of sunlight amenity, whilst a north facing balcony will usually achieve more limited levels of sunlight.

Care should also be taken when assessing the performance of north facing balconies / terraces that fall below the SHOG target. Consideration of the context and type of development being assessed is key. This is particularly so when assessing the performance of a small area, using a method that is designed for larger open spaces such as: gardens, parks, playing fields, playgrounds, swimming pools; public squares, etc (see BRE paragraph 3.3.3).

14.3.4.6 Transient Overshadowing: BRE 2011

The BRE Guidelines suggest that where buildings are proposed which may affect gardens or open spaces in the surrounding area, it is useful and illustrative to plot a shadow plan to show the location of shadows at different times of the day and year.

The BRE Guidelines do not provide specific criteria for the scale of transient overshadowing effects other than to identify the different times of the day and year when shadow would be cast over a surrounding area. Southern orientation is important, as are the heights of the Proposed Development and surrounding buildings.

14.3.4.7 Supplementary Assessments – Climate Based Daylight Modelling (CBDM)

Additional daylight assessments for the Proposed Development have been undertaken in accordance with both the new European Standard target criteria (EN 17037), and what is expected to be the updated BRE target criteria (i.e. BS EN 17037 - the current target set out in the UK national Annex). Both of which use climate based daylight modelling to determine the likely performance of new development.

European Standard: EN 17037

EN 17037 provides a range of recommendations for 'high', 'medium' and 'minimum' daylight targets as illustrated in Table 1 below.

Target	Target Illuminance (Lux)
Minimum	300
Medium	500
High	750

Table 1: EN 17037 daylight targets

To meet the minimum targets under the European Standard, a room (including a living room, kitchen or bedroom) must achieve **300 lux to 50% of the area of a room, for 50% of daylight hours; AND 100 lux to be met for 95% of the area.**

This is considered a challenging target in our opinion, particularly when assessing development in urban settings. As such the criteria set out in the European Standard are more difficult to achieve than the well-established ADF (Average Daylight Factor) values, which is the current default method recommended by the BRE for assessing daylight within buildings.

British Standard: BS EN 17037

Whilst the UK National Annex does not apply to Ireland, Section NA.2, 'Minimum daylight provision in UK dwellings, sets out that:

'Even if a predominantly daylight appearance is not achievable for a room in a UK dwelling, the UK committee recommends that the target illuminance values given in Table NA.1 are exceeded over at least 50 % of the points on a reference plane 0.85 m above the floor, for at least half of the daylight hours.'

The minimum target values according to room type are replicated on Table 2 below (based upon Table NA.1).

Room Type	Target Illuminance (Lux)
Bedroom	100
Living Room	150
Kitchen	200

Table 2: Values of target illuminance for room types in UK dwellings

Unlike the European Standard, these targets are to be met for 50% of the room, for 50% of the daylight hours only. There is no minimum uniformity target to be met. The NA states:

"... the recommendation in Clause A.2 – that a target illuminance level should be achieved across the entire (i.e. 95 %) fraction of the reference plane within a space – need not be applied to rooms in dwellings."

Therefore, for a living room to pass this criterion it should achieve **150 lux for 50% of the area of a room, for 50% of daylight hours** (note: no additional minimum uniformity target needs to be met for 95% of the room area, unlike the EN 17037 test. If a kitchen is being assessed the target is 200 lux; with a lower 100 lux target for bedrooms).

In common with the current ADF analysis within the BRE Guidelines (2011), for multiple rooms the UK committee for the European Standard recommends *'that the target illuminance is that for the room type with the highest value'*.

Therefore, a full set of BS EN 17037 technical assessments have been undertaken against all proposed habitable rooms, and benchmarked against the NA standard, which we

understand will become the new BRE target criteria. However, this analysis has been assessed against published real-world climate-based data for Dublin.

14.3.5 Significance Criteria

14.3.5.1 Effect Significance

Appendix I of the BRE Guidelines provide some guidance on impact assessment classifications when undertaking Environmental Impact Assessments.

Paragraph I3 of the BRE Guidelines (Appendix I) state that the assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied.

The BRE Guidelines state in Appendix I Environmental Impact Assessment:

'Adverse impacts occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space... The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied.

Where the loss of skylight or sunlight fully meets the guidelines in this book, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited open space lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines, and a larger number of windows or open space area are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space.

Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:

- only a small number of windows or limited area of open space are affected
- the loss of light is only marginally outside the guidelines
- an affected room has other sources of skylight or sunlight
- the affected building or open space only has a low level requirement for skylight or sunlight
- there are particular reasons why an alternative, less stringent, guideline should be applied (see Appendix F).

Factors tending towards a major adverse impact include:

- a large number of windows or large area of open space are affected
- the loss of light is substantially outside the guidelines
- all the windows in a particular property are affected
- the affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight, eg a living room in a dwelling or a children's playground.'

No guidance is given to what constitutes a 'moderate adverse' loss.

For the purpose of this chapter, all receptors are considered to be of high sensitivity.

The key terminology used to describe the scale of an effect is as follows:

- Major;
- Moderate;
- Minor;
- Negligible.

The nature of the effects may be either adverse (negative) or beneficial (positive). Generally, 'Negligible' and 'Minor' effects are considered 'not significant'. 'Moderate' or 'Major' effects are 'significant'.

Compliance with the BRE Guidelines is deemed to have been achieved if the levels of daylight, sunlight and overshadowing within receptors meet or exceed the values recommended by the BRE Guidelines, and the potential effect will therefore be considered to be negligible and not significant.

Where the effects are beyond the guidelines, professional judgement will be used to establish the nature (beneficial or adverse), scale (negligible, minor, moderate or major) and ultimately the significance of effects, taking all relevant factors such as environmental context, policy and guidance into consideration, and by reference to the BRE Guidelines.

Daylight and Sunlight to Existing Neighbouring Properties

The assessment of potential adverse or beneficial daylight and sunlight amenity is based on professional judgement, taking into consideration the BRE's recommended targets for daylight – VSC and NSL and sunlight - APSH as discussed previously in this Chapter and summarised in table 3 below.

Assessment Methods	BRE Criteria
Vertical Sky Component - VSC	A window may be adversely affected if the VSC measured at the centre of an existing main window is less than 27% and less than 0.8 times its former value. (see <i>BRE Guidelines Paragraph 2.2.21</i>)
No Sky Line – NSL (daylight distribution)	A room may be adversely affected if the area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value. (see <i>BRE Guidelines Paragraph 2.2.21</i>)
Annual Probable Sunlight Hours - APSH	A window may be adversely affected if the centre of the window receives less than 25% of APSH, or less than 5% or winter sunlight; and receives less than 0.8 times its former sunlight hours during either period; and has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours. (see <i>BRE Guidelines Paragraph 3.2.11</i>)

Table 3: Summary of BRE Criteria for daylight/sunlight assessment methods to existing neighbouring properties

Daylight and Sunlight within the Proposed Development

The assessment of daylight and sunlight amenity to newly proposed habitable rooms within the Proposed Development is based on professional judgement, taking into consideration the BRE 2011 and BS:8206 recommended targets for daylight – ADF (refer to *BRE Guidelines Appendix C, Paragraph C4*) and NSL (refer to *BRE Guidelines Appendix C, Paragraph C16*) and sunlight – APSH (refer to *BRE Guidelines Paragraph 3.1.15*), as previously discussed in this chapter.

A summary is also provided in relation to the internal daylight performance of the proposed residential units in consideration of the European Standard EN 17037 and British Standard BS EN 17037.

Sun Hours on Ground Overshadowing

In relation to external neighbouring amenity areas, the effect to those which receive two hours or more of direct sunlight to over 50% of their area on the 21st March and/or experience an alteration of less than or equal to 20% will be considered negligible and so not significant (refer to *BRE Guidelines Paragraph 3.3.17*).

The potential effect to proposed amenity areas which receive two hours or more of direct sunlight to over 50% of their area on the 21st March will be considered negligible and not significant.

The assessment of the classification of potential adverse effects to those spaces that do not receive two hours or more of direct sunlight to over 50% of their area on the 21st March is based on the above guidance, context, and professional judgement.

Transient Overshadowing

The BRE Guidelines do not provide specific criteria for the scale of transient overshadowing effects other than to identify the different times of the day and year when shadow would be cast over a surrounding area.

The assessment of potential adverse or beneficial effects as a result of transient overshadowing are therefore based on professional judgement, taking into consideration the baseline conditions of the site and surrounding area, and comparing these conditions against the transient overshadowing arising from the Proposed Development.

14.4 Sources of Information, Scope and Assumptions

In order to undertake the daylight, sunlight and overshadowing technical assessments, a 3D computer model of the site and neighbouring properties has been created using the following sources of information:

- 3D AccuCities model of the existing Site and surrounding context (received 14th September 2020);
- Site visit;
- Google Map aerial and street view imagery;
- Desktop search of online planning records for sensitive neighboring properties;
- Floor plans obtained for some properties located on Priestfield Cottages; and
- 3D model of the Proposed Development and associated drawings provided by O'Mahony Pike Architects (received 7th January 2022 and 1st February 2022).

The scope of neighbouring properties considered has been determined as a reasonable zone which considers both the scale of the Proposed Development and the proximity of those buildings which surround and face the site.

Best estimates have been made as to the uses which are carried out legally within the adjoining properties in terms of commercial and residential usage. These have been estimated from external observation from aerial/street view imagery and online planning records where available.

As is standard practice when assessing daylight and sunlight to adjoining properties, AY have not sought access to any of the adjoining properties. However, full/partial floor plans were obtained from online/public records for some of the sensitive neighboring properties and these have been incorporated into our 3D model prior to the assessment.

Where internal layouts have not been acquired, reasonable assumptions as to the internal layouts of the rooms behind the fenestration have been made. Unless the building form

dictates otherwise, we have assumed a standard 4.2m deep room for residential properties depending upon the information received.

Floor levels have been assumed for those adjoining properties where drawing information was not obtained. This dictates the level of the working plane which is relevant for the No Sky Line assessment.

Internal layouts are only relevant for the NSL (No Sky Line/daylight distribution) assessment. The primary daylight (VSC – Vertical Sky Component) and sunlight (APSH – Annual Probable Sunlight Hours) assessments are calculated at the window face and therefore do not require floor plans.

AY have used the following reflectance values in our ADF and CBDM calculations within the proposed units:

- Window transmission 0.70%
- Glazing bar correction 0.90 (90%)
- Maintenance factor 8 (80%)

- Internal room reflectance's:
 - reveals 0.3
 - ceiling 0.85
 - floor 0.4
 - partition 0.81

- External reflectance's:
 - surroundings 0.2
 - wall (proposed) 0.3
 - proposed 0.3
 - green space 0.1
 - man made surface 0.2
 - road 0.1
 - road bridge 0.1
 - terrain 0.1
 - terrain bridge 0.1
 - wall bridge 0.1
 - water 0.2

14.5 Receiving Environment

The baseline that has been considered for the assessments undertaken is illustrated in Figure 1 below, see also drawings BRE/01-02 located in Appendix 2.

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace.

The 1.443ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

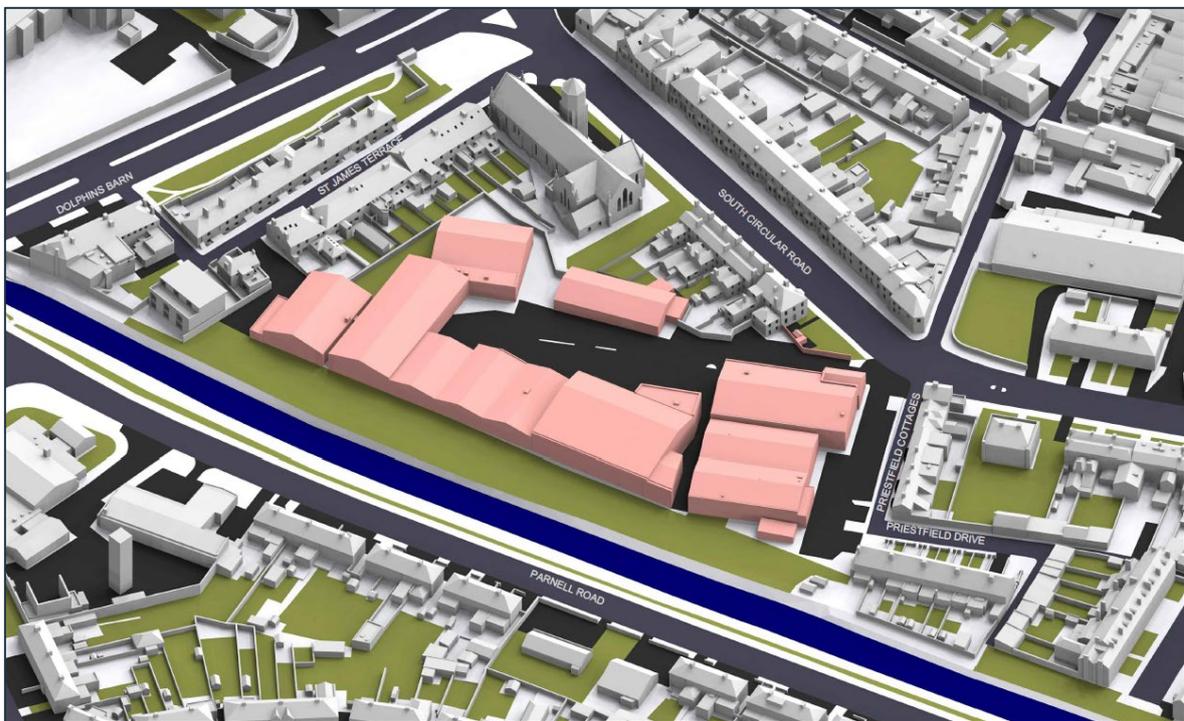


Figure 1: Baseline considered for assessment

14.6 Characteristics of the Proposed Development

The Proposed Development consists of 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity

areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

The Proposed Development is illustrated in green in Figure 2 below, see also drawings BRE/03-04 located in Appendix 2.

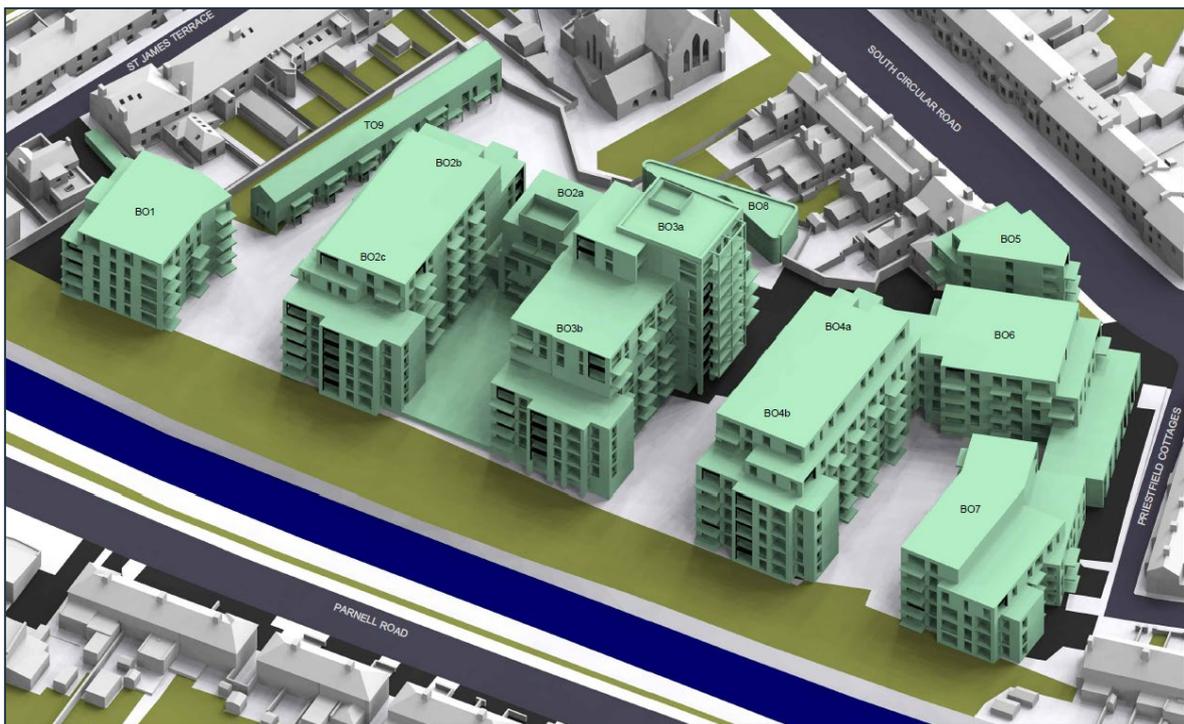


Figure 2: Proposed Development illustrated in green

14.7 Potential Effect of the Proposed Development

14.7.1 Construction Phase

There is no particular methodology for determining construction effects as these are variable and constantly change as the Proposed Development is constructed.

Owing to the evolving and changing nature of construction activities, the assessment of potential effects during construction of the Proposed Development on daylight, sunlight and overshadowing has not been modelled. Instead, a qualitative assessment has been undertaken using professional judgement and experience.

During construction, conditions will gradually evolve from those of the existing baseline to those of the Proposed Development (once completed and operational). It is therefore considered that the potential effects will vary throughout construction and gradually increase to the potential effects identified for the completed Proposed Development. Thus the completed Proposed Development represents the worst-case assessment in terms of likely daylight, sunlight and overshadowing effects.

On this basis, no technical analysis of the likely effects during construction has been carried out and the remainder of this chapter focuses on the effects relating to the completed Proposed Development.

14.7.2 Operational Phase

14.7.2.1 Existing Neighbouring Properties – Daylight/Sunlight Assessment

In accordance with the BRE Guidelines, neighbouring residential properties have been considered as sensitive receptors for the daylight and sunlight technical assessment as they are recognised as having a greater requirement for natural light than commercial properties.

Daylight and sunlight technical analysis has been undertaken to determine if existing neighbouring properties will retain sufficient levels of daylight and sunlight amenity should the Proposed Development be implemented: daylight – Vertical Sky Component (VSC) and No Sky Line (NSL) and sunlight - Annual Probable Sunlight Hours (APSH).

Supplementary VSC (Vertical Sky Component) façade assessments were also undertaken against a number of neighbouring elevations in No's 1-9 Priestfield Cottages and No's 309-319 South Circular Road which do not face the site (see Appendix 14). These supplementary assessments were undertaken to better determine the light enjoyed by these properties as a whole post development on the front and rear elevations, as a way to better determine the impact of the Proposed Development upon the daylight amenity of the existing

occupants as a whole, rather than simply considering the impact to windows facing the development in isolation.

The following properties as illustrated on Figure 3 below have been considered as receptors:

- No's 289, 309-319 (odd), 344-384 (even), 390 South Circular Road;
- No's 1-7 Priestfield Cottages;
- No's 1-9 Priestfield Drive;
- No's 113-116 and 123-136 Parnell Road;
- No's 41-43 Dolphins Barn; and
- No's 1-25 and 13A St James Terrace.

Non-habitable rooms such as bathrooms, WC's, storerooms and circulation spaces (such as hallways) within residential properties have been discounted from our analysis where identified, in accordance with the recommendations set out in the BRE Guidelines at Paragraph 2.2.2:

'The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed.'



Figure 3: Location of Proposed Development and Existing Neighbouring Properties

The full daylight and sunlight results are located in Appendix 4 along with the No Sky Line Contours (see drawings BRE/05-21) at Appendix 5.

Technical analysis indicates that the following neighbouring properties that have been assessed will comply with the BRE's recommended daylight (VSC and NSL) and sunlight (APSH) criterion and therefore there will be a negligible impact upon the daylight/sunlight amenity within these properties as a result of the Proposed Development:

- No's: 348-384 (even) and 390 South Circular Road;
- No's: 1-9 Priestfield Drive;
- No's: 113-116, 123-136 Parnell Road;
- No's: 41-43 Dolphins Barn; *and*
- No's: 1, 3, 5, 6, 8, 14-25 and 13A St. James Terrace.

The remaining properties will experience instances of technical breaches of the recommended BRE Guidelines and are discussed in further detail.

289 South Circular Road

Daylight

Technical analysis confirms that two (67%) of the three windows and two (67%) of the three rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

One window (W2/10) serving a ground floor room (R2/10) will fall below the recommended BRE criteria for VSC and NSL due to its location opposite the Proposed Development.

The window will experience a minor adverse alteration in VSC of 22%, which is just above the 20% change allowed by the BRE and will retain 24% VSC.

The room will also experience a minor adverse alteration in NSL of 24% and it will retain daylight distribution to over 73% of its area, which although below the BRE's recommended 80% could be considered adequate for an urban context.

Despite isolated minor deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **negligible to minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

1 Priestfield Cottages

Daylight

Three windows (W1/20, W1/21 and W2/21) serving a ground floor living room (R1/20) and two first floor bedrooms (R1/21 and R2/21) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a minor adverse alteration in VSC of 23% and will retain 23% VSC. The ground floor living room will experience a moderate adverse alteration in NSL of 34% and will retain daylight distribution to 54% of its area.

The two first floor windows will experience minor adverse alterations in VSC of 21%, which is just above the 20% change allowed by the BRE and will retain 26% VSC, which is just below the 27% target recommended by the BRE. One of the bedrooms will experience a minor adverse alteration in NSL of 26% and retain daylight distribution to 70% of its area and the other will experience an alteration in NSL of 49% and retain daylight distribution to 46% of its area.

Bedrooms are generally considered less sensitive than primary habitable rooms due to their nature and night time use. This is acknowledged by the BRE Guidelines in Paragraph 2.2.8 which states; '*Bedrooms should be analysed although they are less important*'.

Despite deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

2 Priestfield Cottages

Daylight

Technical analysis confirms that one (33%) of the three rooms assessed will comply with the recommended BRE Guidelines for NSL (daylight).

Three windows (W2/20, W3/21 and W4/21), the ground floor living room (R2/20) and one of the two first floor bedrooms (R3/21) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a minor adverse alteration in VSC of 24% and will retain 23% VSC. The living room will experience a moderate adverse alteration in NSL of 35% and will retain daylight distribution to 54% of its area.

The two first floor windows will experience minor adverse alterations in VSC of 22%, which is just above the 20% change allowed by the BRE and will retain 26% VSC, which is just below the 27% target recommended by the BRE. One of the bedrooms will experience a noticeable alteration in NSL of 47% and retain daylight distribution to 47% of its area and the remaining bedroom meets the recommended BRE criteria for NSL and retains daylight distribution to 78% of its area.

In addition, bedrooms are generally considered less sensitive than primary habitable rooms.

Despite deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

3 Priestfield Cottages

Daylight

Technical analysis confirms that one (33%) of the three rooms assessed will comply with the recommended BRE Guidelines for NSL (daylight).

Three windows (W1/30, W1/31 and W2/31), the ground floor living room (R1/30) and one of the two first floor bedrooms (R1/31) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a minor adverse alteration in VSC of 25% and will retain 22% VSC. The living room will experience a moderate adverse alteration in NSL of 38% and will retain daylight distribution to 49% of its area.

The two first floor windows will experience minor adverse alterations in VSC of 22%, which is just above the 20% change allowed by the BRE and will retain 26% VSC, which is just below the 27% target recommended by the BRE. One of the bedrooms will experience a moderate adverse alteration in NSL of 35% and retain daylight distribution to 63% of its area and the remaining bedroom meets the recommended BRE criteria for NSL and retains daylight distribution to 93% of its area.

In addition, bedrooms are generally considered less sensitive than primary habitable rooms.

Despite deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant) to moderate adverse (significant)**.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

4 Priestfield Cottages

Daylight

Technical analysis confirms that two (67%) of the three rooms assessed will comply with the recommended BRE Guidelines for NSL (daylight).

Three windows (W7/30, W3/31 and W4/31) and the ground floor living room (R4/30) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a minor adverse alteration in VSC of 28% and will retain 23% VSC. The living room will experience a moderate adverse alteration in NSL of 38% and will retain daylight distribution to 59% of its area.

The two first floor windows will experience minor adverse alterations in VSC of 23% and 24% and will retain in excess of 26% VSC, which is just below the 27% target recommended by the BRE. Furthermore, both bedrooms will meet the recommended BRE criteria for NSL and retain daylight distribution to 91% and 83% of their areas.

In addition, bedrooms are generally considered less sensitive than primary habitable rooms. Despite deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

5 Priestfield Cottages

Daylight

Technical analysis confirms that two (67%) of the three rooms assessed will comply with the recommended BRE Guidelines for NSL (daylight).

Three windows (W8/30, W5/31 and W6/31) and the ground floor living room (R5/30) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a minor adverse alteration in VSC of 28% and will retain 23% VSC. The living room will experience a moderate adverse alteration in NSL of 31% and will retain daylight distribution to 66% of its area.

The two first floor windows will experience minor adverse alterations in VSC of 25% and 27% and will retain in excess of 26% VSC, which is just below the 27% target recommended by the BRE. Furthermore, both bedrooms will meet the recommended BRE criteria for NSL and retain daylight distribution to over 86% of their areas.

In addition, bedrooms are generally considered less sensitive than primary habitable rooms.

Despite deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

6 Priestfield Cottages

Daylight

Technical analysis confirms that one (33%) of the three rooms assessed will comply with the recommended BRE Guidelines for NSL (daylight).

Three windows (W14/30, W7/31 and W8/31), the ground floor living room (R8/30) and one of the two first floor bedrooms (R8/31) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a moderate adverse alteration in VSC of 35% and will retain 19% VSC. The living room will experience a noticeable alteration in NSL of 52% and will retain daylight distribution to 46% of its area.

The two first floor windows will experience minor adverse alterations in VSC of 28% and 29% and will retain 26% VSC, which is just below the 27% target recommended by the BRE. One of the bedrooms will meet the recommended BRE criteria for NSL and retain daylight distribution to over 84% of its area. The remaining bedroom will experience a moderate adverse alteration in NSL of 37% and will retain daylight distribution to 60% of its area.

In addition, bedrooms are generally considered less sensitive than primary habitable rooms.

Overall the potential daylight effect is considered to be **minor adverse (not significant) to moderate adverse (significant)**.

Sunlight

Technical analysis confirms that two (67%) of the three windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

One ground floor window (W14/30) achieves 3% winter sunlight in the existing context, which is already below the 5% target recommended by the BRE, and falls to 0% in the proposed context. The window achieves 33% total sunlight in the existing context which falls to 18% in the proposed context.

This window is oriented west and thus is restricted in its access to available sunlight hours due to the sun's trajectory from east to west throughout the day. The BRE Guidelines acknowledge this in paragraph 3.1.6 which states:

'A south-facing window will, in general, receive most sunlight, while a north facing one will only receive it on a handful of occasions (early morning and late in summer). East and west facing windows will receive sunlight only at certain times of the day.'

Despite an isolated deviation to one window from the recommended BRE Guidelines, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

7 Priestfield Cottages

Daylight

Technical analysis confirms that one (33%) of the three rooms assessed will comply with the recommended BRE Guidelines for NSL (daylight).

Three windows (W19/30, W9/31 and W10/31), the ground floor living room (R10/30) and one of the two first floor bedrooms (R10/31) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a moderate adverse alteration in VSC of 36% and will retain 21% VSC. The living room will experience AN alteration in NSL of 54% and will retain daylight distribution to 44% of its area.

The two first floor windows will experience moderate adverse alterations in VSC of just under 30% and will retain 25% VSC, which is just below the 27% target recommended by the BRE. One of the bedrooms will meet the recommended BRE criteria for NSL and retain daylight distribution to over 76% of its area. The remaining bedroom will experience an alteration in NSL of 42% and will retain daylight distribution to 60% of its area.

In addition, bedrooms are considered less sensitive than primary habitable rooms.

Overall the potential daylight effect is considered to be **moderate adverse (significant)**.

Supplementary Façade Analysis: The VSC façade analysis of the east (non-site) facing elevation of this property (see Appendix 14) indicates that any windows to the rear should achieve VSC levels of circa 30-35%, which may help compensate for any daylight losses to the site facing windows.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

13 St James Terrace

Daylight

Technical analysis confirms that two (33%) of the six windows assessed and one (25%) of the four rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

Four windows on the ground and first floors (W1/110, W1/111, W2/111 and W3/111) and three first floor rooms (R1/111, R2/111 and R3/111) will fall below the recommended BRE criteria for VSC and NSL.

The ground floor window will experience a moderate adverse alteration in VSC of 38% and will retain 20% VSC. However, the room this window serves (R1/110) also benefits from an additional two mitigating windows which both meet the recommended BRE Guidelines and will retain in excess of 27% VSC. As such the room as a whole will meet the recommended BRE criteria for NSL and will retain daylight distribution to 94% of its area.

Three first floor windows will experience minor to moderate adverse alterations in VSC of 27%, 34% and 37% and will retain between 19% and 24% VSC. The three rooms served by these windows will experience moderate alterations in NSL of 34% and 39% and will retain daylight distribution to between 44% and 60% of their room areas.

Overall, the potential daylight effect is considered to be **moderate adverse (significant)**.

Supplementary Façade Analysis: The VSC façade analysis of the west (non-site) facing elevation of this property (see Appendix 14) indicates that windows to the front of this property should achieve high VSC levels of circa 30-35%, which may help compensate for any daylight losses to the site facing windows.

Sunlight

Technical analysis confirms that of the six windows considered relevant for the sunlight assessment, four (67%) will meet the recommended winter sunlight criteria and five (83%) will meet the total sunlight criteria.

One ground floor window (W3/110) will fall below the recommended BRE criteria and experience alterations of 82% winter sunlight and 51% total sunlight. This window achieves 11% winter sunlight and 43% total sunlight in the existing context which fall to 2% and 21% in the proposed context. However, the room served by this window benefits from two additional mitigating windows that will both meet the recommended BRE criteria for winter and total sunlight and retain in excess of the 5% and 25% targets. This should therefore ensure that there is sufficient access to sunlight amenity throughout the year.

The remaining first floor window (W1/111) will fall below the recommended BRE criteria falling from 5% in the existing context to 0% in the proposed context. This window is oriented south east which restricts its access to sunlight (see BRE Guidelines paragraph 3.1.6). However, this window will meet the BRE criteria for total sunlight and retain 29% APSH in the proposed context.

Despite isolated deviations from the recommended BRE Guidelines, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

12 St James Terrace

Daylight

Technical analysis confirms that six (75%) of the eight windows assessed and all seven rooms assessed (100%) will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

Two ground floor windows (W13/120 and W14/120) will fall below the recommended BRE criteria for VSC and experience minor adverse alterations of 26% and 27% and will retain 20% and 23% VSC. The two rooms these windows serve will both meet the recommended BRE criteria for NSL and retain daylight distribution to 83% and 86% of their areas.

Despite isolated minor deviations from the recommended BRE Guidelines to two windows, overall the potential daylight effect is considered to be **negligible to minor adverse (not significant)**.

Sunlight

Technical analysis confirms that of the eight windows considered relevant for the sunlight assessment, seven (88%) will meet the recommended winter sunlight criteria and all eight (100%) will meet the total sunlight criteria.

One ground floor window (W13/120) will fall below the recommended BRE criteria and for winter sunlight and experience an alteration in excess of 40%. The winter sunlight will fall from 19% in the existing context and retain 4% in the proposed context, which is just below the BRE's recommended target of 5%. Furthermore, this window will retain 43% APSH which should ensure that there is access to sunlight amenity throughout the year.

Despite an isolated deviation from the recommended BRE Guidelines to one window, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

11 St James Terrace

Daylight

Technical analysis confirms that eight (80%) of the ten windows assessed and all three rooms assessed (100%) will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

Two ground floor windows (W5/120 and W6/120) will fall below the recommended BRE criteria for VSC and experience minor adverse alterations of 23% and 25% and will retain 23% and 15% VSC. However, the room this window serves (R5/120) also benefits from an additional six mitigating windows which meet the recommended BRE Guidelines and retain in excess of 27% VSC. As such the room as a whole will meet the recommended BRE criteria for NSL and will retain daylight distribution to over 89% of its area.

Despite isolated minor deviations from the recommended BRE Guidelines to two windows, overall the potential daylight effect is considered to be **negligible to minor adverse (not significant)**.

Sunlight

Technical analysis confirms that of the 10 windows considered relevant for the sunlight assessment, nine (90%) will meet the recommended winter sunlight criteria and all 10 (100%) will meet the total sunlight criteria.

One ground floor window (W5/120) will fall below the recommended BRE criteria for winter sunlight and experience an alteration in excess of 40%. The winter sunlight will fall from 12% in the existing context to 3% in the proposed context. However, this window will retain 37% APSH, comfortably over the 25% recommended by the BRE.

Despite an isolated deviation from the recommended BRE Guidelines to one window, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

10 St James Terrace

Daylight

Technical analysis confirms that three (75%) of the four windows assessed and three (75%) of the four rooms assessed (100%) will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

One window (W4/120) serving a ground floor room (R4/120) will fall below the recommended BRE criteria for VSC and NSL. This window achieves 21% VSC in the existing context which is already below the 27% target recommended by the BRE and will experience a minor alteration just over the 20% change allowed by the BRE, retaining 17% VSC. The room this window serves will experience a moderate adverse alteration in NSL of 34% and will retain daylight distribution to 49% of its room area.

Despite isolated deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that of the four windows considered relevant for the sunlight assessment, three (75%) will meet the recommended winter sunlight criteria and all four (100%) will meet the total sunlight criteria.

One ground floor window (W1/130) achieves 3% winter sunlight in the existing context which is already below the 5% recommended by the BRE Guidelines and falls to 1% in the proposed context. However, the window will retain 31% APSH which should ensure that there is access to sunlight amenity throughout the year.

Despite an isolated deviation from the recommended BRE Guidelines to one window, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

9 St James Terrace

Daylight

Technical analysis confirms that all three windows and three rooms assessed (100%) will meet the recommended VSC and NSL daylight criteria.

Overall the potential daylight effect is therefore considered to be **negligible (not significant)**.

Sunlight

Technical analysis confirms that of the three windows considered relevant for the sunlight assessment, two (67%) will meet the recommended winter sunlight criteria and all three (100%) will meet the total sunlight criteria.

One ground floor window (W3/120) will fall below the recommended BRE criteria for winter sunlight and experience a moderate adverse alteration of 33%. This window achieves 3% winter sunlight in the existing context which is already below the 5% recommended by the BRE Guidelines and falls to 2% in the proposed context. However, the window will retain 29% APSH which should ensure that there is access to sunlight amenity throughout the year.

Despite an isolated deviation from the recommended BRE Guidelines to one window, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

7 St James Terrace

Daylight

Technical analysis confirms that all six windows and four rooms assessed (100%) will meet the recommended VSC and NSL daylight criteria.

Overall the potential daylight effect is therefore considered to be **negligible (not significant)**.

Sunlight

Technical analysis confirms that of the six windows considered relevant for the sunlight assessment, four (67%) will meet the recommended winter sunlight criteria and all six (100%) will meet the total sunlight criteria.

Two ground floor windows (W8/130 and W9/130) achieve 4% and 8% winter sunlight in the existing context which fall to 1% and 4% in the proposed context. Both windows will retain

26% and 34% APSH which should ensure that there is access to sunlight amenity throughout the year.

Despite an isolated deviation from the recommended BRE Guidelines to two windows, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

4 St James Terrace

Daylight

Technical analysis confirms that all six windows and five rooms assessed (100%) will meet the recommended VSC and NSL daylight criteria.

Overall the potential daylight effect is therefore considered to be **negligible (not significant)**.

Sunlight

Technical analysis confirms that of the six windows considered relevant for the sunlight assessment, four (67%) will meet the recommended winter sunlight criteria and all six (100%) will meet the total sunlight criteria.

Two windows on the ground and first floors (W13/140 and W7/141) achieve 2% and 5% winter sunlight in the existing context, which are just on/below the recommended BRE target, and fall to 0% and 3% in the proposed context.

W13/140 is oriented north east and thus is restricted in its access to sunlight (see *BRE Guidelines paragraph 3.1.6*).

Window W7/141 is oriented south east and located next to an existing projecting wing to the south which contributes towards the restriction in available sunlight hours. Furthermore this window will retain 36% APSH which should ensure that there is access to sunlight amenity throughout the year.

Despite isolated deviations from the recommended BRE Guidelines to two windows, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

2 St James Terrace

Daylight

Technical analysis confirms that all eight windows and five rooms assessed (100%) will meet the recommended VSC and NSL daylight criteria.

Overall the potential daylight effect is therefore considered to be **negligible (not significant)**.

Sunlight

Technical analysis confirms that of the eight windows considered relevant for the sunlight assessment, seven (88%) will meet the recommended winter sunlight criteria and all eight (100%) will meet the total sunlight criteria.

One ground floor window (W7/140) will fall below the recommended BRE criteria for winter sunlight and experience a moderate adverse alteration of 33%. This window achieves 3% winter sunlight in the existing context, which is already below the 5% recommended by the BRE Guidelines and falls to 2% in the proposed context.

This window is oriented south east and thus is restricted in its access to sunlight amenity due to its orientation. Furthermore this window is located next to an existing projecting wing to the south which will also contribute towards the restriction in available sunlight hours.

Despite an isolated deviation from the recommended BRE Guidelines to one window, overall the potential sunlight effect is considered to be **minor adverse (not significant)**.

346 South Circular Road

Daylight

Technical analysis confirms that two (67%) of the three windows assessed and one (33%) of the three rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

One window (W17/220) serving a ground floor room (R9/220) will fall below the recommended BRE criteria for VSC and NSL. This window will experience a minor alteration in VSC of 21%, which is just over the 20% change allowed by the BRE and will retain just under 27% VSC which is the BRE's recommended target. The room this window serves will experience a minor adverse alteration in NSL of 23% and will retain daylight distribution to 72% of its room area.

The remaining first floor room (R9/221) will experience a minor adverse alteration in NSL of 27% and will retain daylight distribution to 68% of its room area. Furthermore, the window served by this room will meet the recommended BRE Guidelines for VSC and will retain in excess of 27% VSC.

Despite isolated deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all three (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

344 South Circular Road

Daylight

Technical analysis confirms that four (80%) of the five windows assessed and two (50%) of the four rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

One window (W1/230) serving a ground floor room (R1/230) will fall below the recommended BRE criteria for VSC and NSL. This window will experience a minor alteration in VSC of 25% and will retain 26% VSC, which is just below the BRE's recommended 27% target. The room this window serves will experience a moderate adverse alteration in NSL of 29% and will retain daylight distribution to 68% of its room area.

The remaining first floor room (R1/231) will experience a moderate adverse alteration in NSL of 37% and will retain daylight distribution to 61% of its room area. Furthermore, the window served by this room will meet the recommended BRE Guidelines for VSC and will retain in excess of 27% VSC.

Despite isolated deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all five (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect is therefore considered to be **negligible (not significant)**.

319 South Circular Road

Daylight

Technical analysis confirms that six (75%) of the eight windows assessed and all five (100%) rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

Window W1/240 on the ground floor will experience a minor adverse alteration in VSC of 21% which is just over the 20% change by the BRE Guidelines. This window achieves 19% VSC in the existing context which is already below the 27% target recommended by the BRE and falls to 15% VSC in the proposed context. The room this window serves will meet the recommended BRE criteria for NSL and will retain daylight distribution to 78% of its area.

The remaining window W1/250 on the ground floor will experience a minor adverse alteration in VSC just over the 20% change allowed by the BRE. In addition this window will

retain just under the 27% VSC target recommended by the BRE. The room this window serves also benefits from an additional mitigating window which meets the recommended BRE Guidelines. The room as a whole will therefore meet the recommended BRE criteria for NSL and will retain daylight distribution to over 93% of its area.

Despite isolated minor deviations from the recommended BRE Guidelines to two windows, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that all eight (100%) of the windows considered relevant for the sunlight assessment will meet the recommended sunlight criterion.

Overall the potential sunlight effect to this property is therefore considered to be **negligible (not significant)**.

317 South Circular Road

Daylight

Technical analysis confirms that all nine windows and five rooms assessed (100%) will meet the recommended VSC and NSL daylight criteria.

Overall the potential daylight effect is therefore considered to be **negligible (not significant)**.

Sunlight

Technical analysis confirms that of the five windows considered relevant for the sunlight assessment, two (40%) will meet the recommended winter sunlight criteria and all five (100%) will meet the total sunlight criteria.

Three windows on the ground and first floors (W2/240, W3/251 and W4/251) achieve 5% winter sunlight in the existing context which will fall to 2% and 3% in the proposed context.

Windows W3/251 and W4/251 are oriented north west and thus are restricted in their access to sunlight (see BRE Guidelines paragraph 3.1.6) and window W2/240 is located next to an existing projecting wing to the south which contributes towards the restriction in available sunlight hours.

Overall the potential sunlight effect to this property is considered to be **minor to moderate adverse (significant)**.

315 South Circular RoadDaylight

Technical analysis confirms that eight (80%) of the ten windows assessed and four (80%) of the five rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

Window W3/240 on the ground floor will experience a minor adverse alteration in VSC of 23%. This window achieves 19% VSC in the existing context which is already below the 27% target recommended by the BRE and falls to 15% VSC in the proposed context. The room this window serves will meet the recommended BRE criteria for NSL and retain daylight distribution to 79% of its area.

The remaining window (W9/250) on the ground floor will experience a minor adverse alteration in VSC of 26% and will retain 24% VSC. In addition this window will retain just under the 27% VSC target recommended by the BRE. The room this window serves also benefits from an additional two mitigating windows which meet the recommended BRE Guidelines. The room as a whole will therefore meet the recommended BRE criteria for NSL and retain daylight distribution to over 97% of its area.

One ground room (R6/250) will fall below the BRE's recommended criteria for NSL. This room will experience a moderate adverse alteration of 30% and will retain daylight distribution to 43% of its room area. Both windows serving this room will meet the BRE criteria for VSC as they experience less than a 20% alteration from their existing position and will retain 15% and 11% VSC.

Despite isolated deviations from the recommended BRE Guidelines, overall the potential daylight effect to this property is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that of the 10 windows considered relevant for the sunlight assessment, eight (80%) will meet the recommended winter sunlight criteria and all 10 (100%) will meet the total sunlight criteria.

Two ground floor windows (W10/250 and W11/250) achieve 18% and 20% winter sunlight in the existing context which will fall to 4% in the proposed context, which is just below the BRE's recommended 5% target.

Both windows are oriented south east and thus are restricted in their access to sunlight (see BRE Guidelines paragraph 3.1.6). Furthermore, both windows will meet the criteria for total sunlight and retain 39% and 37% APSH. As such this should ensure that there is access to sunlight amenity throughout the year.

Despite isolated deviations from the recommended BRE Guidelines to two windows, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

313 South Circular Road

Daylight

Technical analysis confirms that all nine windows and five rooms assessed (100%) will meet the recommended VSC and NSL daylight criteria.

Overall the potential daylight effect is therefore considered to be **negligible (not significant)**.

Sunlight

Technical analysis confirms that of the five windows considered relevant for the sunlight assessment, two (40%) will meet the recommended winter sunlight criteria and all five (100%) will meet the total sunlight criteria.

One ground floor window (W4/240) and two first floor windows (W9/251 and W10/251) will fall below the recommended BRE criteria for winter sunlight.

The ground floor window will experience a minor adverse alteration in winter sunlight. This window achieves 4% winter sunlight in the existing context which is already below the 5% recommended by the BRE Guidelines and falls to 3% in the proposed context. This window is located next to an existing projecting wing to the south which contributes towards the restriction in available sunlight hours.

The two first floor windows achieve 4% winter sunlight in the existing context, which is already below the 5% recommended by the BRE Guidelines and fall to 2% in the proposed context. These windows are oriented north west and thus are restricted in their access to sunlight (see BRE Guidelines paragraph 3.1.6). The room these two first floor windows serve also benefit from an additional mitigating window that will meet the recommended BRE criteria for winter and total sunlight and retain 12% and 62%.

Despite isolated deviations from the recommended BRE Guidelines, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

311 South Circular Road

Daylight

Technical analysis confirms that eight (89%) of the nine windows assessed and four (80%) of the five rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

The remaining window (W5/240) serving a ground floor room (R5/240) will fall below the recommended BRE criteria for VSC and NSL.

The window will experience a minor adverse alteration in VSC of 25%. This window achieves 18% VSC in the existing context which is already below the 27% target recommended by the BRE and falls to 13% VSC in the proposed context. The room this window serves will experience a minor adverse alteration in NSL of 24% and will retain daylight distribution to over 55% of its area.

Despite isolated minor deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that of the nine windows considered relevant for the sunlight assessment, eight (89%) will meet the recommended winter sunlight criteria and all nine (100%) will meet the total sunlight criteria.

One ground floor window (W5/240) achieves 13% winter sunlight in the existing context and will fall to 3% in the proposed context.

This window is located next to an existing projecting wing to the south which contributes towards the restriction in available sunlight hours. Furthermore, this window meets the BRE criteria for total sunlight and will retain 28% APSH which should ensure that there is access to sunlight amenity throughout the year.

Despite an isolated deviation from the recommended BRE Guidelines to one window, overall the potential sunlight effect on this property is considered to be **minor adverse (not significant)**.

309 South Circular Road

Daylight

Technical analysis confirms that six (60%) of the ten windows assessed and six (75%) of the eight rooms assessed will comply with the recommended BRE Guidelines for daylight (VSC and NSL).

Four windows on the ground and first floors (W2/261, W1/270, W2/271 and W3/271) and two rooms on the ground and first floors (R2/270 and R2/271) will fall below the recommended BRE criteria for VSC and NSL.

Three windows on the ground and first floors (W2/261, W1/270 and W2/271) will experience moderate adverse alterations in VSC between 32% and 37% and will retain 20%-24% VSC.

The three rooms served by these windows will all meet the recommended BRE criteria for NSL and will retain daylight distribution to between 87% and 91% of the room areas.

The remaining first floor window (W3/271) will experience a minor adverse alteration in VSC of 28%. This window achieves 25% VSC in the existing context which is already below the 27% target recommended by the BRE and falls to 18% VSC in the proposed context. The room this window serves benefits from a mitigating window which meets the BRE criteria and retains in excess of 27% VSC. The room as a whole will experience a minor adverse alteration in NSL of 24% and will retain daylight distribution to over 57% of its area.

Despite deviations from the recommended BRE Guidelines, overall the potential daylight effect is considered to be **minor adverse (not significant)**.

Sunlight

Technical analysis confirms that of the eight windows considered relevant for the sunlight assessment, seven (88%) will meet the recommended winter sunlight criteria and all eight (100%) will meet the total sunlight criteria.

One first floor window (W1/270) achieves 5% winter sunlight in the existing context and will fall to 1% in the proposed context. This window is oriented north west and thus is restricted in its access to sunlight (see BRE Guidelines paragraph 3.1.6).

Furthermore, the room this window serves also benefits from an additional mitigating window that will meet the recommended BRE criteria for winter and total sunlight and retain 7% and 34%. As such this should ensure that there is access to sunlight amenity to this room throughout the year.

Despite an isolated deviation from the recommended BRE Guidelines to one window, overall the potential sunlight effect to this property is considered to be **minor adverse (not significant)**.

14.7.2.2 Neighbouring Amenity Areas – SHOG Overshadowing Assessment

The Sun Hours on Ground Overshadowing assessment has been undertaken against 19 existing neighbouring amenity areas (Areas 01-19), as illustrated in Figures 4 and 5 below and drawings BRE/04-07 located in Appendix 7.

21st March

In accordance with the BRE Guidelines the assessment has been undertaken on 21st March.

The assessment demonstrates that 13 of the 19 existing neighbouring amenity areas assessed will retain two or more hours of direct sunlight to over 50% of their areas on 21st March with the Proposed Development in place and thus will comply with the recommended BRE Guidelines.

In addition, Area 2 will fall from 51% in the existing context to 43% in the proposed context and experience a 16% alteration in the area retaining two or more hours of direct sunlight. As such this area will also comply with the BRE Guidelines, as the percentage change is less than 20%.

The remaining five Areas 4, 15, 16, 17 and 19 will fall below the recommended BRE criteria and will retain two or more hours or direct sunlight to between 5% and 37% of their areas on 21st March.

It is clear that existing obstructions, such as boundary walls and outbuildings do have a material bearing on the availability of direct sunlight to these gardens on 21st March, as can be seen from the existing 21st March SHOG analysis in Figure 4 below, with the areas illustrated in grey indicating low existing levels of sun hours on ground, despite the low height on the existing Site.

Furthermore, it should be noted that additional assessments SHOG assessments have been undertaken on 21st April and 21st June as discussed below which illustrate the times if year that these areas will achieve two or more hours of direct sunlight to over 50% of their areas.

21st April

The assessment has also been undertaken on 21st April.

The assessment demonstrates that all 19 (**100%**) amenity areas will achieve two or more hours of direct sunlight to over 50% of their areas on 21st April, which is just one month after the BRE's recommended date of assessment.

21st June

The assessment has also been undertaken on 21st June (Summer Solstice) as this is the time of year that these amenity areas are most likely to be used.

The assessment indicates that all (**100%**) 19 existing neighbouring amenity areas will retain two or more hours direct sunlight to 83%-99% of their areas on 21st June and thus will be well sunlit when they are most likely to be in use during the summer months.

Summary

Overall, the effect of overshadowing to existing neighbouring amenity areas is considered to be **minor adverse (not significant), with isolated moderate adverse** impacts.

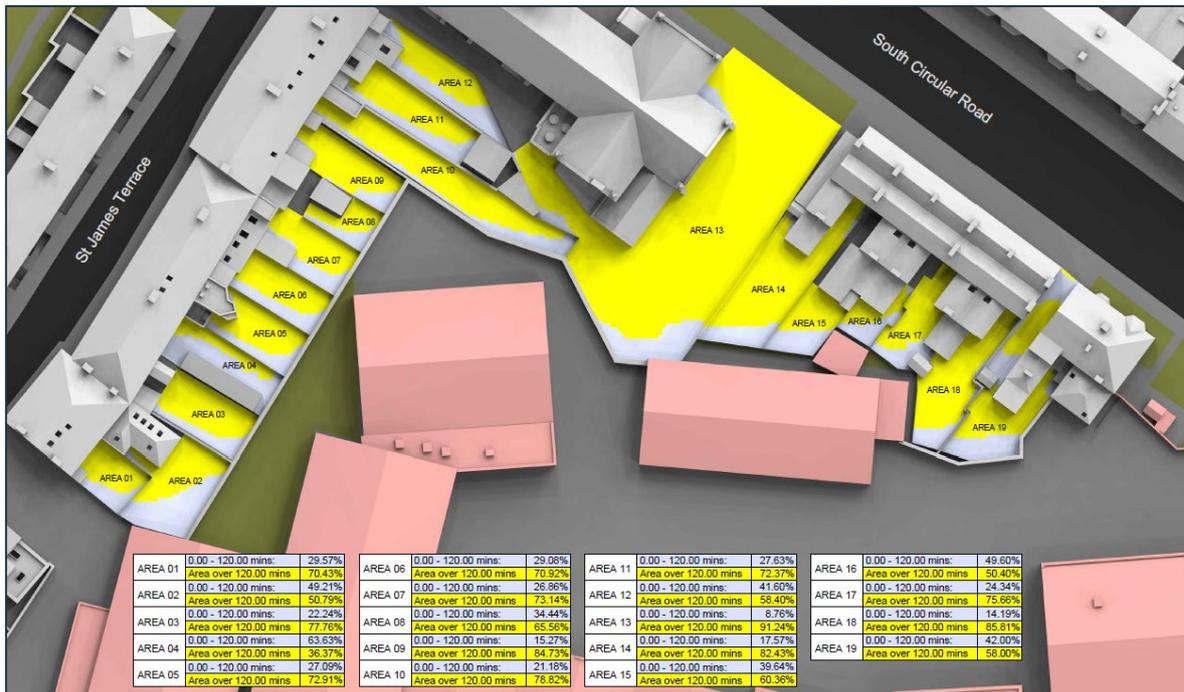


Figure 4: Sun Hours on Ground Overshadowing Assessment for sensitive neighbouring amenity areas in the existing context – 21st March

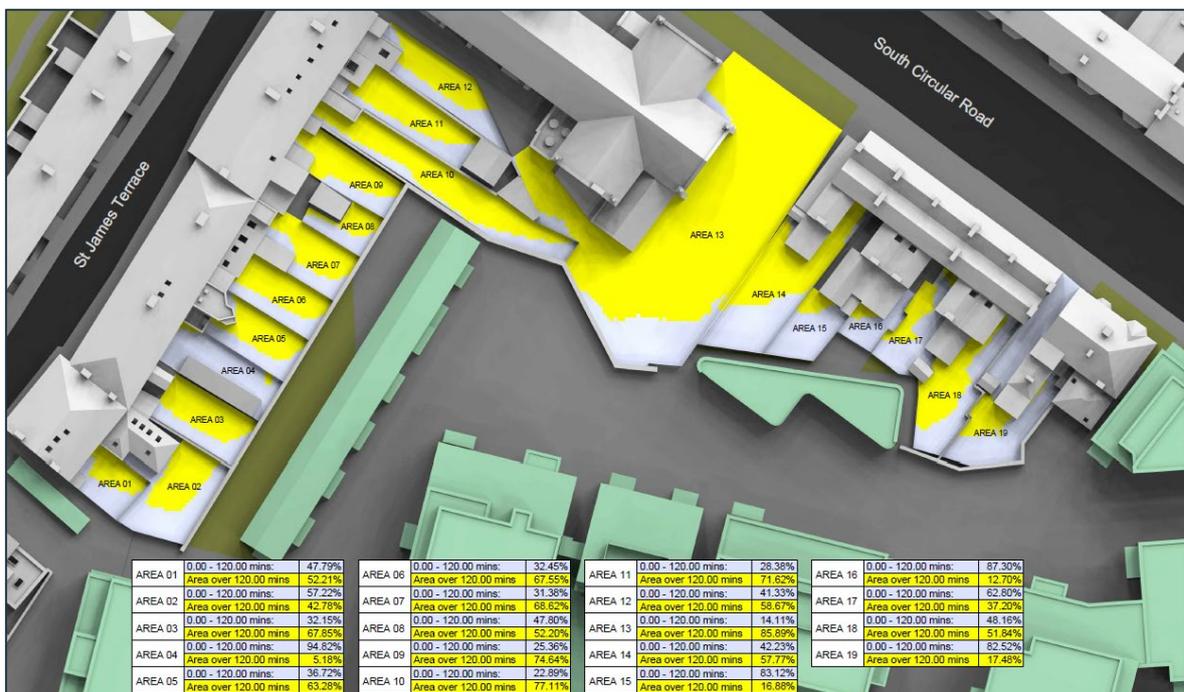


Figure 5: Sun Hours on Ground Overshadowing Assessment for sensitive neighbouring amenity areas in the proposed context – 21st March

14.7.2.3 Existing Neighbouring Amenity Areas - Transient Overshadowing

In addition to the sun hours on ground assessments, transient overshadowing assessments have been run for the 19 existing neighbouring amenity areas (Areas 01-19).

For the purpose of this assessment the overshadowing has been mapped every hour for the following three key dates in the year:

- 21st March (Spring Equinox) - 7.00am-5.00pm;
- 21st June (Summer Solstice) - 6.00am-7.00pm; *and*
- 21st December (Winter Solstice) - 8.00am-3.00pm.

September 21st (Autumn Equinox) provides the same overshadowing images as March 21st (Spring Equinox) as the sun follows the same path at these corresponding times of year.

Drawings BRE/01-11 illustrate the proposed shadow for 21st March; drawings BRE/12-26 illustrate the proposed shadow for 21st June; and drawings BRE/27-35 illustrate the proposed shadow for 21st December; these images are presented within Appendix 6. The results are discussed below.

21st March

On 21st March, each of the existing neighbouring amenity spaces will experience some additional overshadowing as a result of the Proposed Development. However, as discussed above, six areas: no.'s 2, 4, 15, 16, 17 and 19, will fall below the recommended BRE Guidelines.

These six areas are therefore discussed in further detail below:

Area 2: This area which is located to the west of the Proposed Development will predominantly experience additional overshadowing in the morning. However, from noon the levels of sunlight enjoyed to this space will largely remain the same as in the existing condition.

Area 4: This area is located to the north of Area 2 and also to the west of the Proposed Development. The transient overshadowing analysis shows that this space will experience additional overshadowing in the morning between 9am and 11am. However, from noon the levels of sunlight enjoyed to this space will largely remain the same as in the existing condition.

Area 15: This area is located directly to the north of the Proposed Development and on the spring equinox will experience additional overshadowing for most of the day. The additional sun on ground analysis discussed above however, shows that this space will enjoy 2 hours

sun on ground to over 50% of its area by the 21st April. This space will therefore enjoy 2 hours of sun on ground to over 50% of the space for at least half of the year.

Area 16: This area is located directly to the north of the Proposed Development and on the spring equinox will experience additional overshadowing from 11am. The additional sun on ground analysis discussed above however, shows that this space will enjoy 2 hours sun on ground to over 50% of its area by the 21st April. This space will therefore enjoy 2 hours of sun on ground to over 50% of the space for at least half of the year.

Area 17: This area is located directly to the north of the Proposed Development and on the spring equinox will experience additional overshadowing from noon. The additional sun on ground analysis discussed above however, shows that this space will enjoy 2 hours sun on ground to over 50% of its area by the 21st April. This space will therefore enjoy 2 hours of sun on ground to over 50% of the space for at least half of the year.

Area 19: This area is located directly to the north of the Proposed Development and on the spring equinox will experience additional overshadowing for most of the day. The additional sun on ground analysis discussed above however, shows that this space will enjoy 2 hours sun on ground to over 50% of its area by the 21st April. This space will therefore enjoy 2 hours of sun on ground to over 50% of the space for at least half of the year.

In consideration of the transient overshadowing assessment and the SHOG overshadowing assessment previously discussed, the overshadowing effect on 21st March to existing neighbouring amenity areas is considered to be **minor to moderate adverse (significant)**.

21st June

During the summer, shadows are shorter in length due to the higher position of the sun.

Area 2: Overshadowing will occur between 6am-9am, however the shadow moves and by 10am the space will continue to enjoy similar levels of sunshine as in the existing condition.

Area 4: There will be no additional overshadowing to this amenity space as a result of the Proposed Development on 21st June.

Area 15: Additional overshadowing will occur to this space between 10am and 5pm, with the main additional shadow occurring between 12 and 3pm. However this space will enjoy at least 2 hours of sun on ground to over 50% of its space.

Area 16: There will be no additional overshadowing to this amenity space as a result of the Proposed Development on 21st June.

Area 17: Very slight additional overshadowing will occur between 11am and 4pm at the very southern end of the garden. It is therefore considered that this amenity space will be able to enjoy good levels of sunlight during the summer months.

Area 19: Additional overshadowing to this space will occur in the late afternoon between 5pm and 7pm. It will not however experience any other additional overshadowing throughout the rest of the day.

In consideration of the transient overshadowing assessment and the SHOG overshadowing assessment previously discussed, the overshadowing effect on 21st June to existing neighbouring amenity areas is considered to be **minor adverse (not significant)**.

21st December

Areas 4, 5, 15, 16, 17 and 19: Slight additional overshadowing will occur throughout the day on the 21st December, however it is not unusual for this time of the year and is largely due to longer shadows being cast by the Proposed Development given the low trajectory of the sun in winter.

In consideration of the transient overshadowing assessment and given that it is not unusual for longer shadows to be cast at this time of the year due to the low trajectory of the sun in winter, the overshadowing effect on 21st December to existing neighbouring amenity areas is considered to be **minor adverse (not significant)**.

14.7.2.4 Daylight/Sunlight Within the Proposed Development

Detailed daylight - Average Daylight Factor (ADF) and No Sky Line (NSL), and sunlight (APSH) analysis has been undertaken against all 805 habitable residential rooms identified by Avison Young in the Proposed Development.

The technical results and NSL contour drawings (see drawings BRE/05-21) are located in Appendix 5 of this report.

Summary of Daylight (ADF & NSL) Technical Analysis

Detailed daylight analysis has been undertaken against a total of 805 habitable rooms located within proposed Buildings B01-08 and T09 (as illustrated on Figure 4 below, see also drawings BRE/03-04 located in Appendix 11).

As previously stated, full depth LKD's have been considered against the BRE's minimum recommended 2% ADF target for a multi-use room such as this, and this primary daylight assessment is the focus of this Chapter.

As it is not uncommon for deep LKD's served by balconies in multi storey apartment blocks to experience reduced quantum's of daylight to the rear of their rooms, LKD's have also been considered against a lower 1.5% ADF target as an alternative and supplementary assessment to provide additional context. It should be noted that 1.5% ADF is the recommended target for a living room and is lower than the 2% ADF target recommended by the BRE for a multi-use LKD.

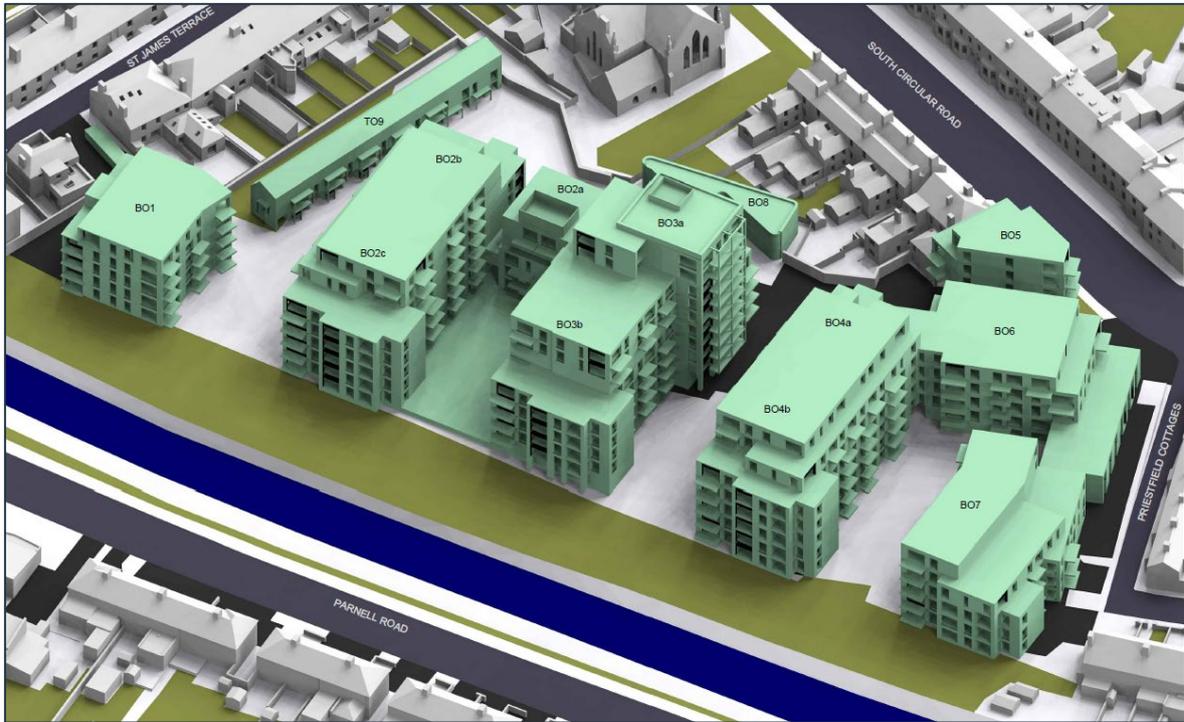


Figure 4: Proposed Development illustrated in green

Primary Daylight Assessment:

In total, 725 (**90%**) of the 805 habitable rooms (full rooms depth) assessed will meet the minimum recommended ADF targets as follows:

- 437 (94%) of the 465 bedrooms assessed will achieve an ADF of **1%+**;
- 277 (84.5%) of the 328 LKD's assessed will achieve an ADF of **2%+**;
- One of the two studios assessed will achieve an ADF of **2%+**;
- All five (100%) kitchen/dining (KD) rooms assessed will achieve an ADF of **2%+**;
- All five (100%) living rooms assessed will achieve an ADF of **1.5%**.

577 (72%) of the 805 rooms assessed will achieve the recommended level of NSL to 80% or more of the room areas.

Alternative Daylight Assessment:

If a lower 1.5% target were considered (*i.e., the ADF target recommended for a living room*) for the LKD's, 760 (**94%**) of the 805 habitable rooms (full room depth) will meet the following criteria:

- 437 (94%) of the 465 bedrooms assessed will achieve an ADF of 1%+;

- 312 (95%) of the 328 LKD's assessed will achieve an ADF of 1.5%+;
- One of the two studios assessed will achieve an ADF of 2%+;
- All five (100%) kitchen/dining (KD) rooms assessed will achieve an ADF of 1.5%+;
- All five (100%) living rooms assessed will achieve an ADF of 1.5%.

The daylight results for each building are detailed below:

It should be noted that the following in depth commentary regarding rooms within each block focuses on LKD's that achieve below 1.5% ADF and discusses the reasons for this i.e. rooms located on lower levels beneath overhanging balconies. Whilst we have not discussed every room that falls below the criteria in depth within this Chapter, similar reasons such as overhanging balconies will apply to many of these also.

Building B01

All 58 (100%) rooms relevant for analysis will meet the following criteria:

- All 34 (100%) bedrooms assessed will achieve an ADF of 1%+;
- All 24 (100%) LKD's assessed will achieve an ADF of 2%+;

The NSL assessment demonstrates that 50 (86%) of the 58 rooms will achieve daylight distribution to 80%+ of their room area. Furthermore, all 58 (100%) rooms will achieve daylight distribution to over 50%+ of their room area.

Building B02

Of the 196 rooms relevant for analysis, 174 (89%) will meet the following criteria:

- 104 (93%) of the 112 bedrooms assessed will achieve an ADF of 1%+;
- 70 (83%) of the 84 LKD's assessed will achieve an ADF of 2%+;
- If a 1.5% target were considered for the LKD's, 183 (93%) of the 196 habitable rooms will meet the alternative criteria.
- A small number of rooms (*R14/410, R16/410, R18/411, R18/412, R23/413*) located underneath balconies on lower levels will achieve lower levels of ADF of between 0.82% to 1.34% ADF.
- The NSL assessment demonstrates that 148 (76%) of the 196 rooms will achieve daylight distribution to 80%+ of their room area.
- 167 (85%) rooms will achieve daylight distribution to over 50%+ of their room area.

Building B03

Of the 183 rooms relevant for analysis, 157 (86%) will meet the following criteria:

- 93 (88%) of the 106 bedrooms assessed will achieve an ADF of 1%+;
- 64 (83%) of the 77 LKD's assessed will achieve an ADF of 2%+;
- If a 1.5% target were considered for the LKD's, 166 (91%) of the 183 habitable rooms will meet the alternative criteria.
- A small number of rooms (*R45/411, R61/411, R61/412, R59/413*) located underneath balconies on lower levels will achieve lower levels of ADF of between 0.61% to 1.44% ADF.
- The NSL assessment demonstrates that 119 (65%) of the 183 rooms will achieve daylight distribution to 80%+ of their room area.
- 141 (77%) rooms will achieve daylight distribution to over 50%+ of their room area.

Building B04

Of the 168 rooms relevant for analysis, 148 (88%) will meet the following criteria:

- 89 (93%) of the 96 bedrooms assessed will achieve an ADF of 1%+;
- 59 (82%) of the 72 LKD's assessed will achieve an ADF of 2%+;
- If a 1.5% target were considered for the LKD's, 157 (93%) of the 168 habitable rooms will meet the alternative criteria.
- A small number of rooms (*R6/430, R8/430, R11/430, R17/431*) located underneath balconies on lower levels will achieve lower levels of ADF of between 1.04% to 1.48% ADF.
- The NSL assessment demonstrates that 106 (63%) of the 168 rooms will achieve daylight distribution to 80%+ of their room area.
- 131 (78%) rooms will achieve daylight distribution to over 50%+ of their room area.

Building B05

All 24 (100%) rooms relevant for analysis will meet the following criteria:

- All 14 (100%) bedrooms assessed will achieve an ADF of 1%+;
- All 10 (100%) LKD's assessed will achieve an ADF of 2%+;
- The NSL assessment demonstrates that 20 (83%) of the 24 rooms will achieve daylight distribution to 80%+ of their room area.

- 23 (96%) rooms will achieve daylight distribution to over 50%+ of their room area.

Building B06

Of the 76 rooms relevant for analysis, 69 (91%) will meet the following criteria:

- All 47 (100%) bedrooms assessed will achieve an ADF of 1%+;
- 21 (78%) of the 27 LKD's assessed will achieve an ADF of 2%+;
- One (50%) of the two studios assessed will achieve an ADF of 2%+. The remaining ground floor studio (R34/430) will achieve 1.72% ADF
- If a 1.5% target were considered for the LKD's, 75 (99%) of the 76 habitable rooms will meet the alternative criteria.
- The NSL assessment demonstrates that 58 (76%) of the 76 rooms will achieve daylight distribution to 80%+ of their room area.
- 72 (95%) rooms will achieve daylight distribution to over 50%+ of their room area.

Building 07

Of the 79 rooms relevant for analysis, 74 (94%) will meet the following criteria:

- All 47 (100%) bedrooms assessed will achieve an ADF of 1%+;
- 27 (84%) of the 32 LKD's assessed will achieve an ADF of 2%+;
- If a 1.5% target were considered for the LKD's, 76 (96%) of the 79 habitable rooms will meet the alternative criteria.
- The three LKD's (R42/430, R67/431 and R67/432) on the ground to second floors that fall below 1.5% ADF are located beneath an overhanging balconies which restricts light entering the rooms, and retain between 1% - 1.37% ADF.
- The NSL assessment demonstrates that 61 (77%) of the 79 rooms will achieve daylight distribution to 80%+ of their room area.
- 70 (89%) rooms will achieve daylight distribution to over 50%+ of their room area.

Building T09

All 21 (100%) rooms relevant for analysis will meet the following criteria:

- All nine (100%) bedrooms assessed will achieve an ADF of 1%+;
- Two (100%) LKD's assessed will both achieve an ADF of 2%+;
- All five KD's assessed will achieve an ADF of 2%+;
- All five living rooms assessed will achieve an ADF of 1.5%+;

The NSL assessment demonstrates that 15 (71%) of the 21 rooms will achieve daylight distribution to 80%+ of their room area. Furthermore, 19 (90%) of the 21 rooms will achieve daylight distribution to over 50%+ of their room area.

Both of the two rooms that achieve daylight distribution (NSL) to less than 50% of their room areas are bedrooms (R3/441, R5/441) which could be considered less sensitive.

Summary of Sunlight (APSH) Technical Analysis

Proposed Development – windows oriented within 90 degrees due south

Technical analysis indicates that of the 741 windows assessed, 431 windows (**58%**) will meet the recommended criteria for winter sunlight and 359 (**48%**) for total sunlight (i.e. 25% of Annual Probable Sunlight Hours - APSH, and 5% Winter Probable Sunlight Hours - WPSH).

Of the 310 windows that fall below for winter sunlight, 77 serve bedrooms; and of the 382 windows that fall below the criteria for total sunlight, 96 serve bedrooms.

Bedrooms can be considered less sensitive to alterations in sunlight, as acknowledged in the BRE Guidelines at Paragraph 3.1.2 which states the following in relation to sunlight:

'It is viewed as less important in bedrooms and kitchens, where people prefer it in the morning rather than the afternoon'.

The remaining 233 windows that fall below winter sunlight, and 286 windows that fall below for total sunlight serve LKD's, KD's, studios and living rooms.

The majority of windows not meeting the APSH criteria are either oriented north and have been considered for assessment as they serve dual aspect rooms that are also served by windows that are oriented within 90 degrees of due south; they are oriented east or west and see the sun for shorter periods of the day (i.e. morning or evening); and/or are located beneath overhanging balconies, which limits the quantum of available sunlight hours hitting the centre point of the window (i.e. the point of APSH calculation). Windows on lower floors and which overlook other elements of the proposed scheme also see lower levels of APSH due to the lower levels of sky visibility and access to APSH.

The sunlight results for each block are detailed below:

Building B01

Of the 59 windows considered relevant for analysis:

- 47 (80%) windows will meet the recommended winter sunlight criteria;
- 39 (66%) windows will meet the recommended total sunlight criteria.

Building B02

Of the 140 windows considered relevant for analysis:

- 79 (56%) windows will meet the recommended winter sunlight criteria;
- 57 (41%) windows will meet the recommended total sunlight criteria.

Building B03

Of the 152 windows considered relevant for analysis:

- 95 (63%) windows will meet the recommended winter sunlight criteria;
- 78 (51%) windows will meet the recommended total sunlight criteria.

Block B04

Of the 141 windows considered relevant for analysis:

- 98 (70%) windows will meet the recommended winter sunlight criteria;
- 88 (62%) windows will meet the recommended total sunlight criteria.

Block B05

Of the 28 windows considered relevant for analysis:

- 12 (43%) windows will meet the recommended winter sunlight criteria;
- 15 (54%) windows will meet the recommended total sunlight criteria.

Block B06

Of the 81 windows considered relevant for analysis:

- 31 (38%) windows will meet the recommended winter sunlight criteria;
- 26 (32%) windows will meet the recommended total sunlight criteria.

Building 07

Of the 77 windows considered relevant for analysis:

- 47 (61%) windows will meet the recommended winter sunlight criteria;
- 39 (51%) windows will meet the recommended total sunlight criteria.

Building T09

Of the 63 windows considered relevant for analysis:

- 22 (35%) windows will meet the recommended winter sunlight criteria;
- 17 (27%) windows will meet the recommended total sunlight criteria.

Inclusion of north facing windows in APSH assessment

The BRE does not provide guidance on the appropriate benchmark against which to assess probable sunlight hours expected in predominately north facing windows. If all windows, including north facing windows, were assessed against the baseline BRE criteria for sunlight (*i.e.* 25% of Annual Probable Sunlight Hours - APSH, and 5% Winter Probable Sunlight Hours -

WPSH), technical analysis indicates that of the 1,118 windows assessed, 496 windows (**44%**) will meet the recommended criteria for winter sunlight and 414 (**37%**) for total sunlight.

14.7.2.5 Proposed Amenity Areas within the Site – SHOG Overshadowing Assessment

The Sun Hours on Ground (SHOG) overshadowing assessment has been undertaken against 12 proposed amenity areas within the Site (Areas 01-12) as illustrated in Figures 6-8 below and drawings BRE/05-07 located in Appendix 12; seven proposed roof terraces (Terraces 1-7) as illustrated in Figures 9-11 below and drawings BRE/08-10 located in Appendix 12; and 306 proposed balconies and terraces in Buildings B01-07, as illustrated in drawings BRE/01-38 located in Appendix 13.

Proposed Shared Amenity Areas

12 shared amenity areas within the Proposed Development (Areas 01-12) as illustrated in Figures 6-8 (below) have been considered for SHOG assessment. See also drawings BRE/05-07 located in Appendix 12.

The movement of shadow and the availability of sunlight to areas that sit outside of Areas 01-12, can be reviewed in the additional transient overshadowing analysis presented within Appendix 6 and discussed in Section 14.7.2.6 below.

21st March

In accordance with the BRE Guidelines the assessment has been undertaken on 21st March.

The assessment demonstrates that 10 (**83%**) of the 12 proposed amenity areas will achieve two or more hours of direct sunlight to 65%-100% of their areas on 21st March, which is in excess of the 50% recommended by the BRE and thus will fully comply with the recommended BRE Guidelines.

Two Areas (06 and 07 – both proposed private gardens) achieve less than 2hrs direct sunlight, on the on 21st March. These areas are oriented northwest and thus are restricted in their access to sunlight amenity due to the sun's trajectory from east to west in a southerly trajectory throughout the day.

21st April

By the 21st of April all (**100%**) 12 amenity areas will achieve two or more hours of direct sunlight to over 50% of their areas.

21st June

On the 21st June (Summer Solstice) all (**100%**) 12 amenity areas will achieve two or more hours direct sunlight to 88%-100% of their areas.

Summary

The effect of overshadowing to the proposed amenity areas is considered to be **negligible to minor adverse (not significant)** overall.

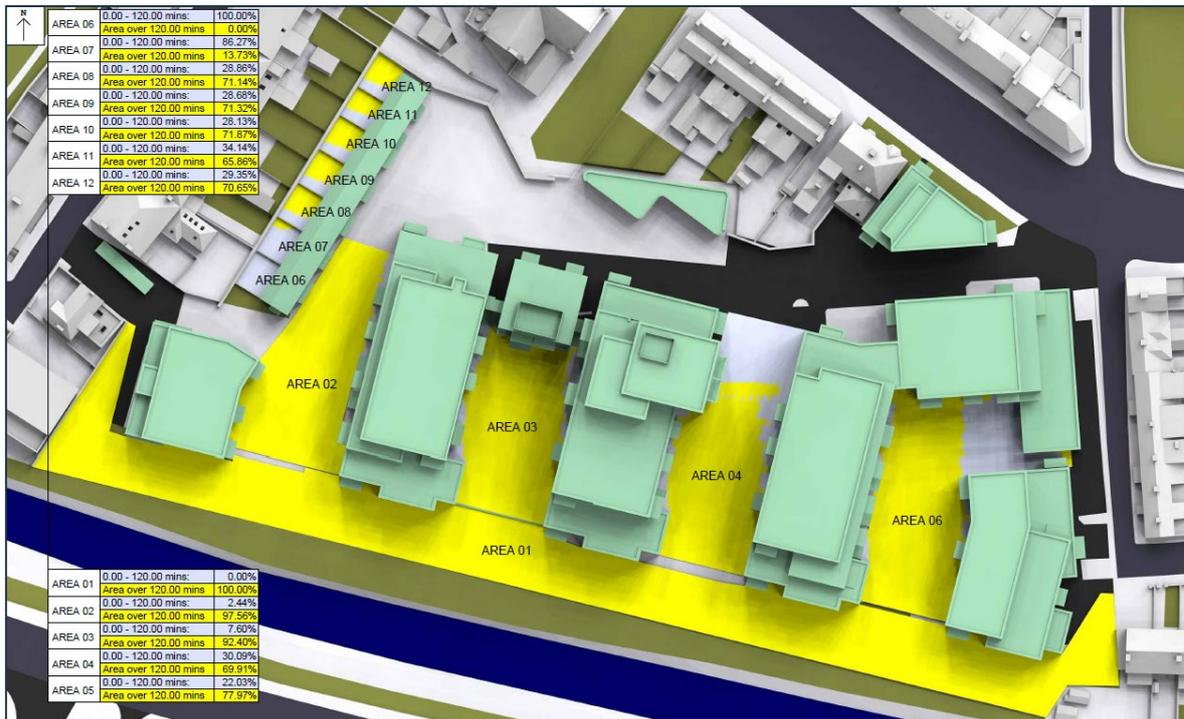


Figure 6: Sun Hours on Ground Overshadowing Assessment for proposed amenity areas within the Site – 21st March

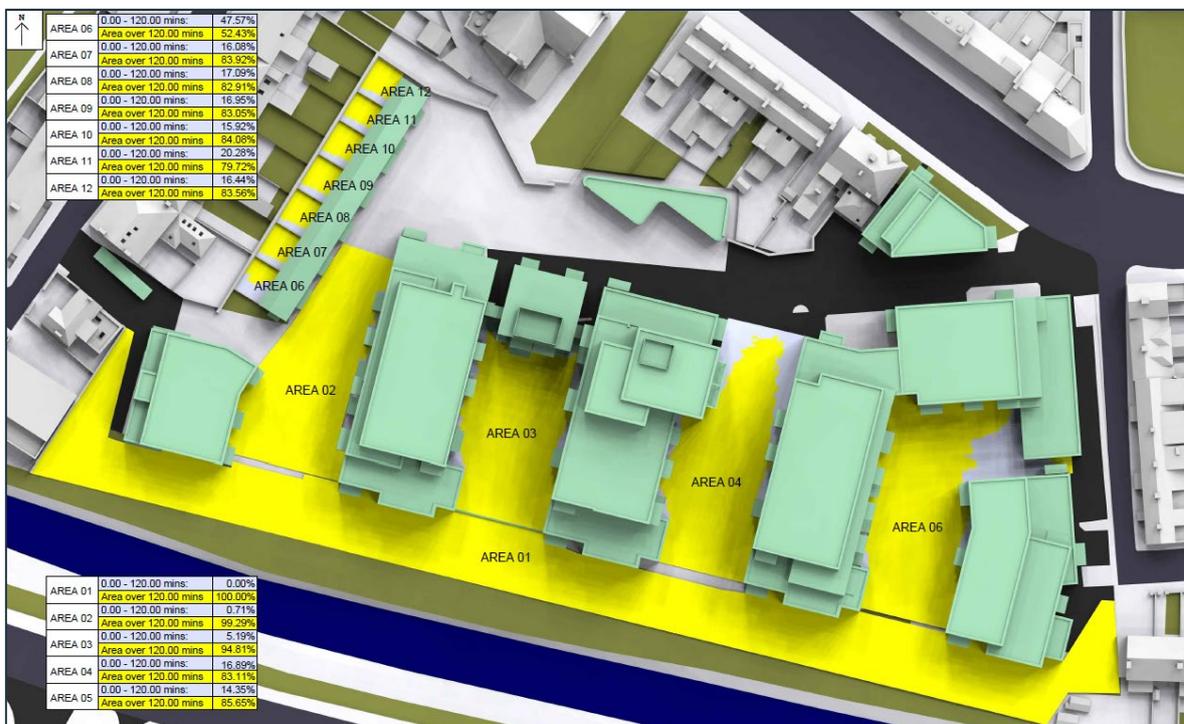


Figure 7: Sun Hours on Ground Overshadowing Assessment for proposed amenity areas within the Site – 21st April

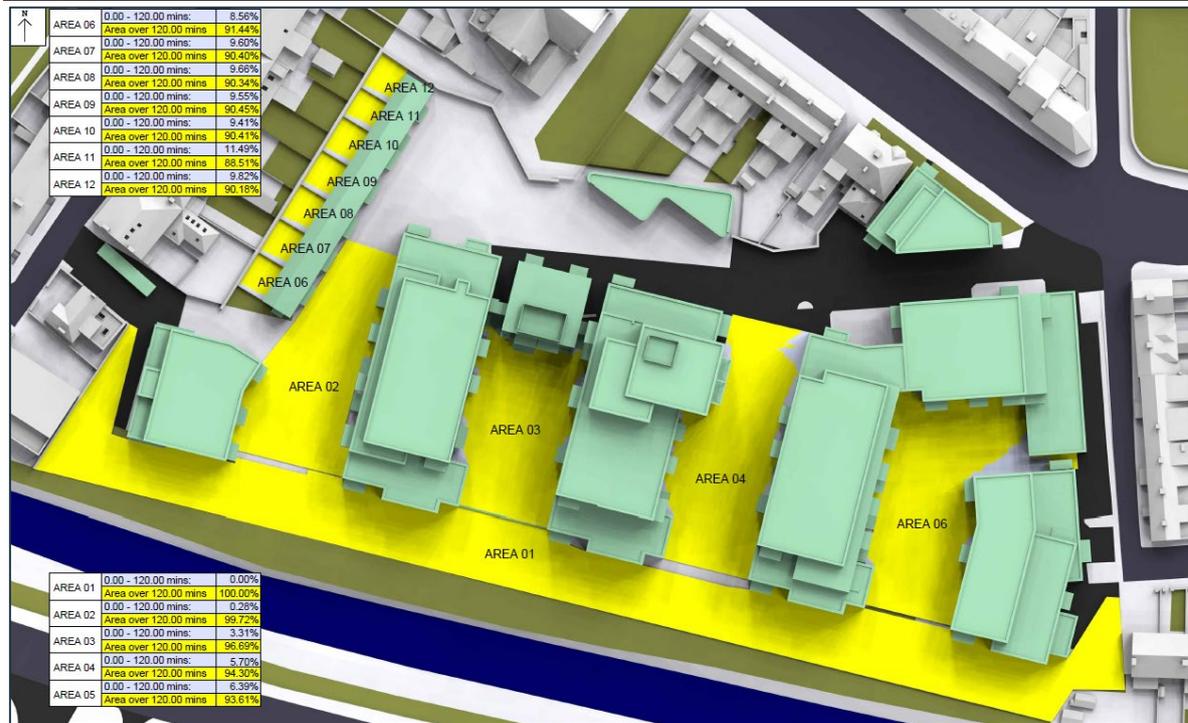


Figure 8: Sun Hours on Ground Overshadowing Assessment for proposed amenity areas within the Site – 21st June

Proposed Roof Terraces

Seven proposed roof terraces within the Site (Terraces 1-7) have been considered for SHOG assessment, as illustrated in Figures 09-11 (see also drawings BRE/8-10 located in Appendix 12).

21st March

The assessment demonstrates that five of the seven roof terraces will achieve two or more hours of direct sunlight to 54%-97% of their areas on 21st March.

The remaining two roof terraces No. 2 and No. 3 will achieve two or more hours of direct sunlight to 31% and 24% of their areas on 21st March.

These roof terraces are oriented north and thus are restricted in their access to sunlight amenity due to the sun’s trajectory from east to west throughout the day.

21st April

By the 21st of April all seven roof terraces will achieve two or more hours of direct sunlight to over 50% of their areas.

21st June

On 21st June (Summer Solstice) all seven (**100%**) roof terraces will achieve two or more hours direct sunlight to 94%-100% of their areas.

Summary

Overall, the effect of overshadowing to the proposed roof terraces is **negligible to minor adverse (not significant)**.

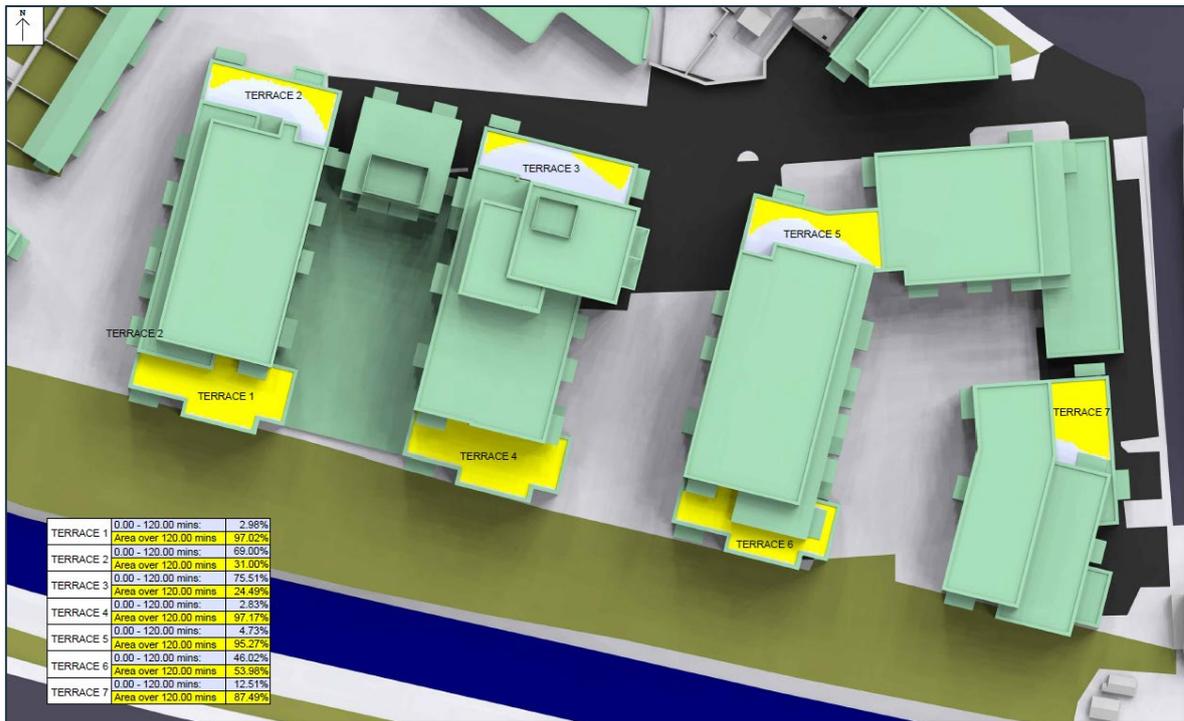


Figure 9: Sun Hours on Ground Overshadowing Assessment for proposed roof terraces within the Site – 21st March

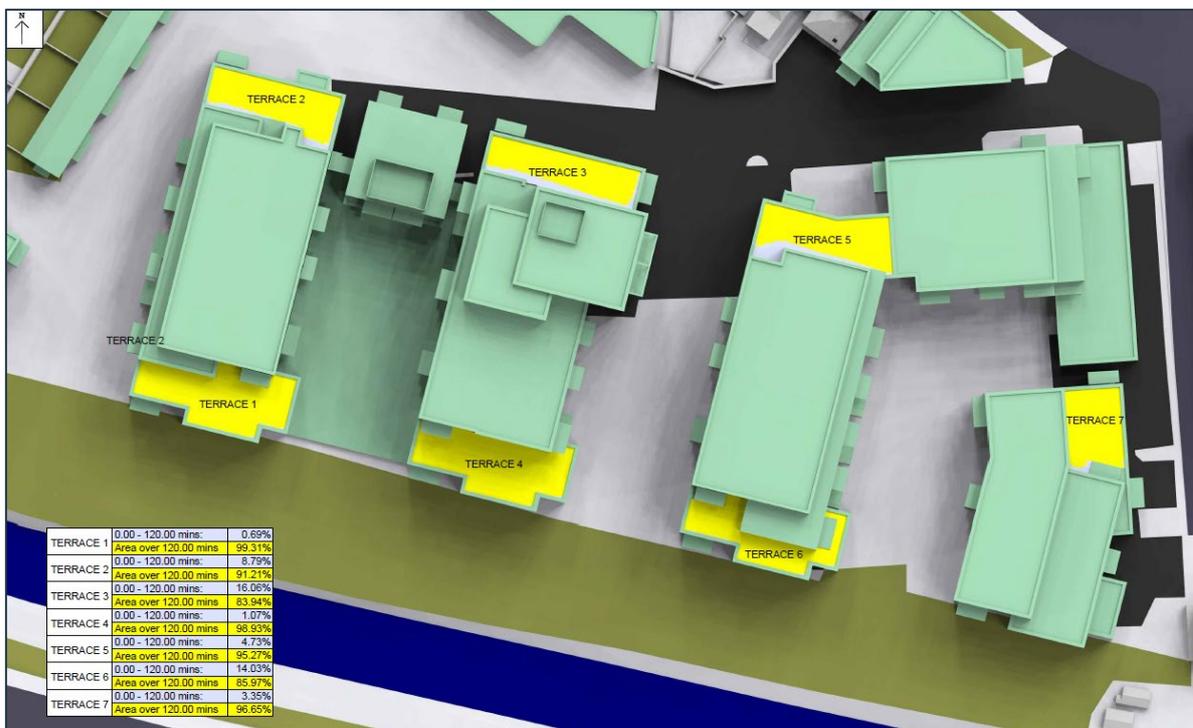


Figure 10: Sun Hours on Ground Overshadowing Assessment for proposed roof terraces within the Site – 21st April

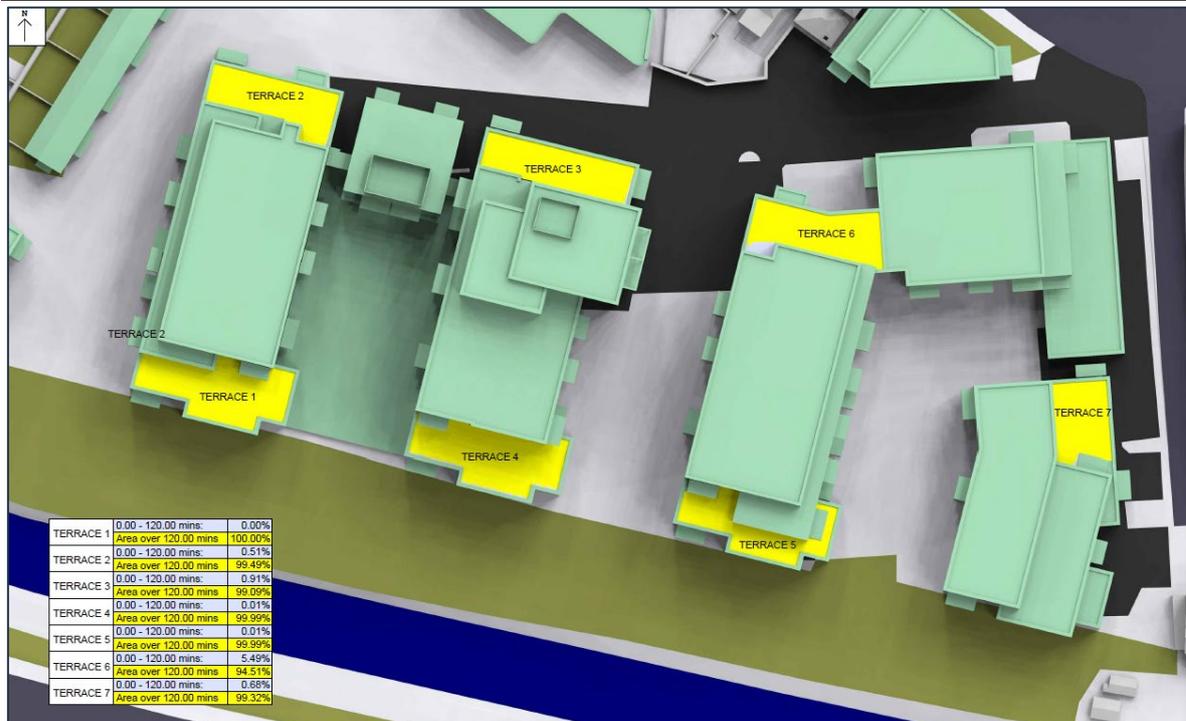


Figure 11: Sun Hours on Ground Overshadowing Assessment for proposed roof terraces within the Site – 21st June

Sunlight Amenity to Proposed Private Balconies

306 proposed private balconies and terraces in Buildings B01-07 have been considered for assessment, see drawings BRE/01-38 located in Appendix 13.

21st March

The assessment has been undertaken on 21st March.

Technical analysis indicates that of the 306 proposed balconies and terraces assessed in Buildings B01-07, 234 (**76%**) will achieve two or more hours of sunlight to over 50% of their areas on 21st March.

It should be acknowledged that where balconies/terraces will fall below the SHOG standard due to orientation, these spaces will still afford residents with high levels of private external daylight amenity.

Furthermore, all residents will have easy access to a number of shared amenity spaces within the Site that achieve high levels of direct sunlight amenity as previously discussed in this Chapter. Summary results for each building are detailed below:

Building B01: Of the 25 balconies/terraces assessed:

- 20 (75%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;

- The remaining five balconies/terraces (B1/400-404) are oriented north and therefore have lower access to sunlight.

Building B02: Of the 76 balconies/terraces assessed:

- 60 (79%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;
- The remaining 16 balconies/terraces (B1, B3, B10, B11/410; B1, B10, B11, B12/411; B10, B11, B12/412; B10, B11, B12/413; B10/414; B7/415) are oriented north or east and therefore have lower access to sunlight.

Building B03: Of the 74 balconies assessed:

- 56 (76%) balconies will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;
- The remaining 18 balconies (B14, B15, B16, B17, B20, B25/411; B14, B15, B16, B20, B25/412; B13, B14, B15, B19/413; B13, B15, B19/414) are oriented north, east or west and therefore have lower access to sunlight.

Building B04: Of the 64 balconies/terraces assessed:

- 47 (73%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;
- The remaining 17 balconies/terraces (B3, B4, B8, B9/430; B4, B8, B9, B10/431; B4, B9, B10/432; B4, B9, B10/433; B10/434; B9/435; B6/436) are oriented north, east or west and therefore have lower access to sunlight.

Building B05: Of the nine balconies assessed:

- Eight (89%) balconies will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;
- The remaining balcony (B11/451) is oriented south west and therefore has lower access to sunlight.

Building B06: Of the 30 balconies/terraces assessed:

- 20 (67%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;
- The remaining 10 balconies/terraces (B10, B11/430; B11, B12/431; B11, B12/432; B11, B12/433; B11, B12/434) are oriented north or west and therefore have lower access to sunlight.

Building B07: Of the 28 balconies/terraces assessed:

- 23 (82%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;

- The remaining five balconies/terraces (B19, B21/430; B15/431; B17/432; B17/433) are oriented north or east and therefore have lower access to sunlight.

21st April

The assessment has also been undertaken on 21st April.

Technical analysis indicates that of the 306 proposed balconies and terraces assessed in Buildings B01-07, 259 (**85%**) will achieve two or more hours of sunlight to over 50% of their areas on 21st April.

The results for each building are detailed below:

Building B01: Of the 25 balconies/terraces assessed:

- 20 (75%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st April;
- The remaining five balconies/terraces (B1/400-404) are oriented north.

Building B02: Of the 76 balconies/terraces assessed:

- 65 (86%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st April;
- The remaining 11 balconies/terraces (B1, B2, B10, B11/410; B10, B11, B12/411; B11, B12/412; B12/413; B7/415) are oriented north or east.

Building B03: Of the 74 balconies assessed:

- 64 (86%) balconies will achieve two or more hours of sunlight to over 50% of their areas on 21st April;
- The remaining 10 balconies (B14, B15, B16, B20/411; B14, B15, B16, B20/412; B15, B19/413) are oriented north or east.

Building B04: Of the 64 balconies/terraces assessed:

- 54 (84%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st April;
- The remaining 10 balconies/terraces (B4, B9/430; B4, B9, B10/431; B10/432; B10/433; B10/434; B9/435; B6/436) are oriented north, east or west.

Building B05: Of the nine balconies assessed:

- All nine (100%) balconies will achieve two or more hours of sunlight to over 50% of their areas on 21st April.

Building B06: Of the 30 balconies/terraces assessed:

- 22 (73%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st March and thus will meet the recommended BRE criteria;
- The remaining eight balconies/terraces (B10, B11/430; B11, B12/431; B11, B12/432; B11, B12/433) are oriented north or west.

Building B07: Of the 28 balconies/terraces assessed:

- 25 (89%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st April;
- The remaining three balconies/terraces (B19/430; B15/431; B17/432) are oriented north.

21st June

The assessment has also been undertaken on 21st June (Summer Solstice).

Technical analysis indicates that of the 306 proposed balconies and terraces assessed in Buildings B01-07, 291 (**95%**) will achieve two or more hours of sunlight to over 50% of their areas on 21st June and thus will be well sunlit when they are most likely to be in use during the summer months.

The results for each building are detailed below:

Building B01: Of the 25 balconies/terraces assessed:

- 23 (92%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st June;
- The remaining two balconies/terraces (B1/400-401) are oriented north.

Building B02: Of the 76 balconies/terraces assessed:

- 74 (97%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st June;
- The remaining two balconies/terraces (B3/410 and B7/415) are oriented north and east.

Building B03: Of the 74 balconies assessed:

- 71 (96%) balconies will achieve two or more hours of sunlight to over 50% of their areas on 21st June;
- The remaining three balconies (B16, B20/411; B16/412) are oriented east.

Building B04: Of the 64 balconies/terraces assessed:

- 58 (91%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st June;

- The remaining six balconies/terraces (B10/431; B10/432; B10/433; B10/434; B9/435; B6/436) are oriented north.

Building B05: Of the nine balconies assessed:

- All nine (100%) balconies will achieve two or more hours of sunlight to over 50% of their areas on 21st June.

Building B06: Of the 30 balconies/terraces assessed:

- 28 (93%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st June;
- The remaining two balconies/terraces (B10/430 and B11/431) are oriented west.

Building B07: Of the 28 balconies/terraces assessed:

- All 28 (100%) balconies/terraces will achieve two or more hours of sunlight to over 50% of their areas on 21st June.

Summary

Overall the effect of overshadowing to the proposed balconies and terraces is considered to be **minor adverse (not significant)**.

14.7.2.6 Proposed Amenity Areas within the Site - Transient Overshadowing

The transient overshadowing impact against the five proposed public amenity areas, seven private amenity areas and seven rooftop terraces within the Site previously discussed above has been considered.

For the purpose of this assessment the overshadowing has been mapped every hour for the following three key dates in the year:

- 21st March (Spring Equinox) - 7.00am-5.00pm;
- 21st June (Summer Solstice) - 6.00am-7.00pm; *and*
- 21st December (Winter Solstice) - 8.00am-3.00pm.

Drawings BRE/01-11 illustrate the proposed shadow for 21st March; drawings BRE/12-26 illustrate the proposed shadow for 21st June; and drawings BRE/27-35 illustrate the proposed shadow for 21st December; these images are presented within Appendix 6. The results are discussed below.

21st March

Area 1: will experience no overshadowing during the course of the day by the Proposed Development as it is located to the south of the Site.

Areas 2-5: The public amenity spaces between the buildings, will experience some overshadowing from 9am through to 1pm and then from 2pm through to 5pm.

Areas 6-12: Overshadowing to these private gardens will occur for most of the morning, with Areas 8-12 being well sunlit for most of the afternoon. Areas 6-7 will remain overshadowed for most of the daylight hours.

Roof Terraces 1-7: Roof terraces 1, 4, 6 and 7 will enjoy at least 2 hours of sun on ground to over 50% of their area on the spring equinox and will experience very little overshadowing as a result of the Proposed Development as they are located on the south and eastern elevations of the Proposed Development. Roof Terraces 2, 3 and 5 however are located on the northern elevations of the Proposed Development, therefore overshadowing to these spaces is inevitable on the 21st of March.

In consideration of the transient overshadowing assessment and also the SHOG overshadowing assessment on 21st March, overall the effect of overshadowing to these amenity areas is considered to be **minor adverse (not significant)**.

21st June

During the summer, shadows are shorter in length due to the higher position of the sun.

Area 1: will experience no overshadowing during the course of the day by the Proposed Development as it is located to the south of the Site.

Areas 2-5: The public/shared amenity spaces between the buildings, will experience some overshadowing from 9am through to 12pm and then from 2pm through to 5pm. However, the shadows move quickly throughout the day, limiting the quantum of long term shadowing.

Areas 6-12: Overshadowing to these private gardens will occur for most of the morning, however each space will be achieve good levels of sunlight potential over the course of the afternoon.

Roof Terraces 1-7: Roof terraces 1, 4, 6 and 7 will experience very little overshadowing as a result of the Proposed Development as they are located on the south and eastern elevations of the Proposed Development.

Roof Terraces 2, 3 and 5 however are located on the northern elevations of the Proposed Development, therefore some overshadowing to these spaces is inevitable. However, as the sun is higher in the sky, overshadowing to roof terraces 2 and 5 are limited. Roof terrace 3

still experiences some overshadowing due to its central positioning within the scheme, however the sun hours on ground assessments show that it will still be able to enjoy good levels of sunlight in the summer months.

In consideration of the transient overshadowing assessment and also the SHOG overshadowing assessment demonstrates that all newly proposed amenity areas will retain two or more hours direct sunlight to their areas on 21st June, overall the effect of overshadowing to these amenity areas is considered to be **negligible (not significant)**.

21st December

Area 1: will experience no overshadowing during the course of the day by the Proposed Development as it is located to the south of the Site.

Areas 2-5: The public amenity spaces between the buildings, will experience overshadowing from 9am through to 1pm and then from 2pm through to 5pm. However, the shadows move quickly and plenty of sunlight is able to reach the proposed public amenity spaces throughout the day.

Areas 6-12: Overshadowing to these private gardens will occur for most of the day with the exception of first thing in the morning, however each resident will have access to Areas 1-5 which will be well sunlit throughout the year.

Roof Terraces 1-7: Roof terraces 1, 4, 6 and 7 will experience very little overshadowing as a result of the Proposed Development as they are located on the south and eastern elevations of the Proposed Development. Roof Terraces 2, 3 and 5 however are located on the northern elevations of the Proposed Development, therefore overshadowing to these spaces is inevitable. Yet each resident will have access to Areas 1-5 which will be well sunlit throughout the year.

In consideration of the transient overshadowing assessment and given that it is not unusual for longer shadows to be cast at this time of the year due to the low trajectory of the sun in winter, overall the effect of overshadowing to these newly proposed amenity areas on 21st December is considered to be **minor adverse (not significant)**.

14.7.3 Summary of Supplementary CBDM Technical Analysis

The full set of EN 17037 and BS EN 17037 analysis can be found in Appendix 15.

European Standard: EN 17037

Proposed Development as a whole

- Total number of habitable rooms assessed: 805
- Total number of rooms which meet the 300-lux assessment: 352 (44%)
- Total number of rooms that meet the 100-lux assessment: 444 (55%)

British Standard: BS EN 17037

Proposed Development as a whole

- Total number of habitable rooms assessed: 805
- Total number of rooms which meet the 100-lux assessment (bedrooms) and 200 lux assessment (LKD's): 600 (75%)

14.7.4 'Do Nothing' Scenario

If the Proposed Development were not constructed, there would be no change in the daylight, sunlight and overshadowing levels currently enjoyed.

14.8 Mitigation Measures

14.8.1 Construction Phase

The potential daylight, sunlight and overshadowing effects during construction will gradually increase to be the same as the potential effects for the completed Proposed Development. Such effects during construction are expected to be less than that of the completed Proposed Development and therefore no mitigation measures will be required.

14.8.2 Operational Phase

14.8.2.1 Daylight and Sunlight

Residual levels of daylight and sunlight and overshadowing will be consistent with findings set out in this chapter and the associated technical appendices.

14.8.2.2 Overshadowing

Residual levels of daylight and sunlight and overshadowing will be consistent with findings set out in this chapter and the associated technical appendices.

14.9 Monitoring

This is not relevant to daylight, sunlight and overshadowing. No monitoring measures are required.

14.10 Reinstatement

This is not relevant to daylight, sunlight and overshadowing.

14.11 Potential Cumulative Impacts

We are aware of two Strategic Housing Developments known as the Bailey Gibson Site (*ABP Case Ref. 307221*) and Player Wills Site (*ABP Case Ref. 308917*) which are located to the north-east of the Proposed Development on the far side of South Circular Road.

In consideration of their location and distance in relation to the Site, they have not been considered relevant for consideration in terms of a cumulative assessment.

14.12 References

- Ref 1 Sustainable Urban Housing: Design Standards for New Apartments (2020);
- Ref 2 Urban Development and Building Heights: Guidelines for Planning Authorities (2018)
- Ref 3 Dublin City Development Plan 2016-2022
- Ref 4 Draft Dublin City Development Plan 2022-2028
- Ref 5 Buildings Research Establishment (BRE) (2011); Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition - BR 209
- Ref 6 British Standards Institution; BS8206-2: 2008 Lighting for buildings; Code of Practice for Daylighting
- Ref 7 European Standard: EN17037 / IS EN 17037
- Ref 8 British Standard: BS EN17037:2018 – Daylight in buildings



Chapter 15. Wind Microclimate

15.0 Climate (Wind Microclimate)

15.1 Introduction

IN2 Engineering Design Partnership has been commissioned by the Applicant to carry out an analysis of the impact of the proposed development on lands at White Heather SHD, South Circular Road, Dolphins Barn, Dublin 8 on wind microclimate in the surrounding area. To date, it is understood that no standards or guidance documents (statutory or otherwise) on the subject of wind microclimate around buildings have been prepared or published in Ireland.

In the absence of guidance on the matter, the analysis was undertaken using sophisticated Building Simulations performed with regards to Wind/ Pedestrian Comfort, in all cases validating results in accordance with robust best practice guidelines to ensure compliance. Wind Analysis was assessed utilising Airflow Simulation techniques, calculating predicted pressures and velocities throughout the proposed development site and its surroundings. These wind simulations were then compiled and assessed against Lawson Criteria Methodology- an assessment method for Pedestrian Comfort in order to predict activity suitability (sitting/ standing etc.) for persons in the vicinity of the development.

This chapter has been prepared by David Walshe and Eamonn Williams of IN2 Engineering. David Walshe is a Chartered Engineer (CEng) and member of Engineers Ireland. He has over 23 years experience of low energy design and building simulation and is responsible for overseeing Wind Microclimate, Daylight and Sunlight Analysis on all projects.

Eamonn Williams joined IN2 Engineering in 2019 as an Environmental Engineer. Since joining IN2 Eamonn has developed expertise on a range of Building Simulation techniques and Environmental Analysis, with particular specialism in Wind Microclimate, Daylight and Sunlight Assessments. He holds a Bachelor of Engineering (Hons) in Building Engineering from Technological University Dublin and is a Member of Engineers Ireland.

This Chapter and assessment have been completed having regard to the guidance outlined in the EPA documents Guidelines on information to be contained in EIAR (Draft, August 2017) and Advice note for Preparing Environmental Impact Statements (Draft, September 2015) as outlined under Chapter 1 of this EIAR.

15.2 Consultation

The assessment covers neighbouring buildings surrounding the proposed development. The impact of the proposal on adjacent existing buildings and amenity space along the canal was a topic throughout the design stages. Early-stage studies to quantify the wind microclimate conditions ensured that adjacent buildings and amenity spaces are not negatively impacted by the proposed development.

15.3 Methodology

15.3.1 Scoping

The wind flow around buildings can have an impact on pedestrian comfort and safety at ground level. The pedestrian-level wind environment is governed by the layout and massing of buildings. Tall buildings, in particular, can cause strong downward currents of air to pedestrian level. Good building design must ensure a pleasant and safe pedestrian level wind environment. A building can impact on winds in both its immediate and surrounding environment.

Adverse wind effects have potential to lead to financial or amenity loss due to people avoiding windy areas. In the most extreme cases, may lead to serious injury if people are blown over by strong winds.

15.3.2 Detailed Methodology

15.3.2.1 Wind Analysis

To determine the predicted wind patterns around the proposed development, airflow simulations were undertaken using Computational Fluid Dynamics (CFD) software (Phoenics). This enabled an assessment of the site wind conditions: highlighting zones of high pressure, negative pressure, and air movement for varying wind conditions.

An initial 3D representational model of the existing buildings and their immediate surroundings was created, and simulations undertaken for 12 cardinal wind directions.

In terms of microclimate assessment, wind data for the nearest meteorological station at Dublin Airport was utilised. Analysis is based on frequency of hourly wind speeds and direction data included in European Wind Atlas for Dublin Airport. Wind data and subsequent analysis is therefore based on hourly averages and does not include for example, intermittent gusting effects.

The CFD simulations utilised wind profiles accounting for terrain effects. Allowing for the nature of the site and location, a surface roughness layer profile representative of Dense Urban Terrain ($z_0=0.4\text{m}$ height) was utilised, derived from GIS survey analysis.

The methodology calculates predicted airflow patterns around buildings for all wind orientations and calculates average velocity applying weighting based on probability of occurrence throughout the year. It should be noted that wind effects around buildings for prevailing S/ SW wind conditions are deemed to have more of a potential impact to pedestrian discomfort, as these will occur on a more regular occurrence.

However, it should be noted that the methodology assesses averaged (hourly) wind conditions for the purposes of general pedestrian comfort and does not intend to predict gusting, abnormal nor potential future climate change conditions.

Nevertheless, the Lawson Criteria methodology basis has been proven to be a robust means of analysing Pedestrian Comfort and its basis has been successfully adapted and implemented in both National Standards (Netherlands NEN.8100) and Design Guidelines (City of London – Wind Microclimate Guidelines (2019)).

15.3.2.2 Pedestrian Comfort

Pedestrian Wind Comfort was assessed utilising the “Lawson Criteria” scale, which has been developed as a means of assessing the long term suitability of urban areas for walking or sitting, accounting for both microclimatic wind effects (i.e. site location and prevailing winds) and microclimatic air movement associated with wind forces influenced by the localised built environment forms and landscaping effects.

The original Lawson Criteria (as described in Building Aerodynamics, Tom Lawson, Imperial College Press, 2001) assesses probability of wind discomfort based on the Beaufort Scale as referenced in Figure 15.1.

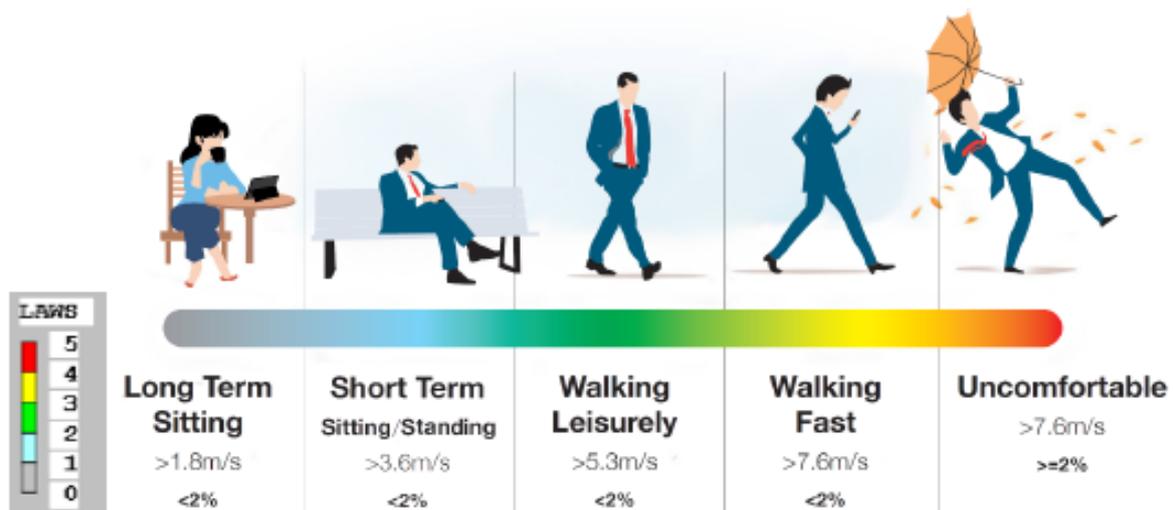
Figure 15.1 - Beaufort Scale

Beaufort Force	Hourly-Average Windspeed m/s	Description of Wind	Noticable Effect of Wind
0	<0.45	Calm	Smoke rises vertically
1	0.45 - 1.55	Light	Direction shown by Smoke drift but not by vanes
2	1.55 - 3.35	Light	Wind felt on faces: leaves rustle: wind vane moves
3	3.35 - 5.60	Light	Leaves and twigs in motion: wind extends a flag
4	5.60 - 8.25	Moderate	Raises dust and loose paper: small branches move
5	8.25 - 10.95	Fresh	Small trees in leaf sway
6	10.95 - 14.10	Strong	Large branches begin to move: telephone wires whistle
7	14.10 - 17.20	Strong	Whole trees in motion

Figure 15.2 illustrates the Lawson Criteria scale, which ranges from areas deemed suitable for long term sitting through to regions uncomfortable for pedestrian comfort. "Pedestrian Walking" areas, for example, are defined as areas that would not experience wind velocities in excess of 8m/s for more than 5% of the year, whereas uncomfortable areas would experience averaged wind velocities greater than 10m/s for more than 5% of the year.

The assessment identifies area where potential wind occurrence, based on probability of wind direction and speed, would either be mitigated (Outdoor Dining/ Pedestrian Sitting and Standing) or exacerbated (Business Walking/ Uncomfortable) due to proposed massing from potential developments.

Figure 15.2 - Lawson Scale



However, it should be noted that in terms of pedestrian comfort, the Lawson Criteria assesses solely for wind/associated air velocity effects. Therefore, other environmental aspects that may influence a space's microclimate, such as exposure to sunlight and envisaged temperature variation throughout the year are not accounted for within this methodology.

15.4 Receiving Environment

The subject site is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

From a Wind Microclimate perspective, the wind rose for the nearest weather station at Dublin Airport is shown in Figure 15.3. This data has been adjusted for the specific site at White Heather, which is relatively sheltered on a macro level, on the edge of the Dublin City

area. A surface roughness layer profile representative of “Dense Urban Terrain ($z_0=0.4m$ height)” was determined for the site, derived from GIS survey data. Wind profiles accounting for terrain effects are illustrated in Fig 15.4.

Figure 15.3 - Mean Wind Speeds At Dublin Airport - Eur Wind Atlas

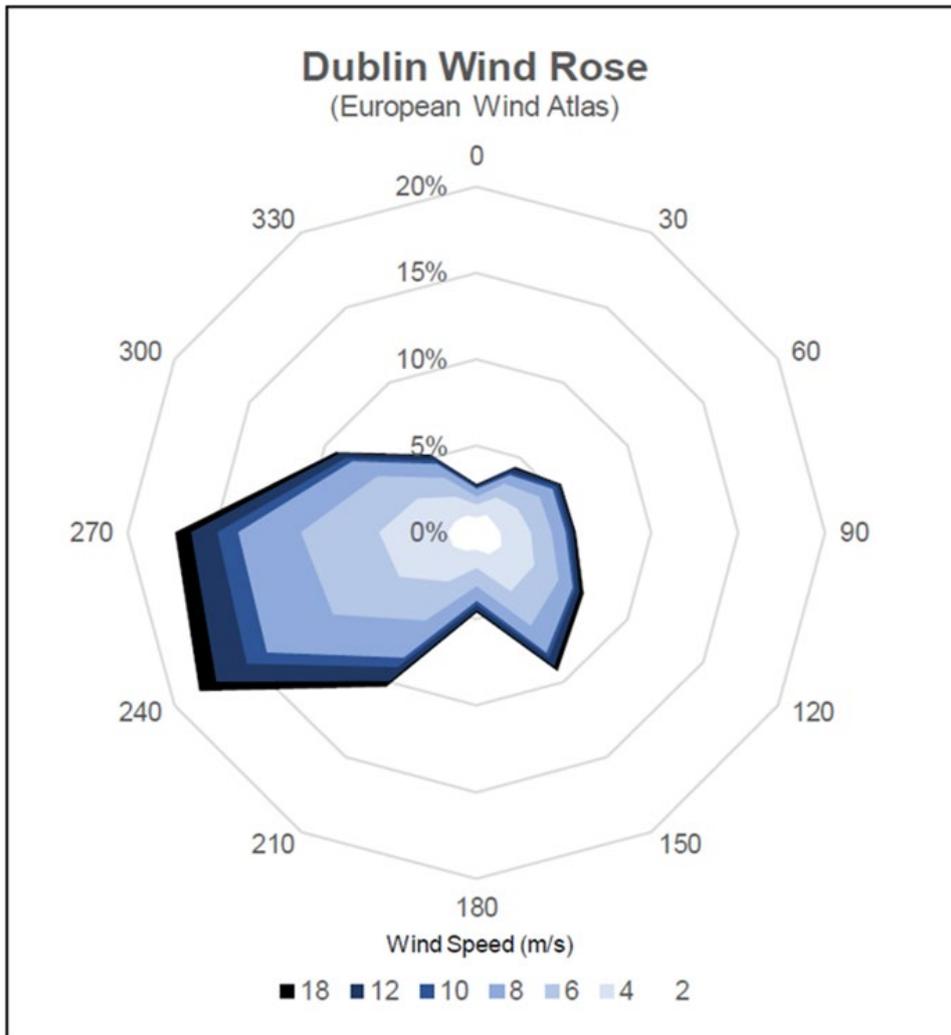
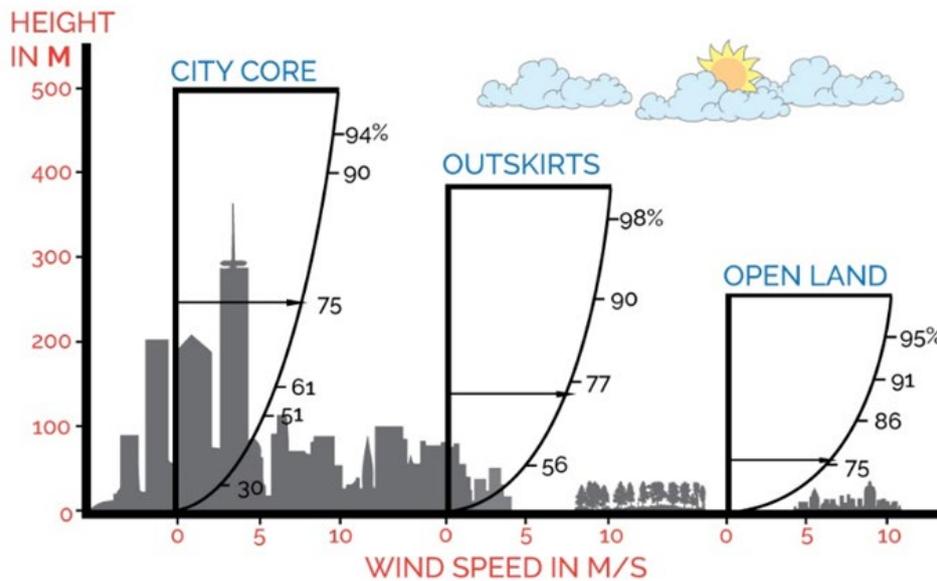


Figure 15.4 Wind Profiles accounting for Terrain Effects



15.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in

convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

The full detail of the nature and extent of the proposed development is set out in Chapter 2 of this EiAR.

15.6 Potential Impact of the Proposed Development

15.6.1 Construction Phase

The potential impact of the construction phase of the proposed development on wind microclimate is likely to be, initially, lesser than the potential impact of the completed development. As the proposed development nears completion, the potential impact of the emerging development is likely to be similar in all material respects to that of the completed development. It is noted that temporary structures and machinery (e.g. hoarding, scaffolding, cranes, etc.) have the potential to result in changes in wind microclimate, although any additional impacts arising from temporary structures or machinery are likely to be temporary and minor.

15.6.2 Operational Phase

As described in Section 3.0 of IN2 document "D2044 Microclimatic Wind Analysis and Pedestrian Comfort", which has been included with the Planning Submission, the proposed development is predicted to not negatively impact on its receiving environment.

The U-Shaped footprint of the proposed development provides a self-sheltering effect, resulting in comfortable wind conditions for users of both the public and private outdoor amenity spaces. The presence of landscaping in the centre of the development provides suitable sheltering and prevents regions of pedestrian discomfort being formed due to a "funneling effect".

Additionally, the proposed Canal Amenity to the South of the development is predicted to experience a comfortable wind environment, with all of this area deemed suitable for "Short/ Long Term Sitting" in accordance with the Lawson Criteria methodology utilised. While the majority of the 5th floor roof terraces are suitable for "Long/Short Term Sitting" localised mitigation measures such as trees and shrubbery were seen improve wind conditions in areas which were subjected to higher exposure.

All balconies across the development were assessed and deemed suitable for “Long/Short Term Sitting” according to the Lawson scale.

Therefore, the proposed development has been determined to not negatively impact on the wind microclimate in its receiving environment.

15.6.3 ‘Do Nothing’ Scenario

In a ‘Do Nothing’ scenario, there will be no change to the wind microclimate. Wind conditions would remain the same as they are at present.

15.7 Mitigation Measures

15.7.1 Construction Phase

Given that the potential impact of the proposed development on wind microclimate around neighbouring existing buildings surrounding the application site is likely to be zero, there is no scope for mitigation measures during the construction phase.

15.7.2 Operational Phase

Given that the potential impact of the proposed development on wind microclimate around neighbouring existing buildings surrounding the application site is likely to be zero, there is no scope for mitigation measures during the operational phase.

15.8 Predicted Impact of the Proposed Development

15.8.1 Construction Phase

The predicted impacts during the construction phase is the same as those presented in the potential impact section.

15.8.2 Operational Phase

The predicted impacts in operation phase are the same as outlined in the potential impacts section above.

The U-Shaped footprint of the proposed development provides a self-sheltering effect, resulting in comfortable wind conditions for users of both the public and private outdoor amenity spaces. The presence of landscaping in the centre of the development provides suitable sheltering and prevents regions of pedestrian discomfort being formed due to a “funneling effect”.

Additionally, the proposed Canal Amenity to the South of the development is predicted to experience a comfortable wind environment, with all of this area deemed suitable for “Short/ Long Term Sitting” in accordance with the Lawson Criteria methodology utilised.

While the majority of the 5th floor roof terraces are suitable for “Long/Short Term Sitting” localised mitigation measures such as trees and shrubbery were seen improve wind conditions in areas which were subjected to higher exposure.

All balconies across the development were assessed and deemed suitable for “Long/Short Term Sitting” according to the Lawson scale.

Therefore, the proposed development has been determined to not negatively impact on the wind microclimate in its receiving environment.

15.8.3 ‘Do Nothing’ Scenario

In a ‘Do Nothing’ Scenario, wind conditions would remain the same as they are at present.

15.9 Monitoring

Monitoring of avoidance, remedial and mitigation measures is not relevant to the assessment of impacts on wind microclimate in the case of the subject application.

15.10 Reinstatement

Reinstatement is not relevant to the assessment of impacts on wind microclimate in the case of the subject application. It is intended that the proposed development will be permanent.

15.11 Interactions and Potential Cumulative Impacts

15.11.1 Interactions

The proposed development has been determined to increase the area determined to be “Suitable for Sitting” in accordance with the Lawson Criteria within the proposed development. This results in an increase in the quantity and quality of amenity space which will be suitable for long term seated use. Therefore, the proposed development is predicted to have a positive interaction with population and human health.

15.11.2 Potential Cumulative Impacts

Planning permissions have been granted for the former Bailey Gibson site (ABP Ref. 307221) and former Player Wills site (ABP Ref. 308917).

The Bailey Gibson site is located to the North East of the proposed development, on the opposite side of the South Circular Road. The Player Wills site is located to the North East of the Bailey Gibson site.

Through CFD analysis of the proposed development and its interactions with its receiving environment, it has been determined that although the proposed development alters wind and airflow across its own site and immediate vicinity, this does not extend past the White Heather site boundaries, or beyond to the Bailey Gibson or Player Wills sites. From a wind and airflow perspective, the interaction between the proposed development and these two nearby developments is minimal.

As a result of this, the proposed development is not predicted to impact the wind environment at the Bailey Gibson or Player Wills sites.

Therefore, there are unlikely to be significant potential cumulative impacts on wind microclimate.

15.12 References

IN2 referenced the following documents or sources above:

- Environmental Protection Agency. 2002. Guidelines on the Information to be Contained in Environmental Impact Statements. Wexford: Environmental Protection Agency.
- Environmental Protection Agency. 2017. Guidelines on information to be contained in Environmental Impact Assessment Reports DRAFT. Wexford: Environmental Protection Agency.
- Environmental Protection Agency. 2015. Advice note for Preparing Environmental Impact Statements DRAFT. Wexford: Environmental Protection Agency.



Chapter 16. Landscape and Visual Impact Assessment

16.0 Landscape and Visual Impact Assessment

16.1 Introduction

This chapter assesses the landscape and visual impacts on the surrounding urban area of the proposed Strategic Housing Development at White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. This chapter and was prepared by ARC Architectural Consultants Limited.

This chapter was completed by W. H. Hastings B. Arch FRIAI, RIAI Grade 1 accredited Conservation Architect.

16.2 Consultation

ARC Consultants attended two Section 247 on-line pre-application meetings with Dublin City Council (DCC), one on the 6th of January 2021 and the second on the 21st of May 2021. At these meetings the likely landscape and visual impacts of the proposed development were discussed at some length, and DCC expressed some concerns about the potential impact of parts of the development when viewed from certain locations, particularly locations close to the development. The location from which photomontages might be prepared was also discussed. The design team made revisions to the scheme following the meetings with DCC.

16.3 Methodology

16.3.1 Scoping

The area around the subject site was visited on several dates in 2020 and 2021 to assess the potential visibility of the proposed development.

16.3.2 Detailed Methodology

Article 1 of the *European Landscape Convention* defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”. The purpose of this chapter is to assess how the existence of a proposed development might change how a surrounding area might be ‘perceived by people’ visually.

The preparation of this landscape and visual impact assessment has had regard to the *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report* (European Commission, 2017) and the draft *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*

(August 2017) prepared by the Environmental Protection Agency. It is noted that the EPA Guidelines, in categorising the extent of environmental impact, uses the term 'effects' in place of 'impacts'.

As has been noted in the European Commission's 2017 EIAR Guidance, the baseline, is not static but is something continuously evolving, and the assessment of the baseline should include all relevant considerations. An understanding of the history of the development of the surrounding area is necessary in order to understand what natural and human factors acted to form the urban landscape. Historical, cultural and social concerns are factors that inform the character of any landscape and need to be understood in assessing the effects on that landscape arising from the existence of proposed development. These factors are part of the baseline.

As has been noted in the European Commission's 2017 EIAR Guidance the perception of development by observers will be influenced by the context in which the development is seen. There are a number of quite different physical contexts from which proposed development on the White Heather lands is likely to be seen. When seen by observers travelling on local roads including the Parnell Road or the South Circular Road, the proposed development is likely to be viewed as a development of a similar or smaller scale to other developments seen along the Grand Canal Corridor. From some nearby roads, where existing development is modest in scale, the scale of the proposed White Heather development may appear jarring to some observers. Some observers are, therefore, likely to regard the existence of the proposed development as giving rise to significant landscape and visual effects, whereas others will not.

Awareness on the part of observers of other developments planned or under way in the local area is also an important factor in how observers will regard a proposed new development. There are extensive other developments in existence, under construction or approved along the Grand Canal and Cork Street corridors, and awareness of these developments is likely to influence how observers will respond to the White Heather development. Awareness of the fact that the inner suburbs of Dublin have been subject to continuous development for centuries and have been subject to major development for the last 50 years, is also central to how a new development will be regarded. Some observers may fall into the trap of believing that their surroundings are fixed and might, therefore, have a negative response to any new development. However, receiving environments are rarely fixed, and almost all observers will be aware of the rapid pace of development in Dublin, and will see the proposed development as simply a minor part of that trend.

The purpose of a landscape and visual impact assessment is, taken together with the full range of other documents lodged as part of a planning application, to assist in informing the decision making process.

Assessment of landscape and visual effects, has three main parts:

1. Analysis of the likely extent of visibility of a proposed development
2. Description of the visual sensitivity of the receiving environment and its consequent capacity to absorb development
3. Assessment of the objective extent of change in the visual character of the receiving environment likely to arise from the existence of the proposed development, and of the likely response of observers to that change.

The EPA draft Guidelines require that landscape and visual impact assessment be carried out in a manner that is systematic, impartial, and objective and independent. It is not the purpose of assessment to promote or advocate for the development. It is an important principle of impact analysis that the analysis should be capable of being repeated independently, and that repeated analysis should lead to the same conclusion. To facilitate this, the steps taken in the analysis of impacts should be clearly set out in an assessment report.

1. Analysis of the likely extent of visibility of a proposed development

The first task of a landscape and visual impact assessment is to assess the likely extent and nature of visibility of the proposed development. This includes determining from what locations the proposed development is likely to be visible and from what locations it will not be. It includes determining, where visible, how major or minor an element the proposed development will be in any view. The primary determining factors when assessing extent of visual impact are:

- (i) Whether a development will be visible or not;
- (ii) Where visible, how much of any view a development will occupy; and
- (iii) Whether or not a proposed development is the focus of a view.

Each of these factors affect the visual prominence of a proposed development.

The extent of visibility of a proposed development in any view tends to be directly related to the distance of the viewpoint from the development. However, intervening obstacles such as buildings or structures, trees and planting, and topography, can modify the extent of visibility of the proposed development. Where streets or urban spaces are aligned towards the site of a proposed development, and where the buildings or trees at the end of these alignments are relatively modest in height, there is a potential for taller developments to be visible above any lower intervening buildings or other obstacles. This potential increases with the length of the open foreground but reduces when the viewpoint is closer to any intervening obstacles. It follows, that for taller structures (e.g. taller than the

prevailing height of the surrounding built environment or landscape elements) to be openly visible, they must be seen across an open foreground or at the end of a long vista or alignment. From viewpoints within dense urban, or even suburban, environments, very modest buildings in the foreground can conceal even very large or tall structures from view.

An initial survey of the potential visibility of the proposed development was carried out by ARC on several dates in 2020, and further surveys of potential visibility were carried out in early 2021. Before visiting the surrounding area, ARC carried out mapping analysis to identify locations surrounding the application site, which would be representative of the extent of visibility of the proposed development, including locations from which views of the proposed development were likely.

Photomontages were prepared by Model Works from these view locations and these photomontages are appended to this report. ARC had regard to those photomontages in the preparation of this Landscape and Visual Impact Assessment.

2. Description of the visual sensitivity of the receiving environment and its consequent capacity to absorb development

As has been discussed above, the visibility of proposed development is mediated by the physical geometry of the receiving environment, including the pattern and form of the existing built environment. These are among the factors that determine the visual capacity of a receiving environment to absorb development. Among other characteristics are the visual character and uniformity of the receiving environment and its historical or cultural value.

An intact and uniform Georgian square, which is a coherent and integrated visual setting, would usually be regarded as visually sensitive with a consequent low capacity to absorb new development that might dilute the existing visual character. The same might be true of certain suburban environments. On the other hand, a centre city environment or dockland settings where there are structures of a diverse character and a wide range of scales are settings that are usually less sensitive and are likely to have a high visual capacity to absorb development. Locations that have a statutory designation as an architectural conservation area or locations where there are protected structures, because of such designations are usually regarded as having an increased visual sensitivity leading to a reduced visual capacity to absorb development. Other designations, such as special amenity area orders, designated views and prospects and designated high amenity zones, may also limit this absorption capacity. Capacity to absorb development, therefore, has a direct bearing on the extent of likely landscape and visual impacts / effects.

In areas that are very uniform in character the introduction of larger structures may change the visual character of the area. In established urban areas, the introduction of new large structures as part of a process of densification has the potential to give rise to substantial visual impacts / visual effects. The extent of this change will depend on the extent of difference in visual character between the new development and the existing surrounding visual environment. The extent of change is likely to be the main factor in determining the extent of landscape and visual impacts / effects.

3. Assessment of the objective extent of change in the visual character of the receiving environment likely to arise from the existence of the proposed development, and of the likely response of observers to that change

The list of definitions given below is taken from *Table 3.3: Descriptions of Effects* contained in the draft EPA *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*. Some comment is also given below on what these definitions might imply in the case of visual impact or landscape and visual impact. The definitions from the EPA document are in italics.

Imperceptible: *An effect capable of measurement but without significant consequences.* The definition implies that the development would be visible, capable of detection by the eye, but not noticeable to the casual observer. If the development were not visible, there could be no impact.

Not Significant: *An effect which causes noticeable² changes in the character of the environment but without significant consequences (the footnote “2” to the word “noticeable” is: “for the purposes of planning consent procedures”).* The definition implies that the development would be visible, capable of detection and of being noticed by an observer who is actively looking for the development with the purpose of assessing the extent of its visibility and visual effects.

Slight: *An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.* For this definition to apply, a development would be both visible and noticeable, and would also bring about a change in the visual character of the environment. However, apart from the development itself, the visual sensitivity of the surrounding environment would remain unchanged.

Moderate: *An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.* In this case, a development must bring about a change in the visual character of the environment; and this change must be consistent with a pattern of change that is already occurring or is likely to occur.

Significant: *An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.* The definition implies that the existence of the development would change an important characteristic of the visual environment in a

manner that is not “consistent with existing and emerging baseline trends”. Whether an effect might or might not be significant can depend on the response of individual observers, since what one person might regard as a sensitive aspect of the visual environment, another might not. A conservative approach, classifying effects as significant even though many observers might not regard them as significant, is taken here.

Very Significant: *An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.* The definition implies that the existence of the development would substantially change most of the visual characteristics of the environment in a manner that is not “consistent with existing and emerging baseline trends”.

Profound: *An effect which obliterates sensitive characteristics.* In visual terms, profound impacts are only likely to occur on a development site, in that it is only on the site that all previous visually sensitive characteristics could be obliterated. Outside the site, some visual characteristic of the original environment is likely to remain.

The range of possible effects listed above deal largely with the extent of impact; and the extent of the impact of a development is usually proportional to the extent to which that development is visible. The extent of impact will also, in part, depend on the sensitivity of the spaces from which the development is seen. This proportionality may be modified by the extent to which a development is regarded as culturally or socially acceptable. The character of the impact: positive, negative or neutral, will depend on how well a development is received by the public, and on the general contribution of the development to the built environment. The character of a landscape and visual impact, and even the duration of that impact, is very dependent on the attitude of the viewer. If a viewer is opposed to a new building for reasons other than visual, that viewer is likely to see the building in a negative light, no matter how beautiful the building might be. Although buildings are intended to be permanent, and will be permanently visible, the extent of visual impact associated with a building often diminishes with time as further development in the area takes place.

The Urban Development and Building Heights Guidelines for Planning Authorities

In December 2018, the Department of Housing, Planning and Local Government published the *Urban Development and Building Heights Guidelines for Planning Authorities*, which sets out the following development management criteria:

“In the event of making a planning application, the applicant shall demonstrate to the satisfaction of the Planning Authority/ An Bord Pleanála, that the proposed development satisfies the following criteria:

At the scale of the relevant city/town

- *The site is well served by public transport with high capacity, frequent service and good links to other modes of public transport.*
- *Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/ enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks, protection of key views. Such development proposals shall undertake a landscape and visual assessment, by a suitably qualified practitioner such as a chartered landscape architect.*
- *On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape.*

At the scale of district/ neighbourhood/ street

- *The proposal responds to its overall natural and built environment and makes a positive contribution to the urban neighbourhood and streetscape*
- *The proposal is not monolithic and avoids long, uninterrupted walls of building in the form of slab blocks with materials / building fabric well considered.*
- *The proposal enhances the urban design context for public spaces and key thoroughfares and inland waterway/ marine frontage, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure while being in line with the requirements of "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" (2009).*
- *The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is situated and integrates in a cohesive manner.*
- *The proposal positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood."*

The *Urban Development and Building Heights Guidelines for Planning Authorities* are referenced here in the interests of completeness. However, for the avoidance of doubt these guidelines, nor, indeed, any other planning policy guidelines (save those related to environmental impact assessment), were considered when classifying the magnitude and extent of potential visual impacts of the proposed development on the built environment.

16.4 Receiving Environment

The site of the proposed development is at present an industrial estate and was formerly the site of the White Heather Laundry, founded in 1899. There were a number of laundries in the area, drawing from the waters of the Grand Canal and the old City Watercourse.

Francis Elrington Ball in Part IV of his 'A History of the County of Dublin', published in 1906 begins his description of Dolphin's Barn as follows:

DOLPHIN'S BARN, The district known as Dolphin's Barn, which lies to the west of Harold's Cross between that place and Kilmainham on the South Circular Road, formed portion of the lands belonging to the Priory of the Hospitallers of St. John of Jerusalem at Kilmainham. It was originally called Karnanclonegunethe, and probably derived its present name from the Dolphin family, members of which are frequently mentioned in deeds of the thirteenth and fourteenth centuries relating to Dublin. One of them, David Dolfyn, who was in 1237 about to be sent to England with treasure belonging to the State appears to have been a tenant of the Kilmainham Priory, as it was found necessary to provide that he should not be summoned to the court of the Hospitallers during his absence, and a further indication of his connection with the neighbourhood is the fact that his companion on his journey was to be John de Kilmainham.

During the succeeding century many mills were erected in the Dolphin's Barn neighbourhood owing to the motive power provided for them by the city watercourse which passed through the district. This adaptation of the course for purposes other than a domestic one led to frequent complaints as to the contamination of the water. Particularly in the beginning of the seventeenth century, when, owing to the influence of Sir Thomas Roper, Baron of Bantry and Viscount Baltinglas, from whose family a place near Dolphin's Barn called Roper's Rest obtains its name, a mill" which caused much filthred" was allowed to stand on the course without interference. But when it was proposed to erect a tuckmill in its place the Corporation awoke to a sense of their duty and ordered Mr. Mayor at the first beginning of any nuisance or corruption to have it pulled down with the help of workmen and labourers.

Later Ball goes on to add:

During the early part of the eighteenth century Dolphin's Barn was celebrated on account of the hurling matches which were played there, and the death there in 1761 of "an eminent tanner and weaver," Mr. John Stephens, may perhaps indicate that it still preserved its character as an industrial centre.

The great event in the neighbourhood in the later part of the eighteenth century was the construction of the Grand Canal which completely altered its appearance. As first designed the canal started from James' Street, and the channel which leads from the Liffey at a point near Ringsend, and joins the original channel between Dolphin's Barn

and Kilmainham, was a subsequent addition. Before the advent of railways the canal carried passengers in what were known as fly-boats. These boats were light and narrow, and obtained their name from their being drawn by two or more horses which were ridden and proceeded at considerable speed.

The City Watercourse was created in the mid 13th century and brought water into the west end of the City of Dublin. At the City end of the Watercourse was a wedge shaped body of water called the City Basin. It was a little to the west of James's Gate, the mediaeval western gate to the City. The City Watercourse was created by diverting the flow of the River Dodder into the Poddle, quite far upstream. The flow of the Poddle was then divided near Kimmage, a little to the south of Mount Argus, by constructing a stone structure somewhat like a bridge abutment in the middle of the Poddle. This structure came to a point facing up stream and so divided the flow of water. The eastern half of the flow continued along the established course of the Poddle. The western half followed a new western course into the City, ending in the City Basin. The structure splitting the waters of the Poddle, which is still there, became known as the Stoneboat, and still bears that name.

An extract from John Rocque's Map of the County is reproduced below. This extract shows both the Poddle and the City Watercourse. The City Watercourse is shown flowing through Dolphin's Barn. Dolphin's Barn is shown on that map as quite a long street of houses, winding at the north end after the street crosses the City Watercourse, which was at approximately the location of the present bridge over the canal.

The branch of the Grand Canal that runs around the south of the City and past the site of the proposed development was built in 1791. Older maps show that the centre of Dolphin's Barn was south of the canal and was at the intersection of the present Crumlin Road, Sundrive Road and Herberton Road. This is very clearly shown on a map of Dublin by Thomas Larcom dated 1837. The old village of Crumlin was much further to the south west. On later maps, the southern part of the village of Dolphin's Barn has lost its identity after having been invaded by Crumlin, and only the northern end of Dolphin's Barn, that part north of the canal, retained its name.

Maps of the 1880s show a mill south of the canal, on the City Watercourse, Rutland Flour Mill. On the 25 inch Ordnance map of circa 1910 the flour mill has become a laundry. The 25 inch map also labels what had previously been Dolphin's Barn as Crumlin. That map also shows a huge 'clay pit' and extensive brickworks a distance to the south west along the Crumlin Road. The older maps indicate various quarries and pits in the general area, that must all have been associated with the making of 'Dolphin's Barn' bricks.

Figure 16.1: Extract from John Rocque’s Map of the County of Dublin of 1760

The map shows both ‘The City Water’ and the Poddle to the east. It shows Crumlin well to the southwest of Dolphin’s Barn. (On the map as reproduced below north is to the right)



Figure 16.2: Extract from Thomas Larcom's 'Map of the of the City of Dublin', 1837.

Dolphin’s barn is shown well outside the Grand Canal. The line of the City Watercourse is shown intersecting with the Canal at Dolphin’s Barn Bridge. (National Library of Ireland)



Figure 16.3: Extract from the First Edition Ordnance Map of circa 1837.

The townland of Dolphin's Barn is shown south of the Canal with that of Dolphin's Barn North above the Canal. Part of proposed development site is shown as 'Canal Docks'.

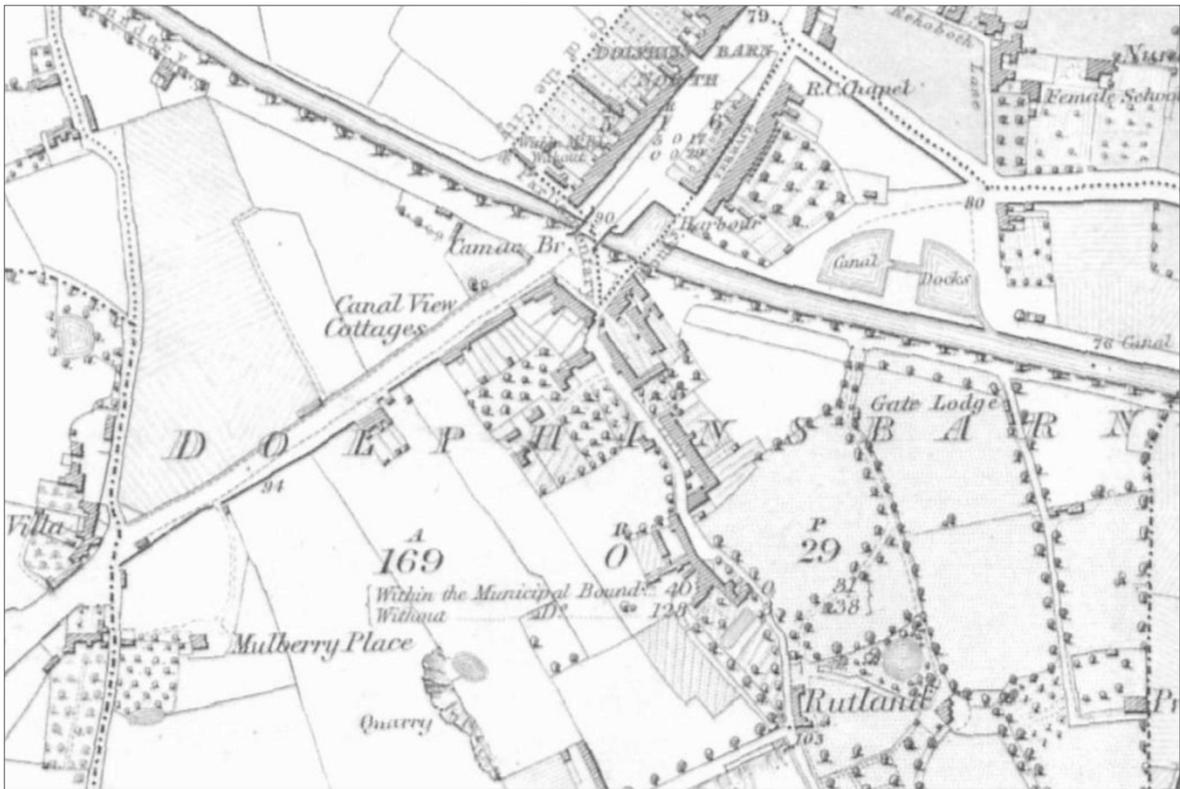


Figure 16.4: Extract from Ordnance maps of the 1880s

The Rutland Flour Mill is shown on the City Watercourse. The 'Canal Docks' on the site of the proposed development have shrunk in size



Figure 16.5: Extract from the 25 Inch Ordnance map of circa 1910.

A large 'Clay Pit' and 'Kilns' are shown at the southwest corner of the map. The Rutland flour mill is now a laundry, and the White Heather Laundry is shown at the northeast corner of the site of the proposed development.

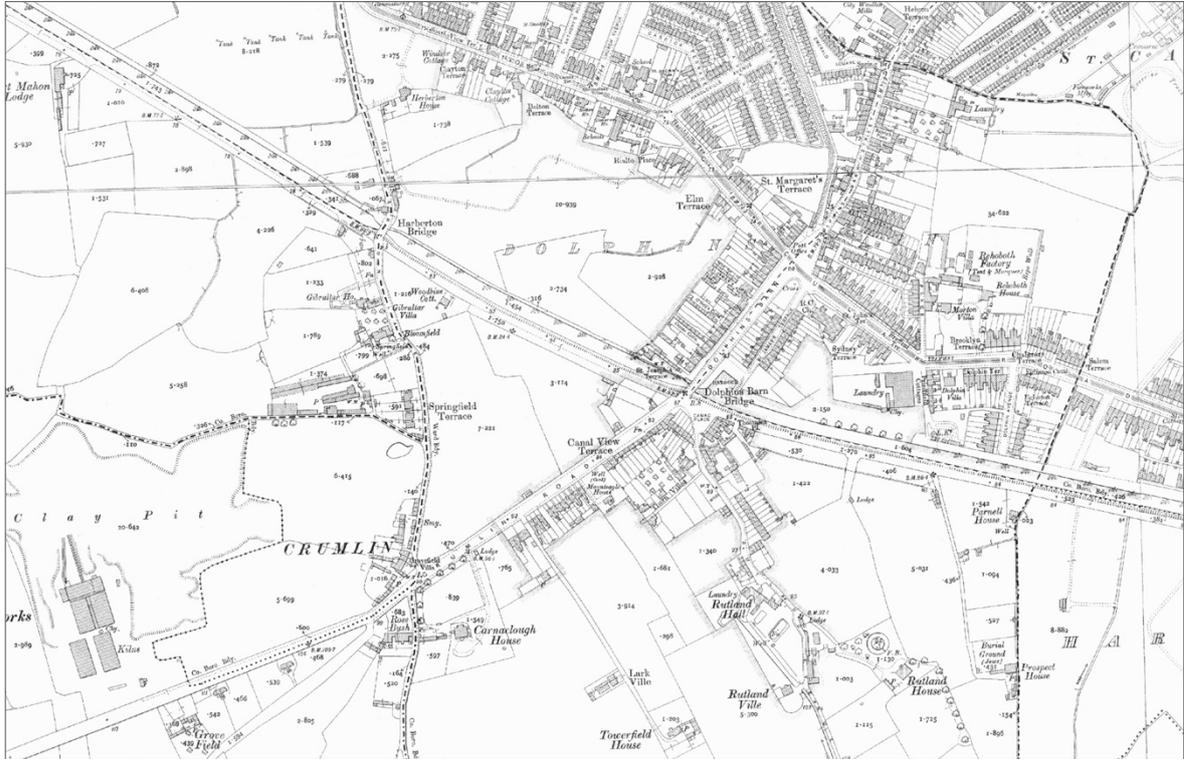
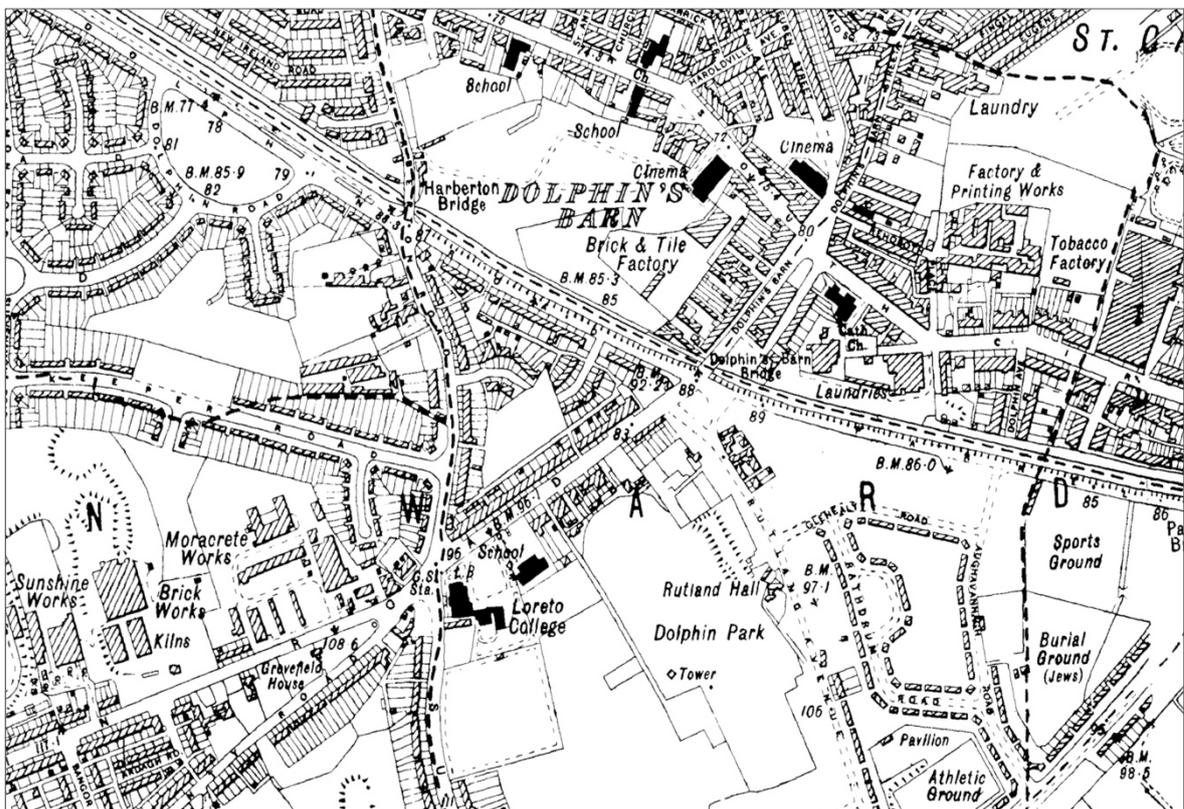


Figure 16.6: Extract from the Cassini map of the early 1940s.

The 'Brick Works' are still there, and on the White Heather site there are now 'Laundries'.



16.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

16.6 Potential Impact of the Proposed Development

16.6.1 Construction Phase

The extent of landscape and visual impact of the development during the construction phase is likely to be similar to that for the operational phase, as tabled below. The character of impacts during the construction phase is likely to be negative at first, tending to become neutral to positive as work proceeds and the new buildings and structures become apparent

16.6.2 Operational Phase

The site of the proposed development is at present occupied by industrial buildings. These buildings are generally modest in height. The proposed development ranges in height from 2 to 10 stories. The proposed development will, therefore, be taller than the generally 2 storey development along the South Circular Road to the immediate north and east of the subject site and the 2 storey houses on St James's Terrace to the west.

16.6.2.1 Potential Visibility

The proposed development will be visible along some sections of nearby streets and along nearby parts of the Grand Canal. The extent of visibility development is likely to be quite limited. From locations to the west and north, even nearby locations, visibility of the proposed development will be restricted to upper parts of one or two buildings in the scheme. From some locations to the east, upper parts of the development are likely to be seen as small elements in the distance, while from other locations to the east and south the proposed development is likely to be entirely concealed from view or be only just discernible in the distance.

From the Grand Canal, the development will be most openly visible from the south side of the canal immediately opposite to the subject site. The development will also be directly visible from Priestfield Cottages, St James's Terrace, Dolphin's Barn, Dolphin's Barn Bridge and the very northern end of the Crumlin Road.

The most open views of the proposed development are likely to be from a nearby sections of the South Circular Road to the north and northeast of the site. Two views from the South Circular Road northeast of the site will look into the entrance to the proposed development. It is proposed that the buildings either side of and framing this entrance will be of red brick matching the typical red brick of houses along that section of the South Circular Road. Other buildings along the periphery of the site are also proposed to use similar red brick at the interface with the existing surrounding development.

16.6.2.2 Visual Sensitivity of the Surrounding Urban Landscape

The surrounding built environment is quite varied in character and scale. In addition to typical two and three storey terraces along South Circular Road, there is extensive modern development in the area that is of a similar or greater scale to that of the proposed development. On the Dolphin's Barn Street at its junction with Reuben Street there is a cluster of development consisting of 4 storey, 6 storey, 8 storey and 12 storey buildings. The 5 storey Coombe Hospital is on the opposite side of Dolphin's Barn Street. Back along Cork Street there are numerous developments, many of 6 and 7 storeys, and more.

In addition to large existing developments, the Dublin City Development Plan, at SDRA12, calls for extensive dense and tall developments on the Bailey Gibson, Player Wills and St Teresa's Gardens sites, and a masterplan for these sites envisages buildings up to 22 stories in height.

16.6.2.3 Change in Visual Character

The existence of the proposed development will bring about changes in the visual character of the immediate surrounding. The existing buildings on the site are a variety of low industrial sheds. Even though the proposed development will include buildings that are larger in scale than the existing industrial sheds on the site, the residential character of the proposed development has the potential to provide a higher standard of visual amenity than what is on the site at present, and the scale of the proposed development is not out of character with that of other existing developments in the area. The proposed publicly accessible landscaped amenity strip along the bank of the Grand Canal is likely to make a very positive contribution to the visual character of the area.

16.6.2.4 Potential Landscape and Visual Effects

A survey of the potential visibility of the proposed development was carried out by ARC on several dates in the autumn and winter of 2020, and further surveys of potential visibility were carried out in early 2021. Following this, 15 view locations representative of the likely extent of visibility of the proposed development were selected, and photomontages were prepared from these view locations by Model Works. Following the tripartite meeting with An Bord Pleanála and Dublin City Council, The Bord issued an Opinion, and in that Opinion the Bord requested that photomontages be prepared from three additional locations, bringing the total number of photomontages to 18. These photomontages are appended to this document. The potential landscape and visual effects from each of the 18 view locations are tabled below, for each of the 18 view locations a description is also provided below.

Given the existing and emerging trends for extensive development in the surrounding area, the proposed White Heather development is likely to be seen as relatively modest in scale when compared to other existing and emerging developments in the immediate area. Where visible, the extent of landscape and visual effects arising from the existence of the development is likely to range from '*imperceptible*' where the development is only just visible to '*moderate*' where openly visible. In line with the terminology of the EPA Guidelines, this report assesses potential landscape and visual effects as '*moderate*' where the development is consistent with existing and emerging trends.

Figure 16.7: Photomontage Location Map

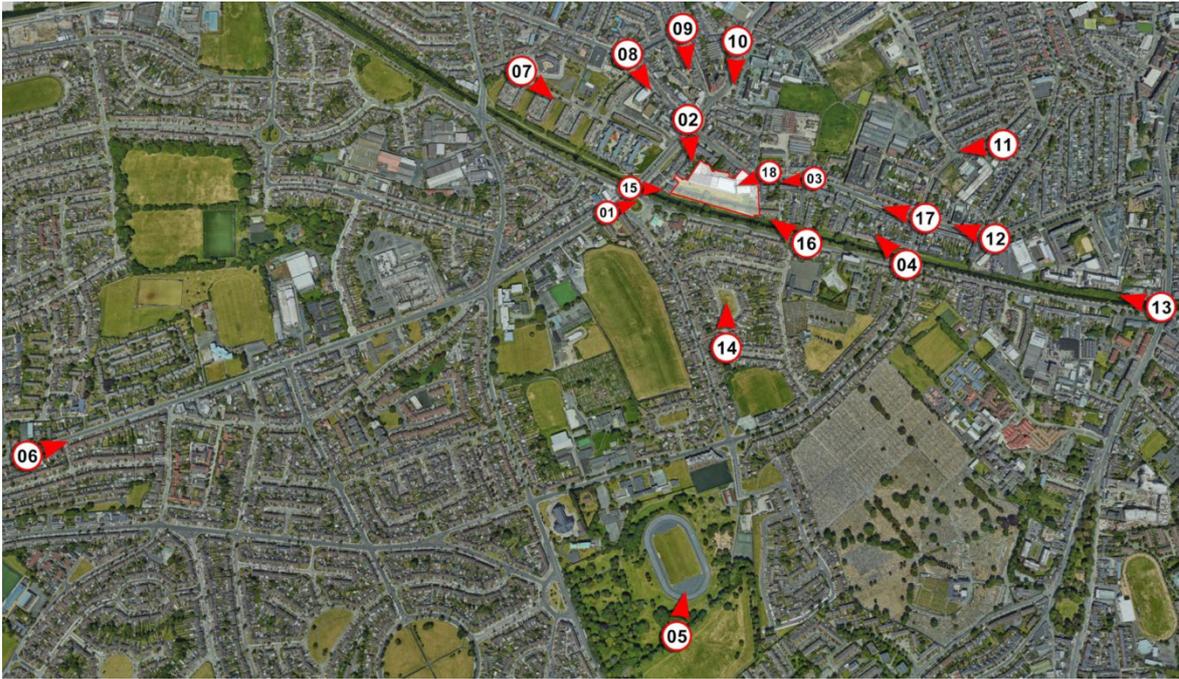


Table 16.1: Potential Landscape and Visual Effects

View	Location	Potential Effects
View 1	Crumlin Road at Rutland Avenue	Moderate
View 2	Dolphin's Barn at South Circular Road	Slight to Moderate
View 3	South Circular Road at Dolphin Avenue	Moderate
View 4	Sally's bridge at Donore Avenue	Slight to Moderate
View 5	Sundrive Velodrome	None to Imperceptible
View 6	Crumlin Road	Imperceptible to Slight
View 7	Dolphin Park	Imperceptible to Slight
View 8	South Circular Road at Haroldville Avenue	Slight to Moderate
View 9	Reuben Street at Haroldville Avenue	Slight
View 10	Dolphin's Barn St / Cork St at the Coombe Hospital	Slight to Moderate
View 11	Greenville Avenue at Wolseley Street	None
View 12	South Circular Road at the National Stadium	Slight
View 13	Emmet Bridge at Harold's Cross	None
View 14	Rathdrum Road	Moderate
View 15	Dolphin's Barn Bridge	Moderate
View 16	Parnell Road at Aughavanagh Road	Slight to Moderate
View 17	South Circular Road at Donore Avenue	Imperceptible
View 18	South Circular Road at Rehoboth Place	Moderate

16.6.2.5 View By View Descriptions

View 1 Crumlin Road at Rutland Avenue

This view looks north east from the west side of Crumlin Road opposite Rutland Avenue and some 50 metres south west of Dolphin's Barn Bridge. Dolphin's Barn Fire station, with its tower, is seen to the right of the view. Our Lady of Dolour's Church is seen in the middle distance to the left of the view. Trees lining the south side of the Grand Canal are seen in the centre of the view, running away to the east. In the view as proposed, upper levels of the proposed development are seen in the centre of the view, emerging from behind the trees along the Canal. The proposed development is a relatively modest element in the view. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed development will be less visible from this location in summer conditions with the trees in full leaf. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'moderate' in extent.

View 2 Dolphin's Barn at South Circular Road

This view looks south east from the north west corner of the junction between the South Circular Road and Dolphin's Barn. Our Lady of Dolour's Church is seen in the centre of the view and is the focus of the view. St James's Terrace is seen behind trees to the right of the view. A two storey building housing a chemist's shop is seen to the left of the view. In the view as proposed, small parts of the upper levels of the proposed development are seen in the centre of the view behind the roof and tower of Our Lady of Dolour's Church and behind St James's Terrace. The visible parts of the proposed development are minor elements in the view. The photograph for this view was taken in winter conditions with trees not in leaf. In summer conditions with the trees in full leaf, parts of the proposed development behind St James's Terrace will be fully screened from view. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'slight' to 'moderate' in extent.

View 3 South Circular Road at Dolphin Avenue

This view looks south west from the north side of the South Circular Road across from its junction with Dolphin Avenue. Existing industrial buildings on the site of the proposed development are seen in the middle distance in the centre of the view. The view is framed on both side by terraces of two storey red brick houses lining the South Circular Road. In the view as proposed, the entrance to the proposed development is seen in the middle distance framed by 5 storey red brick buildings on either side with other parts of the development seen beyond, taller elements of the proposed development rising behind the 5 storey red brick building to the left of the entrance. The buildings of the proposed development are substantial elements in the view and are the focus of the view. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed

development will be less visible from this location in summer conditions with the trees in full leaf. Given that the proposed development is consistent with existing and emerging development trends in the area, the landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'moderate' in extent, as defined by the EPA Guidelines.

View 4 Sally's bridge at Donore Avenue

This view looks north west from Sally's Bridge over the Grand Canal at Donore Avenue. The waters of the Grand Canal are seen in the foreground of this view and running away in a north westerly direction on the left side of the view. Allotments on the north bank of the Canal are seen in the centre of the view, with terraces of single and two storey houses behind. In the view as proposed, small parts of the upper levels of the proposed development are seen in the middle distance to the left of the view behind buildings and trees. The visible parts of the proposed development are minor elements in the view. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed development will be less visible from this location in summer conditions with the trees in full leaf. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'slight' to 'moderate' in extent in the winter, 'slight' in summer.

View 5 Sundrive Velodrome

This view looks north from the south end of Sundrive Velodrome at a distance of some 900 metres from the site of the proposed development. The Velodrome itself and trees around its perimeter are the dominant elements in the view. In the view as proposed, very small parts of the upper levels of the proposed development may be just visible in the distance to the centre right of the view behind buildings and trees. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed development is very unlikely to be visible from this location in summer conditions with the trees in full leaf. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'imperceptible' in extent in the winter, 'none' in summer.

View 6 Crumlin Road

This view looks north from the Crumlin Road near its junction with Rafter's Road and at a distance of some 1.5 kilometres from the site of the proposed development. In the view as proposed, parts of the upper levels of the proposed development may be just discernible in the distance in the centre of the view. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'imperceptible' to 'slight'

View 7 Dolphin Park

This view looks south east from Dolphin Park towards the site of the proposed development. In the view as existing, a number of the 4 storey apartment blocks of Dolphin House are seen to the right, with similar blocks seen to the left of centre in the middle distance. Behind these the 8 and 12 storey red brick buildings of the Earls Court development are seen a little further to the left. A recent 3 and 4 storey development is seen at the left edge of the view. In the view as proposed, small parts of the upper levels of the proposed development may be just visible in the distance to the centre left of the view behind buildings and trees. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed development is less likely to be visible from this location in summer conditions with the trees in full leaf. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'imperceptible' to 'slight'

View 8 South Circular Road at Haroldville Avenue

This view looks south east from the north side of the South Circular Road at its junction with Haroldville Avenue. Our Lady of Dolour's Church is seen in the middle distance in the centre of the view. The view is framed on the left by a terrace of 2 storey red brick houses along the north side of the South Circular Road, and on the right by 3 storey apartment blocks of Dolphin House and the white bulk of a former Rialto Cinema. Beyond these, on both sides of the South Circular Road are further 2 storey terraces of houses and shops running up to the junction with Dolphin's Barn. In the view as proposed, small parts of the upper levels of the proposed development are seen in the middle distance near the centre of the view behind buildings on the south side of the South Circular Road and Our Lady of Dolour's Church. The tallest element of the proposed development appears beside the tower of Our Lady of Dolour's Church. The visible parts of the proposed development are relatively minor elements in the view when compared with the bulk of the former cinema, behind and beyond which they are seen. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'slight' to 'moderate'.

View 9 Reuben Street at Haroldville Avenue

This view looks south east along Reuben Street from its junction with Haroldville Avenue towards Dolphin's Barn Street. The view is framed either side by 2 storey terraced houses on Reuben Street. In the centre of the view the 8 to 12 storey Earls Court development is seen on the east side of Reuben Street and the 3 to 6 storey Reuben Square development on the west side of the street. In the view as proposed, a small part of the upper levels of one of the buildings in the proposed development is seen in the distance near the centre of the view behind buildings on the east side of Dolphin's Barn Street. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'slight'.

View 10 Dolphin's Barn Street at the Coombe Hospital

This view looks south west along Dolphin's Barn Street from outside the Coombe Hospital. The Coombe Hospital is seen on the left of the view. The 8 to 12 storey Earls Court development is seen on the right of the view beyond and behind buildings on the west side of Dolphin's Barn Street, some of these buildings being disused and boarded up. The tower and part of the roof of Our Lady of Dolour's Church is seen in the middle distance near the centre of the view. In the view as proposed, upper levels of three of the buildings in the proposed development are seen in the distance near the centre of the view behind buildings on the east side of Dolphin's Barn Street and in part behind the Church. In the context of the Coombe Hospital on the left and the Earls Court development on the right, the proposed development does not seem out of place. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'slight' to 'moderate'.

View 11 Greenville Avenue at Wolseley Street

This view looks south west along Greenville Avenue from its junction with Wolseley Street, looking in the direction of the site of the proposed development. The view is framed on the left by a 2 storey house on Wolseley Street and on the right by the rear of buildings on Merton Avenue. Buildings on Donore Avenue are seen in the middle distance in the centre of the view, and behind them part of the former Player Wills factory. In the view as proposed, the proposed development is not visible, being concealed behind buildings in the middle distance, and its hidden location is represented by a red outline. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as none.

View 12 South Circular Road at the National Stadium

This view looks west from the north side of the South Circular Road across from the National Stadium. The view is framed on both side by terraces of two storey red brick houses lining the South Circular Road. The gable end of the Dublin Mosque is seen near the left side of the view. In the view as proposed, parts of the taller elements of the proposed development are seen in the distance behind houses on the south side of the South Circular Road. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'slight'.

View 13 Emmet Bridge at Harold's Cross

This view looks west along the Grand Canal from Emmet Bridge at Harold's Cross. The Grand Canal and Parnell Road occupy the left half of the view and a fuel supply yard and Griffith College are seen to the right. In the view as proposed, the proposed development is not visible, being concealed behind buildings in Griffith College, and its hidden location is

represented by a red outline. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as none.

View 14 Rathdrum Road

This view looks north towards the location of the proposed development across a green space in the centre of an established 2 storey housing estate at Rathdrum Road. The semi-detached and terraced houses of the estate fill the view. The top of the tower and the top of Our Lady of Dolour's Church and part of the top of the 12 storey Earls Court building are seen in the distance to the left of centre in the view. In the view as proposed, parts of the taller elements of the proposed development are seen in the distance behind houses at the north side of the green space at Rathdrum Road. The colours of the proposed development blend well with those of the Rathdrum Road Houses. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed development will be less visible from this location in summer conditions with the trees in full leaf. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'moderate'.

View 15 Dolphin's Barn Bridge

This view looks east from a traffic island in the centre of Dolphin's Barn Bridge. The eastern parapet of the bridge is seen in the foreground with the Grand Canal behind to the right and buildings on the east side of Dolphin's Barn to the left. The tower and part of the roof of Our Lady of Dolour's Church are seen to the far left. Industrial buildings on the subject site are just visible in the centre of the view behind other structures in the middle ground. In the view as proposed, buildings of the proposed development are receding along the north bank of the Grand Canal. Publicly accessible open space and a cycleway that form part of the proposed development are seen between the buildings and the Canal. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'moderate' in extent.

View 16 Parnell Road at Aughavanagh Road

This view looks north west from the south pavement of Parnell Road a short distance east of the junction of Parnell Road with Aughavanagh Road. The view looks through a gap in the trees lining the canal on the north side of Parnell Road. In the view as proposed parts of the proposed development are seen in the middle distance behind trees. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed development will be less visible from this location in summer conditions with the trees in full leaf. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'slight' to 'moderate' in extent.

View 17 South Circular Road at Donore Avenue

This view looks west from the South Circular Road at the north east corner of the junction of Donore Avenue with the South Circular Road. In the view as proposed, the proposed development is almost entirely concealed behind buildings on the south side of the South Circular Road, and its hidden location is represented by a red outline. A very small section of the uppermost part of the proposed development is just discernible through winter trees and behind chimneys. The photograph for this view was taken in winter conditions with trees not in leaf. It is unlikely that the proposed development will be visible from this location in summer conditions with the trees in full leaf. The landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'imperceptible'.

View 18 South Circular Road at Rehoboth Place

This view looks south west from the north side of the South Circular Road at its junction with Rehoboth Place. Existing industrial buildings on the site of the proposed development are seen in the middle distance in the centre of the view. The view is framed on both side by two storey red brick houses on the South Circular Road. In the view as proposed, the entrance to the proposed development is seen in the middle distance framed by 5 storey red brick buildings on either side with other parts of the development seen beyond, taller elements of the proposed development rising behind the 5 storey red brick building to the left of the entrance. The buildings of the proposed development are substantial elements in the view and are the focus of the view. The photograph for this view was taken in winter conditions with trees not in leaf. The proposed development will be less visible from this location in summer conditions with the trees in full leaf. Given that the proposed development is consistent with existing and emerging development trends in the area, the landscape and visual effects likely to result from the existence of the proposed development as seen from this view location are assessed as 'moderate' in extent, as defined by the EPA Guidelines.

16.7 Mitigation Measures**16.7.1 Construction Phase**

See Outline Construction Management Plan

16.7.2 Operational Phase

No mitigation measures are proposed. However, it should be noted that, while the landscaping proposed as part of this application will, of itself, result in changes in the visual environment, many would consider boundary and other hard and soft landscaping works to result in positive changes and to have a mitigating effect on the visual impact of new development.

16.8 Predicted Impact of the Proposed Development

16.8.1 Construction Phase

The extent of landscape and visual impact of the development during the construction phase is likely to be similar to that for the operational phase, as tabled above. The character of visual impacts during the construction phase is likely to be negative at first, tending to become neutral to positive as work proceeds and the new buildings and structures become apparent.

16.8.2 Operational Phase

Since no mitigation measures are proposed, predicted residual landscape and visual impacts will be as described for potential impacts above. Visibility of the proposed development is likely to be largely restricted to locations relatively close to the application site. While the existence of the proposed development is likely to result in a significant change to the visual environment from some nearby viewpoints, having regard scale and the pattern of development that has taken place in the area, proposed changes on the White Heather lands are likely to be considered by many observers to be consistent with existing and emerging trends for development in the area.

16.8.2.1 Risks to Human Health

The Institute of Public Health in Ireland in *Health Impacts of the Built Environment: a review* highlights the implications of visual amenity and attractiveness within the built environment for human health as follows: *“Deteriorating physical features of urban environments, vandalism, graffiti and litter can harm health. Studies have highlighted how such environments can impact on both mental and physical health through reduction in physical activity, increased anxiety among residents and increased social disorder.”* The document also notes that people are more like to exercise, *inter alia*, *“if the scenery is enjoyable”*. Whereas *Health Impacts of the Built Environment* notes that the visual environment plays a role in human health, it does not provide any recommendations with regard to the visual environment and human health

In this regard, it should be noted that the character of the impact of changes to the visual environment on human health (positive, negative or neutral) will depend on how well a development is received by the public, and on the general contribution of the development to the built environment. The character of a visual impact, and even the duration of a visual impact, is very dependent on the attitude of the viewer. If a viewer is opposed to a new building for reasons other than visual, that viewer is likely to see the building in a negative light, no matter how beautiful the building might be.

16.8.3 ‘Do Nothing’ Scenario

In the Do Nothing scenario no development will take place.

16.9 Monitoring

Monitoring is not applicable to this chapter.

16.10 Reinstatement

Reinstatement is not applicable to this chapter.

16.11 Interactions and Potential Cumulative Impacts

16.11.1 Interactions

As is always the case where a development will result in a change to the visual environment of an area, the landscape and visual impacts of the development will result in interactions with population and human health, material assets and cultural heritage (including architectural and archaeological heritage)

16.11.1 Potential Cumulative Impacts

A review of the Dublin City Council online planning register did not identify any developments for which permission has been granted and is not under review by the courts, which, in combination with the development now proposed, would have the potential to result in material cumulative impacts on the visual environment surrounding the application site.

16.12 References

Ball, Francis. (1906) *A History of the County Dublin: Part IV*. Dublin: Alex. Thom & Co.

Ordnance Survey maps (available from: <https://shop.osi.ie/shop/>)

Rocque, John. (1760). *Map of the County of Dublin*.

16.13 Legal Notice

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Chapter 17. Cultural Heritage – Archaeology

17.0 Cultural Heritage - Archaeology

17.1 Introduction

IAC Archaeology has prepared this chapter in order to assess the impact, if any, on the archaeological and cultural heritage resource of a proposed redevelopment of the existing White Heather Industrial Estate, South Circular Road, Dublin 8 (ITM 713869, 732690, Figure 17.1). The assessment has been undertaken by Faith Bailey of IAC Archaeology.

Faith is an Associate Director and Senior Archaeologist and Cultural Heritage Consultant with IAC Archaeology. She holds an MA in Cultural Landscape Management (archaeology and built heritage) and a BA in single honours archaeology from the University of Wales, Lampeter. She is a licence eligible archaeologist, a member of the Chartered Institute of for Archaeologists, a member of the Institute of Archaeologists of Ireland and has over 18 years' experience working in the commercial archaeological and cultural heritage sector.

Figure 17.1 Site location



17.2 Methodology

Research for this report was undertaken in two phases. The first phase comprised a paper survey of all available archaeological, historical and cartographic sources. The second phase involved a field inspection of the site.

17.2.1 Desktop Resources

- Record of Monuments and Places for County Dublin;
- Sites and Monuments Record for County Dublin;
- National Monuments in State Care Database;
- Preservation Orders List;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Dublin City Development Plan 2016–2022;
- Dublin City Industrial Heritage Record;
- Aerial photographs;
- Excavations Bulletin (1970-2021)

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as ‘un-located sites’ and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DoHLGH) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument.

The Minister for the DoHLGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act.

Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

- Down Survey Map, Barony of Newcastle, c. 1655
- John Rocque's Map of the City and County of Dublin, 1760
- John Taylor's Map of the Environs of Dublin 1816
- William Duncan's Map of the County of Dublin 1821
- Ordnance Survey maps of County Dublin, 1843-1938

Documentary sources were consulted to gain background information on the archaeological, architectural and cultural heritage landscape of the proposed development area.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The Dublin City Development Plan (2016–2022) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development area.

Dublin City Industrial Heritage Record (DCIHR) makes recommendations for sites to be added to the Record of Protected Structures (RPS) in the City Development Plan and is maintained by DCC. It is a policy of the Council to implement the recommendations of the DCIHR (Policy FC68).

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely

potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey and Google Earth.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970-2021.

17.2.2 Field Inspection Methodology

Field inspection is necessary to determine the extent and nature of archaeological and historical remains, and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The archaeological field inspection entailed -

- Walking the proposed development and its immediate environs.
- Noting and recording the terrain type and land usage.
- Noting and recording the presence of features of archaeological or historical significance.
- Verifying the extent and condition of any recorded sites.
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

17.2.3 Types of Effects

Types of effects are defined as per the draft EPA guidelines (pg 23, 2017). Effects can be positive, neutral or negative and may be direct or indirect in nature.

Imperceptible

An effect capable of measurement but without noticeable consequences.

Not significant

An effect which causes noticeable changes in the character of the environment but without noticeable consequences.

Slight

An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.

Moderate

An effect that alters the character of the environment in a manner that is consistent with existing or emerging trends.

Significant

An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.

Very Significant

An effect which, by its character, magnitude, duration or intensity alters the majority of a sensitive aspect of the environment.

Profound

An effect that obliterates sensitive characteristics.

17.2.4 Guidance and Legislation

The following legislation, standards and guidelines were consulted as part of the assessment.

- National Monuments Acts, 1930-2014;
- Planning and Development Act (as amended);
- Heritage Act, 1995;
- Environmental Protection Agency (EPA) 2015 Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (Draft Sept. 2015). Dublin, Government Publications Office;
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR) (EPA 2017). Dublin: Government Publications Office;
- Guidelines on the Information to be Contained in Environmental Impact Statements, (EPA, 2002);
- Advice notes on Current Practice in the Preparation of Environmental Impact Statements, (EPA, 2003);
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.

17.2.5 Consultations

A number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the background environment, receiving environment and study area, as follows:

- Department of Housing, Local Government and Heritage – the Heritage Service, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland; and
- Dublin City Council: Planning Section.

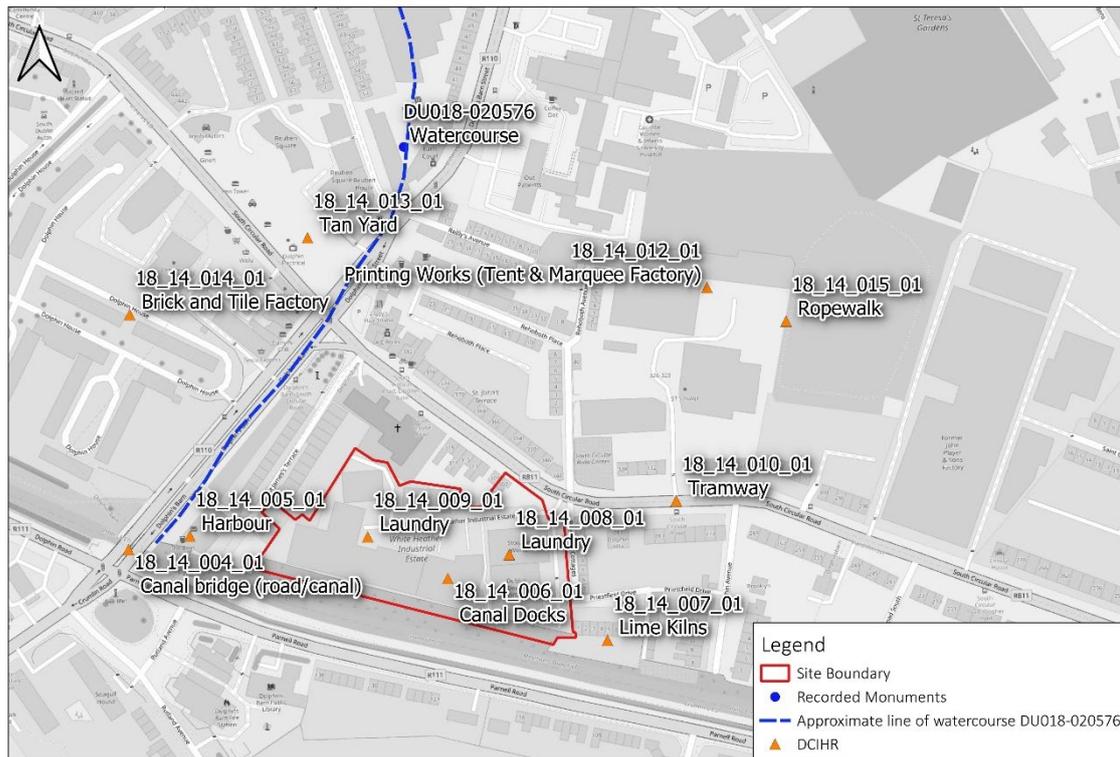
17.3 Receiving Environment

17.3.1 Archaeological and Architectural Background

The proposed development area comprises the existing White Heather Industrial Estate in Dublin 8. The site is situated on the northern bank of the Grand Canal, which forms its southern boundary and to the south of South Circular Road, which forms part of the northern boundary. It is located outside the Zone of Archaeological Potential for Dublin City (DU018-020); however, the zones of archaeological potential for three recorded monuments are located within a 200m radius of the proposed development. These sites all comprise of historic watercourses (DU018-020576, DU018-020692 and DU018-043002). The closest of these, DU018-020576, is located c. 58m to the north. The site is bordered by residential properties along Priestfield Cottages/Priestfield Drive to the east and along St James Terrace to the west. Further residential properties and Our Lady of Dolours Church (a protected structure, RPS 1894), lie to the north along South Circular Road.

There are two DCIHR sites located within the White Heather Industrial Estate, which originally formed the early 20th century White Heather Laundry (No. 18 14 008 01 and No. 18 14 009 01). Neither structure is extant today. Also within the proposed development area is the site of a canal docks, visible on early 19th century mapping and included in the DCIHR as No. 18 14 006 01. A further eight sites within a 200m radius of the proposed development area are included within the DCIHR.

Figure 27.2 Archaeological sites in the vicinity of the proposed development area



17.3.1.1 Prehistoric Period (8000 BC– AD 500)

Although recent discoveries may push back the date of human activity by a number of millennia (Dowd and Carden 2016), the Mesolithic period (c. 8000–4000 BC) is the earliest time for which there is clear and widespread evidence of prehistoric activity in Ireland. During this period people hunted, foraged and gathered food and appear to have had a mobile lifestyle. There is no recorded evidence of early prehistoric activity within the area surrounding the site. However, the River Liffey and Dublin Bay would have made Dublin an attractive location for occupation given the resources available in riverine/coastal environments (Clarke 2002, 1). Mesolithic deposits have been identified within the former estuarine area associated with the River Liffey and along the shores of Dublin Bay, north and south (Mitchell 1972). Mesolithic fish traps were excavated from within estuarine layers at Spencer Dock, c. 3km to the northeast (McQuade and O'Donnell 2007).

During the Neolithic period (4000–2500 BC) communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. There are no previously recorded archaeological sites dating to this period within the vicinity of the proposed development. However, the River Liffey and estuary would have remained as major resources to be exploited during this period, proven by the Neolithic fish trap discovered within the estuarine silts at Spencer Dock (McQuade and O'Donnell 2007).

Evidence for Bronze Age (2500–800 BC) activity is similarly focused upon the River Liffey and remains of a burnt spread dating to the early Bronze Age have been excavated on the northern shore of the Liffey at Hammond Lane, c. 1.8km northeast of the proposed

development area (Licence Ref.: 16E0080, Bennett 2003:535). This activity may relate to domestic or industrial activity and suggests nearby settlement. Further evidence for early Bronze Age activity was uncovered at Kilmainham, in the form of a small cremation cemetery located on a gravel ridge overlooking the Liffey. The cemetery comprised of six burial pits, each of which contained cremated human bone (Licence Ref.: 02E0067, Bennett 2006:665).

The first evidence for Dublin acting as a significant fording point or routeway dates to the late Bronze Age. An extensive wooden riverside revetment, c. 130m long, was excavated at Islandbridge, c. 1.8km northwest of the proposed development area. Dates from the timbers ranged from the late Bronze Age into the Iron Age and the structure may have been associated with a fording place at Kilmainham (Licence Ref.: 07E0261, Bennett 2007:519).

Evidence for fording of the Liffey in the Iron Age was identified at Ormond Quay at the confluence of the Liffey and one of its northern tributaries, the River Bradogue, c. 3.4km to the west of the proposed development area. The earlier of the two prehistoric structures found at this site was a timber braced gravel bank with an associated pathway made of hurdles (pre-fabricated wattle panels), which was in turn succeeded by a brushwood platform. The structures were located at the river's edge and were radiocarbon dated to c. 160-60 BC. (Licence Ref.: 04E1206, 2008:428). They may relate to activities associated with exploiting the resources along the river's floodplain or, given the site's proximity to the supposed location of the 'ford of the hurdles' at Usher's Island (discussed below), they may have been associated with a crossing point of the Liffey.

17.3.1.2 Early Medieval Period (AD 500–1100)

The area now known as County Dublin straddled the ancient Kingdoms of Brega (north of the River Tolka) and Laigin (south of the Tolka). The name Dublin (Duiblinn), meaning black pool, is generally taken to refer to the tidal pool that was located at the confluence of the Poddle and Liffey directly southeast of the site of the present Dublin Castle; c. 2km northeast of the proposed development area. This pool gave its name to an early ecclesiastical foundation the first secure reference to which dates to AD 790 when the Annals of Ulster state that 'Siadal, abbot of the church of Duiblinn died,' (Duffy 2014, 17).

Two distinct names for Dublin are encountered in the contemporary sources, these being Duiblinn and Baile Áth Clíath – the settlement of the ford of the hurdles. A 12th century poem, the *Senchas Gall*, states that the inhabitants of Dublin 'do not know at all of what kind the hurdle-ford was,' (Boyle and Breatnach 2015, 45) suggesting that a bridge had replaced the ford some time previously. The ford is believed to have crossed the Liffey at the point between Ormond Quay to the north and Usher's Quay to the south.

Howard Clarke has suggested that Dublin formed as two separate settlements which would explain why the town has two names: Duibhlinn for the ecclesiastical enclosure, and Baile Áth Cliath for the secular settlement, developed to guard over the 'ford of the hurdles', (1990, 58). Clarke identified the possible position of the ecclesiastical enclosure as a roughly pear-shaped boundary 335m north-south by 260m east-west c. 1.7km northeast of the proposed development area (2002, 2). The alignment of Stephen Street Upper, Peters Row and White Friars Street may represent a remnant of this oval ecclesiastical enclosure (DU018-020389). Clarke equates Baile Áth Cliath with a confluence of streets at Cornmarket close to St Audoen's Church (2002, 1-2). It has been suggested that the Duibhlinn ecclesiastical foundation may have served as the chief church of a minor dynastic group – the Uí Fergusa, who were part of a confederation that extended their hegemony over the province of Leinster from AD 738 to 1042. This may well be the case given that Bishop Siadal of Duibhlinn (d. 790) was of sufficient status to be mentioned in the same annalistic entry as list of seven kings and nobles who died in that year – 'among them the church-heads of Glendalough and Downpatrick,' (Duffy 2014, 17).

Clarke's identification of the Duibhlinn foundation has been challenged in recent years as excavations at St Peter's Church, purportedly in the northwest quadrant of Clarke's enclosure identified ditches and burials that are likely to be of 11th-15th century date, but did not encounter any earlier material (Duffy 2019). The excavation of portions of the St Michael-le-Pole graveyard close to the banks of the Duibhlinn and the dating of several burials to 7th-10th centuries (Licence Ref.: 04E0237, Bennett 2004:0546) would seem to confirm this as the location of the original ecclesiastical enclosure.

There are no Viking or early medieval sites recorded within the closer vicinity of the proposed development area, although the presence of the noted waterways within the landscape means that the area was likely utilised by the population. Another major routeway, the Slighe Dála, led west from the city through the Dolphins Barn area.

17.3.1.3 Medieval Period (AD 1100–1600)

Following the Anglo-Norman invasion of Ireland in 1169, the medieval town of Dublin enjoyed a period of renewed prosperity and development, which continued until the beginning of the 14th century. The Anglo-Norman administration was responsible for reinforcing the town walls with defensive towers. Further improvements to the defences involved erecting a number of gates on the built-up streets outside the walls and supplementing the defensive gates already in place along the town wall itself (Halpin 2000, 34).

It was also during this period that the first substantial reclamations of land occurred along the Liffey at Woodquay (Halpin 2000, 34). The 1192 Dublin Charter admitted that citizens

were free to “improve themselves in making buildings.... upon the water,” implying that land was being reclaimed from the river at that date.

Most of the extramural expansion of Hiberno-Norse Dublin had taken place in the area between the Poddle and the Steine Rivers; however, the Anglo-Normans established ‘Liberties’ or areas of private jurisdiction, outside the city walls which promoted the growth of suburbs. Housing extended along the main routes out of Dublin to the north, south and west. The ‘Liberties’ refers to pre-reformation law that stated these areas were administered by the abbeys and monasteries instead of civil law.

The proposed development area lies at the southern boundary of Donore Liberty, one of the most important liberties adjoining the jurisdiction of the mayor of the city. This liberty is mentioned in Archbishop Allen’s register of 1529 and originally belonged to the Abbey of St Thomas. During the 16th century, when the dissolution of the monasteries by Henry VIII led to the suppression of a large number of religious houses, the Liberties of Thomas Court and Donore were granted to William Brabazon, ancestor of the Earls of Meath. At the dissolution, St. Thomas’s Monastery had in its possessions a ‘carrucate of land called Denour’ – comprising mostly arable and woodland with three watermills (on the Poddle). It has been suggested that the former nucleated settlement of the 13th century was dispersed by this recording in the 16th century (Bradley 1990).

The site of Donore Castle and mills (DU018-047001-2) are recorded on the RMP mapping c. 400m east of the proposed development area. The castle was included in the RMP on the basis of its representation on the first edition six-inch OS map, after which it appears as ‘site of Donore Castle’. There is a local tradition that castle remains were incorporated into 18th and 19th century industrial buildings on site; however, Bradley (1990) did not identify any older material during the Urban Archaeological Survey. Bradley concluded that there was no visible surface trace of medieval mills and it was only possible that any fabric may have been incorporated into the 19th century buildings.

In the medieval period the surrounding lands still served predominantly as farmland, part of a hinterland that helped to feed Dublin’s inhabitants. The ancient Slighe Dhála (‘highway of the assemblies’; now leading west through Dolphins Barn Road, Cork Street and the Coombe), was flanked by agricultural fields and abbey millstreams. The River Poddle and two of the Liffey tributaries enclosed an area of high ground from Ardee Street as far as New Row and from the Coombe to Mill Street. Excavations along the course of the Poddle have produced evidence for extensive archaeological remains dating from the 12th century to the 19th century. The original course of the Poddle (DU018-043004) ran c. 500m east of proposed development. This section of the Poddle was referred to by Sweeny (1991) as the Abbey Stream. It was re-routed in the 13th century to provide a water supply (DU018-043002) within the town. Water mills were built on its banks to grind corn for the increasing population.

While work on the city watercourse (DU018-043002) began in the 13th century, its path was formalised with stone revetments in 1605 and a section in Dolphins Barn was rebuilt in 1754. The zone of archaeological potential (ZAP) for the city watercourse is located c. 75m southwest of the proposed development area. The ZAPs for two further watercourses, DU018-020576 and DU018-020692, are located c. 58m north and c. 195m north respectively.

17.3.1.4 Post-Medieval Period (AD 1600–1800)

During this period Dublin city changed in plan, function, and composition. It moved from a decaying colonial outpost to a cosmopolitan 'city of the Empire' (Boyd 2006). In 1610, Speed's map of Dublin largely depicted the last snapshot of a medieval city, which more or less had occupied the same structural framework for the previous 600 years. In 1756, John Rocque's map captured a transformed city. The reasons for this are multifaceted. In 1538, the Dissolution of the Monasteries changed the ecclesiastical landscape of Dublin and many of the former monasteries were repurposed. The development of lands along the Liffey that had been part of the margins of the river, or low-lying land adjacent, was also undertaken at this time. Land reclamation was carried out initially in the 17th century in the area of the walled town and gradually progressed eastwards.

The Earl of Meath Liberties (Donore and Thomas Court) appealed to the new breed of entrepreneur: the availability of undeveloped land and agricultural raw materials; the closeness to the city without Corporation regulations; and a plentiful supply of water. Donore Castle (DU018-047001) may have been replaced or incorporated into a house known as 'Ropers Rest', which is shown on the mid-17th century Down Survey Barony Map of Newcastle. The house is illustrated as being surrounded by the River Poddle.

During the 18th century the Grand and Royal Canals were excavated, essentially creating a boundary line around the expanding city, the Circular Line of the Grand Canal passing immediately south of the proposed development area. A harbour, named after John Husband, was constructed as part of the Circular Line c. 30m west of the proposed development and is recorded in the DCIHR (No. 18 14 005 01). The harbour has since been filled in, as have the canal docks recorded within the proposed development area (DCIHR No. 18 14 006 01). The docks are visible on Duncan's map of 1821 and the first edition OS mapping (1843), but have been filled in by the time of the 1912 OS map. Immediately west of the harbour, Dolphins Barn Bridge (DCIHR No. 18 14 004 01), built in c. 1791, crosses the Grand Canal. The Circular Road was also constructed around this time immediately north of the proposed development area (Figure 3).

Due to the easy access to water in the form of the city watercourse and the associated weirs, this area flourished in the 18th and 19th centuries as an industrial area. Rocque's mid-18th century maps indicate numerous mills and tenter fields in the vicinity fed by the City

Watercourse (DU018-043002); flowing north towards the Liffey. The two watercourses located to the north of the proposed development (DU018-020576, DU018-020692) appear on historic mapping to be sections of the City watercourse, the original line of which may pass as close as c. 60m west of the proposed development. Aside from the bridge, harbour and canal docks discussed above, a further eight structures recorded in the DCIHR lie within a 200m radius of the proposed development, including a ropewalk (No. 18 14 015 01), a print works (No. 18 14 012 01), a tanning yard (No. 18 14 013 01) and a brick and tile factory (No. 18 14 014 01). Lime kilns are recorded immediately east of the proposed development area (No. 18 14 007 01). Within the proposed development area itself, the White Heather Laundry was constructed in the early 20th century and two of its buildings are recorded by the DCIHR (Nos. 18 14 008 01 and 18_14_009_01), but neither structure remain present today.

While textile production, brewing and distilling were the city's dominant industries, tanning had a significant concentration in the Liberties, particularly in the vicinity of Dolphin's Barn, Cork Street, Watling Street and James's Street (Goodbody 2014, 6.). Both archaeological excavations and the Census Returns indicate that by the end of the 19th century the Dublin tanning industry was in serious decline (Corran 1973, 88).

17.3.2 Previous Archaeological Investigations

A review of the Excavations Bulletin (1970–2021) has revealed that no previous archaeological investigations have taken place within the proposed development area. Four previous investigations have taken place within 200m of the proposed development, none of which have revealed any features or deposits of archaeological significance (Table 17.1).

Table 17.1: Previous Archaeological Investigations

Licence Ref.	Location	Type of Investigation	Distance From Scheme
05E0315	Rutland Avenue	Testing	c. 140m southwest
03E1021	Dolphins Barn Street	Assessment	c. 110m north
00E0876	Reuben Street	Assessment	c. 155m north
11E0432	The Coombe University Hospital	Monitoring	c. 200m north

17.3.3 Cartographic Sources

17.3.3.1 Down Survey Map, Barony of Newcastle, c. 1655

Whilst this map does not provide a detailed depiction of the area of the proposed development, it does provide a general illustration of the wider area. The proposed development lies in an area marked 'pt of Dolphens borne' between two branches of the River Poddle, (dividing at 'the tongue', marked to the south) and to the west of a house marked as Ropers Rest. The western of the two branches of the Poddle depicted is likely to

represent the diversion creating the City Watercourse. Three buildings are depicted in this area, and a feature possibly representing the watercourse recorded on the RMP north of the proposed development (DU018-020692), which appears to continue from the City Watercourse.

17.3.3.2 John Rocque's Map of the City and County of Dublin, 1760 (Figure 17.3)

This map shows the landscape containing the proposed development in greater detail. It is located within greenfields with the River Poddle (DU018-043004) depicted to the east. The site lies near the junction of two roads, one leading north towards Kilmainham and the Liffey, the other northeast through Dolphins Barn towards the city. This latter road approximately corresponds to the present-day R110 and a number of buildings are depicted in garden plots on the northwest side of the road, opposite the area of the proposed development. Mount Jerome Estate is marked in detail to the southeast and Kilmainham to the northwest. A section of the main line of the Grand Canal is depicted running through Kilmainham, marked 'Part of The New Canal'. A number of mills are depicted within the wider landscape surrounding the proposed development.

Figure 37.3 Extract from John Rocque's Map of the City and County of Dublin, 1760 showing the approximate location of the proposed development area



17.3.3.3 John Taylor's Map of the Environs of Dublin 1816 (Figure 17.4)

By the time of Taylor's map, both the Circular Road and the Circular Line of the Grand Canal have been constructed, to the immediate north and south of the proposed development area respectively. The harbour, recorded by the DCIHR (No. 18 14 005 01), to the west of the proposed development area is depicted although the canal docks (DCIHR No. 18 14 006 01) within the area itself are not. The 'City Water Course' (DU018-43002) is marked to the south, running north and meeting the Grand Canal at Dolphins Barn Bridge (depicted but not labelled) close to the south-western corner of the proposed development, before continuing northwards and corresponding to the watercourses, DU018-020576/DU018-020692, recorded on the RMP to the north.

Figure 47.4 Extract from John Taylor's Map of the Environs of Dublin 1816 showing the approximate location of the proposed development area



Figure 57.5 Extract from William Duncan's Map of the County of Dublin 1821 showing the location of the proposed development area



17.3.3.4 William Duncan's Map of the County of Dublin 1821 (Figure 17.5)

This map shows the area surrounding the proposed development in a similar level of detail to Taylors, although with a greater degree of accuracy. The canal docks are now shown within the area of the proposed development and Dolphins Barn Bridge is labelled 'Camack Br.'. Two buildings have appeared to the northeast of the proposed development area, on the north side of Circular Road.

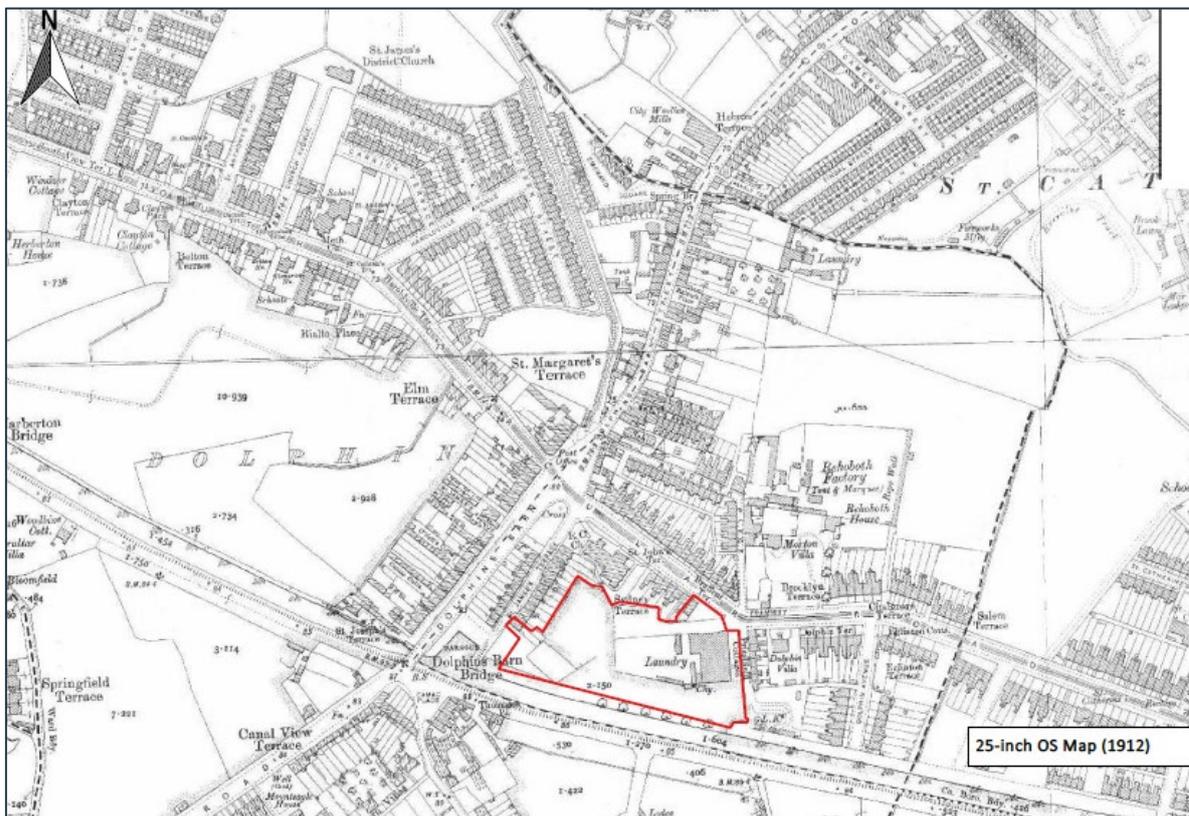
17.3.3.5 First Edition Ordnance Survey Map, 1843, scale 1:10,560 (Figure 17.6)

This is the first accurate historic mapping coverage of the area containing the proposed development. The layout of the major roads around the proposed development closely matches the present-day configuration and more buildings have appeared along 'Dolphins Barn Lane' (now Dolphins Barn Street/R110) and the buildings to the northeast of the area are now labelled 'Nunnery' and 'Female School'. The church immediately north of the proposed development area is now depicted. Small structures depicted to the east may represent the lime kilns recorded on the DCIHR (No. 18 14 007 01). Within the proposed development area, the canal docks are labelled as such and shown in more detail and garden plots/allotments to the rear of properties on St James Terrace are depicted within the western half of the site. A small building is shown to the east of these, close to the northern edge of the site. The water course, DU018-020576/DU018-020692, is still depicted to the north, and the City Water Course (DU018-43002) further to the south. A gate lodge is marked on the south bank of the canal, opposite the southeast corner of the proposed development, associated with Prospect House to the south.

17.3.3.10 Ordnance Survey Map, 1912, scale 1:2,500 (Figure 17.7)

By the time of this map the canal docks have been completely back filled and replaced by a building in the eastern portion of the area marked 'Laundry'. This corresponds to the building recorded in the DCIHR as No. 18 14 008 01. The second laundry building (No. 18 14 009 01) is not yet shown, having been built c. 1930. Dolphins Barn Bridge is now labelled as such, and the structures possibly representing the lime kilns are still shown. The surrounding street layout largely corresponds to the present-day layout, and the area is considerably more developed with the terrace to the north expanded and now marked as Sydney Terrace. The nunnery and school are no longer marked, although a school is shown further to the east. The watercourse, DU018-020576/DU018-020692, and City Water Course (DU018-43002) are depicted similarly to the previous mapping.

Figure 77.7 Extract from 1912 Ordnance Survey Map, showing the location of the proposed development area

**17.3.4 Aerial Photography**

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995-2013), Google Earth (2008-2021) and Bing Maps revealed no changes of any significance to the proposed development area or its immediate surroundings since the late 20th century. No previously unknown features of archaeological significance were identified.

17.3.5 Topographical Files

A review of the Topographical Files, held by the National Museum of Ireland, failed to identify any archaeological finds recorded in or within the immediate vicinity of the proposed development area.

17.3.6 City Development Plan

The Dublin City Development Plan (2016–2022) recognises the statutory protection afforded to all RMP sites under the National Monuments Legislation (1930–2014). The development plan lists a number of aims and objectives in relation to archaeological heritage (Appendix 17.2). It is a policy of the Development Plan to promote the in-situ preservation of archaeology as the preferred option where development would have an impact on buried artefacts. Where other alternatives are acceptable or exceptional circumstances are determined by the relevant statutory agencies. Where preservation in situ is not feasible, sites of archaeological interest shall be subject to archaeological investigations and recording according to best practice, in advance of redevelopment.

The zones of archaeological potential for three recorded monuments are located within 200m of the proposed development (DU018-020576, DU018-020692 and DU018-043002). The closest of these, DU018-020576, is located c. 58m to the north and either this watercourse and/or DU018-020692 appears from historic mapping to have continued south and passed within c. 60m of the proposed development, to the west.

17.3.7 Dublin City Industrial Heritage Record

A review of this record has shown eleven features that are included within the DCHIR within c. 200m of the proposed development area, three of which lie within the boundaries of the site. These are listed in the below Table 17.2 and shown on Figure 17.1.

Table 17.2: DCIHR sites within 200m of the proposed development area

No.	Classification	Location	Upstanding Remains	Distance from Site
18_14_006_01	Canal Docks	White Heather Industrial Estate	None visible	0m
18_14_008_01	Laundry	White Heather Industrial Estate	None visible	0m
18_14_009_01	Laundry	White Heather Industrial Estate	None visible	0m
18_14_005_01	Harbour	Rear numbers 44-45 Dolphins Barn	None visible	c. 30m west
18_14_007_01	Lime Kilns	Rear number 4 Priestfield Cottages	Original Replaced	c. 15m east

No.	Classification	Location	Upstanding Remains	Distance from Site
18_14_004_01	Canal Bridge	Dolphin's Barn Bridge (Camac Bridge)	Substantial remains	c. 60m west
18_14_010_01	Tramway	South Circular Road	None visible	c. 40m east
18_14_014_01	Brick and Tile Factory	Dolphin House Flats	No	c. 140m west-northwest
18_14_013_01	Tan Yard	Rear numbers 394-404 South Circular Road	No	c. 130m north-northwest
18_14_015_01	Ropewalk	Rear numbers 290-312 South Circular road	Appears to survive in property boundaries	c. 175m northeast
18_14_012_01	Printing Works (Tent & Marquee Factory)	Rehoboth Ave/Rehoboth Place	Partial Remains	c. 140m northeast

17.3.8 Field Inspection

The field inspection sought to assess the site, its previous and current land use, the topography and any additional information relevant to the report. During the course of the field investigation the proposed White Heather residential development site and its surrounding environs were inspected.

The site is currently occupied by the warehouses, industrial and ancillary buildings that make up the White Heather Industrial Estate, arranged around a central tarmacked parking area (Plate 17.1). A second parking and deliveries area occupies the easternmost strip of the estate (Plate 17.2). The majority of the buildings are occupied by the Storage World self-storage business and the An Post delivery office. The north-eastern warehouse, occupied by Storage World, occupies the site of the original Laundry building depicted on the 1912 OS mapping, recorded in the DCIHR as No. 18 14 008 01 (Plates 17.2-17.4). A stone-built wall at the eastern boundary of the estate corresponds to the eastern wall surrounding the laundry as depicted on the 1912 map (Plates 17.3 and 17.5). The site of the second laundry building recorded in the DCIHR (No. 18 14 009 01) is also occupied by a modern warehouse belonging to BSS Delivery (Plate 17.6). No remains associated with the former canal docks are visible, although it is highly likely that remains survive beneath the current ground level, in the form of basins 3-4m in depth with masonry revetting walls.

Plate 17.1- Centre of site, facing west-northwest



Plate 17.2 - Eastern edge of site and former location of the laundry building, facing south



Plate 17.3 – Modern development at the site of the laundry structure, facing northwest



Plate 17.4 - North side of original laundry building (left) and site of 1930s laundry building (background), facing west



Plate 17.5 - Eastern boundary wall, facing south



Plate 17.6 - Site of 1930s laundry building at west end of site, facing west



17.3.9 Conclusions

The proposed development area is formed by the White Heather Industrial Estate in Dublin 8. The site is situated on the northern bank of the Grand Canal, which forms its southern boundary and to the south of the South Circular Road, which forms part of the northern boundary. It is located outside the Zone of Archaeological Potential for Dublin City (DU018-020).

The zones of archaeological potential for three recorded monuments are located within 200m of the proposed development, which all represent the site of historic watercourses (DU018-020576, DU018-020692 and DU018-043002). The closest of these, DU018-020576, is located c. 58m to the north and either this watercourse and/or DU018-020692 appears from historic mapping to have continued south and passed within c. 60m of the proposed development, to the west, possibly linking with the city watercourse (DU018-043002) to the south.

The White Heather Industrial Estate originally formed part of the early 20th century White Heather Laundry. The sites of two structures relating to the laundry are included in the DCIHR as No. 18 14 008 01 and No. 18 14 009 01, but are no longer extant. Also within the proposed development area is the site of a canal docks, visible on early 19th century mapping and included in the DCIHR as No. 18 14 006 01. A further eight sites are recorded within 200m of the proposed development, the two closest of these being a harbour on the Grand Canal to the immediate southwest, and lime kilns to the immediate east. Whilst not a recorded archaeological site, it is noted that a Protected Structure, Our Lady of Dolours Church (RPS 1894) lies immediately to the north.

A review of the Excavations Bulletin (1970–2021) has revealed that no previous archaeological investigations have taken place within the proposed development area. Four previous investigations within a 200m radius of the proposed development all revealed nothing of archaeological significance.

Analysis of the historic mapping has shown the area of the proposed development within a largely rural landscape on the outskirts of the city of Dublin at the beginning of the post-medieval period. From this point onwards the proposed development area and the wider vicinity is subject to increasing industrial development (as evidenced by the number of DCIHR records in the vicinity), particularly with the construction of the Circular Line of the Grand Canal to the immediate south and the South Circular Road to the immediate north, during the late 18th century. The proposed development area itself changes little for the majority of the 1800s, after which the canal docks are filled in and the White Heather Laundry is built, some elements of which, as previously mentioned, survive on the site today.

Cartographic analysis also suggests that the watercourses to the north (DU018-020576 and DU018-020692) may be associated with the City Water Course (DU018-043002), originally created in the 13th century by diverting the River Poddle.

A field inspection and examination of aerial photography has revealed that in recent years the existing industrial complex was developed and none of the laundry buildings remain. No remains of the canal docks are extant, although it is highly likely that remains survive beneath the surface, following the backfilling of the features. The docks are likely to be in the region of 3m deep and defined by masonry revetting walls.

The proposed development area possesses high archaeological potential in relation to post-medieval industrial remains. It is possible that earlier features may also survive within the site, although very few features predating the post medieval period have been identified within the immediate surrounding landscape.

17.4 Characteristics of the Proposed Development

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary. A detailed description of the proposed development is included in Chapter 2.

17.5 Potential Impact of the Proposed Development

17.5.1 Construction Phase

Archaeology

Whilst it is clear that the proposed development area has been subject to a large degree of modern development, it remains probable that the backfilled post-medieval canal docks survive beneath the current ground level. It is possible that ground disturbances associated with the development may have a direct negative significant impact on these remains.

It is also possible that ground disturbances may have a direct negative impact on any surviving previously unrecorded archaeological feature or deposits that have the potential to survive beneath the current ground level. The significance of effect, prior to the application of mitigation, may range from moderate to profound, dependant on the nature, extent and significance of any remains.

Ground disturbances may have an adverse impact on any below ground remains associated with the site of the laundry structures (and chimney) in the remaining part of the site.

Cultural Heritage

No specific negative impacts on sites of cultural heritage significance have been identified resulting from the construction phase.

17.5.2 Operational Phase

No negative impacts during operation are predicted upon the archaeological and cultural heritage resource.

17.6 Mitigation Measures

17.6.1 Construction Phase

Archaeology

A programme of test trenching will be carried out within the site following demolition and clearance of the standing buildings. The testing will investigate the potential for survival of remains associated with the former canal docks and post-medieval laundry remains, as well as any earlier features that may survive on the site. Testing will be carried out under licence and dependent on the results, further mitigation may be required, such as preservation *in-situ* or by record (archaeological excavation). Any further mitigation will require agreement from the National Monuments Service of the DoHLGH and the Dublin City Archaeologist.

All ground disturbances, including site investigations, associated with the proposed development will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH and the Dublin City Archaeologist.

Cultural heritage

No mitigation is required for the specific cultural heritage resource.

17.6.2 Operational Phase

As there are no potential negative impacts on the archaeological and cultural heritage resource as a result of the operation of the proposed development, no mitigation is deemed necessary.

Table 17.3: Mitigation Measures

Mitigation Measures
Archaeological test trenching across the development area following demolition. To be carried out under licence, as issued by the National Monuments Service of the DoHLGH and in consultation with the Dublin City Archaeologist.
All ground disturbances associated with the development to be subject to archaeological monitoring by a suitably qualified archaeologist.

17.7 Predicted Impact of the Proposed Development

17.7.1 Construction Phase

Following the completion of the mitigation measures detailed above, there will be no predicted significant negative residual impacts on the archaeological and cultural heritage resource as a result of the proposed development going ahead.

17.7.2 Operational Phase

There are no predicted residual negative impacts for the operational phase of the proposed development upon the archaeological and cultural heritage resource.

17.7.3 ‘Do Nothing’ Scenario

If the proposed development were not to proceed, there would be no negative impact on the archaeological, architectural or cultural heritage resource.

17.7.4 ‘Worst Case’ Scenario

Under a worst-case scenario, the proposed development would disturb previously unidentified and unrecorded deposits and artefacts without appropriate excavation and recording being undertaken.

17.8 Monitoring

The mitigation measures recommended above would also function as a monitoring system prior to construction to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

17.9 Reinstatement

Reinstatement is not applicable.

17.10 Interactions and Potential Cumulative Impacts

17.10.1 Interactions

Chapter 18, Architectural Heritage, has been fully reviewed as part of this assessment.

17.10.2 Potential Cumulative Impacts

With regards to proposed and permitted developments in the environs of the proposed development, no potential significant cumulative impacts on the archaeological and cultural heritage resource have been identified.

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John Taylor's Map of the Environs of Dublin 1816

William Duncan's Map of the County of Dublin 1821

Ordnance Survey maps of County Dublin, 1843-1912

Electronic Sources

www.excavations.ie – Summary of archaeological excavation from 1970–2021.

www.archaeology.ie – DoH/LGH website listing all SMR/RMP sites.

www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.

www.googleearth.com – Satellite imagery of the proposed development area.

www.bingmaps.com – Satellite imagery of the proposed development area.



Chapter 18. Architectural Heritage

18.0 Architectural Heritage

18.1 Introduction

This chapter assesses impacts on architectural heritage of the proposed Strategic Housing Development at White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. This chapter and was prepared by ARC Architectural Consultants Limited.

This chapter was completed by W. H. Hastings B. Arch FRIAI, RIAI Grade 1 accredited Conservation Architect.

18.2 Consultation

ARC Consultants attended two Section 247 on-line pre-application meetings with Dublin City Council (DCC), one on the 6th of January 2021 and the second on the 21st of May 2021. At these meetings the likely impacts of the proposed development on architectural heritage was discussed at some length, and DCC expressed some concerns about the potential impact the development on the heritage of nearby structures of architectural Heritage value.

18.3 Methodology

18.3.1 Scoping

In evaluating the extent of architectural heritage in the surrounding area, ARC Consultants had regard to the Record of Protected Structures (RPS) in the current Dublin City Development Plan, 2016-2022, and to any relevant listings in the National Inventory of Architectural Heritage (NIAH)

18.3.2 Detailed Methodology

ARC carried out considerable research of relevant books, historic documents and historic mapping as part of this assessment. In addition, a series of site visits was carried out to determine the likely impact of the proposed development on architectural heritage. This assessment was prepared with reference to the Department of Arts, Heritage and the Gaeltacht's Architectural Heritage Protection Guidelines for Planning Authorities.

18.3.3 Statutory Provisions and Guidance

Chapter 11: Built Heritage and Culture of the *Dublin City Development Plan 2016-2022* sets out the Planning Authority's policies with respect to architectural heritage.

Policy CHC1 provides that it is a policy of the Planning Authority *"to seek the preservation of the built heritage of the city that makes a positive contribution to the character, appearance and quality of local streetscapes and the sustainable development of the city."*

Policy CHC2 seeks to: *"To ensure that the special interest of protected structures is protected"*. It is noted in this regard that there are no protected structures on the site of the proposed development. The site does adjoin the site of one protected structure, Our Lady of Dolour's Church

Policy CHC4 provides:

"It is the policy of Dublin City Council to protect the special interest and character of all Dublin's Conservation Areas. Development within or affecting a conservation area must contribute positively to its character and distinctiveness, and take opportunities to protect and enhance the character and appearance of the area and its setting, wherever possible.

Enhancement opportunities may include:

1. *Replacement or improvement of any building, feature or element which detracts from the character of the area or its setting*
2. *Re-instatement of missing architectural detail or other important features*
3. *Improvement of open spaces and the wider public realm, and re-instatement of historic routes and characteristic plot patterns*
4. *Contemporary architecture of exceptional design quality, which is in harmony with the Conservation Area*
5. *The repair and retention of shop- and pub-fronts of architectural interest.*

Development will not:

1. *Harm buildings, spaces, original street patterns or other features which contribute positively to the special interest of the Conservation Area*
2. *Involve the loss of traditional, historic or important building forms, features, and detailing including roof-scapes, shop-fronts, doors, windows and other decorative detail*
3. *Introduce design details and materials, such as uPVC, aluminium and inappropriately designed or dimensioned timber windows and doors*
4. *Harm the setting of a Conservation Area*
5. *Constitute a visually obtrusive or dominant form.*

Changes of use will be acceptable where, in compliance with the zoning objective, they make a positive contribution to the character, function and appearance of Conservation Areas and their settings.

The Council will consider the contribution of existing uses to the special interest of an area when assessing change of use applications and will promote compatible uses which ensure future long-term viability."

There is a conservation area running along the Grand Canal, and part of the site of the proposed development falls within this conservation area.

It is noted that some areas to the north and east along the South Circular Road are zoned Z2 Residential Conservation Areas. The policy for Z2 lands as stated in the Dublin City Development Plan 2016-2022 is as follows:

14.8.2 Residential Neighbourhoods (Conservation Areas) – Zone Z2

To protect and/or improve the amenities of residential conservation areas.

Residential conservation areas have extensive groupings of buildings and associated open spaces with an attractive quality of architectural design and scale. The overall quality of the area in design and layout terms is such that it requires special care in dealing with development proposals which affect structures in such areas, both protected and non-protected. The general objective for such areas is to protect them from unsuitable new developments or works that would have a negative impact on the amenity or architectural quality of the area. The policy chapters, especially Chapters 11 – Built Heritage and Culture, and 16 – Development Standards, detailing the policies and objectives for residential conservation areas and standards respectively, should be consulted.

The principal land-use in residential conservation areas is housing but can include a limited range of other uses. In considering other uses, the guiding principle is to enhance the architectural quality of the streetscape and the area, and to protect the residential character of the area.

18.3.4 Record of Protected Structures

While there are no buildings on the site of the proposed development listed in the Record of Protected Structures (RPS), there is some potential for development on the subject site to give rise to impacts on the setting of protected structures in the surrounding area. This is discussed later in this chapter.

18.3.5 National Inventory of Architectural Heritage

It is noted that a small number of buildings in the area around the subject site are listed in The National Inventory of Architectural Heritage (NIAH). These include two protected structures: The Church of Our Lady of Dolours and No 1 to 3 Dolphins Barn (Massey & Sons). 4 nearby shops on South Circular Road are listed in the NIAH: No 380, No 382, No 384, and No 390. One nearby house is also listed: No 387 (Dolphin Villa). It is not understood why these have been listed by the NIAH, because they are not particularly distinguished when compared with the general building stock along the South Circular Road and because the 4 shops have been the subject of modern interventions.

The existence of the proposed development will give rise to some effects on the setting of these buildings, but there will be no direct impact on the fabric of any building listed in the NIAH. The effect on the setting of the seven buildings in the NIAH listed above is likely to range from 'slight' to 'moderate'

18.3.6 Definition of Effects on the Architectural Heritage

The assessment effects on Architectural Heritage had regard to the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* prepared by the Environmental Protection Agency (Draft of 2017), and to Directive 2011/92/EU (as amended by Directive 2014/52/EU) on the assessment of the likely effects of certain public and private projects on the environment.

The list of definitions given below is taken from Table 3.3: *Descriptions of Effects* contained in the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* prepared by the Environmental Protection Agency. Some comment is also given below on what these definitions might imply in the case of architectural heritage. The definitions from the EPA document are in italics.

Imperceptible: *An effect capable of measurement but without significant consequences.* The definition implies that there would be minor change to an aspect of the heritage interest of a structure, but not one that would be readily noticeable to the casual observer; and not a change that would materially alter the overall heritage interest of the structure or its surroundings.

Not Significant: *An effect which causes noticeable² changes in the character of the environment but without significant consequences* (the footnote '2' to the word 'noticeable' is: 'for the purposes of planning consent procedures'). The definition implies that there would be changes to aspects of the heritage interest of a structure capable of being noticed by an observer who is actively assessing the effects of changes to the

heritage interest of a structure for the purposes of planning consent, and, although there may be changes to aspects of the heritage interest of a structure, these changes would not be considered material with reference to planning consent.

Slight: *An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.* The definition implies that there would be changes to aspects of the heritage interest of a structure or part of that structure. However, apart from such changes, the overall heritage interest of the structure, and/or its contribution to its surroundings, would remain substantially intact.

Moderate: *An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.* In this case, there would be material changes to the heritage interest of a structure or part of that structure. These changes must be consistent with a pattern of change that is already occurring, is considered acceptable, and is envisaged by policy.

Significant: *An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.* The definition implies that there would be material changes to aspects the heritage interest of a structure or part of that structure and that these changes would not be consistent with an acceptable pattern of change that is already occurring, nor are envisaged by policy.

Very Significant: *An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.* The definition implies that the heritage interest of a structure would be changed to a considerable degree and these changes would not be consistent with an acceptable pattern of change that is already occurring or envisaged by policy. For example, a “very significant” effect would occur where the heritage interest of a structure or structures would be substantially removed as a result of a proposed development, though parts of the structure might remain intact.

Profound: *An effect which obliterates sensitive characteristics.* The definition implies that a development would result in the loss of the heritage structure, or all of its heritage significance.

It is noted that there are a number of scenarios in which substantial alteration to heritage structures is supported by heritage policy. Giving a heritage building a new and sustainable use would be one such situation. In such circumstances the degree of intervention in the heritage structure should be only the minimum necessary to provide for the new use. Unnecessary interventions would have to be assessed as resulting in negative effects on architectural heritage.

18.4 Receiving Environment

The immediate area is characterised to the north and east by the Z2 Residential Conservation Areas along the South Circular Road, to the south by the Grand Canal Conservation Area and to the west by the late 18th or early 19th century St James's Terrace. The protected structure of Our Lady of Dolours Church immediately adjoins the north west corner of the subject site. The site is at present occupied by industrial development.

In *A History and Topography of Dublin City and County*, published in 1837, Samuel Lewis describes Dolphin's Barn as follows:

DOLPHIN'S BARN, a village, partly in the parish of St James, barony of Newcastle, and partly in that of St Catherine, barony of Uppercross. This village, forming a suburb of the city of Dublin, consists chiefly of a long street on the road to Crumlin, partly situated between the circular road and the Grand Canal, which latter intersects the village, and is here crossed by a stone bridge. There are several tanyards, and the extensive dye works of Messrs Pims, who have also dye stuff mills at Rudland; and on the Crumlin road are the dyeing and finishing works of Mr P. Nevin. There is a R.C. chapel in the village, also a convent of nuns of the Carmelite Order, who have a school for the gratuitous instruction of about 100 poor female children, and a select school for 12 young ladies.

It is noted by Lewis that the Grand Canal cuts Dolphin's Barn into two parts, and evidence from early maps indicates that the main street of Dolphin's Barn ran south west as far as the present inter section of Crumlin Road with Sundrive Road and Herberton Road (formerly Harberton Road). On older maps the village Crumlin itself is shown a considerable distance further to the south west. A detail reproduced below from John Rocque's Map of the County of Dublin, published in 1760, shows the City Watercourse crossing the north end of the main street of Dolphins Barn, the longer part of the street running to the south west. Where the old City Watercourse crossed the main street of Dolphin's Barn was approximately at the location of the present Dolphin's Barn Bridge over the Grand Canal. The First Edition Ordnance map of Circa 1837 shows the townland of Dolphin's Barn south of the canal and the townland of Dolphin's Barn North on the north side of the canal.

The First Edition Ordnance map shows 'Canal Docks' occupying part of the site of the proposed development. Later ordnance maps of 1864 and 1888 show the docks in more detail. On the 1864 map they are shown as a pair of linked 'D' shaped water bodies with the eastern dock connected to the Grand Canal. On the 1888 map the western 'D' has almost disappeared. On the 25 Inch Ordnance map of circa 1910, the docks are gone altogether, and a building indicated as a laundry is shown at the north east corner of the present site. All three Ordnance maps show a small harbour on the north of the Canal just

east of Dolphin's Barn Bridge and between the south end of St James's Terrace and the main street of Dolphin's Barn.

An interesting history of the White Heather Laundry and the surrounding area has been prepared by Cathy Scuffil, Historian In Residence, Dublin South Central, Dublin South East. A passage from this history refers to the White Heather Laundry as follows:

The White Heather Laundry was founded in 1899 by John W. Brittain (1872 – 1937). Brittain, a Methodist, was a native of Manorhamilton, Co. Leitrim and the 1901 census lists him as 'Laundry Manager', living in St. John's Gardens, Kilmainham. He was one of the "pioneers of the laundry business in Ireland" He also founded the Metropolitan Laundry the same year and the Swastika Laundry (Ballsbridge) in 1912. The White Heather Laundry was one of the most significant industries in the Dolphin's Barn area and its distinctive 'square' chimney and premises located on the South Circular Road were well-known landmarks. This, together with the Maple and Mirror laundries located elsewhere in the Dolphin's Barn area were big employers, and had mainly female workforces. In the early years horse-drawn transport was predominately used in the collection and delivery of laundry. This service extended across the city and into Co Kildare.

The White Heather Laundry drew water from the Grand Canal, as did other laundries in the area. Another source of water for industry in the area was the old City Watercourse, created in the middle of the 13th century to supply water to the west end of Dublin City and which fed the City Basin, a body of water a little to the west of St James's Gate, the western gate to the City. The City Watercourse, a man made branch of the River Poddle, ran north from near Kimmage to Dolphin's Barn, and then on to the City Basin.

A composite Ordnance map from the 1880s, an extract from which is reproduced below, shows to the south of Dolphins Barn the Rutland Flour Mill on the line of the City Watercourse, and presumably using its waters. North of the Rutland Flour Mill the City Watercourse is no longer shown on the map, but it reappears north of Dolphin's Barn taking a line parallel to and immediately north east of the present Reuben Street. A lane in that location called St James's Walk appears on early maps running north west along side the City Watercourse.

The last map in this chapter is an extract from the Cassini map of the early 1940s. The small harbour just east of Dolphin's Barn Bridge is still shown and on the site of the proposed development there are now more buildings and the site is labelled 'Laundries'

Figure 18.1: Extract from John Rocque’s Map of the County of Dublin of 1760

The map shows ‘The City Water’ running north across the main street of Dolphin’s barn



Figure 18.2: Extract from the First Edition Ordnance Map of circa 1837.

The townland of Dolphin's Barn is shown south of the Canal with that of Dolphin's Barn North above the Canal. Part of proposed development site is shown as 'Canal Docks'



Figure 18.3: Extract from an Ordnance maps of 1864.

The 'Canal Docks' are still on the subject. A small harbour is shown just east of Dolphin's Barn Bridge and 'Lime Kilns' are shown on the canal bank just east of the site

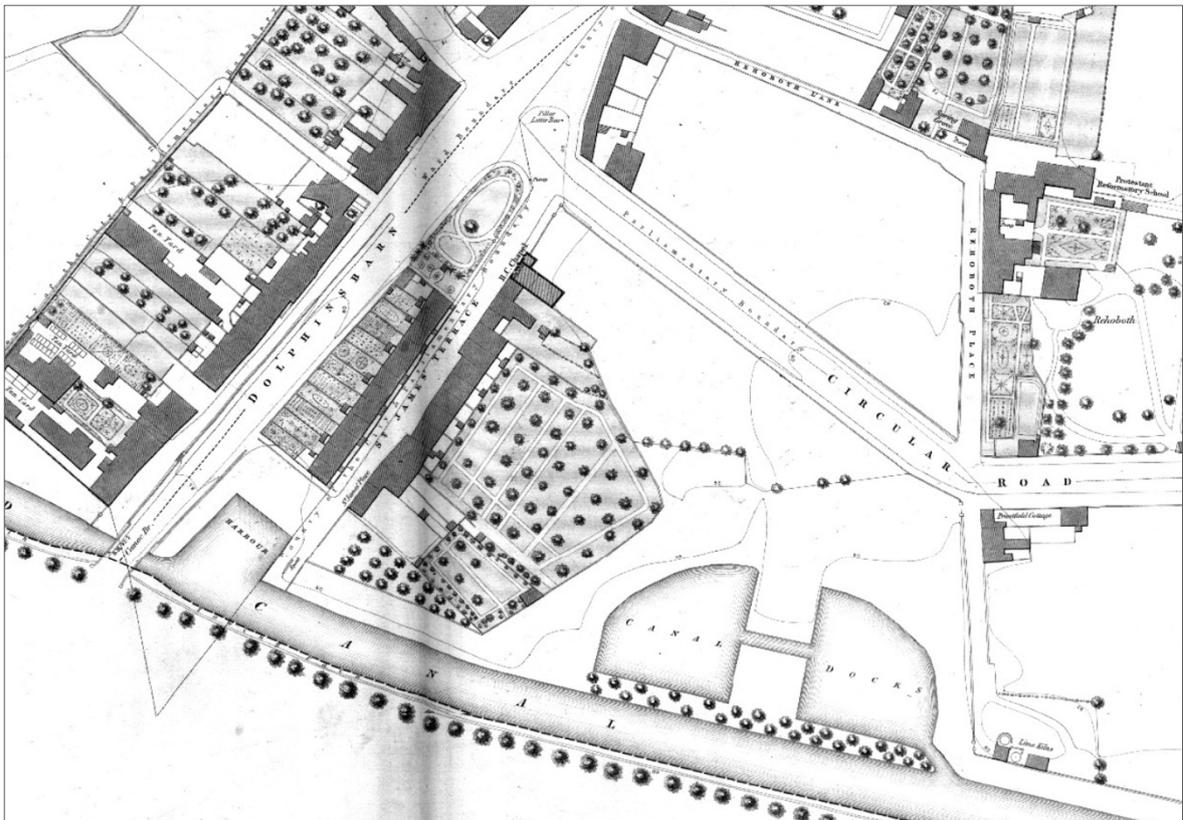


Figure 18.4: Extract from an Ordnance maps of 1888.

The 'Canal Docks' on the subject site have shrunk in size. There is now a line of cottages at Priestfield Cottages. The Lime Kilns are still on the canal bank.



Figure 18.5: Extract from two Ordnance maps of the 1880s .

The Rutland Flour Mill is shown on the City Watercourse. The pale blue line indicates the probable hidden course of the City Watercourse which at the date of these two maps reappeared north of Dolphin's Barn at Reuben Street.



Figure 18.6: Extract from the 25 Inch Ordnance maps of circa 1910.

The 'The White Heather Laundry' is shown at the north east corner of the site of the proposed development. Priestfield Cottages remain as shown on 1888 map and the lime kilns, marked 'L.K.' are still there.

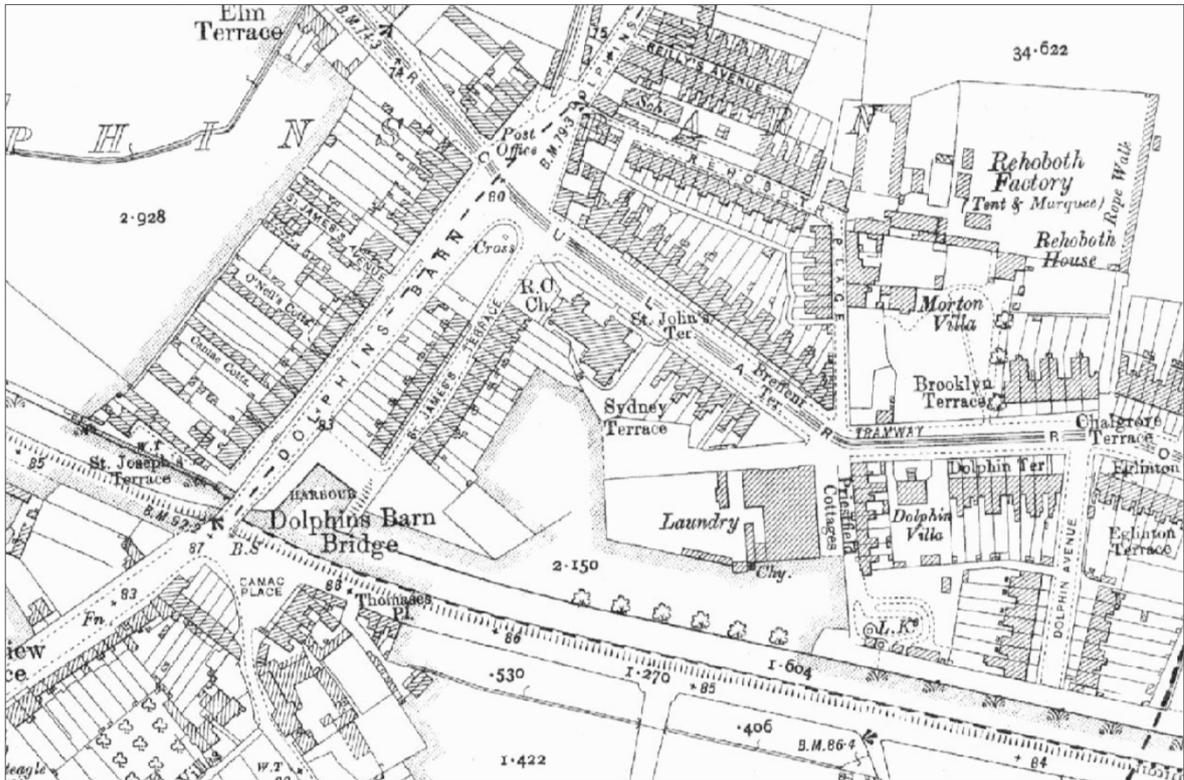


Figure 18.7: Extract from the Cassini map of the early 1940s.

On The White Heather site there are now 'Laundries'

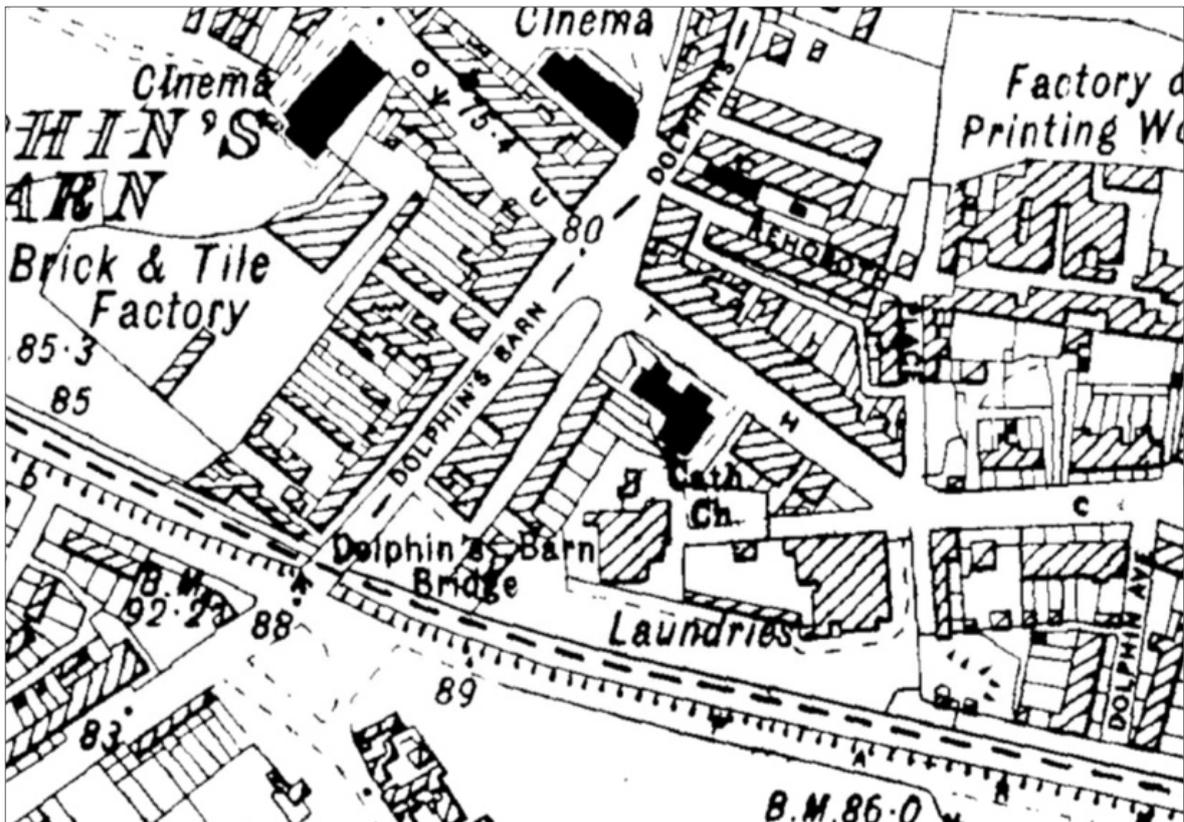


Figure 18.8: Advertisement for the White Heather laundry

From the Official Handbook for Dublin Civic Week 1929

PURITY
PROMPTITUDE
PERFECTION

are some of the characteristics of the

WHITE HEATHER LAUNDRY

All articles—even the most delicate—entrusted to us are handled by a highly trained staff of workers, who are supervised by experienced managers, under the most perfect hygienic conditions.

We guarantee a Perfect Laundry Service at reasonable prices, when you consider the finish and style of the work.

A Telephone Message, or a Post Card, addressed to the
WHITE HEATHER LAUNDRY, LTD., SOUTH CIRCULAR RD.
will receive our prompt attention.

TELEPHONE { *Our Valeting Service and Mending Departments*
No. { *are in full operation and giving complete*
5 1 4 4 7. { *satisfaction to our customers.*

Figure 18.9: Advertisement transport services on the Grand Canal

From the Official Handbook for Dublin Civic Week 1929

Transport in the Irish Free State

The GRAND CANAL, with the system over which the Company trades, serves 3 Ports :
DUBLIN, WATERFORD and LIMERICK,
and 16 Counties in the Irish Free State.

Cheapest & Best Route for all kinds of Merchandise

REGULAR SERVICES WITH MOTOR DRIVEN BARGES

Docks at Ringsend, Dublin, to accommodate Vessels 148 feet in length.

Tel. Address : {
" Granal, Dublin." {
Telephones { Dublin 52311 & 52312.
{ Ringsend Docks, Dublin, 140.

Rates, Sailing Bill and Maps, from
H. PHILLIPS, General Manager, James St. Harbour, Dublin.

18.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

18.6 Potential Impact of the Proposed Development

18.6.1 Construction Phase

The extent of impact of the development on the setting of buildings of architectural heritage value during the construction phase is likely to be similar to that for the operational phase, as tabled below. The character of impacts during the construction phase is likely to be negative at first, tending to become neutral to positive as work proceeds and the new buildings and structures become apparent

18.6.2 Operational Phase

The site of the proposed development is at present occupied by industrial buildings. These buildings are generally modest in height. The proposed development ranges in height from 2 to 10 stories. Parts of the proposed development will, therefore, be taller than the generally 2 storey development along the South Circular Road to the immediate north and east of the subject site and the 2 storey houses on St James's Terrace to the west.

However, there is extensive modern development in the area, both existing and proposed, that is of a similar or greater scale to that of the proposed development. On the corner of Dolphin's Barn Street and Reuben Street there is a cluster of development ranging in height from 4 to 12 stories. The 5 storey Coombe Hospital is opposite. Back along Cork Street there are numerous developments, many of six and seven storeys, and more.

The Dublin City Development Plan, 2016-2022, at SDRA12, calls for extensive dense and tall developments on the Bailey Gibson, Player Wills and St Teresa's Gardens sites, and a masterplan for these sites envisages buildings up to 22 stories in height.

Visibility

The proposed development will be visible along nearby streets and along nearby parts of the Grand Canal. The development is likely to be most openly visible from the South Circular Road, from nearby sections of the road to the east north and west of the subject site. From the Grand Canal, the development will be most openly visible from the south side of the canal immediately opposite to the subject site. The development will also be directly visible from Priestfield Cottages, St James's Terrace, Dolphin's Barn, Dolphin's Barn Bridge and the very northern end of the Crumlin Road. Moving away from the site along the South Circular Road, Dolphin's Barn Street, the Crumlin Road and the Grand Canal, visibility of the proposed development will reduce.

18.6.2.1 Effects on Protected Structures in the Surrounding Area

The proposed development will have no direct effect on the architectural heritage of protected structures in the surrounding area. Where the proposed development can be seen in the context of one or more of the nearby protected structures, the protected structure and the proposed development both being seen in the same view, then there is a potential for effects on the setting of that protected structure. There are also likely to be situations where the development and a protected structure cannot be viewed together, but where the proposed development is likely to be visible from upper floors of such a protected structure. In such a case there may be a potential for the proposed development to give rise to indirect effects on the outlook from such a protected structure.

The table below lists structures in the surrounding area that are entered in Dublin City Council's Record of Protected Structures and provides an assessment of the likely visual effects on the setting of these protected structures from the existence of the proposed development.

Table 18.1: Potential Effects on Setting

RPS No	Address	Description	Effect on Setting
874	Bridges: Grand Canal	Parnell Bridge, Parnell Road	Moderate
1837	119 Circular Road South	House	None
1838	121 Circular Road South	House	None
1839	123 Circular Road South	House	None
1840	125 Circular Road South	House	None
1841	126 Circular Road South	House	None
1842	127 Circular Road South	House	None
1843	128 Circular Road South	House	None
1844	130 Circular Road South	House	None
1845	132 Circular Road South	House	None
1846	131-143 Circular Rd South	Former Griffith Barracks	Imperceptible
1847	163 Circular Road South	Islamic information Centre	Slight
1848	165 Circular Road South	Dublin Mosque	Slight
1849	Circular Road South	Our Lady of Dolour's Church	Significant
1850	468-472 Circular Rd South	Rialto Community Centre	Slight to Moderate
2053	38a Cork Street	Former fever hospital	None
2308	1 Dolphin's Barn	Massey Undertakers premises	Moderate
2325	Donore Avenue	Donore Castle	Slight
2326	Donore Avenue	St. Catherine's and St. James's	Slight

18.7 Mitigation Measures

18.7.1 Construction Phase

See Outline Construction Management Plan

18.7.2 Operational Phase

No mitigation measures are proposed. However, it should be noted that, while the landscaping proposed as part of this application will, of itself, result in changes in the visual environment, many would consider boundary and other hard and soft landscaping works to result in positive changes and to have a mitigating effect on the visual impact of new development.

18.8 Predicted Impact of the Proposed Development

18.8.1 Construction Phase

The extent of impacts on architectural heritage during the construction phase is likely to be similar to that for the operational phase, as tabled above. The character of visual impacts during the construction phase is likely to be negative at first, tending to become neutral to positive as work proceeds and the new buildings and structures become apparent.

18.8.2 Operational Phase

Since no mitigation measures are proposed, predicted residual impacts will be as described for potential effects on the setting of architectural heritage as tabled above. Visibility of the proposed development is likely to be largely restricted to locations relatively to the application site. While the existence of the proposed development is likely to result in a significant change to the visual environment from some nearby viewpoints, having regard scale and the pattern of development that has taken place in the area proposed changes on the White Heather lands may be considered by some observers to be consistent with existing and emerging trends for development in the area.

18.8.3 'Do Nothing' Scenario

In the Do Nothing scenario no development will take place.

18.9 Monitoring

Monitoring is not applicable to this chapter.

18.10 Reinstatement

Reinstatement is not applicable to this chapter.

18.11 Interactions and Potential Cumulative Impacts

18.11.1 Interactions

As is always the case where a development will result in a change to the setting of built heritage in the surrounding area, the landscape and visual impacts of the development will result in interactions with population and human health, landscape and visual character, material assets and cultural heritage (including archaeological heritage)

18.11.1 Potential Cumulative Impacts

A review of the Dublin City Council online planning register did not identify any developments for which permission has been granted and is not under review by the courts, which, in combination with the development now proposed, would have the potential to result in material cumulative impacts on the architectural heritage surrounding the application site.

18.12 References

Ball, Francis. (1906) *A History of the County Dublin: Part IV*. Dublin: Alex. Thom & Co.

Lewis, Samuel. (1837) *A Topographical Dictionary of Ireland*. London: S. Lewis & Co.

Rocque, John. (1760). *Map of the County of Dublin*.

Ordnance Survey maps. (available from: <https://shop.osi.ie/shop/>)

18.13 Legal Notice

This assessment has been prepared by ARC Architectural Consultants Ltd for the benefit of the Applicant only and in accordance with our instructions. ARC Architectural Consultants Ltd disclaims any liability, legal or otherwise, from any party, other than the Applicant, seeking to rely upon the content of this Chapter.



Chapter 19. Risk Management

19.0 Risk Management

19.1 Introduction

This Section provides an assessment of the potential significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters.

This Chapter was prepared by Brian Maher, Heather McMeel and Noel Cronin of Avison Young, Town Planning Consultants. Brian Maher, Associate Director, holds accreditations in architectural technology and town planning. Brian specialises in town planning, urban design, masterplanning, regeneration, design intervention studies and heritage evaluation, and has over 30 years of experience of working in the planning, architectural and urban design sectors. Heather McMeel, Senior Planner, holds a B.A in Political Science and Geography from Trinity College Dublin and an MSc in Real Estate and Planning from Heriot Watt University. Heather is a member of the Royal Town Planning Institute and has over 5 years' experience in planning and development. Noel Cronin, Planner, holds a Bachelor of Social Science from University College Cork, as well as a Masters in Planning and Sustainable Development from University College Cork. Noel has 4 years postgraduate experience in planning and development.

Maurice Johnson & Partners Fire Safety Engineers contributed to the preparation of this Chapter, with input from David Bishop, BEng, MSc, CEng MIEI. In addition, Mark Killian of O'Connor Sutton Cronin Consulting Engineers, and Shane O'Brien of IN2 Engineering Design Partnership, provided inputs in relation to utility connections.

19.1.1 Legislative Context

The 2014 EIA Directive (2014/52/EU) includes an updated list of topics to be addressed as part of an EIAR and 'Risk Management' is identified as a new chapter to be assessed. Article 3(2) of the new EIA Directive requires that EIA shall include the expected effects on population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape deriving from **the vulnerability of the project to risks of major accidents and/or disasters** that are relevant to the project concerned.

The Directive also states that "*where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies*". The 2014 EIA Directive is transposed into Irish Legislation through, inter alia, Schedule 6 of the Planning and Development Regulations 2001 (as amended); paragraph

2 of which states that the following information relating to Risk Management should be included in an EIAR:

“A description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events.”

This Chapter identifies and compiles the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project, in accordance with Article 3(2) of the EIA Directive.

19.2 Consultation

Hazards were reviewed through the identification of likely risks in consultation with the Design Team and relevant specialists, in order to ensure that the safety and precautionary measures required to protect the proposed scheme in the event of a major accident are in place. In this regard, appropriate mitigation measures are outlined that would ensure the protection of the environment in such a scenario.

19.3 Methodology

The following documents informed the methodology utilised for the completion of this Chapter:

- Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out EIA (DHPLG, 2018).
- The EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, draft 2017).
- A Framework for Major Emergency Management Guidance Document 1: A Guide to Risk Assessment in Major Emergency Management (DEHLG, 2010).
- A National Risk Assessment for Ireland (Department of Defence, 2017).
- National Risk Assessment Overview of Strategic Risks (Department of The Taoiseach, 2017).
- Major Emergency Plan (Dublin City Council, 2015).
- Causes of Fire Attended by Brigades (DHPLG, 2015).

The Draft EIA Guidelines outlines that there are two key considerations in assessing the Risk of Major Accidents and/or Disasters:

- *“The potential of the project to cause accidents and/or disasters, including implications for human health, cultural heritage, and the environment; and*
- *The vulnerability of the project to potential disasters/accidents, including the risk to the project of both natural disasters (e.g. flooding) and man-made disasters (e.g. technological disasters)¹.”*

The Draft EPA Guidelines provide further guidance in this regard, outlining that:

“The extent to which the effects of major accidents and / or disasters are examined in the EIA should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.

The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive plants. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required. The EIA should refer to those separate assessments while avoiding duplication of their contents².”

The document ‘A Framework for Major Emergency Management Guidance Document 1: A Guide to Risk Assessment in Major Emergency Management’ (DEHLG, 2010) provides guidance in relation to the carrying out of a risk assessment and outlines a ‘five by five matrix’ using the scales for ‘impact’ and ‘likelihood’. It is suggested that *“the process requires the outcome from the risk assessment to be recorded and inserted in the box judged to be most appropriate for the functional area under consideration.”* For clarity, the National likelihood criteria and the National impact criteria of potential hazards are outlined in Table 19.1 and Table 19.2.

¹ Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out EIA, August 2018, pg 31.

² The EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2017), pg 49.

Table 19.1: National Classification of Likelihood

Ranking	Classification	Likelihood
1	Extremely Unlikely	May occur only in exceptional circumstances; Once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; May occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Source: 'A Framework for Major Emergency Management Guidance Document 1: A Guide to Risk Assessment in Major Emergency Management' (DEHLG, 2010), pg 12.

Table 19.2: National Classification of Impact

Ranking	Classification	Impact	Description
1	Minor	Life, Health, Welfare Environment Infrastructure Social	Small number of people affected; no fatalities and small number of minor injuries with first-aid treatment. No contamination, localised effects. <0.5M Euros Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare Environment Infrastructure Social	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements. Simple contamination, localised effects of short duration 0.5-3M Euros Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment Infrastructure Social	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support. Simple contamination, widespread effects or extended duration 3-10M Euros Community only partially functioning, some services available.
4	Very serious	Life, Health, Welfare Environment Infrastructure Social	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated Heavy contamination, localised effects or extended duration 10-25M Euros Community functioning poorly, minimal services available
5	Catastrophic	Life, Health, Welfare Environment Infrastructure Social	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated. Very heavy contamination, widespread effects of extended duration. >25M Euros Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

Source: 'A Framework for Major Emergency Management Guidance Document 1: A Guide to Risk Assessment in Major Emergency Management' (DEHLG, 2010), pg 13.

A risk matrix can then be prepared incorporating the likelihood rating and the impact (consequence) rating, as described in the 'Framework for Major Emergency Management Guidance Document' (DEHLG, 2010) and this is set out in Table 19.3 below.

Table 19.3: Risk Matrix

			Impact / Consequence				
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
Likelihood	Extremely Unlikely	1					
	Very Unlikely	2					
	Unlikely	3					
	Likely	4					
	Very likely	5					

19.4 Receiving Environment

In order to determine the potential consequences and predicted impacts of major accidents and/or disasters relating to the proposed development, a desktop study was undertaken.

It is noted that the subject site is not prone to natural disasters. Ireland's geographic position means it is less vulnerable to natural disasters such as earthquakes and volcanoes although in recent times there has been an increase in the number of severe weather events, which poses one of the most common risks³. The nearest Seveso site is located c. 2.5km away (Iarnrod Eireann Maintenance Works, Inchicore, Dublin 8).⁴

Hazards were reviewed through the identification of likely risks in consultation with the Design Team and relevant specialists including O'Connor Sutton Cronin (OCSC) Consulting Engineers, IN2 Engineering Design Partnership and Maurice Johnson & Partners (MJP) Fire Safety Engineers. The hazards outlined in the document 'Framework for Major Emergency Management Guidance Document' were reviewed to identify a preliminary list of potential major accidents and/or disasters. These were then screened accordingly and those that are relevant to the proposed development are outlined in Table 19.4.

Table 19.4: Hazard Categories

Category	Hazard Type	Likelihood
Meteorological	Storm/Severe Gales/Heavy Snow	4
Hydrological	Flooding	4
Geological	Made Ground/Landslide	2
Road Accident	Construction Site Incident/Traffic Accident	3
Explosion	Natural Gas	1
Fire	Construction and Operation	2
Building Collapse	Structural Failure	2
Pollution	Construction	2
Epidemic and Pandemic	Communicable Diseases	4

³ A National Risk Assessment for Ireland (Department of Defence, 2017), pg 10.

⁴ HSA Notified Seveso Establishments: https://www.hsa.ie/eng/Your_Industry/Chemicals/Legislation_Enforcement/COMAH/List_of_Establishments/

19.5 Characteristics of the Proposed Development

The proposed Strategic Housing Development is located at the White Heather Industrial Estate, South Circular Road, Dolphins Barn, Dublin 8 and No. 307/307a South Circular Road, Dublin 8 and an industrial building at 12a St James Terrace. The 1.535ha site is bounded by the Grand Canal to the south; Our Lady of Dolour's Church and residential dwellings on the South Circular Road to the north; Priestfield Cottages to the east; and residential dwellings at St James's Terrace to the west.

Across 7 no. blocks, the residential mix of the proposed 335 no. units includes a combination of studio units, 1-bedroom apartments, 2-bedroom apartments, units and a terrace of 3-bedroom townhouse units. A change of use of an existing residential building at 307/307a South Circular Road to be used as a workspace. The proposed Part V social housing requirement is provided at 10% in 2 no. blocks within the proposed scheme. This Build to Rent scheme will also include 2 no. cafés and a 2-storey creche, while the residents will also have access to residential amenity areas at ground floor level and fifth floor level with access to a roof terrace area overlooking the canal. A landscaped square will be accessible to the public, with private open space and amenity areas for the residents also provided including children's play areas. Building heights range from 2 no. to 10 no. storeys, with finger blocks arranged in a north-south direction and height tapering down from the centre of the site to the boundary.

The entrance to the scheme will be from the existing junction at the South Circular Road, which will be reconfigured and upgraded. The existing access road at St James's Terrace will provide pedestrian access only to the development. Car parking is proposed at undercroft and at surface levels, with a number of dedicated car sharing spaces in convenient locations. Covered and secure bicycle storage facilities are located also at undercroft and surface level, adjacent to individual block entrances.

A new street will run east-west across the north of the site and the creation of a new public space at the heart of the proposed scheme will connect to a publicly accessible linear park along the canal to the south.

The full detail of the nature and extent of the proposed development is set out in Chapter 2 of this EiAR.

19.6 Potential Impact of the Proposed Development

The potential significant effects of the proposed development are set out in the following sections.

19.6.1 Construction Phase

The Outline Construction Management Plan (OCMP) prepared by OCSC Consulting Engineers outlines a number of potential hazards during construction stage including *inter alia*: water pollution, noise and vibration from machinery, hazardous and contaminated materials, construction traffic, crane movements, adverse weather conditions and contamination/disturbance from dust and dirt. The Site Specific Flood Risk Assessment, also prepared by OCSC, outlines a number of potential flood risk categories including, tidal, fluvial, pluvial, and groundwater.

Other relevant potential risks at construction stage relate to traffic accidents, mechanical failure, explosions, fire and building/scaffold collapse.

19.6.2 Operational Phase

The operational phase of the proposed scheme will comprise a residential development with ancillary commercial uses in an urban setting.

The main potential risks associated with the operational phase of the proposed development are fire, adverse weather events, flooding and building collapse. The Site Specific Flood Risk Assessment prepared by OCSC addresses a number of potential flood risk categories including, tidal, fluvial, pluvial and groundwater.

The proposed uses comprise 335 residential units with associated support facilities, café, childcare and commercial units. These uses are considered normal hazard fire risks as would be encountered in most developments and do not include any hazards which would be regarded as presenting an exceptional environmental fire hazard.

19.6.3 'Do Nothing' Scenario

The potential risk of Major Accidents at the subject site in a 'do nothing' scenario would be low due to the existing buildings on site not being redeveloped and the lack of potential receptors.

19.7 Mitigation Measures

Construction of the proposed development in accordance with the OCMP submitted with this application will reduce the risk of accidents during construction to acceptable levels.

19.7.1 Construction Phase

The proposed development will be constructed in accordance with current best practice and as such appropriate mitigation regarding the risk of major accidents and/or disasters will be employed throughout the design stage.

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2019. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2021 from Dublin City Council/Dublin Fire Brigade.

Provision of fire rated walls and floors to restrict the spread of fire within and between buildings in accordance with relevant design guidance e.g. Technical Guidance Document B, and BS9999. These measures will, in conjunction with the provision of automatic fire suppression in the blocks containing open plan apartments, serve to control/limit the size of conflagrations.

Use of materials which do not support fire spread with particular reference, *inter alia*, to internal wall and ceiling linings and external wall cladding. With specific reference to the latter it is noted that the external walls of the new blocks will all comprise an inert masonry outer skin. Accordingly, there is negligible risk of the external surfaces acting as path of vertical fire spread as might arise with combustible external surfaces.

19.7.2 Operational Phase

During operation, the provision of early warning fire detection systems will ensure the earliest possible intervention in the event of fire occurrence. Facilities to assist the fire service including fire-fighting shafts, dry rising mains, and external fire hydrants will be provided. It is anticipated, having regard to the nature of the proposed uses and the extent of fire-sub-division/compartimentation which will be provided that the quantity of firefighting water which would be deployed would be in the lower end of the range of application rates i.e. of the order of 20-35L/sec.

19.8 Predicted Impact of the Proposed Development

It is noted that the proposed development has been designed in accordance with best practice and can be safely constructed without significant risk to human health and the environment. The following risk register has been prepared in accordance with the methodology outlined previously in this Chapter, in order to identify the main hazards relevant to the proposed development, their likelihood of occurring, the impact of such hazards and the associated risk rating for each item.

Table 19.5: Major Accidents and/or Disasters Reviewed

Risk no.	Major Accident/ Disaster Category	Hazard Type	Description	Likelihood	Potential Receptor	Impact	Risk Rating	Comments/Mitigation
1	Meteorological	Storm/Severe Gales/Heavy Snow	There is a risk of injury and damage to property as a result of extreme weather events	Likely	Proposed development, future residents and visitors	Limited	8	The proposed development does not have any characteristics that would make it more susceptible to extreme weather events than any other development.
2	Hydrological	Flooding	Addressed in Site Specific Flood Risk Assessment	Likely	Proposed development, future residents and visitors	Limited	8	Predictive flood maps show indications of risk of fluvial and pluvial flooding to the proposed development, however due to the new surface water network which will be constructed as part of the development, the risk of flooding is low. The undercroft car parking will be sealed to ensure protection against any risk of fluvial flooding.
3	Geological	Made Ground, Landslide	Unstable sediment can result in landslides/disturbance with a risk of injury to persons and damage to property	Very Unlikely	Proposed development, future residents and visitors	Limited	6	Impacts on Land, Soils, Geology and Hydrogeology are addressed in Chapter 7 of this EIAR which states that no significant effects were noted based on the assessment of the proposed development.
4	Road /Construction Accident	Construction Incident/ Traffic Accident	There is a risk of fuel spillage during construction phase as fuel and other oils are readily available on construction sites. Fuel spillage could impact on soils and hydrology. The operational phase will lead to increased traffic activity which may increase the likelihood of traffic accidents.	Unlikely	Road users, land, soils and hydrology	Limited	6	The OCMP has identified the requirement for fuels to be stored in bunded areas, fuel containing equipment to be placed on drip trays and spill response measures including spill kits.

Risk no.	Major Accident/ Disaster Category	Hazard Type	Description	Likelihood	Potential Receptor	Impact	Risk Rating	Comments/Mitigation
5	Industrial Accident/ Explosion	Explosion, pipeline incident, gas/fluid emissions	Risk of electric shock/explosion working on medium and low voltage lines.	Unlikely	Both the ESB and electrical contractor will be working on this project along with the general building contractor.	Low to High	6	There will be 3 no new ESB LV sub-stations required to service the residential apartments, ancillary areas and site, including EV charging facilities. The sub-stations will be located in blocks B02, B03 & B04. The ESB sub-stations will be serviced from a new ESB supply entering the site from the South Circular Road. The Contractors will provide the ducting and enabling works to facilitate the installation of the Electrical infrastructure by the ESB. All ducts and sub-stations will be installed and constructed to ESB technical guidance details and inspected and approved prior to installation.
			Risk of explosion and damage to gas lines during both general site works and breaking into existing gas lines for new services to the site.	Unlikely	Works to Gas lines will be undertaken by Gas Networks Ireland approved contractors. Also the general building contractor will work in their vicinity.	<u>Low impact:</u> interruption of supply <u>High impact:</u> Risk of injury or death	6	A new Gas Networks supply will be provided to service the residential apartments and ancillary areas. The new supply will enter the site from the South Circular Road. The Contractors will provide the enabling works to facilitate the installation of the Gas Pipework infrastructure by Gas Networks Ireland. All trenches and pipework will be installed and constructed to GNI technical guidance details and inspected and approved prior to installation.
6	Fire	Construction and Operation	All buildings are susceptible to the risk of fire. The risk of fire inside the proposed development could lead to the loss of life and damage to property.	Unlikely	Proposed development, future residents, visitors and nearby properties.	Limited	6	The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2019. The design of the proposed

Risk no.	Major Accident/ Disaster Category	Hazard Type	Description	Likelihood	Potential Receptor	Impact	Risk Rating	Comments/Mitigation
								development will incorporate early warning fire detection systems and facilities to assist the fire service such as protected shafts and external fire hydrants.
7	Building Collapse	Structural Failure	The proposed scheme includes the construction of structures up to 9 storeys above ground and a basement below which could lead to fatalities in a building collapse.	Very Unlikely	Proposed development, residents, staff and visitors	Very Serious	8	The proposed development will be designed by an accredited engineering firm in accordance with the applicable structural and geotechnical design manuals and Building Regulations.
8	Pollution	Air Quality Events, Hazardous Substances Release	The proposed development has the potential to have an impact on ambient air quality in a number of ways including dust emissions, soil disturbance (i.e. stockpiling and haulage) and increased traffic movements. Hazardous substances such as fuel, oils and lubricants stored on site during construction could leak during a spill.	Very Unlikely	Nearby residents, properties, staff and visitors.	Minor	2	Chapter 12 of this EIAR addresses the impact of the proposed development on Air Quality and concludes that the impact on air quality and climate is considered insignificant and imperceptible. When the dust minimisation measures are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.
9	Epidemic and Pandemic	Viral Pandemic	Risk of construction staff, residents, operational staff and visitors contracting a pandemic virus.	Likely	Construction staff, residents, visitors and operational staff	Very Serious	8	Notwithstanding adherence to Health and Safety Legislation including the Safety, Health and Welfare at Work Act 2005, implementation of Dublin City Council's 'Major Emergency Plan', National Plans such as the Framework for Major Emergency Management and Public Health Advice in relation to Covid-19, the nature of the proposed development makes its vulnerable to a viral pandemic, such as Covid-19. Once complete the proposed development will provide self-contained residential units designed to facilitate 'self-isolation' and to address the requirements related to Infection Prevention and Control.

Table 19.6: Risk Evaluation

			Impact / Consequence				
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
Likelihood	Extremely Unlikely	1					
	Very Unlikely	2	8	3		7	
	Unlikely	3		2, 4, 5, 6			
	Likely	4		1		9	
	Very likely	5					

Table 19.6 provides a visual representation of the risk ratings for each hazard identified following the risk assessment outlined in Table 19.5. The red zone represents ‘high risk’ scenarios, orange; ‘medium risk’ scenarios with green representing ‘low risk’ scenarios. Extreme weather events and building collapse are the only hazards with a moderate risk rating.

19.9 Monitoring

The Construction Manager will be responsible for ensuring the proper implementation of the mitigation measures identified in the EIAR, OCMP and planning conditions attached to any potential Grant of Permission.

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2019. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2021 from Dublin City Council/Dublin Fire Brigade.

19.10 Reinstatement

Reinstatement of the proposed development is not required.

19.11 Interactions and Potential Cumulative Impacts

19.11.1 Interactions

There are potential interactions with Population and Human Health, Biodiversity, Air Quality, Land and Soils, Hydrology, Material Assets, Traffic and Transportation deriving from the risk of major accidents and/or disasters however, these interactions are not expected to be significant.

19.11.2 Potential Cumulative Impacts

The cumulative impact of the proposed development, together with other existing and proposed projects on the Risk of Major Accidents is considered to be long term and insignificant.

Subject to the implementation of mitigation measures set out in this EIAR, there are no identified potential major accidents and/or disasters that present a sufficient degree of risk resulting in significant negative impacts and/or environmental effects deriving from its vulnerability to such major accidents and/or disasters.

19.12 References

- Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out EIA (DHPLG, 2018).
- The EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, draft 2017).
- A Framework for Major Emergency Management Guidance Document 1: A Guide to Risk Assessment in Major Emergency Management (DEHLG, 2010).
- A National Risk Assessment for Ireland (Department of Defence, 2017).
- National Risk Assessment Overview of Strategic Risks (Department of The Taoiseach, 2017).
- Major Emergency Plan (Dublin City Council, 2015).
- Causes of Fire Attended by Brigades (DHPLG, 2015)



Chapter 20. Interactions and Cumulative Impacts

20.0 Interactions and Cumulative Impacts

20.1 Introduction

This chapter describes the interactions between the environmental factors highlighted throughout this EIAR and also provides a summary of the likely significant effects of the proposed development on the environment as a result of cumulative impacts.

This Chapter was prepared by Brian Maher, Heather McMeel and Noel Cronin of Avison Young, Town Planning Consultants. Brian Maher, Associate Director, holds accreditations in architectural technology and town planning. Brian specialises in town planning, urban design, masterplanning, regeneration, design intervention studies and heritage evaluation, and has over 30 years of experience of working in the planning, architectural and urban design sectors. Heather McMeel, Senior Planner, holds a B.A in Political Science and Geography from Trinity College Dublin and an MSc in Real Estate and Planning from Heriot Watt University. Heather is a member of the Royal Town Planning Institute and has over 5 years' experience in planning and development. Noel Cronin, Planner, holds a Bachelor of Social Science from University College Cork, as well as a Masters in Planning and Sustainable Development from University College Cork. Noel has 4 years postgraduate experience in planning and development.

The EIA Directive (2011/92/EU, amended by 2014/52/EU) requires that the environmental assessment identifies, describes and assesses the interactions between the environmental factors, as outlined in Article 3 of the EIA Directive which states the following:

“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).**”*

(Emphasis added)

This chapter also describes the likely significant effects of the proposed development on the environment as a result of cumulative impacts. Annex IV of the EIA Directive outlines

information required for any EIAR and includes the following in relation to cumulative impacts:

“5(1) 5. A description of the likely significant effects of the project on the environment resulting from, inter alia:

- a) the construction and existence of the project, including, where relevant, demolition works;*
- b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;*
- c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;*
- d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);*
- e) **the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources”***

(Emphasis added)

The Environmental Protection Agency's Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA draft, 2017) provides guidance in relation to identifying cumulative effects and in this regard, it states that:

“The interactions between impacts on different environmental factors should be addressed as relevant throughout the EIAR. For example, where it is established in the Hydrology section that there will be an increase in suspended solids in discharged surface waters during construction, then the Biodiversity section should assess the effect of that on sensitive aquatic receptors. Close co-ordination and management within the EIA team is needed to ensure that interactions are adequately addressed throughout an EIAR.

It is general practice to include a matrix to show where interactions between effects on different factors have been addressed. This is usually done using the actual headings used in the EIAR if these differ from the factors contained in the Directive (ref section 3.3.6). This is typically accompanied by brief text describing the interactions¹.”

¹ The EPA Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA draft, 2017), pg. 57.

20.2 Methodology

The Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out EIA (DHPLG, 2018) and the EPA Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA draft, 2017) informed the preparation of this Chapter. It is noted that the interactions between the impacts on the various environmental factors are addressed in detail in the relevant chapters throughout this EIAR.

Close co-ordination and management within the EIA Team was carried out to ensure that interactions were adequately addressed throughout the EIAR. Following completion of the relevant chapters in this EIAR, a matrix was produced to show where interactions between effects on different factors occur (see Table 20.1). This has been done using the chapter headings within this EIAR and presents any interaction during the Construction and Operational Phases of the proposed development.

20.3 Interactions

20.3.1 Population and Human Health

There are several inter-related environmental factors described throughout this EIAR which interact with Population and Human Health. During the construction and operational stages, Air Quality and Climate, Noise and Vibration, Landscape and Visual Impacts, Waste Management and Wind Microclimate are the main environmental factors which may impact on Population and Human Health.

20.3.1.1 Air Quality and Climate

The potential for interaction between Population and Human Health and Air Quality and Climate occurs primarily during the construction phase of development. The implementation of mitigation measures will be required where construction and demolition related activities have the potential to impact on human health. Adherence to these measures will ensure that the impacts on human health will be short-term, negative and imperceptible during the construction phase, and long-term, neutral and imperceptible during the operational phase.

20.3.1.2 Noise and Vibration

The interaction with Noise and Vibration occurs primarily in the construction phase where measures have been outlined to mitigate against the possibility of significant impacts on human health. Adherence to these measures will result in impacts which are short-term, slight to moderate and negative in nature.

20.3.1.3 Landscape and Visual Impact

Population and Human Health interacts with Landscape and Visual Impact as the introduction of a new residential component to the city, providing 335 no. new homes, a crèche, a cafe, and public open space, would have a positive impact for the future residents. The high architectural and landscape quality of the development would also have a positive impact on the surrounding townscape.

20.3.1.4 Waste Management

The Waste Management Chapter notes the potential impact on Population and Health during the construction and operational stages, however adherence to the mitigation measures outlined in Chapter 11 will result in a long-term, imperceptible and neutral impact.

20.3.1.5 Wind Microclimate

The Wind Microclimate Chapter notes that the proposed development is predicted to have a positive impact on Population and Human Health due to the increase in area determined to be 'suitable for sitting' and also the increase in the quantity and quality of amenity space which will be suitable for long term seated use.

20.3.2 Biodiversity

Biodiversity interacts with several environmental factors including Land and Soils, Noise and Air Quality and Climate. Changes to these environmental factors could result in significant impacts on biodiversity including those outlined below.

The potential significant impacts on biodiversity arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

20.3.2.1 Land and Soils

Works during the construction phase have the potential to impact the water resources with risk of surface water run off, suspended solids and potential effects on the habitats and species associated with the Grand Canal adjacent to the project site.

20.3.2.2 Noise & Air Quality

Works during the construction phase have the potential to give rise to increases in noise and air emissions with impacts on air quality, water quality and disturbance to species during daytime hours.

20.3.3 Land & Soils

Chapter 7 Land & Soils considers the likely interactions with other environmental factors and it is noted that there are interactions between site preparatory works in the construction phase having a potential impact of waste management and the potential for accidental leaking of sewage, fuel, oil, etc. during the operational phase. The potential significant impacts on land & soils arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

20.3.4 Hydrology

As outlined in Chapter 8 of this EIAR notes that during the construction phase there would be interactions with Land & Soils and Built Services. In the absence of mitigation, these may give rise to significant effects.

The potential significant impacts on water and hydrology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

20.3.4.1 Land & Soils

Site preparatory works (i.e. site clearance, re-profiling etc.) during the construction stage have the potential to impact the hydrology and hydrogeology due to the risk of suspended solids becoming entrained in surface water runoff and accidental spills etc.

20.3.4.2 Material Assets: Built Services

The construction of the proposed services (water supply, drainage etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids run off. During the operational phase, there will be an increased demand on potable water supply and on the municipal drainage system.

20.3.5 Material Assets: Built Services

Material Assets: Built Services has the potential to interact with Biodiversity, Land & Soils, Hydrology and Population and Human Health. These potential effects have been reviewed within their respective chapters and, with the implementation of mitigation measures, the potential for significant impacts are minimised.

20.3.5.1 Population and Human Health

The proposed utilities services connections are sized to provide adequate power and connectivity to all areas of the site with the capacity included for future expansion, such as EV charging to all car parking spaces. Therefore, the proposed development is predicted to have a positive interaction with population and human health.

20.3.6 Material Assets: Transportation

Material Assets: Transportation interacts with Noise (Chapter 13) and Air Quality and Climate (Chapter 12) through the increased levels of traffic resulting from the proposed development.

20.3.7 Material Assets: Waste Management

Waste Management interacts with Land & Soils, Transportation and Population and Human Health as outlined in the below.

20.3.7.1 Land & Soils

During the construction phase, excavated soil, stone, clay and made ground (c. 10,000 m³) will be generated from the excavations required to facilitate site levelling and the construction of new foundations. Adherence to the mitigation measures in Chapter 11 and the requirements of the RWMP (Appendix 11.1), will ensure the effect is long-term, imperceptible and neutral.

20.3.7.2 Transportation

The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase. Provided the mitigation measures detailed in Chapter 10 and the requirements of the OWMP (included as Appendix 11.2) are adhered to, the predicted effects are short to long-term, imperceptible and neutral.

20.3.7.3 Population and Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. Adherence to the mitigation measures will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be long-term, imperceptible and neutral.

20.3.8 Air Quality and Climate

As outlined in Chapter 12, Air Quality does not have a significant number of interactions with other topics. The most significant interactions are between Population and Human Health and Air Quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short term and imperceptible in the construction phase and long term and imperceptible in the operational phase.

Interactions between Air Quality and Traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

There is the potential for air quality to interact with ecology as a result of dust emissions impacting vegetation and the high sensitivity nature of the ecological area surrounding the site. There is at most a high risk of dust impacts affecting vegetation during the demolition works and a low risk during construction works. Provided the dust mitigation measures associated with a high level of dust control are implemented on site, impacts to ecology from dust emissions will be short-term, localised, negative and imperceptible.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. No other significant interactions with air quality have been identified.

20.3.9 Noise and Vibration

The potential interaction between Noise and Vibration and other chapters in the EIAR is primarily limited to Transportation and Population and Human Health. Chapter 13 – ‘Noise and Vibration’ has been prepared in consideration of, and in conjunction with, the relevant outputs of the Material Assets: Transportation and Population and Human Health Chapters.

20.3.9.1 Population and Human Health

The potential impacts on human beings in relation to the generation of noise and vibration during the construction phases are that high levels of noise and vibration could cause a degree of nuisance to people in nearby sensitive locations. Implementation of the mitigation measures set out and adherence to good practice noise reducing measures will ensure that the residual impact on human health will be lessened.

Similarly, during the operational phase, plant selections designed to achieve the relevant noise criteria will result in a residual impact that is imperceptible to people in nearby noise sensitive locations.

20.3.10 Daylight, Sunlight and Overshadowing

There is the potential for Daylight, Sunlight and Overshadowing to interact with Biodiversity regarding the potential for light spill in sensitive locations, however, the lighting design for the project has been designed to ensure that this will not impact on these areas.

20.3.11 Wind

In relation to Chapter 15, the proposed development has been determined to increase the area which is “Suitable for Sitting”. This results in an increase in the quantity and quality of amenity space which will be suitable for long term seated use. Therefore, the proposed development is predicted to have a positive interaction with population and human health.

20.3.12 Landscape and Visual Impact Assessment

Chapter 16 of the EIAR notes that the development will result in a change to the visual environment of the area and the landscape and visual impacts of the development will result in long term, positive interactions with Population and Human Health, Material Assets and Cultural Heritage.

20.3.13 Cultural Heritage – Archaeology

Archaeology has an interaction with Chapter 18 – 'Cultural Heritage – Architectural Heritage' and this chapter is cross-referenced, where applicable, in order to prevent the replication of information. A full analysis of the architectural heritage resource, along with impacts and mitigation, is provided in Chapter 18.

20.3.14 Cultural Heritage – Architectural Heritage

As outlined in Chapter 18, where the development results in a change to the setting of built heritage in the surrounding area, the landscape and visual impacts of the development will result in interactions with Population and Human Health, Landscape and Visual Character, Material Assets and Cultural Heritage. No significant impacts resulting from interactions are identified.

20.3.15 Risk Management

The risk of major accidents and/or disasters has the potential to interact with Population and Human Health, Biodiversity, Air Quality and Climate, Land and Soils, Hydrology, Material Assets: Built Services and Material Assets: Transportation. However, these interactions are not likely to be significant. The proposed development has the potential to be vulnerable to fire and flooding which would interact with Population and Human Health (future residents/visitors/staff), Air Quality (due to smoke and ash) and Biodiversity (as a result of habitat loss), however, subject to the mitigation measures outlined in Chapter 19 – 'Risk Management', the vulnerability of the proposed project to risk of fire and flooding is not expected to be significant.

All of the interactions outlined above are identified from the Major Accidents and/or Disasters reviewed in Chapter 19 (Table 19.5), and it is noted that none of the impacts deriving from the risk of major accidents and/or disasters are expected to be significant.

Table 20.1: Matrix Showing Interactions between Environmental Factors

Interactions	Population and Human Health		Biodiversity		Land & Soils		Hydrology		Material Assets: Built Services, Transportation & Waste		Air Quality & Climate		Noise and Vibration		Daylight, Sunlight & Overshadowing		Wind		Landscape & Visual Impact		Architectural and Archaeological Heritage		Risk Management	
	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op
Population and Human Health									✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
Biodiversity					✓		✓	✓			✓		✓		✓	✓							✓	✓
Land & Soils			✓				✓	✓	✓	✓													✓	✓
Hydrology			✓	✓	✓	✓			✓	✓													✓	✓
Material Assets: Built Services, Transportation and Waste	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓					✓	✓			✓	✓
Air Quality & Climate	✓	✓	✓		✓	✓			✓	✓									✓					
Noise and Vibration	✓	✓	✓						✓	✓														
Daylight, Sunlight & Overshadowing			✓	✓																				
Wind	✓	✓																						
Landscape & Visual Impact	✓	✓							✓	✓											✓	✓		
Architectural Heritage Archaeology Heritage	✓	✓							✓	✓									✓	✓				
Risk Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓										

Con	Construction Phase
Op	Operational Phase
✓	Interaction

20.4 Cumulative Impacts

This section provides a summary of the cumulative impacts considered throughout this EIAR. The EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (draft, 2017) defines 'Cumulative Effects' as:

*"The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects."*²

The cumulative impacts of the proposed development in combination with other relevant existing or approved projects have been considered to determine whether these would give rise to significant impacts on the environment.

The assessment of the likely cumulative effects requires knowledge of the likely effects of all other relevant existing or permitted projects. The assessment in this instance focuses primarily on existing and permitted projects in the vicinity of the proposed development, although the extent of projects considered varies in each chapter depending on the relevant receptors and sensitivities of the environmental factors therein.

It is noted that cumulative effects in relation to, *inter alia*: 'Land Use Zoning', 'Quality Housing', 'Shape and Structure of the City', 'Sustainable Communities and Neighbourhoods' have been considered for Dublin City at a higher level through the Strategic Environmental Assessment (SEA) for the Dublin City Development Plan 2016-2022. The potential cumulative/in combination adverse environmental effects as a result of the Development Plan have been identified in the SEA and it is noted that mitigation measures have been incorporated into the Development Plan to reduce these impacts.³

Any predicted cumulative impacts arising from the proposed development in combination with other existing and permitted projects are outlined in the various chapters throughout this EIAR.

Table 20.2 outlines the developments considered for their cumulative effects in this EIAR, however other developments may also have been assessed depending on the relevant sensitivities and receptors identified in each chapter.

² Guidelines on Information to be Contained in Environmental Impact Assessment Reports, EPA, (draft 2017)

³ Dublin City Development Plan 2016–2022: Strategic Environmental Assessment, page 264.

Table 20.2: Other Existing and Permitted Projects

Reg. Ref.	Location	Brief Description	Decision
ABP Ref. No. 307221	Former Bailey Gibson Site, 326-328 South Circular Road, Dublin 8.	Strategic Housing Development Application. Demolition of all structures, construction of 416 no. residential units (4 no. houses, 412 no. apartments) and associated site works.	ABP Granted Permission on 14/09/2020.
ABP Ref. No. 308917	Former Player Wills site and undeveloped Land in Ownership of Dublin City Council, South Circular Road, Dublin 8.	Strategic Housing Development Application. Demolition of all buildings excluding the original fabric of the former Player Wills Factory, construction of 492 no. Build to Rent apartments, 240 no. Build to Rent shared accommodation along, creche and associated site works.	ABP Granted Permission on 15/04/2021
DCC Reg. Ref. 3537/21	The Coombe Women and Infants University Hospital, Dolphin's Barn Street, Dublin 8, D08 XW7X	Planning permission sought for the development of a new dedicated Colposcopy / Women's Health Unit building of 3 no. storeys plus rooftop plant room which will be attached to the existing Colposcopy building to the west by way of glazed link.	DCC Granted Permission on 10/03/2022

20.4.1 Population and Human Health

In a worst case scenario, where all of the above developments undertake construction at the same time, there could be a cumulative impact on Population and Human Health resulting from increased levels of dust, noise and construction traffic. Subject to the implementation of the mitigation measures in the OCMP prepared by OCSC, the impacts of the proposed development in relation to dust and noise are expected to be slight, neutral and localised in scale.

There are no significant negative impacts envisaged in relation to Population and Human Health as a result of the proposed development in combination with other existing or approved projects in the local or wider area.

The proposed development, in combination with the delivery of permitted and proposed residential units in the region will contribute significantly to achieving the housing targets set out in the NPF and a sustainable, functioning supply of residential accommodation on a local and regional scale.

20.4.2 Biodiversity

As outlined in Chapter 6, the phasing/commencement of any other permitted developments in the locality could potentially result in the scenario where a number of other construction sites are in operation at the same time as the proposed development. The location of any other nearby construction sites in relation to each other and to nearby biodiversity receptors including fauna such as birds and mammals and freshwater habitats supported by the Grand Canal, will have the potential to combine to result in a cumulative risk of impacts due to cumulative loading of noise disturbance to fauna or sediment and wet concrete in surface water runoff to the river. There is a general low risk of cumulative impacts resulting in significant negative noise disturbance effects to fauna in the area.

The operational phase of the project will not have the potential to result in significant noise emissions and as such there will be no potential for this phase of the development to result in cumulative negative impacts to biodiversity receptors as a result of noise emissions.

The lighting design for the project has been prepared to ensure that light spill in sensitive locations to the south of the project site along Grand Canal is avoided. In light of this the project will not have the potential to combine with other projects to result in cumulative light pollution in these areas to the north of the project site.

The surface water management design for the project will ensure that the project will not have the potential to result in the discharge of contaminated surface water to the Grand Canal and this will eliminate the potential for the project to combine with other sources of surface water pollution to the Grand Canal.

20.4.3 Land, Soils, Geology & Hydrogeology

As outlined in Section 7.12 of this EIA, the residual impact from the developments identified in Table 20.2 on land and soils was determined to be negative, imperceptible, and permanent.

20.4.4 Hydrology

Chapter 8 notes that taking account of the overall environment prior to the development of the White Heather Industrial Estate to date, the potential cumulative impacts may be considered to be Moderate and Long-term impacts.

Any such new developments in the surrounding area (such as the Bailey Gibson and Player Wills developments) would be required to provide sustainable drainage systems, designed to reduce flow rates to greenfield equivalent and reduce overall discharge volumes, while

improving the discharge quality. Wastewater and water supply impacts would be subject to similar Pre-Connection Enquiry process and approval with Irish Water. Therefore, the cumulative impact of new developments in the vicinity of the subject development would likely have just a minor but sustainable impact on the receiving environment.

Any redevelopment in the area complying with current best-practice methods will likely lead to an improvement in surface water runoff conditions, similar to the subject proposed development.

20.4.5 Material Assets: Built Services

Regarding Chapter 9, taking account of the environment surrounding White Heather, the potential cumulative impacts are considered to be moderate and long term. Any such new developments in the surrounding area (such as the Bailey Gibson and Player Wills developments) would be required to provide sustainable drainage systems, designed to reduce flow rates to greenfield equivalent and reduce overall discharge volumes, while improving the discharge quality.

The impact of the local Player Wills and Baily Gibson sites has been considered by the Utilities providers in their assessment of the local capacity to service the proposed White Heather development. The potential cumulative impacts of the development on utilities infrastructure are slight.

20.4.6 Material Assets: Transportation

In relation to the construction phase, a CTMP will be implemented on all sites which will ensure that the impact of the construction traffic will be minimised and can be expected to be negative, slight and short-term. The impact will be local and broadly limited to the South Circular Road.

Regarding the operational phase, capacity analysis at the access junction demonstrates that the junction will continue to operate with significant residual capacity in the future year scenarios, taking committed developments into account. With the MMP in place the car mode share should be reduced further. Therefore, the operational impact of the combined Masterplan lands is considered to be at worst, negative, slight and long-term but confined to the local network. This is considered 'not significant' overall.

20.4.7 Material Assets: Waste Management

The Waste Management chapter notes a number of SHD applications within the Dublin region and highlights that given the high number of waste contractors also operating in this region, there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be short-term, not significant and neutral.

With reference to the operational phase, other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a long-term, imperceptible and neutral.

20.4.8 Air Quality and Climate

Cumulative construction phase impacts will result from dust emissions impacting people and property within 350m of the proposed development site and neighbouring sites. Impacts are predicted to be negative, short-term and imperceptible at nearby receptors once the best practice dust mitigation measures are implemented.

Operational phase impacts involve an increase in traffic related pollutants in the local area. The traffic data for the proposed development in conjunction with other nearby permitted and proposed developments was found to have an imperceptible, neutral and long-term impact on local air quality and climate.

20.4.9 Noise and Vibration

Chapter 13 notes that should another construction site become active in proximity to the proposed development, there is the possibility that cumulative noise impacts could occur at sensitive receptors that are equidistant to both 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 impacts on nearby sensitive receptors.

In the context of the operational phase, permitted developments are included in the traffic impact and therefore the potential for a cumulative impact has been assessed.

20.4.10 Daylight, Sunlight and Overshadowing

Chapter 14 makes reference to the Bailey Gibson and Player Wills developments and notes that, in consideration of their location and distance in relation to the proposed development site, they have not been considered relevant for consideration in terms of a cumulative assessment relating to daylight, sunlight and overshadowing.

20.4.11 Wind

Chapter 15 notes that through CFD analysis of the proposed development and its interactions with its receiving environment, it has been determined that although the proposed development alters wind and airflow across its own site and immediate vicinity, this does not extend past the White Heather site boundaries, or beyond to the Bailey Gibson or Player Wills sites. From a wind and airflow perspective, the interaction between the proposed development and these two nearby developments is minimal.

As a result of this, the proposed development is not predicted to impact the wind environment at the Bailey Gibson or Player Wills sites. Therefore, there are unlikely to be significant potential cumulative impacts on wind microclimate.

20.4.12 Landscape and Visual Impact

Chapter 16 notes that following a review of the online planning register, there were no developments identified which were not under review by the courts which, in combination with the development now proposed, would have the potential to result in material cumulative impacts on the visual environment surrounding the application site.

20.4.13 Cultural Heritage – Archaeology

The archaeological assessment as part of Chapter 17 noted that with regard to proposed and permitted developments in the environs of the proposed development, no potential significant cumulative impacts on the archaeological and cultural heritage resource have been identified.

20.4.14 Cultural Heritage – Architectural Heritage

No potential significant cumulative effects have been identified which will impact on Architectural Heritage.

20.5 Conclusion

This chapter provides a summary of the potential impacts arising from interactions between the various environmental factors described throughout this EIAR. The cumulative effects of the proposed development in combination with other existing and permitted projects have also been identified. There is potential for a range of interactions between the various environmental factors, however, subject to the mitigation measures outlined in this EIAR, these interactions are not likely to give rise to significant adverse effects.

The cumulative impacts of the proposed development in combination with other relevant existing or approved projects have been considered to determine whether these would give rise to significant impacts on the environment. No significant adverse impacts have been identified as a result of the proposed development in combination with other existing or permitted developments.

